Fire & Rescue NSW
Standard Operational Guidelines

Version 15

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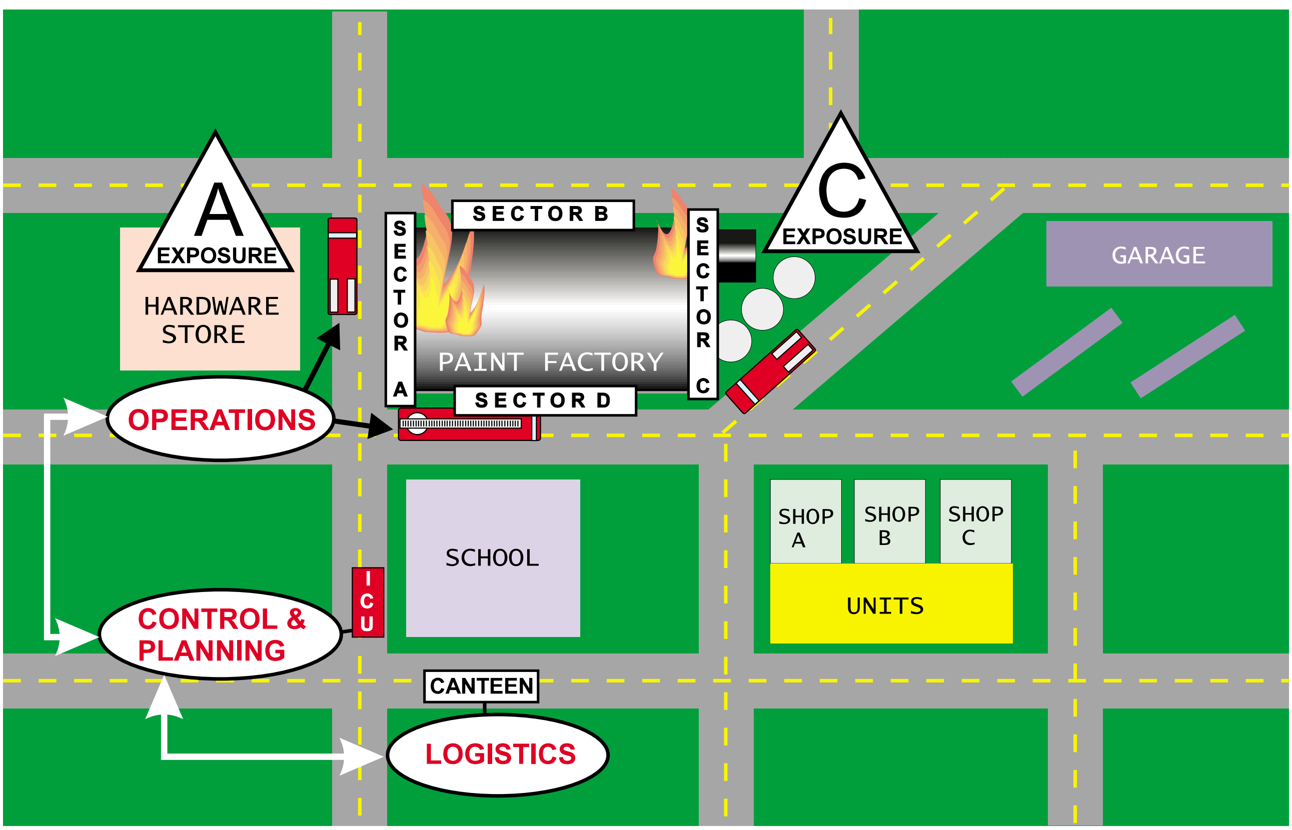
NSW FIRE BRIGADES

Standard Operational Guidelines

INCIDENT CONTROL SYSTEM



Section One

1 INCIDENT CONTROL SYSTEM

1.1 Introduction

1.1.1 The Incident Control System (ICS) is used by the NSWFB as a standard method for managing all types of emergency incidents. The NSWFB Standard Operational Guidelines (SOGs) for ICS are based on the ICS developed for the Australian Inter-service Incident Management System.

1.2 Application

1.2.1 ICS is to be used to manage operations at all emergency incidents attended by the NSWFB.

1.2.2 At major incidents involving other services, ICS procedures will be used by the NSWFB to manage and command NSWFB operations. ICS is also used by other services to manage major wildfire fighting operations.

1.3 ICS Components

1.3.1 There are four main components of ICS:

- Control - taking charge of an incident and developing strategies;
- Operations - commanding tactical deployment;
- Planning - gathering information upon which strategies and tactics are based; and
- Logistics - providing non-operational support, including food and fuel etc.

1.4 Control

1.4.1 The Incident Controller is the NSWFB Officer-in-Charge (OIC) of the incident. SOG No 1.7 describes how the Incident Controller builds up a control organisation while maintaining an effective span of control.

1.4.2 The role and responsibilities of the Incident Controller are detailed in SOG No 1.2.

1.5 Operations

1.5.1 At medium to large incidents the Incident Controller may appoint an Operations Officer to command the tactical deployment of resources at the incident. The role and responsibilities of the Operations Officer are detailed in SOG No 1.3.

1.6 Planning

1.6.1 A Planning Officer may be required at large or complex incidents. The role and responsibilities of the Planning Officer are detailed in SOG No 1.4.

1.7 Logistics

Logistical support for an incident may be handled by the Incident Controller or can be devolved to a Logistics Officer. The role and responsibilities of the Logistics Officer are detailed in SOG No 1.5.

1.8 Safety

Safety is a priority for all personnel at the incident. At complex incidents or incidents involving more than four appliances, the Incident Controller may appoint a Safety Officer. The Safety Officer's powers and responsibilities are detailed in SOG No 1.6.

1.9 Staging

The Incident Controller may decide to use a staging area for appliances and other resources in order to reduce congestion at the incident. At high rise incidents, the Incident Controller may establish a staging area within the building for personnel and equipment. This process is detailed in SOG No 1.8.

1.10 Other Functions

The Incident Controller may find it necessary to appoint people to other positions to support operations. Examples of some of these positions include:

- **Evacuation Officer** - high rise and multiple occupancy fires/incidents;
- **Lobby Control Officer** - controls access to the building during high rise incidents;
- **Rehabilitation Officer** - organises food, drink and rest for crews during prolonged and demanding incidents;
- **Water Relay Officer** - oversees the establishment of relay pumping operations and water supplies;
- **Hazard Control Officer** - acts as Safety Officer at HazMat incidents, and controls access to the combat zone; and
- **Decontamination Controller** - controls the decontamination of personnel and equipment at a HazMat incident.

2 INCIDENT CONTROLLER

2.1 Introduction

2.1.1 The Incident Controller is the NSWFB OIC of an incident.

2.2 Application

2.2.1 The Incident Controller determines the overall strategy, sets objectives, and develops the incident action plan. At minor incidents, the Incident Controller directly supervises the performance of tasks. At larger incidents, the Incident Controller delegates functions to other officers in order to maintain an effective span of control.

2.3 Responsibilities

2.3.1 It is the Incident Controller's responsibility to:

- assume control on arrival at an incident, and implement the Incident Control System (ICS);
- establish a Control Point and assign a radio callsign;
- size up the incident;
- determine strategies and set objectives for controlling the incident;
- consider tactical priorities;
- develop an incident action plan;
- deploy resources and assign tasks in accordance with the incident action plan and SOGs;
- monitor the safety and welfare of all personnel at the incident;
- request additional resources;
- send communications from the Control Point to the Fire Command Centre;
- maintain communications with all personnel at the incident through the chain of command;
- maintain an effective span of control by delegating functions using ICS;
- establish contact with other services, utilities, property owners and occupants;
- continuously seek additional information about the incident;
- review, evaluate and revise the incident action plan;

- ensure continuity of control and its efficient transfer when necessary;
- ensure that the cause and origin of the incident is investigated; and
- terminate the incident.

2.4 Identification

2.4.1 At large incidents the Incident Controller is identified by a reflective vest (tabard), and should control operations from the Control Point.

2.4.2 At incidents where control is vested by law in another emergency service, the OIC of the NSWFB is called the *NSWFB Commander,* and will wear the appropriate tabard.

2.5 Radio Call Sign

2.5.1 The Incident Controller uses the call sign *Control* along with the geographical location of the incident e.g. Jones Street Control, ICI Control, Engadine Control etc.

2.6 Arrival at Incident

2.6.1 The first arriving officer, regardless of seniority within ranks, takes the position of Incident Controller until the arrival of a more senior officer. Where a member of the Retained Staff arrives first at an incident, control will be passed to the first arriving permanent officer.

2.6.2 After sizing up the incident, the Incident Controller **must** send a situation report (SITREP) to the Fire Command Centre announcing:

- arrival at scene;
- incident conditions;
- whether assistance is required;
- basic strategy being adopted (offensive or defensive); and
- name of incident and location of Control Point.

2.7 Getting to Work

2.7.1 Investigation required

When the first arriving crew needs to investigate the situation in order to determine the nature of the incident, the Incident Controller should go with the crew to investigate, using a portable radio to control the incident.

If, on investigation, the Incident Controller finds a situation that requires immediate action by the crew and the commitment of additional resources, the Incident Controller may transfer control to the second arriving officer.

2.7.2 Fast attack

At incidents which require immediate action from the first arriving crew under the direct supervision of their Crew Leader, he/she should go with the crew. Examples of these situations include:

- offensive fire attacks;
- operations in marginal situations;
- critical search and rescue operations;
- any incident where the safety of personnel is a major concern; and
- obvious working incidents that require further investigation by the Incident Controller.

If the commitment of the Incident Controller to a fast attack strategy means that they cannot give sufficient attention to deploying additional resources, the Incident Controller may transfer control to the second arriving officer.

2.7.3 Stationary Control Point

At incidents where the size, complexity or hazards of the incident require the first arriving officer to adopt a defensive strategy, he/she should use the appliance as the Control Point and deploy arriving resources by radio until relieved by a more senior ranked officer.

The Incident Controller should consider assigning sector and group commanders to facilitate tactical control.

2.8 Establishing A Control Point

2.8.1 Location

When establishing a Control Point, the Incident Controller must consider the following:

- safety of Control Point staff;
- a good vantage point from which to control operations;
- visibility of control point to arriving appliances; and
- access for reporting crews and officers.

The first arriving appliance will be positioned to the best operational advantage and will also be the initial Control Point. Upon assuming control, the first arriving senior officer will determine the most suitable location to position his/her vehicle or Control Unit, which will then take over as Control Point for the incident.

2.8.2 Identification

Once a senior officer takes control, the Control Point is identified by a green flashing light on the senior officer's car or a Control Unit.

⚠ **NOTE**

Only one green flashing light is to be used at an incident.

2.8.3 Additional Control Point Resources

In the Greater Sydney Area (GSA), Control Units will respond to major incidents.

Incident Controllers may also call on additional resources such as:

- **Technical Advisers** e.g. OIC BA/Hazmat, Senior Rescue Instructors, Fire Safety Division, Fire Investigation Unit, or outside experts. Technical Advisers may also be used by the Planning Section;

- **Information/Media Officer** who will be the point of contact for the media and provide information directly from the incident. The Information/Media Officer should be a senior operational officer and will work closely with the NSWFB Public Relations Officer;

- **Liaison Officer** who will be the point of contact for representatives from other services for the communication of NSWFB requirements, and will also establish contact with persons affected by the incident and give them information, support and advice;

- **Communications staff** to handle incident communications; and

- **Administrative staff** to record information and assist generally at very large incidents.

2.9 TRANSFER OF CONTROL

2.9.1 When control is transferred from one officer to another, the officer being relieved must:

- communicate with the relieving officer face to face; and

- hand over the Incident Controller tabard.

2.9.2 Using the tactical worksheet (if available), the officer being relieved will brief the new Incident Controller on:

- incident conditions;

- incident action plan;

- strategies;

- progress in completing tactical objectives;
- safety considerations; and
- deployment of personnel and resources.

2.9.3 The new Incident Controller must conduct his/her own size up and review the incident action plan.

2.9.4 A radio message must be sent to the Fire Command Centre and to personnel at the incident advising them of the transfer of control and of the new Incident Controller's name and rank. The radio callsign for the Control Point should not change throughout the incident.

NOTE

The arrival of an officer senior to the Incident Controller need not necessarily result in the transfer of control. Senior officers may choose not to assume control if in their opinion it is not necessary. If a senior officer then chooses to remain on the scene, they will operate under the direction of the Incident Controller.

INCIDENT CONTROLLER RESPONSIBILITIES CHECK SHEET

The purpose of this Check Sheet is to provide the Incident Controller with a list of his/her responsibilities at the incident ground.

RESPONSIBILITIES

- It is the Incident Controller's responsibility to:
  - ☐ assume control on arrival at an incident, and implement the Incident Control System (ICS);
  - ☐ establish a Control Point and assign a radio callsign;
  - ☐ size up the incident;
  - ☐ determine strategies and set objectives for controlling the incident;
  - ☐ consider tactical priorities;
  - ☐ develop an incident action plan;
  - ☐ deploy resources and assign tasks in accordance with the incident action plan and SOGs;
  - ☐ monitor the safety and welfare of all personnel at the incident;
  - ☐ request additional resources;
  - ☐ send communications from the Control Point to the Fire Command Centre;
  - ☐ maintain communications with all personnel at the incident through the chain of command;
  - ☐ maintain an effective span of control by delegating functions using ICS;
  - ☐ establish contact with other services, utilities, property owners and occupants;
  - ☐ continuously seek additional information about the incident;
  - ☐ review, evaluate and revise the incident action plan;
  - ☐ ensure continuity of control and its efficient transfer when necessary;
  - ☐ ensure that the cause and origin of the incident is investigated; and
  - ☐ terminate the incident.

3 OPERATIONS OFFICER

3.1 Introduction

3.1.1 The Operations Officer is responsible for all Divisions, Sectors, Groups, appliances and crews engaged in tactical operations at an emergency incident.

3.2 Application

3.2.1 An Operations Officer can be appointed at large or complex incidents when the Incident Controller needs to delegate the management of tactical activities in order to maintain an effective span of control.

3.2.2 Operations is always the first function to be delegated by the Incident Controller e.g. when a Superintendent takes over from an Inspector, the Inspector normally becomes Operations Officer. Division, Group and Sector Commanders (if appointed) will then report directly to the Operations Officer.

⚠ **NOTE**

Until an Operations Officer is appointed, the Incident Controller is responsible for carrying out the operations function.

3.3 Responsibilities

3.3.1 It is the responsibility of the Operations Officer to:

- implement the strategies contained in the incident action plan;
- constantly review strategies and provide feedback and recommendations to the Incident Controller;
- manage tactical operations, including resource deployment;
- monitor the safety and welfare of all personnel;
- appoint a Safety Officer if more than four stations are involved at an incident, or if deemed necessary;
- deploy resources based on priorities, strategies and tactical objectives;
- request additional resources via the Incident Controller;
- maintain an effective span of control by appointing Division, Group and Sector Commanders (when necessary);
- communicate the incident action plan, strategic objectives and tactical priorities to Division, Group and Sector Commanders;

- consult with the Planning and Logistics Officers (if appointed); and
- provide the Incident Controller with regular SITREPs.

OPERATIONS OFFICER RESPONSIBILITIES CHECK SHEET

The purpose of this Check Sheet is to provide the Operations Officer with a list of his/her responsibilities at the incident ground.

RESPONSIBILITIES

- It is the responsibility of the Operations Officer to:
  - ☐ implement the strategies contained in the incident action plan;
  - ☐ constantly review strategies and provide feedback and recommendations to the Incident Controller;
  - ☐ manage tactical operations, including resource deployment;
  - ☐ monitor the safety and welfare of all personnel;
  - ☐ appoint a Safety Officer if more than four stations are involved at an incident, or if deemed necessary;
  - ☐ deploy resources based on priorities, strategies and tactical objectives;
  - ☐ request additional resources via the Incident Controller;
  - ☐ maintain an effective span of control by appointing Division, Group and Sector Commanders (when necessary);
  - ☐ communicate the incident action plan, strategic objectives and tactical priorities to Division, Group and Sector Commanders;
  - ☐ consult with the Planning and Logistics Officers (if appointed); and
  - ☐ provide the Incident Controller with regular situation reports (SITREPS).

4 PLANNING OFFICER

4.1 Introduction

4.1.1 The Planning Officer assists the Incident Controller by:

- collecting and analysing incident information;
- predicting incident behaviour;
- recording and displaying the location and tasks of resources; and
- preparing suggested control strategies and changes to the incident action plan for approval by the Incident Controller.

4.2 Application

4.2.1 A Planning Officer can be appointed at large or complex incidents when the Incident Controller needs to delegate some planning functions in order to maintain an effective span of control, and to more effectively process information.

NOTE

Until a Planning Officer is appointed, the Incident Controller is responsible for carrying out the planning function.

4.3 Responsibilities

4.3.1 It is the Planning Officer's responsibility to:

- develop and review the incident action plan and strategies with the Incident Controller and Operations Officer;
- evaluate incident organisation and span of control;
- evaluate strategic objectives and tactical priorities;
- analyse risks to personnel, the community and the environment;
- forecast possible incident outcomes;
- evaluate requirements for further resources in consultation with the Incident Management Team;
- organise appropriate technical advice;
- co-ordinate planning activities with other services;
- record and display the location and status of all personnel and resources;

- maintain incident records; and
- plan for termination of the incident.

4.4 Additional Resources

4.4.1 The Planning Officer may establish sub-units or call on specialist personnel to assist with planning tasks.

4.4.2 Examples of Units or officers that could be used include:

- a Resources Unit to record the status and location of personnel and resources;
- a Situation Unit to gather sitreps, weather information, etc;
- a Documentation Unit to maintain records and provide clerical assistance; and
- technical advisers such as the OIC BA/HazMat, Senior Instructors - Rescue, Senior Instructors - Bushfire, Fire Safety Division Officers, Fire Investigation Officers, or outside experts.

PLANNING OFFICER RESPONSIBILITIES CHECK SHEET

The purpose of this Check Sheet is to provide the Planning Officer with a list of his/her responsibilities at the incident ground.

RESPONSIBILITIES

- It is the Planning Officer's responsibility to:
  - ☐ develop and review the incident action plan and strategies with the Incident Controller and Operations Officer;
  - ☐ evaluate incident organisation and span of control;
  - ☐ evaluate strategic objectives and tactical priorities;
  - ☐ analyse risks to personnel, the community and the environment;
  - ☐ forecast possible incident outcomes;
  - ☐ evaluate requirements for further resources in consultation with the Incident Management Team;
  - ☐ organise appropriate technical advice;
  - ☐ co-ordinate planning activities with other services;
  - ☐ record and display the location and status of all personnel and resources;
  - ☐ maintain incident records; and
  - ☐ plan for termination of the incident.

5 LOGISTICS OFFICER

5.1 Introduction

5.1.1 The Logistics Officer supports the Incident Controller by providing and managing non-operational facilities, services and supplies that are required to support incident operations.

5.2 Application

5.2.1 At most incidents, many of the logistics functions can be carried out by the Fire Command Centre, acting upon requests from the Incident Controller. A Logistics Officer will rarely be required at a structure fire.

5.2.2 A Logistics Officer can be appointed at large or complex incidents when the Incident Controller needs to delegate the logistics functions in order to maintain an effective span of control.

5.2.3 The Logistics Officer may be an appropriately trained operational officer, or an appropriately trained member of the NSWFB Administrative or Technical staff.

⚠ **NOTE**

Until a Logistics Officer is appointed, the Incident Controller is responsible for carrying out the logistics function.

5.3 Responsibilities

5.3.1 It is the responsibility of the Logistics Officer to:

- be accountable to the Incident Controller for all non operational logistics support;
- provide for the welfare, recuperation and refreshment of personnel;
- arrange critical incident stress debriefing (if necessary);
- manage the supply of required materials and equipment;
- work with the Planning Section to forecast resource needs;
- develop a communications plan and supply equipment that is required;
- supply fuel and repairs for equipment;
- obtain technical advisers required by the Incident Controller or the Planning Section; and
- organise the recall of additional personnel and changes of shift.

5.4 Additional Resources

5.4.1 The Logistics Officer may call on additional personnel or establish sub-units to assist with logistical functions. Examples could include:

- a Recuperation Officer to organise food, drink and rest for crews during prolonged or demanding incidents;
- a Water Relay Officer to oversee relay pumping operations and to ensure adequate water supplies;
- a Communications Co-ordinator to implement the communications plan;
- a Mechanical Maintenance Officer to co-ordinate necessary field repairs; and
- any other functions deemed necessary.

LOGISTICS OFFICER RESPONSIBILITIES CHECK SHEET

The purpose of this Check Sheet is to provide the Logistics Officer with a list of his/her responsibilities at the incident ground.

RESPONSIBILITIES

- It is the responsibility of the Logistics Officer to:
  - ☐ be accountable to the Incident Controller for all non operational logistics support;
  - ☐ provide for the welfare, recuperation and refreshment of personnel;
  - ☐ arrange critical incident stress debriefing (if necessary);
  - ☐ manage the supply of required materials and equipment;
  - ☐ work with the Planning Section to forecast resource needs;
  - ☐ develop a communications plan and supply equipment that is required;
  - ☐ supply fuel and repairs for equipment;
  - ☐ obtain technical advisers required by the Incident Controller or the Planning Section; and
  - ☐ organise the recall of additional personnel and changes of shift.

1.6 SAFETY OFFICER

1 Introduction

Safety Officers are appointed by the Incident Controller (IC) as part of the Incident Management Team to provide advice and guidance on safety issues at an incident.

Appointing a Safety Officer does not absolve Incident Controllers/Commanders of their responsibility to ensure the health and safety of all personnel in attendance at an incident.

2 Application

This SOG applies to personnel appointed to the position of Safety Officer

⚠ **NOTE**

***Everyone* at an incident is responsible for safety, whether or not a Safety Officer is appointed.**

3 When to appoint a Safety Officer

The Incident Controller must appoint a Safety Officer at all incidents involving:

- Second Alarm calls or greater
- complex or protracted operations
- large sites where crews operate out of direct sight of the IC
- bushfires where an Incident Management Team (IMT) has been established
- where appropriate at other incidents.

Safety Officers should also be appointed at other operations such as large training exercises or hazard reduction activities.

More than one Safety Officer may be appointed for the same incident. When more than one Safety Officer is appointed at large/complex incidents, a strategic-level Safety Officer advises the IC/IMT directly, while tactical-level Safety Officers are deployed around the incident to cater for incident-ground issues. The higher level Safety officer becomes the overall coordinator and manages the communications and actions of the tactical Safety Officers.

4 Qualifications required for Safety Officers

A Safety Officer must:

- preferably be of officer rank (although this may be impractical in some areas)
- possess the knowledge, skills and ability to manage incident safety in accordance with this and other SOGs
- possess a knowledge of the *Occupational Health and Safety Act* and *Regulations* and how to apply their principles to incident management
- possess a knowledge of the hazards that could be encountered at the incident, eg structure fires, hazardous materials, rescue and bushfire incidents
- possess knowledge of personnel rotation, rest and refreshment requirements.

5 Authority

A Safety Officer has the delegated authority of the IC to stop or change any order, action or condition when the lives and safety of emergency services personnel are at immediate risk. This does not extend to directing firefighting tactics should the Safety Officer have operational opinions different to other commanders. The Safety Officer must not intervene unless there is a genuine and immediate safety issue.

⚠ **NOTE**

The appointed Safety Officer must act immediately in the case of an imminent threat to the safety of emergency services personnel. Where possible, consult with the Incident Controller to review the Incident action plan.

6 Risk assessment and planning

The Safety Officer must be provided with a briefing on the incident action plan and will contribute to the plan by:

- obtaining a briefing from the IC including decisions on risk management
- attending IMT meetings and briefings
- ensuring that a safety briefing is developed and delivered to all personnel at the scene if required by the IC.

7 Responsibilities

The appointed Safety Officer is responsible to the Incident Controller for:

- identifying and reporting significant unsafe conditions or operations to the IC/ Operations Officer
- assisting with, or conducting an operational risk assessment, completing an appropriate risk assessment form and communicating this information to the IC
- assessing, monitoring and providing a risk assessment on hazards likely to affect the safety, health and welfare of personnel
- monitoring and ensuring that all utilities are identified and rendered safe
- ensuring that the location of the combat zone, safety zones, collapse zones and other designated areas are known to all personnel
- ensuring that systems are in place, eg *Incident Crew Management System* (SOG 18.1) and *Breathing apparatus control* (SOG 9.4), to monitor all personnel and ensure that there are no 'freelance' operations
- ensuring that all personnel at the incident are properly briefed on all known hazards, advising on measures to eliminate, prevent or mitigate risks
- correcting unsafe work practices through the appropriate commander
- advising on the rotation, rest and refreshment of personnel
- requesting the appointment of additional Safety Officers when required
- preventing unsafe operations
- monitoring the use of safe working practices, including appropriate personal protective equipment

- monitoring the effectiveness of incident communications and being alert to barriers that could result in missed, unclear or incomplete communication
- monitoring the health and welfare, including psychological welfare, of all personnel
- advising on the need for critical incident stress support on-scene or afterwards
- advising the IC on all aspects of safety and risk management.

If the Safety Officer's actions affect strategy and tactics, Division, Sector and Group Commanders must be informed and the incident action plan reviewed.

8 Communications

Safety Officers must maintain strategic and tactical communications in accordance with the SOG 2.1, *Communication Plans*. When required, a second handheld transceiver must be obtained from the IC.

9 Protection of serious incident sites

A *serious incident* is any work-related incident that:

- causes the death of a person
- results in the amputation of a limb
- results in a person being placed on a life support system
- presents an immediate threat to life although incidents attended by FRNSW are not included.

If a *serious incident* occurs, the Safety Officer must assist the IC to ensure that:

- plant or equipment in the workplace is not used, moved or interfered with after it has been involved in a serious incident
- the area within four metres of the location of the serious incident is not disturbed until an accident investigator can be contacted for advice.

Movement of plant or equipment, and changes to the surrounding area, are allowed in the following circumstances:

- to help or remove a trapped or injured person or to remove a body
- to avoid injury to a person or damage to property
- for the purposes of any police investigation
- in accordance with a direction or permission of a WorkCover NSW Inspector
- in accordance with the provisions of the NSW *Fire Brigades Act 1989*.

10 Accident investigation

Any injury, illness, exposure to hazardous substance or near miss, by a firefighter or other person must be reported to the IC and Safety Officer.

In the event of a serious incident, the Safety Officer, in accordance with FRNSW accident investigation policy, must protect the immediate incident site in accordance with Section 9, pending the arrival of a trained accident investigator.

11 Post-incident debrief

The Safety Officer must participate in the post-incident debrief and is responsible for preparing a written report on the health and safety issues pertaining to the incident. This must be provided to the IC before the debrief.

1.6 SAFETY OFFICER RESPONSIBILITIES

The purpose of this Check Sheet is to provide the appointed Safety Officer with a list of his/her responsibilities at the incident ground.

Responsibilities

The Safety Officer is responsible to the Incident Controller for:

- ☐ identifying and reporting significant unsafe conditions or operations to the IC/Operations Officer
- ☐ assisting with, or conducting an operational risk assessment, completing an appropriate risk assessment form and communicating this information to the IC
- ☐ assessing, monitoring and providing a risk assessment on hazards likely to affect the safety, health and welfare of personnel
- ☐ monitoring and ensuring that all utilities are identified and rendered safe
- ☐ ensuring that the location of the combat zone, safety zones, collapse zones and other designated areas are known to all personnel
- ☐ ensuring that systems are in place to monitor all personnel to ensure that there are no 'freelance' operations, eg Incident Crew Management System (SOG 18.1) and Breathing apparatus control (SOG 9.4)
- ☐ ensuring that all personnel at the incident are properly briefed on all known hazards, advising on measures to eliminate, prevent or mitigate risks
- ☐ correcting unsafe work practices through the appropriate commander
- ☐ advising on the rotation, rest and refreshment of personnel
- ☐ requesting the appointment of additional Safety Officers when required
- ☐ preventing unsafe operations
- ☐ monitoring the use of safe working practices, including appropriate personal protective equipment
- ☐ monitoring the effectiveness of incident communications and being alert to barriers that could result in missed, unclear or incomplete communication
- ☐ monitoring the health and welfare, including psychological welfare, of all personnel
- ☐ advising on the need for critical incident stress support on-scene or afterwards
- ☐ advising the IC on all aspects of safety and risk management.

If the Safety Officer's actions affect strategy and tactics, Division, Sector and Group Commanders must be informed and the incident action plan reviewed.

1.7 SECTORS, GROUPS AND DIVISIONS

1 Introduction

The use of Sectors, Groups and Divisions improves communication, implementation of the Incident Action Plan (IAP) and effective use of resources at an incident. Appointing Division Commanders, Sector Commanders and Groups allows the Incident Controller to implement tactics while maintaining effective span of control.

The purpose of this SOG is to provide a standard system for the effective control of an incident by dividing operations into sectors, groups and divisions.

2 Span of Control

Span of control refers to the number of crews or officers controlled by one person.

Five officers or fire crew members are the recommended span of control for each level of command (see Fig 1). Where the span of control exceeds seven, information overload can occur, resulting in reduced efficiency and safety.

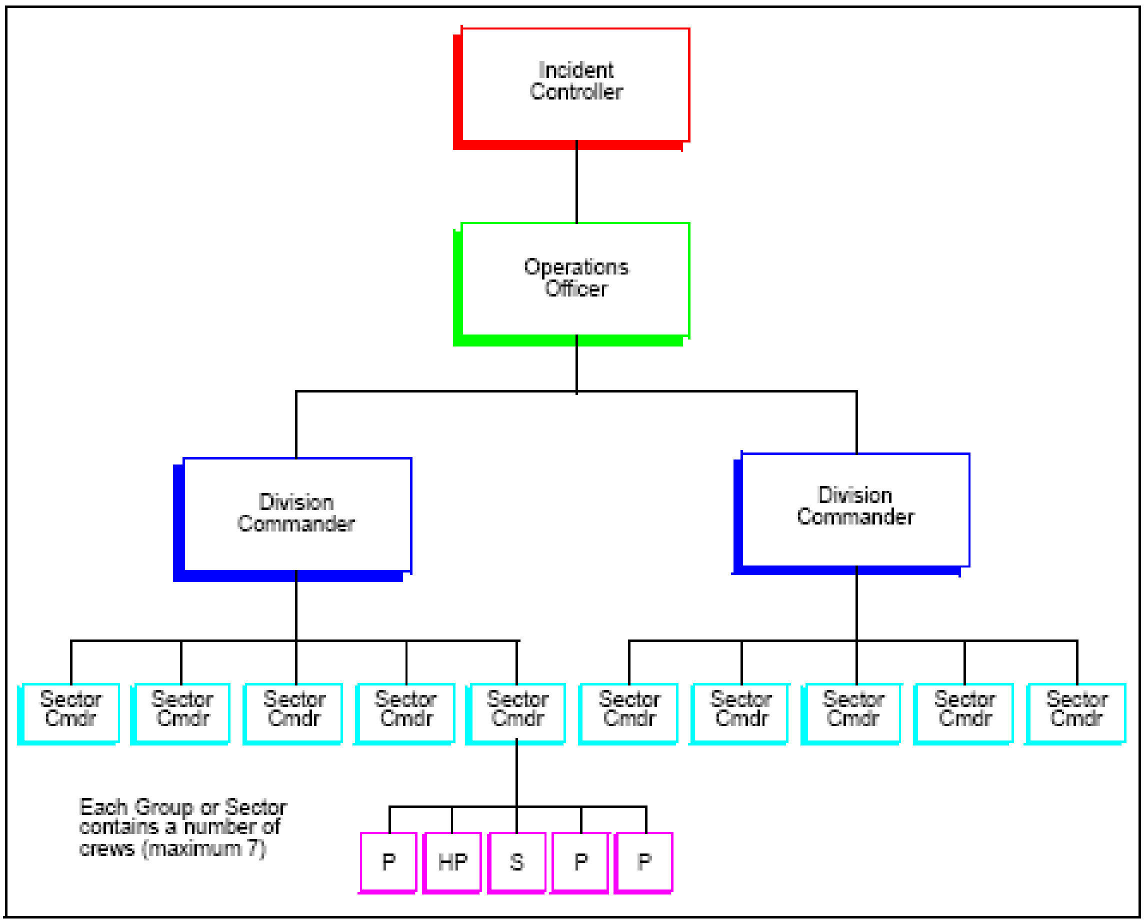


Figure 1 Maintaining an Effective Span of Control at a Large Incident

Incident Controllers must ensure that they maintain an effective span of control by delegating the command of areas or functions. By using this procedure, Incident Controllers and/or Operations Officers can concentrate on strategic objectives and tactical priorities while Sector, Group and Division Commanders provide direct tactical supervision of crews.

3 Sector, Group and Division Commanders

Division Commanders are officers appointed by the Incident Controller to achieve the strategic objectives of the IAP and manage the operations of sectors and groups within their division.

Sector and Group Commanders are officers appointed by the Incident Controller to manage the incident at a tactical level and, supervise activities and ensure that safe working practices are employed.

Division, Sector and Group Commanders are responsible for:

- the safety and welfare of all personnel under their command
- achieving objectives assigned by the Incident Controller
- maintaining an awareness of the IAP and communicating the plan and objectives to crews
- sending regular sitreps and relevant information up the chain of command
- allocating resources in their area of responsibility
- requesting additional resources through the chain of command
- ensuring tasks are being supervised and carried out using safe working practices
- co-ordinating operations with other divisions, sectors or groups.
- conducting stage 1 and 2 Incident Crew Management System checks.

Division, Sector and Group Commanders should consider:

- appointing a Safety Officer to manage the safety of all personnel under their command
- establishing a rest and rehabilitation area for their crews
- establishing a Rapid Intervention Team
- using specialist advice, eg hazmat, building manager to achieve objectives
- using the tactical and risk assessment worksheets.

Commanders should maintain a visible position as much as possible, be identified by a tabard and maintain communication on both task and tactical radio channels.

4 Sectors

4.1 When to sector an incident

The Incident Controller should sector an incident when:

- the number of crews needed is greater than the Incident Controller's effective span of control
- complex operations are involved
- special hazards require supervision of crews by senior officers
- crews are operating out of sight of the Control Point.

Sectoring should begin as early in the incident as possible.

4.2 Exterior sectors

Exterior sectors of structure fires are designated alphabetically (see Fig 2). The front of the structure, from the Incident Controller’s position, is always Sector A. Sectors are then designated in a clockwise direction, with Sector B always on the left-hand side, Sector C at the rear, and Sector D on the right-hand side.

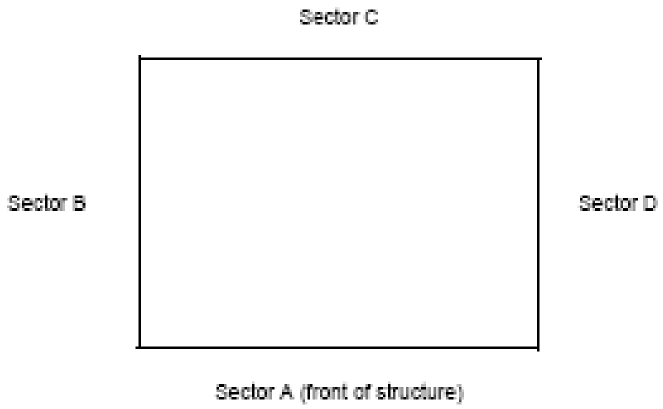


Figure 2 Exterior Sectors

Note

In the case of irregularly shaped buildings, Incident Controllers should assign sector names in a logical manner, suitable for the building shape.

4.3 Interior sectors

The Incident Controller should allocate interior sectors in the most appropriate way for the particular incident.

4.4 Multi-storey buildings

These are sectored by floor level. Generally, ground level is Sector G, the first floor is Sector 1, the second floor is Sector 2, and so on. The first floor below ground is Sector B1, the second floor below ground is Sector B2, etc (see Fig 3).

Level 3	Sector 3
Level 2	Sector 2
Level 1	Sector 1
Ground	Sector G
Basement 1	Sector B1
Basement 2	Sector B2

Figure 3 Standard Method for Sectoring a Multi-storey Building

In high rise buildings and other buildings with automatic fire alarm systems, it is recommended that the Incident Controller use the floor numbering shown on the fire alarm panel, as this will match the floor numbering on the fire stair doors. High rise buildings are numbered in a variety of ways (see Fig 4) and the Incident Controller should have the fire alarm panel checked before designating sectors.

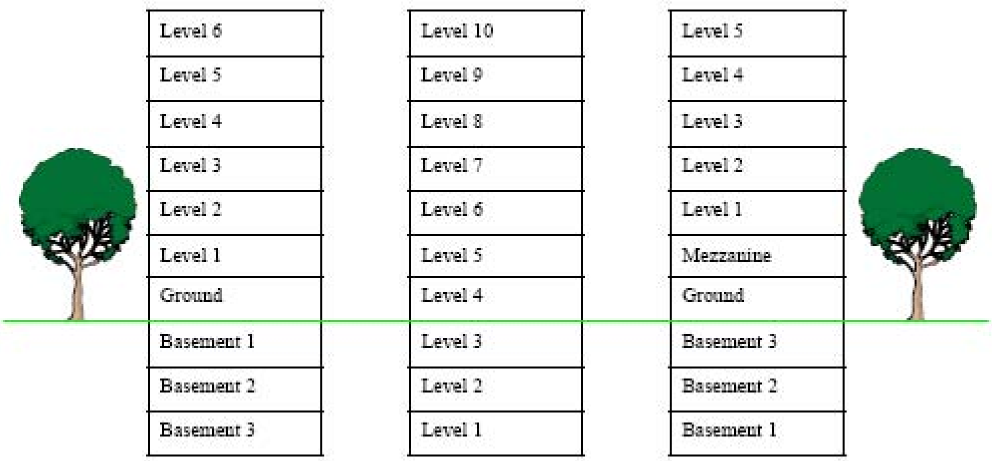


Figure 3 Some Different Ways High Rise Building Levels may be Numbered

4.5 Other ways to sector structures

At incidents involving complex or unusual structures, the standard sectoring systems outlined above may not be appropriate. The Incident Controller should sector the incident in a logical way, using the principles outlined above.

Sector Commanders appointed at high rise fires should follow the guidelines in SOG 4.5 High Rise Structure Fires.

4.6 Bushfire sectors

Bushfires may be sectored using the alphabet, locality, or points of the compass as designations (see Fig 5, Fig 6 and Fig 7)

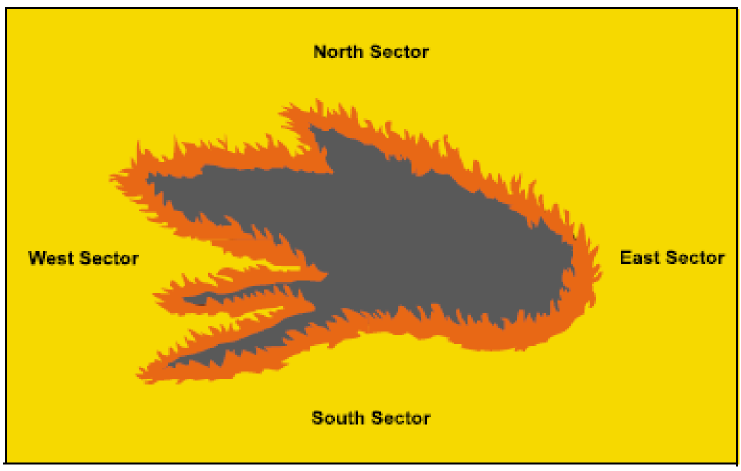


Figure 4 Sectoring a Bushfire Using Points of the Compass

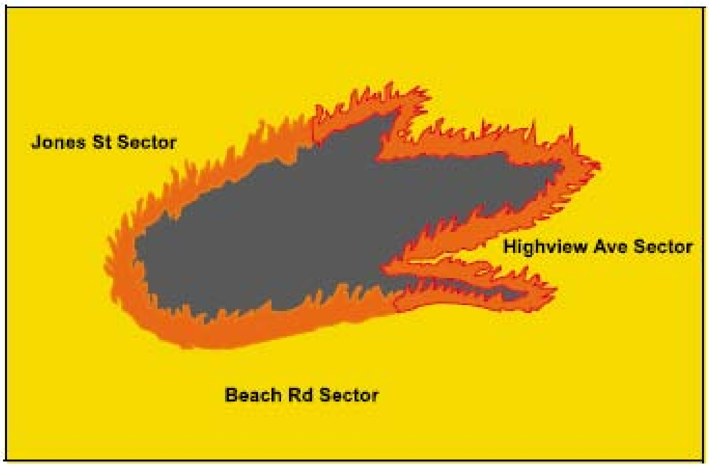


Figure 5 Sectoring a Bushfire Using Street Names

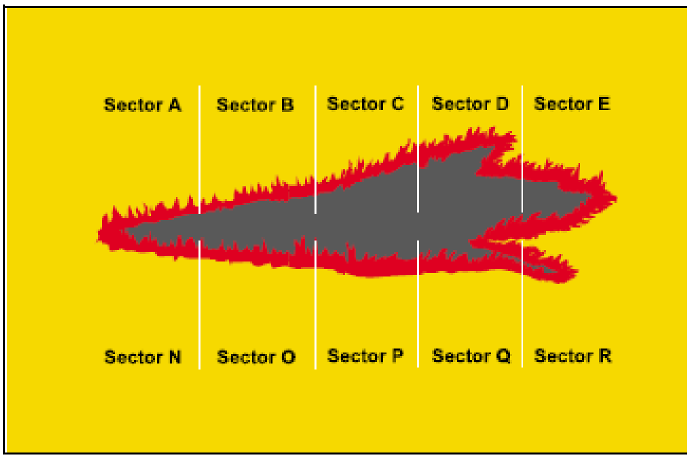


Figure 6 Sectoring a Bushfire Using Letters of the Alphabet

Note

When dealing with two sides of a fire, alphabetic designations start from A on one side and N on the other. This avoids confusion if divisions are established.

5 Groups

Groups are established by the Incident Controller to perform particular functions.

Examples of groups include:

- Fire Attack Group
- Search and Rescue Group
- Evacuation Group
- Hazmat Group
- Decontamination Group
- Ventilation Group
- Salvage Group
- Backburn Group.

Note

Groups are commanded by an officer and each may contain up to five crews.

Within the ICS structure, sectors and groups are identical. However, sectors refer to *locations*, while groups refer to *tasks* which may take place in various locations.

6 Divisions

The Incident Controller should establish Divisions when:

- there are more than seven sectors or groups
- sectors or groups are operating out of direct contact with the Control Point.

Note

Divisions are rarely established at structure fires.

6.1 Identifying divisions

Divisions may be identified by number (see Fig 8) such as:

- Division 1
- Division 2
- Division 3

or by function such as:

- Backburn Division
- Hazmat Division.

Figure 8 Divisions established at a large structure fire

7 Communication

All communication between crews and the Incident Controller must be directed through the chain of command.

Each level of command is responsible for:

- maintaining communications with personnel under their command
- making regular progress reports up the chain of command
- passing instructions through the chain of command.

The Incident Controller **must** be informed immediately of:

- threats to the safety and welfare of personnel or the public
- an injury occurring to a firefighter or civilian
- escalation of the incident
- changes to exposure risks
- significant changes to operating conditions
- the completion of objectives
- inability to complete objectives
- departures from the incident action plan.

Communication between Sector or Group Commanders and their Crew Leaders should, where possible, be made face to face. Progress reports should contain only essential information.

7.1 Radio callsigns

Sector, Group and Division Commanders should identify themselves using the designation of the sector or division in radio communication. For example:

- Sector A
- Jones Street Sector
- Fire Attack Group
- Division 1.

Note

Radio traffic should be kept to a minimum at all times.

1.7 SECTOR, GROUP AND DIVISION COMMANDER RESPONSIBILITIES

The purpose of this Check Sheet is to provide Sector Group and Division Commanders with a list of their responsibilities.

Responsibilities

Sector, Group and Division Commanders are responsible for:

- ☐ the safety and welfare of all personnel under their command
- ☐ achieving objectives assigned by the Incident Controller
- ☐ maintaining an awareness of the Incident Action Plan and communicating the plan and objectives to crews
- ☐ sending regular sitreps and relevant information up the chain of command
- ☐ allocating resources in their area of responsibility
- ☐ requesting additional resources through the chain of command
- ☐ ensuring tasks are being supervised and carried out using safe working practices
- ☐ coordinating operations with other, sectors groups or divisions
- ☐ conducting stage 1 and 2 Incident Crew Management System checks

Sector, Group and Division Commanders should consider:

- ☐ appointing a Safety Officer to manage the safety of all personnel under their command
- ☐ establishing a rest and rehabilitation area for their crews
- ☐ establishing a Rapid Intervention Team
- ☐ using specialist advice, eg hazmat, building manager to achieve objectives
- ☐ using the tactical and risk assessment worksheets

Commanders should maintain a visible position as much as possible, be identified by a tabard and maintain communication on both task and tactical radio channels.

1.8 PRE-DEPLOYMENT AND STAGING

1 Introduction

Pre-deployment and staging are the placement of uncommitted appliances at an incident. This SOG outlines how later arriving appliances are positioned for deployment and tasking by the Incident Controller (IC).

The advantages of having appliances pre-deployed or staged are:

- it reduces congestion at the scene
- it enables the IC to complete a size up and establish an Incident Action Plan prior to tasking appliances
- it reduces the likelihood of having to relocate appliances during an incident
- it gives the IC a reserve that can be mobilised quickly, and
- it reduces radio traffic.

2 Scope and application

This SOG applies to all incidents where three or more appliances attend an incident. It does not apply to an Officer who is of higher rank than the IC and able to take transfer of command.

High-rise staging is covered in SOG 4.5, *High-rise Structure Fires*.

3 Levels of staging

There are two levels of staging:

Pre-deployment: applies automatically to all pumpers and specialist appliances, except for the first two pumpers to arrive at an incident. (Refer Figure 1)

Staging: applies when the IC sends a radio message to the Communications Centre (ComCen) requesting staging and giving the staging area location. (Refer Figure 2)

4 Pre-deployment

The first and second pumpers will respond directly to the incident, and commence operations.

All other appliances must stage in their direction of travel, at a point that will:

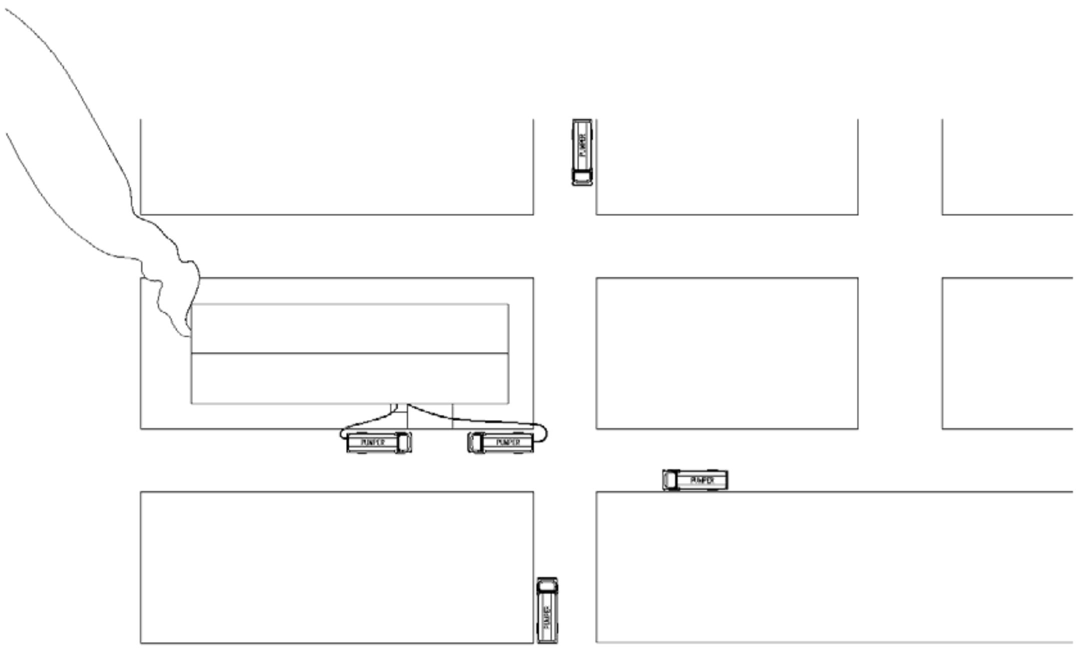
- allow response to any sector at the incident
- be within portable radio range, eg one block back or at the entrance of a large industrial park.

On arrival, these appliances must:

- send a Code 3 to the ComCen
- advise the IC of their arrival and approximate location on the tactical/task channel (eg channel 510) and await tasking, *eg IC, Pump 4, pre-deployed West.*

If unable to contact the IC by portable radio, switch the mobile (vehicle) radio to the tactical/task channel and contact the IC or relocate for better reception.

Figure 1 Pre-deployment



5 Staging

Staging applies when the IC sends a radio message to the ComCen requesting staging and giving the location of the staging area. Appliances still in pre-deployment and all other responding appliances must go to this location.

6 Staging area location

A staging area may be identified as part of a Pre Incident Plan or nominated by the IC as part of the size up.

Factors that determine the location of a staging area are:

- in radio contact with the Operations Officer (OO) or IC
- avoids traffic congestion
- clear of smoke from the incident
- room to position existing and additional appliances so they can respond individually as required.

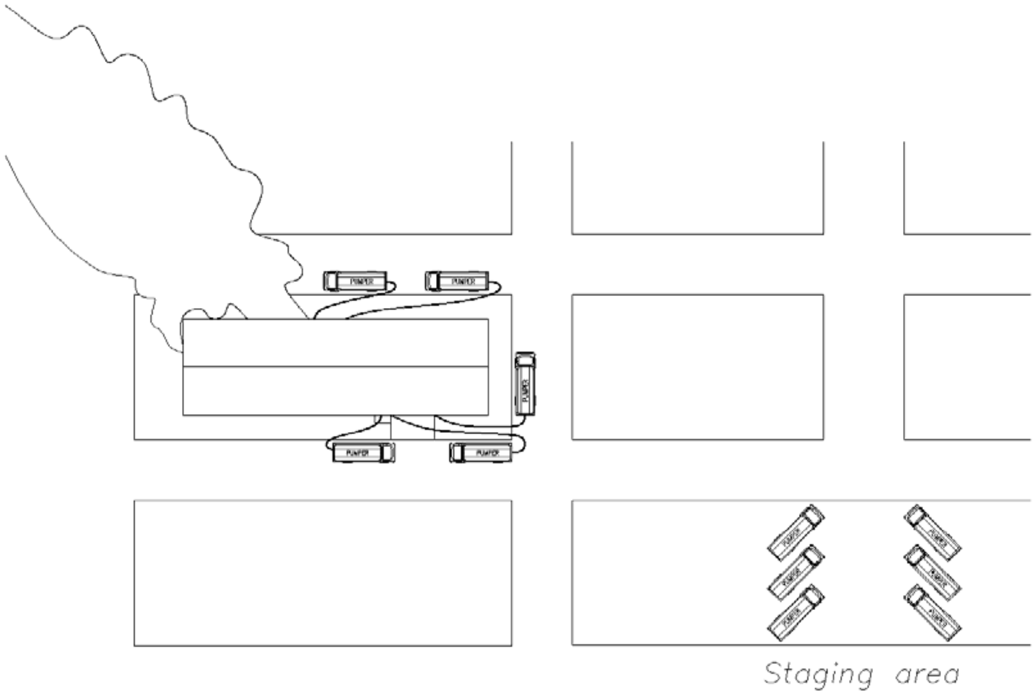
Appliances in the staging area must report on arrival to the Staging Officer and be ready for immediate response, ie standing by.

NOTE

Consider parking pumpers at 45° to the kerb. Aerials should be parked parallel to the kerb with enough room to manoeuvre.

Request Police assistance if streets need to be closed or traffic diverted to form the staging area.

Figure 2 Staging



7 Appointing a Staging Officer

The IC may appoint a Staging Officer or ask the ComCen to appoint one.

If a Staging Officer is not appointed by the IC or ComCen, the first officer (of a standard pumper) to arrive at the staging area automatically becomes the Staging Officer and must advise the IC that the role has been established.

Crew members who responded with the Staging Officer will be assigned to assist with staging operations.

When all other appliances have left the staging area, the Staging Officer will advise the OO or IC that the crew is available for tasking.

8 Staging Officer Role

The Staging Officer is in charge of the staging area and reports to the OO, or to the IC if an OO has not been appointed yet.

The Staging Officer is identified by a tabard and the radio call sign *Staging*.

The Staging Officer:

- maintains communications with the OO or IC and all appliances in the staging area
- provides regular sitreps to the OO or IC on the number and type of appliances in the staging area
- ensures all appliances in the staging area are ready for deployment or release from the incident
- brief crews on the incident details (Control Point, ICMS board, safety issues, rehabilitation area, communications plans, etc)
- deploys appliances to Sectors, other tasks or stand down (Code 4) as requested by the OO or IC.

9 Deployment from the Staging Area

When assigned to incident duties, appliances leaving the staging area must report directly to the Control Point or to their assigned Sector as directed by the Staging Officer.

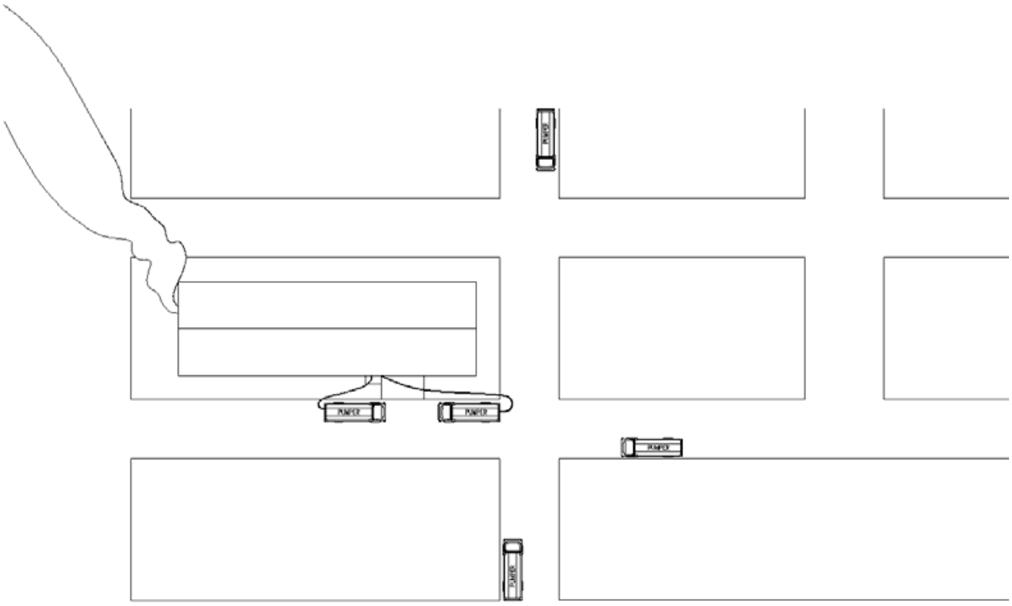
The Incident Crew Management System (ICMS) tags must be attached to the ICMS board at this time (*SOG 18.1*).

1.8 PRE-DEPLOYMENT AND STAGING

Pre-deployment and *staging* refer to the practice of placing uncommitted appliances near an incident, ready for deployment, to reduce congestion at the incident.

Pre-deployment

After the arrival of the first and second appliances at an incident, *all other appliances* are *pre-deployed*.



Pre-deployment position

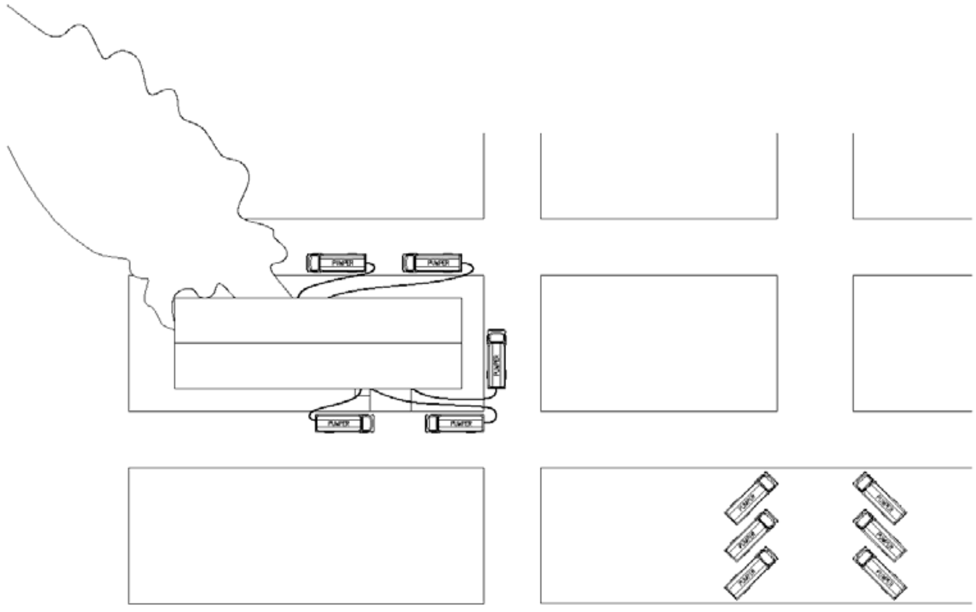
- ☐ In the *direction of travel*, near the incident.
- ☐ Allows response to any sector at the incident.
- ☐ Within portable radio range.

Upon arrival:

- ☐ Send a Code 3 to the Communication Centre.
- ☐ Advise the Incident Controller of your arrival and approximate location, and wait for tasking.

Staging

Staging occurs when the Incident Controller sends a **radio message** to the Communication Centre requesting staging and giving the *staging area* location.



Staging area

- ☐ Within *radio contact* of the Incident Controller (IC), or Operations Officer (OO) if appointed.
- ☐ Where it will avoid *traffic congestion*.
- ☐ *Clear of smoke*.
- ☐ With *room to position* appliances.

Police assistance may be required if streets need to be closed or traffic diverted.

Once a staging area is established:

- ☐ Proceed to the *staging area*, even if your appliance is in *pre-deployment*.
- ☐ Upon arrival, report to the Staging Officer and stand by for response to the incident.

Staging Officer role

The Staging Officer *is in charge of the staging area* and is appointed by the IC or the Communication Centre.

If not appointed, the first officer arriving at the staging area is the Staging Officer and must advise the IC.

The Staging Officer reports to the OO, or if not appointed, to the IC.

- ☐ Maintain communications with the OO and all appliances in the staging area.
- ☐ Provide regular sitreps to the OO on the number and type of appliances in the area.
- ☐ Ensure all appliances in the area are ready for deployment.
- ☐ Brief crews on the incident details.
- ☐ Deploy appliances to sectors or stand down as requested by the OO.

9 STRIKE TEAMS AND TASK FORCES

9.1 Introduction

9.1.1 Strike Teams and Task Forces are groups of resources deployed as tactical units to significant incidents. However, they may be formed in the preparedness phase of an incident, due to predicted weather conditions etc.

9.1.2 The use of Strike Teams and Task Forces ensures that the ICS principle of a manageable span of resource control is applied.

9.2 Application

9.2.1 The application of Strike Teams and Task Forces increases the efficiency of resources, whilst reducing the management workload at significant incidents. Their formation enables Division and Sector Commanders to implement incident tactics while maintaining an effective span of control over resources.

9.2.2 This guideline applies whenever ICS is implemented at significant incidents, and provides information relating to the purpose, formation and operation of Strike Teams and Task Forces.

9.3 Strike Teams

9.3.1 A **Strike Team** is a tactical unit that is assembled for a non-specific purpose. It:

- comprises of between 4 and 7 **similar** resources, normally 4; and
- is used for rapid response and generally for up to **24 hrs** commitment.

*An example of a **Strike Team** is a unit formed with four/five pumpers, Composites and /or water tankers that is to be deployed as part of bushfire response.*

9.4 Task Forces

9.4.1 A **Task Force** is a tactical unit that is assembled for a specific purpose. It:

- comprises of between 4 and 7 **specific** resources, normally 4; and
- is used for rapid response and is established to meet **particular** tactical needs. Once the purpose is **accomplished**, the Task Force is **disbanded** and **resources** may be **reallocated**.

***Example 1 -** A unit formed with specific resources such as a HazMat appliance, USAR appliance, rescue appliance, aerial appliance and a pumper, that is assigned to deal with rescue duties following an earthquake.*

***Example 2 -** A unit formed with specific resources such as a bulldozer, water tanker, pumper, and rescue appliance, that is assigned to deal with a township evacuation and property protection for an approaching bushfire.*

9.5 Formation and Response

9.5.1 When a decision is made to form either a Strike Team or a Task Force, an officer (usually Inspector rank) is appointed as Strike Team/Task Force Leader with a vehicle.

9.5.2 Strike Teams/Task Forces are formed and responded by:

- GSA - Response Co-ordinator Sydney Communication Centre; and
- Country Zones - Zone Commander in consultation with Communication Centres and using Zone resources; and
- whenever the Major Incident Co-ordination Centre (MICC) is activated - by the Operations Officer, MICC.

9.6 Strike Team/Task Force Leaders' Responsibilities

9.6.1 Upon arrival at an incident Strike Team/TaskForce Leaders will report to the Incident Controller, or the nominated deputy for further instructions.

9.6.2 Strike Team/Task Force Leaders may act as Sector Commanders or command tactical operations of the Strike Team/Task Force as required by the Incident Controller.

9.6.3 Strike Team/Task Force Leaders are responsible for:

- all resources and personnel under their direct control;
- ensuring that all duties allocated to their Strike Team/Task Force are carried out efficiently;
- updating Sector /Division Commanders via regular SITREPS (to include work progress, resource status, any significant changes in situation and any injuries sustained); and
- maintaining a log of all activities undertaken by their Strike Team/Task Force.

9.7 Tactical Operations

9.7.1 While Strike Teams/Task Forces will travel together, incident conditions may require that the team be dispersed (within their Sectors), and given individual tasks at an incident. In this case, each appliance will communicate with the appropriate Strike Team/Task Force Leader or Sector Commander.

9.7.2 Strike Teams and Task Forces will have a nominated call sign. Single resources within the Strike Team/Task Force will communicate to the Leader. The Leader will provide regular SITREPS to the Sector Commander or Operations Officer.

STRIKE TEAM/TASK FORCE LEADERS' RESPONSIBILITIES CHECK SHEET

The purpose of this Check Sheet is to provide Strike Team/Task Force Leaders with a list of his/her responsibilities.

RESPONSIBILITIES

- Upon arrival at an incident Strike Team/TaskForce Leaders will report to the Incident Controller, or nominated deputy for further instructions.
- Strike Team/Task Force Leaders will normally either act as Sector Commanders or command tactical operations of the Strike Team/Task Force as required by the Incident Controller.
- Strike Team/Task Force Leaders are responsible for:
  - ☐ all resources and personnel under their direct control;
  - ☐ ensuring that all duties allocated to their Strike Team/Task Force are carried out efficiently;
  - ☐ updating Sector /Division Commanders via regular SITREPS (to include work progress, resource status, any significant changes in situation and any injuries sustained); and
  - ☐ maintaining a log of all activities undertaken by their Strike Team/Task Force.
- Strike Teams and Task Forces will have a nominated call sign. Single resources within the Strike Team/ Task Force will communicate to the Leader. The Leader will provide regular SITREPS to the Sector Commander or Operations Officer.

10 SPECIAL RESPONSE GROUPS

10.1 Introduction

10.1.1 When a significant incident reaches the stage where **substantial** support resources are required, a Special Response Group (SRG) may be formed.

10.2 Application

10.2.1 This guideline applies whenever ICS is implemented at significant incidents and there is a requirement for SRGs to be formed. It provides information relating to the purpose, formation, resources and operation of SRGs.

10.3 Purpose

10.3.1 A **SRG** is a tactical unit that:

- comprises **two or more** Strike Teams and/or Task Forces;
- has adequate resources to be **self sufficient for a minimum of 24 hrs**; and
- is intended for **long term** commitments (over 24 hrs).

Example 1 *- An earthquake in Country NSW where local resources have been committed and require supplementary resources. A SRG is mobilised that incorporates several Task Forces and support, to ensure that a long term and self managed response is effected.*

Example 2 *- A bushfire in Country NSW where resources are required for two tasks: Strike Teams to combat fire in bushland in support of local resources; and Task Forces to provide township property protection. The SRG ensures that a long term and self managed response is effected.*

10.4 Formation and Authorisation

10.4.1 Following the recommendation of the Manager Operational Communications and/or MSO, the formation of a SRG requires the authorisation of:

- the Commissioner;
- DSO;
- DPOPT; or
- a Regional Commander.

10.4.2 All SRGs will have:

- a Commander and Deputy Commander;
- a Logistics Officer; and
- a suitable vehicle for control and communications.

10.5 Resources

10.5.1 SRGs will provide the resources appropriate to the incident which **may** include some, or all of the items detailed in Tabel 10A.

QTY	ITEM
As reqd	Strike Teams and/or Task Forces with Leaders
1	Bus (for crew shift changeovers)
1	Canteen
1	Mechanic complete with own vehicle
1	Radio technician complete with own vehicle
1	Bulk Water Tanker
1	Portable generator

Table 10A SRG Resources

10.6 SRG Commander/Deputy Commander Responsibilities

10.6.1 SRG Commanders and their Deputies are responsible for:

- all resources and personnel within their Group;
- ensuring that all duties allocated to their Group are carried out efficiently;
- Strike Teams/Task Forces are deployed within the incident structure;
- updating Response Co-ordinator or MICC of SRG activities via regular SITREPS;
- maintaining a log of all activities undertaken by their SRG; and
- acting as Liaison Officers to the Incident Management Team (IMT).

⚠ **NOTE**

When acting as Liaison Officers, Commanders and Deputy Commanders are to alternate on day and night shifts.

10.7 Tactical Operations

10.7.1 Where a SRG is to respond to a remote location, the SRG Commander, SRG Deputy Commander and logistics team may be transported (possibly flown) to the area ahead of the SRG. This action may be required in order to communicate and integrate within IMT, organise resource deployment and logistical support e.g. accomodation, fuel and food etc.

1.10 SPECIAL RESPONSE GROUPS

A Special Response Group (SRG) is formed when a significant incident reaches the stage where *substantial* resources are required. An SRG is a tactical unit that:

- Comprises *two or more* Strike Teams and/or Task forces
- Has adequate resources to be *self-sufficient for a minimum of 24 hours*
- Is intended for *long-term* commitments (over 24 hours)

Composition

All SRGs have:

☐ A commander and deputy commander

☐ A logistics officer

☐ A suitable vehicle for control and communications

SRG Commander/Deputy Commander role

The SRG Commander and Deputy Commander are responsible for *all resources and personal* within the SRG.

☐ Ensure all duties allocated to the SRG are carried out efficiently.

☐ Deploy Strike Teams/Task Forces within the incident structure.

☐ Update Response Coordinator or MICC of SRG with regular sitreps.

☐ Maintain a log of all activities undertaken by the SRG.

☐ Act as liaison officers to the Incident Management Team – when doing so, alternate Commander and Deputy Commander on day and night shifts.

11 JOINT OPERATIONS - NSW RURAL FIRE SERVICE

11.1 Introduction

11.1.1 The NSWFB and NSW RFS regularly work together at a variety of emergency incidents to effectively combat incidents for the benefit of the community.

11.1.2 The conduct of joint operations is dealt with in *Operations Plans* prepared by District Bush Fire Management Committees, the *Memorandum of Understanding for NSW Fire Services*, and in local *Mutual Aid Agreements*.

11.1.3 In order to ensure properly co-ordinated activities of the two services at joint operations, ICS will be implemented.

11.2 Application

11.2.1 This guideline is specific to joint fire fighting operations involving NSWFB and NSW RFS, except co-oordinated bushfires (Class 2 and 3), where the Executive of the District Bush Fire Management Committe will appoint an Incident Controller.

11.3 Operational Jurisdiction

11.3.1 The NSWFB has operational jurisdiction for all fires within Fire Districts, for hazardous materials incidents throughout NSW (except State waters), and for rescue where units are accredited by the Rescue Board.

11.3.2 The NSW RFS has operational jurisdiction for all fires within rural Fire Districts, except those defined as hazardous materials incidents.

11.4 Structure Fires in Rural Fire Districts

11.4.1 Where the NSWFB is requested to assist the NSW RFS at a structure fire in a rural Fire District, the senior officer from the NSW RFS present at the fire will be the Incident Controller.

11.4.2 The OIC of the NSWFB present at the incident will report to the NSW RFS Incident Controller immediately upon arrival at the incident.

11.4.3 Unless the fire is minor e.g. a small kitchen fire or shed fire, the NSWFB OIC will act as Operations Officer and implement strategies in close consultation with the NSW RFS Incident Controller, who will retain overall control of the incident.

11.5 Bush and Grass Fire in Fire Districts

11.5.1 Where the NSWFB requests assistance from the NSW RFS at a bush or grass fire in a Fire District, the senior officer from the NSWFB will be the Incident Controller.

11.5.2 The OIC of the NSW RFS units present at the incident will report to the NSWFB Incident Controller immediately upon arrival at the incident.

11.5.3 Unless the fire is minor or the level of NSW RFS commitment is minor, the Incident Controller will appoint the senior NSW RFS officer present at the incident as Operations Officer. The Operations Officer will implement strategies in close consultation with the NSWFB Incident Controller, who will retain overall control of the incident.

11.6 Control Point

11.6.1 Where unified control is to be implemented at a bush or grass fire within a Fire District, it will be necessary to designate a Control Point (refer to *SOG 1.2*).

11.6.2 A suitable vehicle e.g. Operational Commander's vehicle or Incident Control Vehicles are ideal for use as a Control Point.

11.6.3 In order to ensure safe, co-ordinated operations, radio contact from the Control Point to appliances from all services should be arranged.

11.6.4 During a joint operation, if the Incident Controller is required to leave the Control Point, control must be handed over to another person. The Incident Controller and Operations Officer must work closely together, and if necessary appoint Sector Commanders to direct tactics.

11.7 Class 2 and 3 Bushfires

11.7.1 Where a fire deteriorates to Class 2 and is likely to escalate, the Executive of the Bush Fire Management Committee may decide to relocate the Incident Management Team to a Bushfire Control Centre. When a fire is spreading rapidly, on-site management and collection of intelligence becomes difficult. Bushfire Control Centres are therefore more appropriate for control of large fires.

11.7.2 Unless authorised by the Incident Controller to remain for a specific purpose e.g. radio *dead spot*, Division or Sector Control, the NSWFB Incident Control Vehicle will be withdrawn once radio communication is established from the Bushfire Control Centre.

NOTE

Failure to do so can detract from co-operative operations.

1.11 JOINT OPERATIONS – NSW RURAL FIRE SERVICE

The NSWFB and NSW Rural Fire Service (RFS) regularly work together at emergency incidents. The following applies to *joint firefighting operations* between the NSWFB and the RFS, except during coordinated Class 2 and 3 fires.

Structure fires – in RFS fire districts

Where the NSWFB is requested to assist at a structure fire in an RFS Fire District:

- ☐ RFS senior officer will be the Incident Controller and retains overall control of the incident.
- ☐ Upon arrival, NSWFB officer-in-charge reports to the Incident Controller.
- ☐ Unless the fire is minor, NSWFB officer-in-charge is appointed Operations Officer and implements strategies in close consultation with the IC.

Bush and grass fires – in NSWFB fire districts

Where the NSWFB requests assistance from the RFS at a bush or grass fire:

- ☐ NSWFB senior officer will be the Incident Controller and retains overall control of the incident.
- ☐ Upon arrival, RFS officer-in-charge reports to the Incident Controller.
- ☐ Unless the fire is minor or RFS resources are limited, the RFS officer-in-charge is appointed Operations Officer and implements strategies in close consultation with the IC.

Incident Control System

Implement the Incident Control System at joint firefighting operations to ensure that the activities of the two services are properly coordinated.

Control Point

At bush and grass fires in NSWFB fire districts:

- ☐ Designate a unified Control Point. Where possible, use the Duty Commander's vehicle or the Incident Control Vehicle as the Control Point.
- ☐ Arrange radio communications from the Control Point to all appliances to ensure a safe, coordinated operation.
- ☐ If required to leave the Control Point, appoint another person.
- ☐ If necessary, appoint Sector Commanders.

Class 2 and 3 bushfires

If a *Bushfire Control Centre* is established and the Incident Management Team is relocated there, *withdraw* the NSWFB Incident Control Vehicle once communications are in place.

1.12 INCIDENT CONTROL SYSTEM TABARDS

1 Introduction

When deploying the Incident Management Team in accordance with the Incident Control System it is essential that everyone at the incident is able to identify the Incident Controller and other command or functional positions.

To identify Incident Management Team members, a range of tabards is carried on response vehicles.

2 Application

This guideline applies to all NSWFB personnel who fill Incident Control System roles. It describes the available tabards and when they should be worn.

3 Range of tabards

Tabards are available for the positions detailed below:

Double-sided

Side A LIAISON OFFICER
Side B MEDIA OFFICER

Side A OPERATIONS OFFICER
Side B DIVISION COMMANDER

Side A STRIKE TEAM LEADER
Side B LIAISON OFFICER

Side A INCIDENT CONTROLLER
Side B NSWFB COMMANDER

Side A SAFETY OFFICER
Side B SECTOR COMMANDER

Single-sided

PLANNING OFFICER
LOGISTICS OFFICER
STAGING OFFICER
WATER OFFICER
REHABILITATION OFFICER
NSWFB RESCUE
ICMS MANAGER

4 Wearing tabards

Personnel with Incident Management Team functions working in field conditions must wear tabards over their normal protective clothing, with a helmet to enable officers to be easily identified as fire service personnel. Peak caps must *not* be worn.

Personnel with Incident Management Team functions working within Incident Control Centres or Incident Control Vehicles are *not* required to wear protective clothing, but where appropriate, should wear tabards over their standard uniforms.

If tabards are available at an incident, they should be worn by the Incident Controller and any other officer or firefighter appointed as part of an Incident Management Team by the Incident Controller, in accordance with *SOGs 1.1* to *1.8* inclusive.

NOTE

The exception to this is when engaged in offensive (interior) fire fighting or when wearing breathing apparatus.

5 Incident Controller/NSWFB Commander

The Incident Controller tabard is reversible with the markings **INCIDENT CONTROLLER** on one side and **NSWFB COMMANDER** on the other.

In accordance with SOG 1.2, *Incident Controller*, the Incident Controller tabard is used when the NSWFB is the combat agency and the NSW Fire Brigades Commander tabard is used when control is vested by law in another emergency service.

5.1 Incident Controller

The Incident Controller tabard is used at all fire-related incidents within NSWFB Fire Districts.

NOTE

Only one Incident Controller tabard may be used at any time at an incident. If control is transferred from one officer to another, the tabard must be handed over in accordance with SOG 1.2, *Incident Controller*.

5.2 NSWFB Commander

The NSWFB Commander tabard is used at:

- hazmat incidents (Police will be Site Controller)
- rescue incidents (Police will be Site Controller)
- storm and other natural hazard incidents
- fires in Rural Fire Service Districts and all interstate incidents

1.12 INCIDENT CONTROL SYSTEMS TABARDS

All Incident Management Team (IMT) members deployed are to wear a tabard that readily identifies their command or functional position.

Tabards available

Double-sided:

- Side A – Liaison Officer
  Side B – Media Officer
- Side A – Operations Officer
  Side B – Division Commander
- Side A – Strike Team Leader
  Side B – Liaison Officer
- Side A – Incident Controller
  Side B – NSWFB Commander
- Side A – Safety Officer
  Side B – Sector Commander

Single-sided:

- Planning Officer
- Logistics Officer
- Staging Officer
- Water Officer
- Rehabilitation Officer
- NSWFB Rescue
- ICMS Manager

Wearing tabards

Tabards are carried on response vehicles.

If appointed as part of an IMT:

☐ *When working in field conditions* – wear the tabard over normal protective clothing, with a helmet (no peak caps).

☐ *When working within Incident Control Centres or Incident Control Vehicles* – if not required to wear protective clothing, wear the tabard over standard uniform.

⚠ **NOTE**

Exception – tabards *are not required* for IMT members engaged in offensive (interior) fire fighting, or when wearing breathing apparatus.

1.14 MEDIA LIAISON OFFICER

1 Introduction

Managing the media is an essential component of any emergency operation. At any major emergency incident, there is likely to be significant media interest. At many incidents, Incident Controllers need to inform the public of safety or other issues by issuing media statements.

The Incident Controller should appoint a Media Liaison Officer as early as possible to ensure that correct and timely information is passed to the media and community.

2 Application

This guideline applies to all members of the NSWFB who fulfil the role of Media Liaison Officer.

It applies at incidents where the NSWFB is the lead combat agency. Other incidents will require close cooperation and liaison with the Police Site Controller and/or the Lead Combat agency’s media liaison personnel in accordance with the applicable emergency management plan.

3 Authority

The Incident Controller is responsible for disseminating information to the media.

The Incident Controller must approve all information before it is passed to the media.

4 Personal protective equipment

The Media Liaison Officer must wear PPE appropriate for the incident and the Media Officer tabard.

5 Responsibilities

The Media Liaison Officer is responsible for:

- making the media aware of the incident
- disseminating approved information to the media
- managing media representatives at the incident
- managing the flow of information to the community about any incident for which the NSWFB is the combat agency
- liaising with other services’ representatives to disseminate information specific to their roles
- where appropriate, advising the Police Site Controller that the NSWFB is assuming control of media management
- reporting to and consulting with the Incident Controller to arrange the issue of media statements, providing the Incident Controller with every opportunity to deliver such statements personally

- keeping the Incident Controller briefed on developing media issues concerning the incident
- ensuring that essential public information, such as evacuation arrangements or health warnings, is prepared by the relevant agency and distributed in a timely manner
- collating as much incident information as possible to satisfy the media need for news
- being a point of contact for media not present at the incident, eg radio news
- keeping stakeholders informed of media issues.

6 Media access to the incident

To assure the safety of media representatives and ensure that incident operations are not compromised, the Media Liaison Officer must:

- establish a Media Point for media representatives to gather at a convenient location near the Control Point
- inform the Police Site Controller of the location of the Media Point and arrange access for media representatives
- consult with the Incident Controller to clearly define the limits to media access so that occupational health and safety and efficient operations are maintained
- within safety limits, identify optimal vantage points for filming. If access is limited, consider a ‘pool shoot’ strategy, using one camera operator for all media interests.

7 Post incident responsibilities

After the incident, the Media Liaison Officer should consult with the State Operations Liaison Officer (SOLO) to ensure that:

- media entities are followed up to ensure that they have accurate, current information
- media releases are drafted for distribution to media wholesalers
- incident related information is posted on the NSWFB internet and intranet web sites
- all media releases are filed.

1.14 MEDIA LIAISON OFFICER

At major emergency incidents, the Incident Controller (IC) may appoint a Media Liaison Officer. Responsibilities vary according to whether the NSWFB is, or is not, the *lead combat agency*.

The Media Liaison Officer must:
☐ Wear PPE appropriate for the incident.
☐ Wear the *Media Officer* tabard.

Media Liaison Officer role – NSWFB lead combat agency

The Media Liaison Officer *takes control* of media management and the flow of information to the community.

- ☐ Advise Police Site Controller that the NSWFB is assuming control of media management.
- ☐ Make the media *aware* of the incident. Be the point of contact for media not at the incident.
- ☐ Keep the IC informed on developing media issues.

Media access

- ☐ Consult with the IC to determine if the media will be given access, and to clearly define limits.
- ☐ With the IC, choose a safe **Media Point** for the media to gather – *near* the Control Point but *away* from the incident. Advise the Police Site Controller of its location, and arrange access for the media.
- ☐ Identify safe vantage points for filming. If access is limited, consider a 'pool shoot' using one camera operator for all media.

Dissemination

- ☐ Collate incident information.
- ☐ In consultation with the IC, issue information and media statements approved by the IC. Provide the IC with opportunities to deliver statements personally.
- ☐ Manage the flow of information to the community.
- ☐ Ensure public information, such as evacuations or health warnings, is prepared and distributed by the relevant agency.
- ☐ Keep any other stakeholders informed of media issues.
- ☐ Liaise with other services' representatives about information specific to their roles.

NSWFB not lead combat agency

If the NSWFB is *not* the lead combat agency, cooperate closely with the Police Site Controller or the lead combat agency's media liaison officer, in accordance with the emergency management plan.

Post-incident

Contact the NSWFB Operational Media Coordinator to determine if further media liaison is required.

NSW FIRE BRIGADES

Standard Operational Guidelines

COMMUNICATIONS

Section Two

1 COMMUNICATION PLANS

1.1 Introduction

1.1.1 Communication is a fundamental element of incident ground command and control and is a key responsibility of the Incident Controller (IC) in the NSWFB's Incident Control System (ICS). It is the link between the IC and his/her resources and external assistance through the Communication Centre (ComCen). The IC is only as effective and efficient as the communication links that allow the officer to request, deploy and manage resources at an incident.

1.1.2 Incident communication is achieved using a logically structured communication plan that identifies standard message formats and key benchmarks of incident operations. The communication plan must be scalable and reflect the command structure established at an incident, and be applied over a defined geographic area or location. This means that a small-scale routine incident will have a simple communication plan, while a large-scale or geographically widespread incident requires a larger, more complex communication structure - but both are based on the same fundamental principles and applications.

1.2 Application

1.2.1 This SOG applies to all NSWFB personnel, appliances and ComCens using communication systems during emergency operations or other activities.

1.3 Purpose

1.3.1 The purpose of this SOG is to provide guidance on the development of a communication plan at an incident.

1.4 Communication principles

1.4.1 The three basic principles for communication at incidents are:

(a) to use the principles of ICS and ensure an effective span of control;

(b) to establish a flow of information at all levels of the incident, without overwhelming the IC or ComCen with superfluous data; and

(c) to ensure the safety of firefighters by using effective communication.

1.5 Communication equipment

1.5.1 Communication equipment currently available includes:

- portable radios, otherwise known as hand-held transceivers or HHTs;
- mobile radios, otherwise known as appliance or vehicle-mounted radios or RTs;
- transportable base stations, which are suitcase-sized radios stored at ComCens and at Communications Services at Greenacre for deployment to incidents, Emergency Operations Centres, or with specialist teams;
- mobile base stations in Incident Control Vehicles (ICVs);
- ComCens;
- specialist urban search and rescue (USAR) and hazmat radio communication equipment;
- telephones - landline, GSM mobile, CDMA mobile, satellite phones;
- pagers;
- facsimile machines; and
- electronic mail.

1.6 Communication plans

1.6.1 Every incident requires a communication plan. This can be as simple as using the mobile radio in your appliance to contact a ComCen, or as complex as a widespread, multi-agency operation using various equipment, radio frequencies and talkgroups.

1.6.2 A communication plan is a prescribed strategy for establishing and maintaining the communication necessary to manage an incident. This begins at the organisational level with the dispatch of resources and continues through to the task and tactical levels.

1.6.3 The communication plan must be flexible and scalable, reflecting the size and complexity of an incident, and so must be driven by the command structure established to manage the incident.

1.6.4 For small or routine incidents, the normal designated operational talkgroup is usually sufficient. Routine incidents include single-family residential structure fires, automatic fire alarm calls, a minor grass or bush fire, a minor hazmat spill, or a road accident rescue. Simplex talkgroups (506 to 510) are recommended for communication within sectors and between crew members because these talkgroups only have line of sight reception and a limited range.

1.6.5 Larger and more complex incidents may require several talkgroups, allowing for the clear and timely exchange of incident information through a structure that reflects an appropriate span of control. Duplex talkgroups (e.g. 600 or 700 series on the Government Radio Network (GRN)) are recommended for communication between the Incident Controller and the Incident Management Team (Sector Commanders, Safety Officer, Operations and Logistics Officers, etc.). This is because these talkgroups are on the GRN, meaning that they have greater range and are recorded at the ComCen.

⚠ **NOTE**

Whenever possible, firefighters should use the appliance radio to communicate with the ComCen rather than hand-held transceivers. Appliance radios have a higher output (25 watts) than hand-held radios (4 watts). This means that appliance radio messages will be much clearer over longer distances.

1.7 Communication Centres

1.7.1 All radio communication from mobile resources and other users not committed to an incident under the control of an IC must be directed to the ComCen responsible for the area in which the user is located.

1.7.2 Upon arrival at every incident, including AFAs where more than one appliance is committed, a local Control Point or (*SOG 1.2* and *2.8*) will be established by the first arriving officer. This officer will then manage incident ground command, control and communication until relieved by a more senior officer.

1.7.3 It is the responsibility of the Incident Controller to regularly update the ComCen with incident information (*SOG 1.1*).

1.8 Levels of communication

1.8.1 There are three levels of incident ground radio communication:

- **Task** e.g. an individual crew assigned to fire attack;
- **Tactical** (or front-line command) e.g. Sector Commanders reporting to the IC or Operations Officer; and
- **Strategic** or organisational resource coordination e.g. sitreps to the ComCen from the Control Point.

1.9 Task level

1.9.1 The task level of communication allows specific tasks to be assigned to crews. Task level is the normal operational radio communication between firefighters within a crew, and between firefighters and their crew leaders.

1.9.2 Most task level communication can be achieved face to face, which is preferable as personal contact allows for better understanding of instructions. Where radio communication is necessary, task level communication is normally achieved by hand-held transceivers using simplex talkgroups (known as incident ground talkgroups).

1.9.3 The IC is responsible for assigning task-level talkgroups, and communicating this to the ComCen for notification to all attending resources.

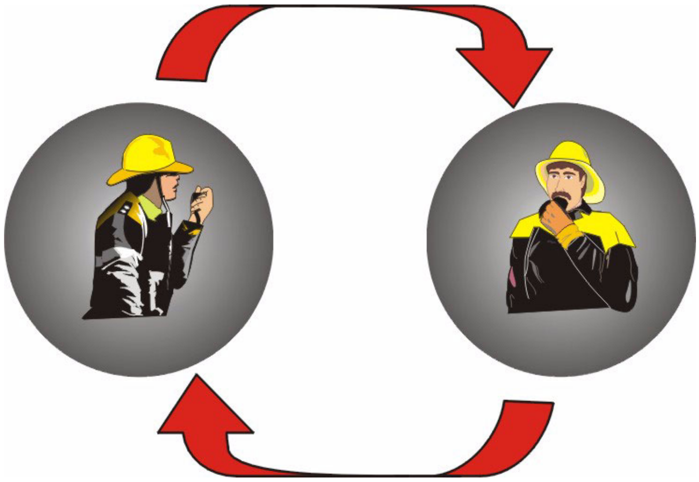


Figure 1 Task level of communication

1.10 Tactical level

1.10.1 The tactical or field command level officer is responsible for meeting assigned objectives. Tactical level communication allows officers to supervise and deploy grouped resources, and to manage objectives that must be achieved to meet the strategic incident goals.

1.10.2 The main principle of tactical communication is to stay wherever possible on the normal talkgroup, as changing talkgroups mid-incident poses risks to operational safety.

1.10.3 Tactical level officers are responsible for specific geographic areas or functions. Examples could be geographic Sectors and Divisions under ICS, or functional areas such as BA Control, Safety or Water Relay. The establishment and maintenance of tactical communication provides the means to:

- disseminate decisions and assignments;
- receive and provide information; and
- confirm the completion of tasks.

1.10.4 Tactical communication is established:

- between the IC and their subordinate command-level officers; and
- between Sector Commanders and grouped resources within the area of responsibility.

1.10.5 The tactical level of communication can employ handheld transceivers and mobile radios on a simplex channel (assigned by the IC), or a dedicated *Special Operations* talkgroup assigned by the ComCen at the request of the IC to report progress. It is the IC's responsibility to have radios monitored to ensure all appliances are operating on the designated talkgroup.

1.10.6 Once the tactical channel or dedicated *Special Operations* talkgroup has been assigned, all resources at the incident will switch to the specified channel. Resources that arrive subsequently will notify the ComCen of their arrival, then switch to the *Special Operations* talkgroup or channel and confirm their arrival with the Control Point. Resources leaving an incident where a Special Operations talkgroup or channel has been activated will return to their normal talkgroup and advise their ComCen.

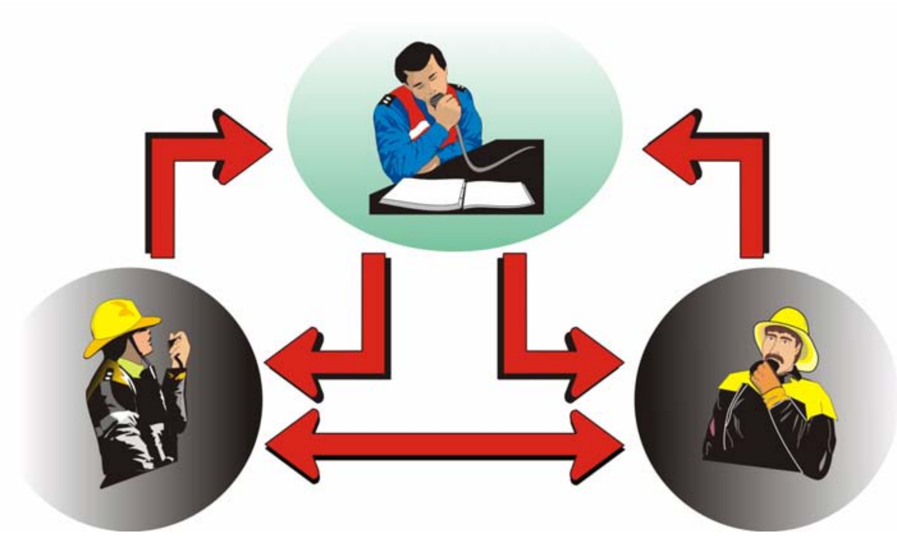


Figure 2 Tactical level of communication

1.11 Strategic level

1.11.1 The strategic level of communication is the primary means by which the Control Point passes information to the ComCen and Major Incident Coordination Centre (MICC) so that it can be processed, analysed and further distributed, if required. The Control Point is established by the first officer on scene, and at a large incident can be an Emergency Operations Centre, an RFS Fire Control Centre, or an Incident Control Vehicle (ICV).

1.11.2 Strategic radio communication is used by the Control Point to dispatch resources to incidents. For routine incident communication, this is normally achieved by mobile or vehicle radio to the ComCen. Under optimal conditions, portable radios are capable of establishing radio contact with the ComCen, but the weaker signal output (4 watts compared to 25 watts of a mobile radio) means that mobile radios are always preferable.

1.11.3 Strategic communication is established between:

- the ComCen and resources responding to or returning from an incident;
- the ComCen and the IC at incidents;
- Control Points and the ComCens; and
- the IC and ComCen with other attending agencies.

1.11.4 The MICC is responsible for planning and logistical issues that are often best managed remote from the incident site. This can include notifications associated with local, district and State emergency plans. The provision of resources for protracted incidents is also best managed through the MICC. The MICC allows incident management teams to focus on the strategic goals required to conclude the incident. Strategic communication involving the MICC and other co-ordinating points or resources is usually achieved by telephone and fax, with an increasing use of electronic mail.

1.11.5 Interagency strategic communication is achieved by the appointment of Liaison Officers (LO) on-scene, and by the direct links between agencies from the ComCen.

1.11.6 For major incidents, inter-agency cooperation may require the activation of an Emergency Operations Centre, such as RFS State Operations Rosehill or an RFS Fire Control Centre, to which the NSWFB appoints a Liaison Officer. Communication between the LO and the MICC, ComCen and/or NSWFB Commander/s will be by phone, fax and radio.

1.11.7 Strategic level communication includes passing incident information to senior and specialist officers, to other agencies, and to the media for dissemination to the community. A variety of equipment is used, including phones, faxes, pagers, radios, etc.

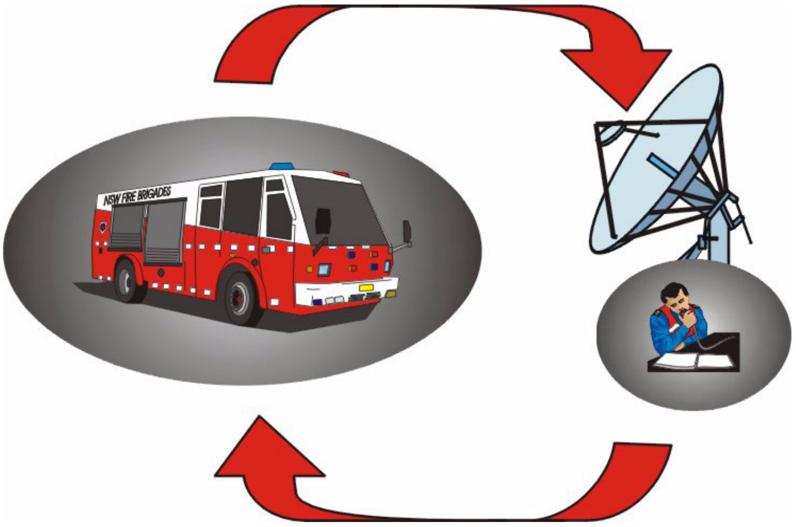


Figure 3 Strategic level of communication

1.12 Communication at multi-agency incidents

1.12.1 Multi-agency incidents require a more complex communication plan than single-agency responses. The communication plan must cater for internal NSWFB needs, as well as the passing of crucial information between agencies.

1.12.2 Fundamental to any effective multi-agency operation is the establishment of a joint Emergency Operations Centre. This enables significant face-to-face communication and joint analysis of information by senior agency representatives and/or Liaison Officers.

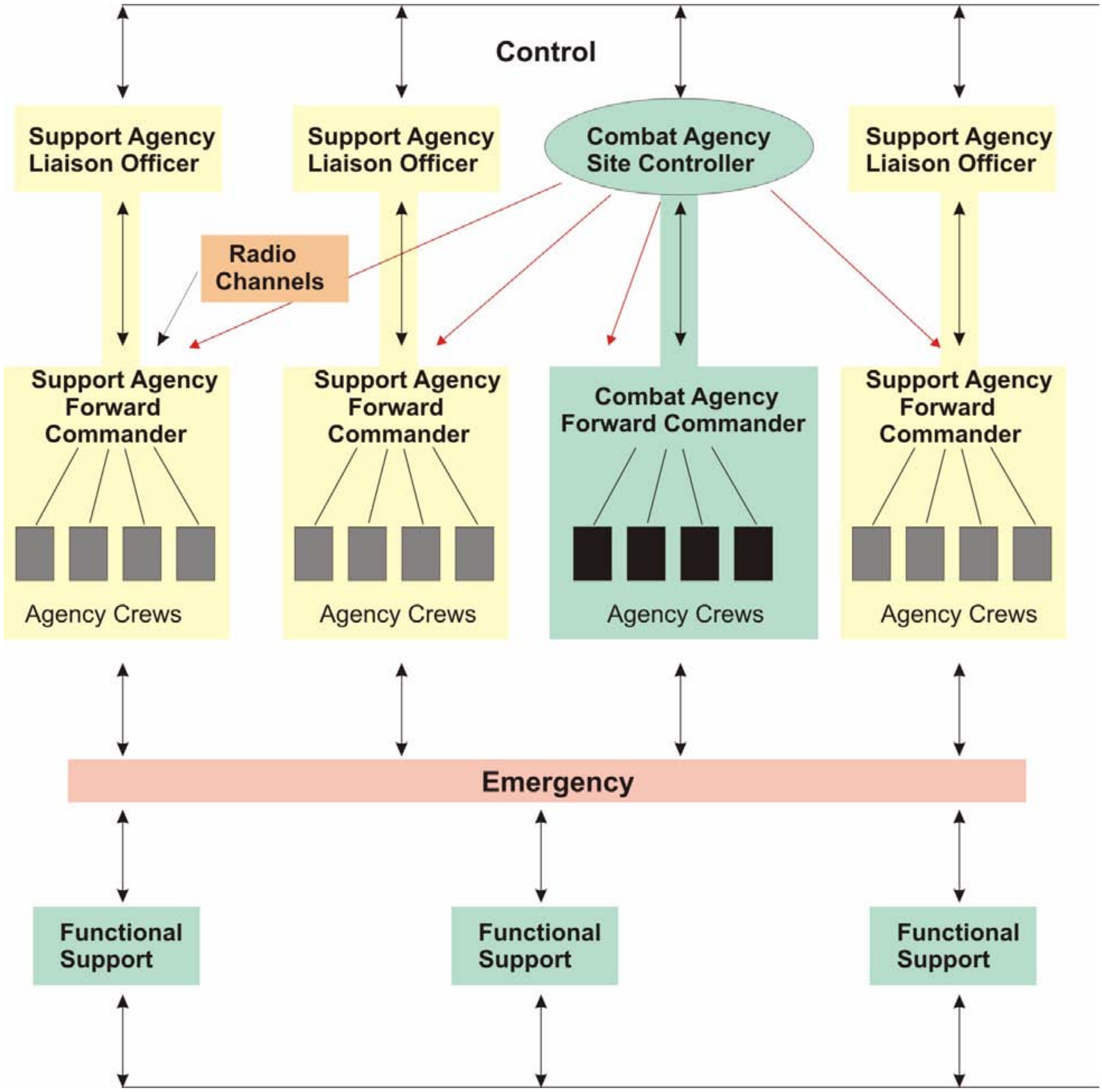


Figure 4 Combat agency controlled incident

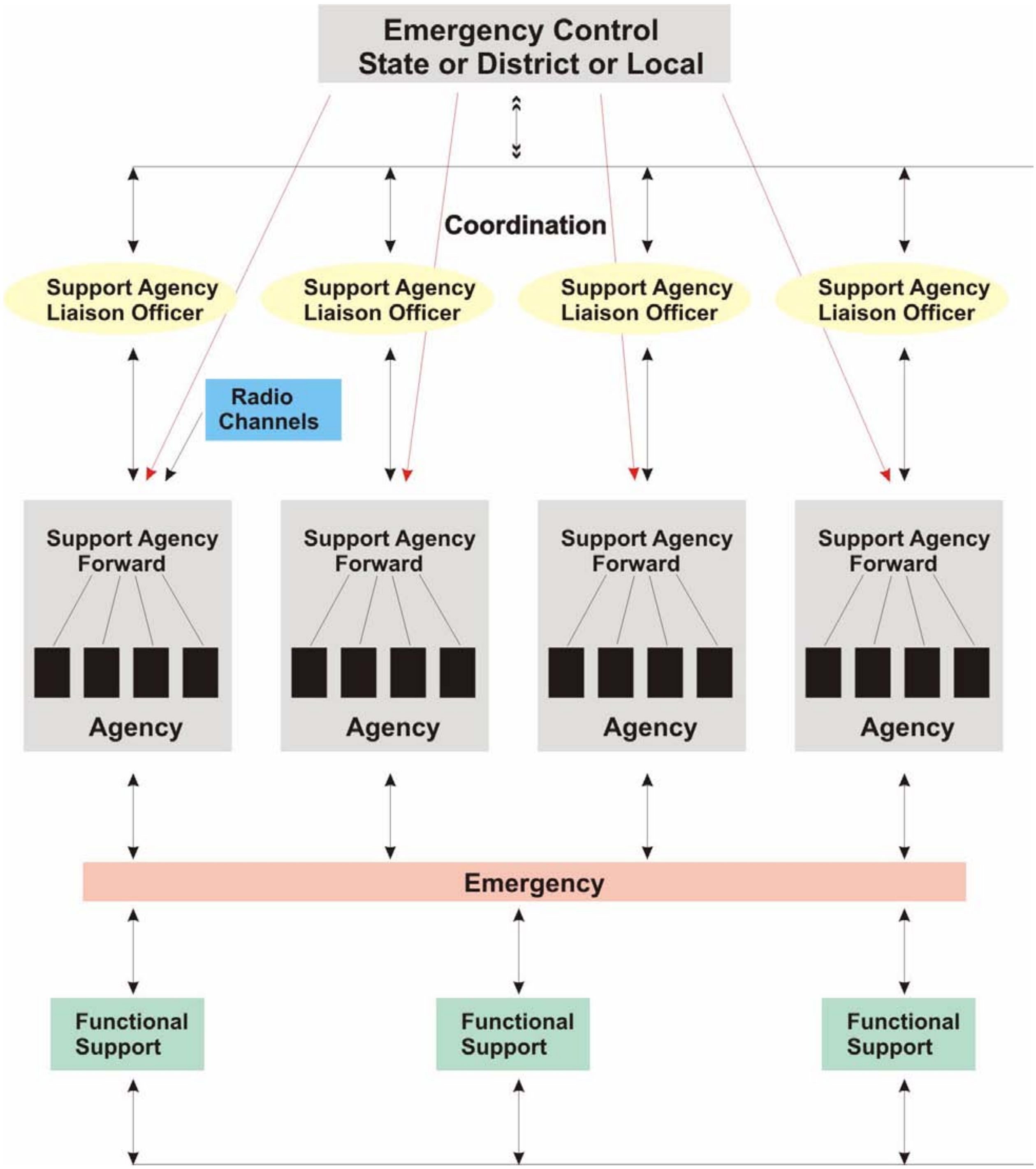


Figure 5 Emergency Operations Centre controlled incident

2 RADIO DISCIPLINE

2.1 Introduction

2.1.1 A disciplined approach to radio communication ensures that messages are easy to formulate, hear and understand.

2.1.2 Effective incident management and firefighter safety depend on the right people hearing the right message at the right time.

2.2 Application

2.2.1 This SOG applies to all NSWFB personnel, Communication Centres (ComCens) and appliances using radio communication systems.

2.3 Be clear, concise and factual

2.3.1 Speak clearly and at a practised rate – not too fast, not too slow.

2.3.2 Control emotions and excitement. If you do not consciously control your voice it will become garbled under stress, and critical information may not be understood by the receiver.

2.3.3 Think about what you are going to say before transmitting a message. Pausing to think before sending a message also helps you confirm that the channel is clear. Taking notes before a long, complex or critical message is advisable.

2.3.4 Use complete callsigns and standard terminology that the receiver has been conditioned to listen for.

2.3.5 Choose precise terms to make the message clear and brief. Plain language and accepted NSWFB terminology should be used (*see SOGs 2.4 Radio callsigns, 2.5 Standard radio codes, 2.6 Standard radio messages, and 2.7 Standard terminology*).

2.3.6 Slang, profanities and obscenities are not to be used, and if used could result in disciplinary action.

2.4 Make sure the message is understood

2.4.1 Listen carefully. If you are not sure what the message was, ask for it to be repeated.

2.4.2 Repeat critical or complicated messages back to the sender.

2.4.3 Ask the receiver to repeat critical and complex messages to ensure that they have understood them.

2.4.4 Always acknowledge a message and follow it up. Conversely, assume that messages that are not acknowledged have not been received.

2.5 Avoid radio congestion

2.5.1 Avoid transmitting unnecessary messages.

2.5.2 Keep messages short and directly to the point. Avoid long, rambling messages.

2.5.3 Use face-to-face communication whenever possible. Face-to-face communication is better than radio communication because it includes facial expressions and body language.

2.5.4 Don’t interrupt another unit’s communications unless you have a truly urgent or Red message to deliver.

2.5.5 Unless the Incident Controller is not receiving your Red message, do not communicate directly with the Communication Centre when using a portable radio or when a Control Point has been established *(see SOG 2.8 Incident callsigns – Control Points).*

2.6 Describe what is happening

2.6.1 Report danger signs, safety concerns and hazards to life immediately.

2.6.2 Don’t assume that the receiver can see what you can see.

2.6.3 Report what you don’t see – the absence of smoke, the lack of odours, no sign of fire, etc.

2.6.4 Beware of tunnel vision - sometimes people will become so focused on their immediate situation that they don’t see the bigger picture.

2.6.5 It is better to report a potential or suspected condition immediately than a confirmed but escalating situation later.

2.6.6 Think ahead. What will conditions be like in 30 minutes and what assistance will you need then? Remember that resources will take some time to arrive.

2.6.7 Don’t just report problems – if you need assistance, report the situation and recommend the solution.

2.6.8 When you have completed your assignment let whoever gave you the task know that the job is done.

2.6.9 Notify the Incident Controller if you change position or function, or if you leave the hot zone for relief or refreshments.

2.7 Joint operations

2.7.1 At joint operations with another service, use plain language for radio communications between services rather than colours and codes which may not be understood.

2.7.2 If there is no facility for direct radio communication, ensure that a liaison officer with a radio is present at the Control Point.

2.8 Protect sensitive information

2.8.1 Don't send sensitive information across an open channel. Many non-NSWFB people monitor radio transmissions.

2.8.2 Messages containing details of injuries, fatalities or personal information should be sent by alternative means of communication such as mobile phone, GRN private call facility, or face-to-face.

2.8.3 Be sensitive to the feelings of non-operational personnel or members of the public who may overhear messages. Ensure that outside speakers on appliances are turned off if sensitive information is being sent e.g. fatalities.

2.9 Using radio equipment

2.9.1 Operate your radio in the way it was intended, and learn what it takes to produce good results.

2.9.2 Depress the microphone switch fully and pause a second before speaking, ensuring that all of the message is received.

2.9.3 Use extension microphones to protect radios and ensure messages do not go unheard.

2.9.4 Establish and use an incident ground channel as soon as possible, and ensure all appliances are aware of this.

2.9.5 Know which dial position is the incident ground channel, so you can easily select the correct channel.

2.9.6 Wherever possible use the appliance radio instead of portable hand-held radios to talk to a ComCen. There is a significant difference in output and the transmission quality, so that a message sent by hand-held radio is less likely to be received and acted upon.

2.9.7 Do not use appliance radios in scan mode at emergency operations.

2.9.8 Avoid changing radio channels in the middle of operations. Establish an incident radio talkgroup at the beginning of operations.

2.9.9 The use of mobile phones or portable transceivers in hospitals may cause interference to electronic medical equipment.

WARNING

NSWFB personnel are not to use mobile phones or portable transceivers in, or in the vicinity of, clinical areas such as critical care, coronary care, general wards, labour wards, diagnostic and treatment areas, operating theatres and laboratories.

2.10 Operating procedures

2.10.1 Any mobile to mobile radio communication must be coordinated by the ComCen operator, i.e., a mobile must first call the operator who will, in turn, call the second mobile. The base station operator is to maintain control of the radio channel at all times. It is a further requirement that communication must relate to operational matters only.

2.3 ALARM RESPONSE PROTOCOLS

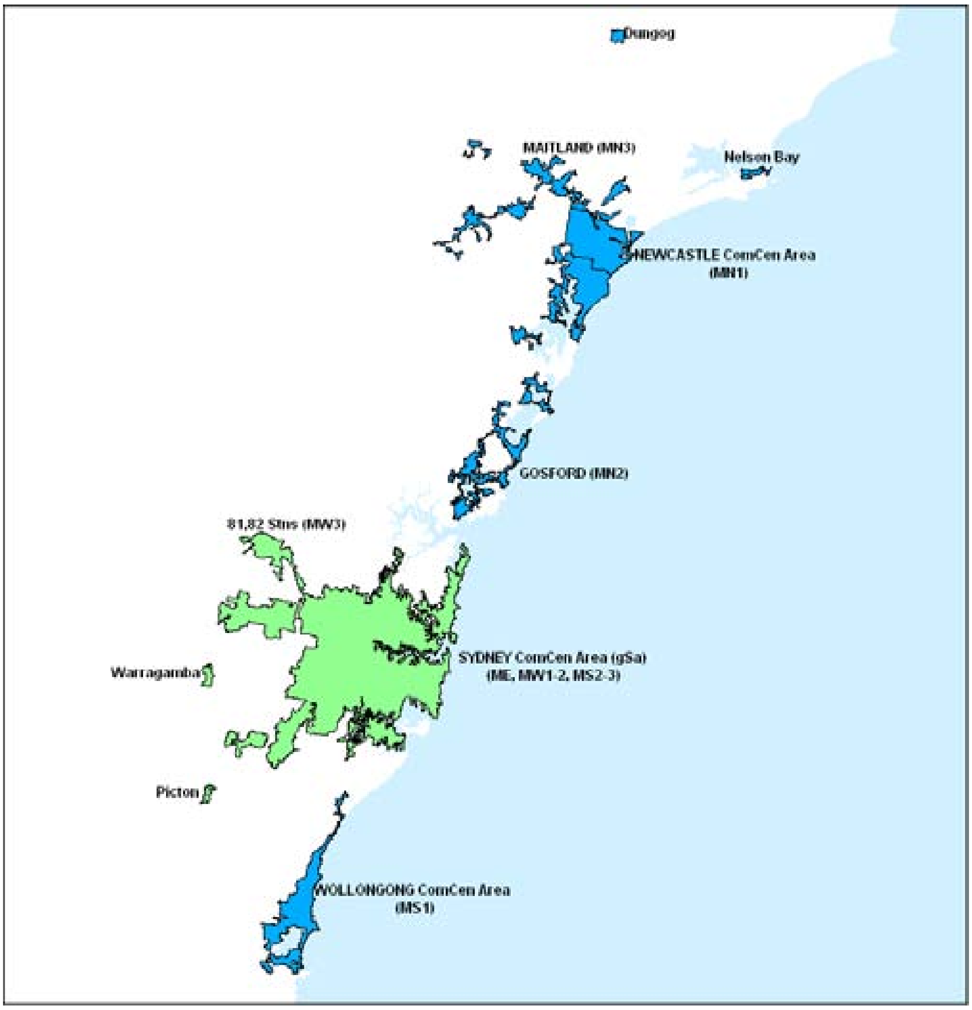
1 Introduction

The purpose of this SOG is to standardise dispatch processes and procedures in major Fire Districts where there are networks of supporting fire stations. It provides a logical approach to initial dispatch and resource escalation at incidents matching incident resources with command, control and support resources based on the principles of the Incident Control System (*SOG 1.1*).

2 Application

This SOG applies to all Zones within the Metropolitan Division except Metropolitan West 3 in the Katoomba Communication Centre (ComCen) area.

Figure 1: ARP areas, NSWFB Metropolitan Division



There are three separate ARP areas:

- **Greater Sydney area (gSa) Zones ME, MS2, MS3, MW1, MW2, Stations 81 and 82. (Sydney ComCen area of operations)**. ARP Levels for Structure Fires, Bush/Grass Fires, Hazmat and Rescue/Urban Search and Rescue (USAR) incidents are listed in Tables 3.1 to 3.4. They include a greater response of resources than other ARP Zones.

- **Zones MN 1, 2 and 3**. ARP Levels for Structure Fires, Bush/Grass Fires, Hazmat and Rescue/USAR incidents are listed in Tables 3.5 to 3.8.
- **Zone MS1**. ARP Levels for Structure Fires, Bush/Grass Fires, Hazmat and Rescue/USAR incidents are listed in Tables 3.9 to 3.12.

This SOG does not apply in:

- NSWFB Fire Districts where there is no network of supporting fire stations. In such areas, dispatch protocols reflect local risks, resources and response arrangements.
- Major incidents where resources are organised into Task Forces or Strike Teams.

At incidents or events where NSWFB is not the lead combat agency, NSWFB resources may still be organised according to ARP Levels.

3 ARP Levels

The Incident Controller (IC) will determine the Alarm Level based on initial and subsequent incident size-ups and incident conditions (*SOG 3.3* and *SOG 3.4)*.

The message requesting assistance must include the type of Alarm and the type of incident i.e. Structure Fire, Bush/Grass Fire, Hazmat Incident or Rescue/USAR.

NOTE ICs are encouraged to over-order rather than under-order resources.

All ARP Levels consist of three components:

- Operations — Pumpers (includes Tankers at Bush/Grass Fires)
- Specials — Specialist NSWFB resources, including a Logistics Support Vehicle (LSV) where available. Also included in Level 2 and above Structure Fires is a Pumper to perform the role of the Rapid Intervention Team (RIT).
- Incident Management — Senior and specialist officers e.g. Bushland Urban Interface Officer (BUI Officer) or Senior Rescue Instructor (SRI).

NOTES for ARP Level Tables

1. **'Hazmat' may be a dedicated Hazmat Unit, a Hazmat Tanker or a Hazmat Pumper. 'Rescue' may be a dedicated Rescue Unit, Rescue Tanker or a Rescue Pumper. 'Aerial' may be a dedicated Aerial or an Aerial Pumper.**
2. **The Incident Management Team (IMT) Leader (an Assistant Commissioner) has the discretion to attend any incident and either take command or assist the IC in a coaching/mentoring role.**

Table 3.1 ARP Levels for Structure fires in Zones ME, MS2, MS3, MW1, MW2, Stations 81 and 82

Structure fire	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials		1 Pumper for RIT 1 Aerial **Optional** ICV	1 Pumper for RIT 1 Rescue 1 Aerial 1 Hazmat LSV **Optional** ICV	1 Pumper for RIT 1 Rescue 2 Aerials 2 Hazmats ICV LSV	1 Pumper for RIT 2 Rescues 3 Aerials 2 Hazmats ICV LSV	Additional specials as required
Incident Management		1 Duty Commander (at 3rd Pumper)	2 Duty Commanders	3 Duty Commanders 2 Superintendents	3 Duty Commanders 2 Superintendents 1 Chief Superintendent 1 Hazmat Commander	Assistant Commissioner Additional IMT members as required

Table 3.2 ARP Levels for Bush/Grass fires in Zones ME, MS2, MS3, MW1, MW2, Stations 81 and 82

Bush/Grass fire	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers or Tankers	4 Pumpers or Tankers	6 Pumpers or Tankers	8 Pumpers or Tankers	10 Pumpers or Tankers	2 Additional Pumpers or Tankers per Alarm Level
Specials		**Optional** ICV	LSV **Optional** ICV	ICV LSV	ICV LSV	Additional Specials as required
Incident Management		1 Duty Commander **Optional** 1 BUI Officer	2 Duty Commanders 1 BUI Officer	3 Duty Commanders 2 Superintendents 1 BUI Officer	3 Duty Commanders 2 Superintendents 1 Chief Superintendent 2 BUI Officers	Assistant Commissioner Additional IMT members as required

NOTES

1. **When determining ARP levels for bush/grass fires *within* NSWFB Fire Districts, RFS resources must be included, e.g. 6 NSWFB appliances + 6 RFS appliances within a NSWFB Fire District = a 6th Alarm.**
2. **When determining ARP levels for bush/grass fires *outside* NSWFB Fire Districts, only NSWFB resources are included, e.g. 6 NSWFB appliances + 6 RFS appliances responding outside NSWFB Fire District = a 3rd Alarm.**
3. **The ICV will be withdrawn from Bush/Grass Fires when the fire reaches Class 2 or Class 3, when incident management should be transferred to a Fire Control Centre/Emergency Operations Centre.**

Table 3.3 ARP Levels for Hazmat incidents in Zones ME, MS2, MS3, MW1, MW2, Stations 81 and 82

Hazmat Incident	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials		1 Hazmat 1 Pumper for RIT **Optional** ICV	2 Hazmats 1 Pumper for RIT LSV **Optional** ICV	2 Hazmats 1 Pumper for RIT 1 Rescue ICV LSV	3 Hazmats 1 Pumper for RIT 1 Rescue ICV LSV	Additional Specials as required
Incident Management		1 Duty Commander	2 Duty Commanders 1 Hazmat Commander	3 Duty Commanders 2 Superintendents 1 Hazmat Commander	3 Duty Commanders 2 Superintendents 1 Chief Superintendent 1 Hazmat Commander	Assistant Commissioner Additional IMT members as required

Table 3.4 ARP Levels for Rescue incidents in Zones ME, MS2, MS3, MW1, MW2, Stations 81 and 82

Rescue Incident	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	1 Pumper	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials	1 Rescue	2 Rescues **Optional** ICV	3 Rescues LSV **Optional** ICV	4 Rescues 1 Hazmat ICV LSV	4 Rescues USAR 1 1 Hazmat ICV LSV	Additional Specials as required
Incident Management		1 Duty Commander	2 Duty Commanders 1 SRI	3 Duty Commanders 2 Superintendents 1 Rescue Commander 1 SRI	3 Duty Commanders 2 Superintendents 1 Chief Superintendent 1 Rescue Commander 1 SRI	Assistant Commissioner Additional IMT members as required

Table 3.5 ARP Levels for Structure fires in Zones MN 1, 2 and 3

Structure fire	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials		1 Pumper for RIT 1 Aerial	1 Pumper for RIT 1 Rescue 1 Aerial 1 Hazmat LSV	1 Pumper for RIT 1 Rescue 1 Aerial 1 Hazmat LSV	1 Pumper for RIT 1 Rescue 1 Aerial 1 Hazmat LSV	Additional Specials as required
Incident Management		1 Duty Commander	1 Duty Commander **Optional** 1 Superintendent	1 Duty Commander 1 Superintendent	1 Duty Commander 1 Superintendent IMT from gSa as required	Additional IMT members as required

Table 3.6 ARP Levels for Grass/bush fires in Zones MN 1, 2 and 3

Bush/Grass fire	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers or Tankers	4 Pumpers or Tankers	6 Pumpers or Tankers	8 Pumpers or Tankers	10 Pumpers or Tankers	2 Additional Pumpers or Tankers per Alarm Level
Specials			LSV	LSV	LSV	Additional Specials as required
Incident Management		1 Duty Commander **Optional** 1 BUI Officer	1 Duty Commander 1 BUI Officer **Optional** 1 Superintendent	1 Duty Commander 1 Superintendent 1 BUI Officer	1 Duty Commander 1 Superintendent 1 BUI Officer IMT from gSa as required	Additional IMT members as required

NOTES

1. **When determining ARP levels for bush/grass fires *within* NSWFB Fire Districts, RFS resources must be included, e.g. 6 NSWFB appliances + 6 RFS appliances within a NSWFB Fire District = a 6th Alarm.**
2. **When determining ARP levels for bush/grass fires *outside* NSWFB Fire Districts, only NSWFB resources are included, e.g. 6 NSWFB appliances + 6 RFS appliances responding outside NSWFB Fire District = a 3rd Alarm.**

Table 3.7 ARP Levels for Hazmat incidents in Zones MN 1, 2 and 3

Hazmat incident	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials		1 Hazmat 1 Pumper for RIT	1 Hazmat 1 Pumper for RIT LSV	2 Hazmats 1 Pumper for RIT LSV	2 Hazmats 1 Pumper for RIT 1 Rescue LSV	Additional Specials as required
Incident Management		1 Duty Commander	1 Duty Commander **Optional** 1 Superintendent 1 Hazmat Commander	1 Duty Commander 1 Superintendent 1 Hazmat Commander	1 Duty Commander 1 Superintendent 1 Hazmat Commander IMT from gSa as required	Additional IMT members as required

Table 3.8 ARP Levels for Rescue incidents in Zones MN 1, 2 and 3

Rescue incident	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	1 Pumper	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials	1 Rescue	1 Rescue	2 Rescues LSV	2 Rescues 1 Hazmat LSV	3 Rescues 1 Hazmat LSV	Additional Specials as required
Incident Management		1 Duty Commander	1 Duty Commander **Optional** 1 Superintendent 1 SRI	1 Duty Commander 1 Superintendent 1 SRI	1 Duty Commander 1 Superintendent 1 SRI IMT from gSa as required	Additional IMT members as required

Table 3.9 ARP Levels for Structure fires in Zone MS1

Structure fire	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials		1 Pumper for RIT 1 Aerial	1 Pumper for RIT 1 Rescue 1 Aerial 1 Hazmat LSV	1 Pumper for RIT 1 Rescue 1 Aerial 1 Hazmat LSV	1 Pumper for RIT 1 Rescue 1 Aerial 1 Hazmat LSV	Additional Specials as required
Incident Management		1 Duty Commander (at 3rd Pumper)	2 Duty Commanders	3 Duty Commanders 2 Superintendents	3 Duty Commanders 2 Superintendents 1 Chief Superintendent 1 Hazmat Commander	Assistant Commissioner Additional IMT members as required

Table 3.10 ARP Levels for Grass/bush fires in Zone MS1

Bush/Grass fire	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers or Tankers	4 Pumpers or Tankers	6 Pumpers or Tankers	8 Pumpers or Tankers	10 Pumpers or Tankers	2 Additional Pumpers or Tankers per Alarm Level
Specials			LSV	LSV	LSV	Additional Specials as required
Incident Management		1 Duty Commander **Optional** 1 BUI Officer	2 Duty Commanders 1 BUI Officer	3 Duty Commanders 2 Superintendents 1 BUI Officer	3 Duty Commanders 2 Superintendents 1 Chief Superintendent 2 BUI Officers	Assistant Commissioner Additional IMT members as required

NOTE

1. **When determining ARP levels for bush/grass fires *within* NSWFB Fire Districts, RFS resources must be included, e.g. 6 NSWFB appliances + 6 RFS appliances within a NSWFB Fire District = a 6th Alarm.**

2. **When determining ARP levels for bush/grass fires *outside* NSWFB Fire Districts, only NSWFB resources are included, e.g. 6 NSWFB appliances + 6 RFS appliances responding outside NSWFB Fire District = a 3rd Alarm.**

Table 3.11 ARP Levels for Hazmat incidents in Zone MS1

Hazmat incident	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	2 Pumpers	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials		1 Hazmat 1 Pumper for RIT	1 Hazmat 1 Pumper for RIT LSV	2 Hazmats 1 Pumper for RIT LSV	2 Hazmats 1 Pumper for RIT 1 Rescue LSV	Additional Specials as required
Incident Management		1 Duty Commander	2 Duty Commanders 1 Hazmat Commander	3 Duty Commanders 2 Superintendents 1 Hazmat Commander	3 Duty Commanders 2 Superintendents 1 Chief Superintendent 1 Hazmat Commander	Assistant Commissioner Additional IMT members as required

Table 3.12 ARP Levels for Rescue incidents in Zone MS1

Rescue incident	1st Alarm	2nd Alarm	3rd Alarm	4th Alarm	5th Alarm	6th Alarm & higher
Operations	1 Pumper	4 Pumpers	6 Pumpers	8 Pumpers	10 Pumpers	2 Additional Pumpers per Alarm Level
Specials	1 Rescue	1 Rescue	2 Rescues LSV	2 Rescues 1 Hazmat LSV	3 Rescues 1 Hazmat LSV	Additional Specials as required
Incident Management		1 Duty Commander	2 Duty Commanders 1 SRI	3 Duty Commanders 2 Superintendents 1 Rescue Commander 1 SRI	3 Duty Commanders 2 Superintendents 1 Chief Superintendent 1 Rescue Commander 1 SRI	Assistant Commissioner Additional IMT members as required

4 Initial response

The ComCen Supervisor is responsible for making resourcing decisions until resources arrive at the incident.

ComCens assign resources to an initial call based on Pre-Determined Attendances (PDAs) programmed into FireCAD, the NSWFB computer-aided dispatch system. This may be less than or higher than a 1st Alarm.

If additional information received by the ComCen suggests that an incident is serious, the ComCen Supervisor can escalate the Alarm Level above the PDA. The ComCen will notify responding resources of any decision to escalate or decrease responses and the reasons why this decision was made.

ComCen Supervisors may vary standard responses:

- if the call indicates a need for specialised resources
- if the call is to a high-hazard facility or critical infrastructure
- during periods of high resource demand, e.g. days of extreme bushfire danger or storm activity (see *SOG 19.1*), or
- at incidents in locations where the standard response resources are unavailable.

5 Special calling

'Special calling' allows the IC to vary the number and type of resources without changing the ARP Level.

The IC can 'special call':

- for less specialised resources e.g. '*Require a Structure Fire 3rd Alarm, with the exception of an aerial*', or
- for more specialised appliances e.g. '*Sydney Comms, Duty Commander North, Require a Structure Fire 5th Alarm with four aerials*'
- one additional pumper e.g. '*Sydney Comms, Pumper 10, require a Structure Fire 2nd Alarm with one additional pumper.*'

NOTE **If the available resources are not adequate, 'special calling' an additional appliance can assist the IC establish such functional areas as Command Support and ICMS (SOG 18.1), and with the development of communications plans, mapping etc.**

6 High-rise fires

If the ComCen receives confirmed information that there is a fire in a building with five or more levels above ground, the ComCen Operator is required to dispatch a minimum of a Structure Fire 2nd Alarm, as high-rise firefighting is labour intensive and a high life risk is possible.

ICs cannot downgrade this response until:

- firefighters reach the fire floor
- the position is clearly in hand, and
- the IC believes it is safe to call off resources.

7 Rescue incidents

NSW Police will determine which emergency service will send a Rescue unit to rescue incidents.

A USAR response will be initiated for a structural collapse emergency in accordance with the NSW State DisPlan Sub-plan, the *NSWFB Major Incident Management Plan — USAR*, and at the direction from the State Emergency Operations Controller (SEOCON).

8 Hazmat incidents

1st Alarm assignments for hazmat incidents may vary depending on the situation and the emergency call information; however, the usual response will be two pumps.

9 Bush and grass fires

The Operations component for each Bush/Grass Fire Alarm Level can be Pumpers or Tankers.

If tankers are required, the IC must make this clear in the assistance message, e.g. '*Wollongong Comms, Pumper 277. Require a Bushfire 3rd Alarm, including three Tankers.'*

At incidents in NSWFB Fire Districts where the NSWFB and the NSW Rural Fire Service (RFS) are in attendance, RFS Heavy Tankers (Cat 1, 2 and 11) will be included in the total number of pumping appliances that will be counted in the Alarm Level.

The IMT response, however, will be determined by the NSWFB Incident Controller, the RFS Commander and the Response Co-ordinator (RESCO), depending on the number of NSWFB appliances and the RFS incident management resources that have been dispatched.

10 Major incidents — split alarms

At major incidents, resources may be split between locations or functions and Alarm assignments made to each area or function.

For example, the crash of a passenger aircraft into a commercial area might require the following response:

- Fire attack in crash area; 5th Alarm
- Hazmat operations; 3rd Alarm
- Rescue operations; 2nd Alarm.

Splitting Alarms in this way ensures that all facets of the incident will be properly managed by a dedicated IMT.

11 Incident management of simultaneous major incidents

In the event of simultaneous major incidents (i.e. 4^{th} or higher Alarm) occurring, the normal IMT arrangements may be altered.

The minimum requirements for an IMT at each simultaneous major incident will be:

- one Superintendent
- one Inspector
- a Duty Commander's vehicle.

NOTE The Duty Commander's vehicle will provide the infrastructure for effective incident management e.g. tactical communications and ICS Tabards

During these events, the RESCO or the Major Incident Co-ordination Centre (MICC), may authorise:

- the response of additional off duty Senior Officers, and/or
- ordering on Senior Officers from an active incident to another incident.

12 Out of area fires

Initial response to out of area fires is based on Mutual Aid Agreements and PDAs.

ICs may use Alarm Levels when calling for assistance at out of area incidents. The IMT will normally be based only on the NSWFB resources in attendance.

4 RADIO CALLSIGNS

4.1 Introduction

4.1.1 When sending and receiving any form of radio communication it is essential that both the sender and receiver know precisely with whom they are communicating. For this reason NSWFB Communication Centres (ComCens), appliances and specialist officers and Control Points are identified by unique radio callsigns.

4.1.2 Callsigns are structured to convey the appliance and officer type and/or identification, usually with an identifying number.

4.2 Application

4.2.1 This SOG applies to all NSWFB personnel, ComCens and appliances using NSWFB radio communication systems.

4.3 ComCen callsigns

4.3.1 The four ComCens located in NSW and their callsigns are listed in Table 4A.

ComCen	Radio Callsign
Sydney	Sydney Comms
Katoomba	Katoomba Comms
Newcastle	Newcastle Comms
Wollongong	Wollongong Comms

Table 4A ComCen callsigns

4.3.2 Appliances or personnel calling a ComCen must start their message with the ComCen callsign, e.g. *Sydney Comms, Pumper 3, Blue.*

4.3.3 When ComCens call mobile resources they must identify which ComCen is calling, e.g. *Wollongong Comms calling Pumper 241 Over.*

4.4 Appliance callsigns

4.4.1 The naming protocol for appliance callsigns is <vehicle> <Station> <Alpha, Bravo, Charlie, etc.>. For example the primary pumping appliance from 82 Station Richmond would have the callsign ‘Pumper 82 Alpha’, with the second pump attached to the station being ‘Pumper 82 Bravo’.

4.4.2 After the ComCen has been identified, messages must identify the appliance and station number, e.g. *Newcastle Comms, Rescue two sixty, Yellow.*

4.4.3 The callsigns allocated to various types of NSWFB appliances are detailed in Table 4B.

Callsign	Description Of Appliance
PUMPERS	
Pumper	Standard NSWFB pumper (types 1, 2, 3 and 4).
Super Pumper	High-capacity Type 5 Pumper.
Aerial Pumper	Pumper with 15 m elevating hydraulic boom, ladder and monitor.
Rescue Pumper	Pumper with primary rescue accreditation.
⚠ **NOTE** **Whenever a specialist appliance, such as an Aerial Pumper, is replaced by a spare standard pumper, the callsign reverts to 'Pumper'. In all cases, the ComCen must be notified immediately.**	
AERIAL APPLIANCES	
Platform	Hydraulic platforms.
Ladder Platform	Bronto ladder platforms.
Ladders	Turntable ladder appliances.
RESCUE APPLIANCES	
Rescue	Dedicated rescue unit with primary or secondary rescue accreditation, including City of Sydney Salvage and Mercedes rescue vans.
4WD APPLIANCES	
Tanker	4WD 3000 - 4000 litre tanker/Class 1 Pumper with crew of 2 to 6. Includes appliances formerly designated as Composites, except where a 4WD Isuzu appliance is the primary response appliance (*pumper*).
Rescue Tanker Hazmat Tanker	4WD appliance with pumping capacity – may be Hazmat Tanker or Rescue Tanker.
HAZMAT & BREATHING APPARATUS APPLIANCES	
Hazmat Nine Alpha, Bravo and Charlie	Dedicated hazardous materials/BA appliances attached to Hazmat Response Unit Sydney.
Hazmat	Dedicated hazardous materials/BA appliances including Mercedes hazmat vans.
CO2 Nine	CO_2 tender attached to Hazmat Response Unit Sydney.
Lab Nine	Hazmat Mobile Analytical Vehicle.
Hazmat Support	Hazmat Decontamination Support Vehicle (Pantec).
SAS Nine	Scientific Advisor Support attached to Hazmat Response Unit Sydney.
SPECIALIST SUPPORT APPLIANCES	
ICV Alpha and ICV Bravo	Incident Control Vehicles.
ATV	All terrain vehicle.
Transporter	Prime mover for modular transport system when not carrying a pod.

Callsign	Description Of Appliance
⚠ **NOTE** **When in use the transporter will adopt the callsign of the pod that it is carrying.**	
SV	Logistics support vehicle (including district trucks and personnel carriers).
MODULAR TRANSPORT SYSTEM PODS	
USAR 1	Sydney/State urban search and rescue (USAR/major structural collapse rescue) equipment cache
USAR 2 Alpha	Newcastle's primary USAR cache
USAR 2 Bravo	Newcastle's secondary USAR cache
USAR 3 Alpha	Wollongong's primary USAR cache
USAR 3 Bravo	Wollongong's secondary USAR cache
USAR 4	USAR reconnaissance vehicle for Sydney/State deployment
Hazmat Support	Chemical, biological and radiological specialised hazmat equipment cache

Table 4B Appliance types

4.5 Identifying appliances and crews

4.5.1 Where a station has more than one appliance of the same type the appliances are designated A, B, C, etc., using the phonetic alphabet, e.g. *Pumper 82 Alpha* and *Pumper 82 Bravo* (other examples are given in Table 4C). The sole exception to this is the City of Sydney Pumper with the callsign *Flyer 1*.

Appliance	Callsign
37 stn Pumper	Pumper thirty seven
260 stn Pumper	Pumper two sixty
47 stn Aerial Pumper	Aerial Pumper forty seven
84 stn Rescue Pumper	Rescue Pumper eighty four
445 stn Mercedes Water Tanker	Tanker four four five
101 stn Pumper	Pumper one zero one
251 stn Isuzu 4WD	Tanker two five one
City of Sydney Salvage	Rescue one
63 stn Rescue	Rescue sixty three
36 stn Ladder Platform	Ladder Platform thirty six
21 stn Hydraulic Platform	Platform twenty one
4 stn Turntable Ladder	Ladders four

Appliance	Callsign
216 stn Isuzu 4WD Hazmat	Hazmat Tanker two one six
Incident Control Vehicles	ICV Alpha and ICV Bravo
Modular Transporter	Transporter Alpha and Transporter Bravo

Table 4C Examples of appliance callsigns

4.5.2 Appliances maintain their normal callsign even when moving up to another station or responding out of area.

4.5.3 Aircraft can identify appliances by the number painted on the roof. This is normally the appliance radio callsign, e.g. P46 for Pumper 46. If a Service Exchange Vehicle (SEV) or other appliance, which does not have the station number on the roof, is being used, notify the Control Point so that it can effectively plot appliance locations given by the aircraft.

4.5.4 Where communication is by hand-held transceiver, callsigns are based on the appliance to which the crew is attached and their operational function at the incident. A crew that has yet to be allocated a task (e.g. at a Staging area) will not include an operational function in their callsign.

Crew	Callsign
26 Station crew involved in firefighting	Pumper 26 fire attack
472 Station crew involved in search and rescue	Pumper 472 search and rescue
503 Station crew performing salvage work	Pumper 503 salvage
207 Station crew performing ventilation	Tanker 207 ventilation
97 Station crew waiting to be allocated a task	Pumper 97 crew
Pumper 32 Station Officer	Station Officer 32

Table 4D Examples of functional callsigns

4.6 Senior/specialist officer callsigns

4.6.1 The callsign for a senior officer is either the name of the position held (e.g. Zone Commander North 1) or, when involved in operations, the role on an Incident Management Team (e.g. Incident Controller, Operations Officer) as described in *SOG 1.4*.

4.6.2 Where more than one officer shares the same position title, the officers are described by a number after the callsign, e.g. BFO 4. Examples of senior and specialist officer callsigns are given in Table 4E.

Position / Designation	Senior / Specialist Officer Callsign
Commissioner	Commissioner
Director State Operations	DSO
Director Capability Development	DCD

Position / Designation	Senior / Specialist Officer Callsign
Regional Commander North	Regional Commander North
Deputy Regional Commander South	DRC South
Zone Commander North 1	Zone Commander North one
Operational Commander West 2	Operational Commander West two
Manager Hazmat	Hazmat one
Deputy Manager Hazmat	Hazmat two
Manager Rescue	SAR one
Deputy Manager Rescue	SAR two
Assistant Rescue Officers	SAR three, four, etc.
Manager Bushfire and Natural Hazards	BFO one
Assistant Bushfire Officers	BFO two/three, etc.
Principal Instructor West Region	PI West

Table 4E Examples of senior/specialist officer callsigns

4.7 Incident Control System callsigns

4.7.1 Some examples of Incident Control System callsigns are given in Table 4F.

Function	Callsign
Incident Controller	IC
Operations Officer	Operations
Logistics Officer	Logistics
Planning Officer	Planning
Safety Officer	Safety Officer
Division Commander	Division 1, 2, etc.
Sector Commander	Sector Alpha, Bravo, etc.
Fire Attack Group Commander	Fire Attack
Salvage Group Commander	Salvage

Table 4F Incident Control System callsigns

⚠ **NOTE**

All messages from an incident to a ComCen should go through the Control Point and/or Incident Controller, except in an emergency requiring immediate action.

2.5 STANDARD RADIO CODES

1 Introduction

Standard radio codes quickly and effectively indicate message priority and appliance status changes while reducing radio traffic.

2 Application

This SOG applies to all NSWFB personnel, Communication Centres (ComCens) and appliances using NSWFB radio communication systems.

3 Priority codes

Standard colour codes at the beginning of radio messages indicate priority.

ComCen operators must give **Red, Red, Red** messages priority over all other radio messages.

Standard colour codes

Colour	Meaning
Red, Red, Red	Highest priority. Require urgent assistance or priority access to radio channels.
White	Very high priority. Reporting a new incident (appliance to ComCen).
Blue	High priority. Incident message.
Green	Medium priority. Incident stop.
Yellow	Low priority. Non-incident message.

4 Status codes

Use standard numerical codes to convey status to the ComCen.

Standard numerical status codes

Code	Meaning
1	Responding to an incident or move-up – should include a clarification when the appliance is travelling under normal road conditions.
2	Call off (sent by ComCen).
3	On scene at incident or move-up station (state location/address).
4	Available for response (if not returning to station, give destination, eg *Sydney Comms Pumper 53 Code 4, returning to stand by at 60 Station*).
5	Returned to station (if you have returned to a station other than your home station, give your location, eg *Sydney Comms Pumper 53 Code 5 at 60 Station*). A Code 5 can be given to the ComCen by telephone.
6	Incident in Rural Fire District (see section 5).
7	Unavailable for response (state reason and transmit Code 4 immediately when available).

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5 Code 6

Code 6 is used to indicate that the NSWFB is responding to a call in a Rural Fire District, ie in a NSW Rural Fire Service Area.

A Code 6 must be transmitted:

- Immediately it becomes apparent to the Officer-in-Charge (OIC) of a NSWFB appliance that they have received a call to an incident located within a Rural Fire District, or
- With the Code 1 (responding) message if it is known at the time of the call that the incident is in a Rural Fire District.

Code 6 should be transmitted for all types of incidents in Rural Fire Districts, including rescue and hazmat calls, whether or not Rural Fire Service attendance is required.

ComCen Operators must immediately notify the relevant Rural Fire District of the receipt of a Code 6.

The Rural Fire Service should be requested to support the NSWFB's response to rescue and hazmat incidents within Rural Fire Districts when:

- there is a possibility of fire,
- they may be able to offer logistical support (eg with water supply), or
- they can assist in other support roles.

When the incident does not require Rural Fire Service assistance (eg a vertical rescue), the ComCen will notify the Rural Fire Service as a professional courtesy, but advise them that Rural Fire Service response is not necessary.

Where it is obvious that the call has been mistakenly passed to a NSWFB station (eg a call to a bushfire within a Rural Fire District), contact the ComCen immediately, so that the Rural Fire Service can be assigned to the call instead of the NSWFB.

6 Radio codes for automatic fire alarms

Radio codes for automatic fire alarms (AFAs) are used by the OIC to send Stop messages to the ComCen at the conclusion of an AFA-reported incident. The ComCen operator enters the code into the FireCAD system, which then automatically sends it to AIRS.

AFA-reported fire

Use code 100 where an AFA call is to an actual fire – ie one which the NSWFB has been alerted to by the activation of an AFA or manual call point.

The OIC must ensure that an *informative* Stop message is sent with the 100 code. The code is passed to AIRS, but, on return to station, the AIRS report needs to be updated to reflect the nature of the incident.

AFA-reported incident without fire

Use the 700 codes to identify AFA types. The OIC must ensure that the appropriate code is transmitted to the ComCen as part of the Stop message.

If an AFA-reported incident cannot be classified according to these codes, send a *spoken* Stop message rather than a code. This will ensure that undetermined causes are classified as required.

Cooking fumes – false alarm or fire?

The OIC at an incident in which an AFA was activated by cooking fumes (such as burnt toast) must make a determination as to whether that alarm is a false alarm or an actual fire. The distinction is made as follows:

- If the cooking fumes occur *with* flaming, it is an actual fire. Send a code 100.
- If the cooking fumes occur *without* flaming, it is a false alarm. The AFA activation is considered avoidable by appropriate design or management by the premises owner or occupier. Send a code 756.

Radio codes for automatic fire alarms

AFA reported fire		
100	An actual fire reported by the activation of an AFA detection or fire sprinkler system	Non chargeable
AFA false alarm - other		
702	Alarm operated due to extreme weather conditions – rain, storm, lightning, thunder, dust, flood, rainwater leaking onto detector, etc	Non chargeable
706	Council or water supply authority causes pressure fluctuation through water mains	Non chargeable
707	Alarm operated due to power surge/spike or short circuit, blackout	Non chargeable
Malicious/mischievous false alarm		
711	Malicious false alarm – eg activation of Break Glass Alarm or Manual Control Point (see code 762 for accidental or good intent calls)	Chargeable
Suspected malfunctions		
731	Sprinkler suspected malfunction – eg loss of pressure and equipment faults	Chargeable
732	Smoke detector suspected malfunction – eg continuous or intermittent fault in detector or FIP (defective apparatus)	Chargeable
733	Heat detector suspected malfunction – eg continuous or intermittent fault in detector or FIP (defective apparatus)	Chargeable
738	Alarm system suspected malfunction – eg fault in wiring, alarm panel, poor maintenance, etc (fault in system)	Chargeable
Suspected malfunction in private alarm system		
745	False alarms generated from a non-AFASP monitored alarm system – domestic premises (alarm bell ringing)	Chargeable
746	False alarm generated from a non-AFASP monitored alarm system – commercial premises (alarm bell ringing)	Chargeable

Simulated conditions – no fire		
751	Smoke detector operated – no fire – smoke from external source – eg bushfire	Non chargeable
752	Heat detector operated – no fire – eg heat from oven, dryer, heater, hair straightener, etc	Chargeable
756	Cooking fumes – eg toast, foodstuffs, etc	Chargeable
758	Simulated conditions – eg incense, candles, sparklers, smoke machine, smokers materials, etc	Chargeable
Unintentional alarms – not involving a suspected malfunctions		
762	Unintentional alarm – eg accidental activation of Break Glass Alarm or Manual Control Point, damaged sprinkler head not attributed to owner/occupant	Non chargeable
764	Incorrect operation/service by servicing company personnel	Chargeable
765	Alarm activation due to workers/occupier activities	Chargeable
766	Alarm activation due to poor building maintenance – eg dust, cobwebs, damage, insects, etc	Chargeable
767	Alarm activation due to aerosol use – eg hair spray, insecticides, etc	Chargeable
768	Alarm activation due to steam – eg shower, bath, sauna, kettle, steam room, etc	Chargeable
Fire Indicator Panel		
772	Fire Indicator Panel active, Alarm Signalling Equipment not activated	Chargeable
773	Fire Indicator Panel not active (includes system reset before arrival), Alarm Signalling Equipment activated	Chargeable

6 STANDARD RADIO MESSAGES

6.1 Introduction

6.1.1 The use of standard radio message formats and procedures ensures that critical incident information is communicated in a timely and accurate manner.

6.2 Application

6.2.1 This SOG applies to all NSWFB personnel, Communication Centres (ComCens) and appliances using NSWFB radio communication systems.

6.3 Message sequence

6.3.1 Radio messages from responding appliances to ComCens should follow a logical sequence to ensure that critical information and incident status is conveyed. This enables ComCens to dispatch appropriate resources, arrange logistics support, notify appropriate senior officers and support agencies, and record incident details.

6.3.2 The messages from an incident reflect the progress of the incident as it moves through different stages:

- Responding;
- On scene and investigating OR on scene and requiring assistance;
- Under control; and
- Completed.

6.3.3 At most incidents the communication flow will follow these stages, as shown in Figure 1.

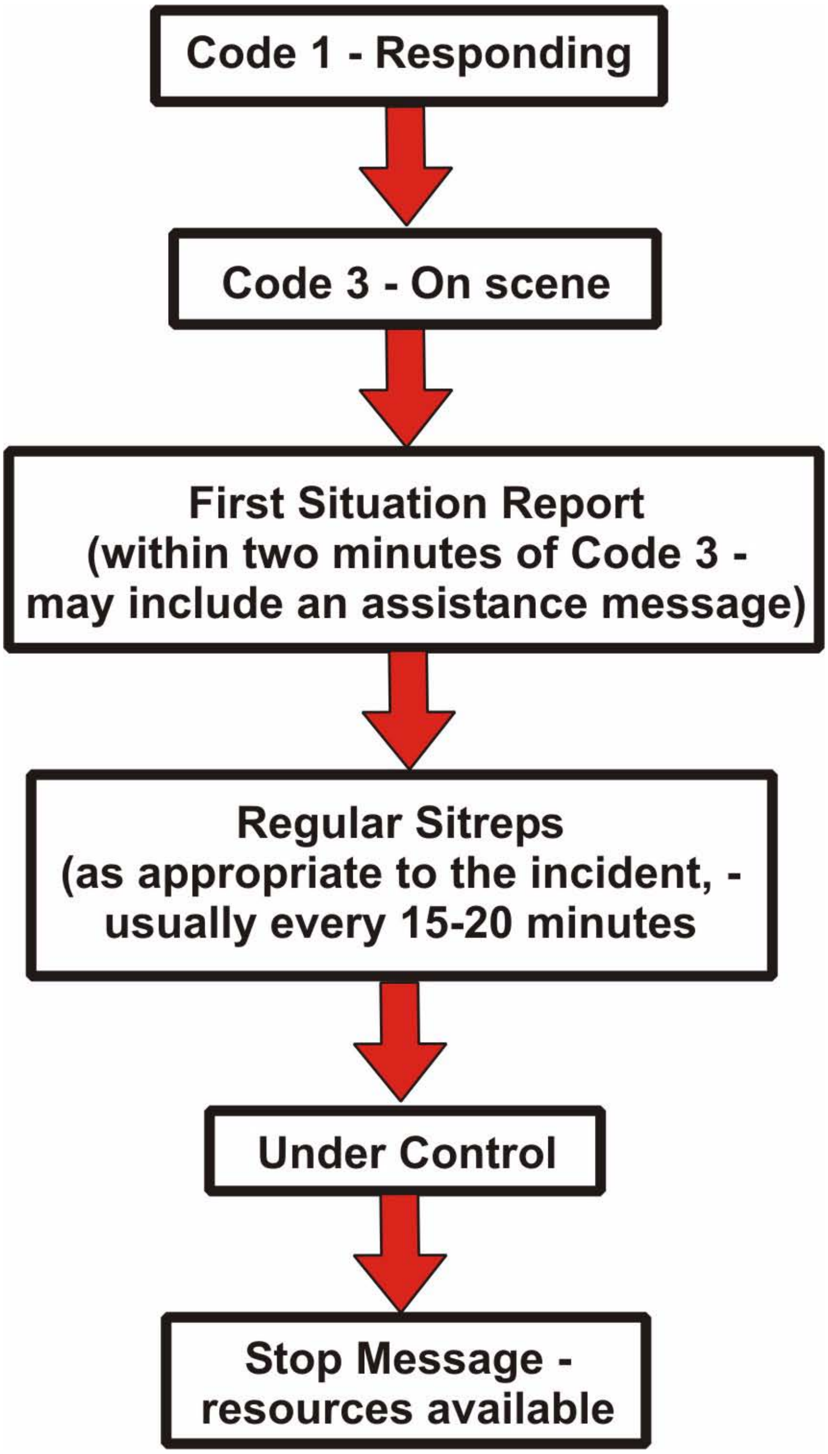

Figure 1 – Typical incident communication flow

6.4 On scene message

6.4.1 All appliances must send a Code 3 on arrival at an incident. The first appliance to arrive at an incident should send a brief informative message with their Code 3 giving the location of the incident and basic information about incident conditions. To make it easier to convey information to the ComCen Operator, use the standard terminology in Table 6A.

Call Type	Description
STRUCTURE FIRE (include basic construction and size)	Investigating Smoke issuing Large volumes of smoke issuing Alight (<50% involved) Well alight (>50% involved) Totally involved Persons reported
AUTOMATIC FIRE ALARM	As above, where investigation determines there is an actual fire or emergency incident. For false alarms, short messages and Stops are acceptable.
NON-STRUCTURE FIRE (provide brief description, e.g. semi-trailer)	Investigating Smoke visible/issuing Alight (<50% involved) Well alight (>50% involved) Totally involved
BUSH OR GRASS FIRE (indicate size and severity)	Investigating Smoke in the area - investigating Small area of bush/grass alight Large area of bush/grass alight Property in danger
HAZARDOUS MATERIAL INCIDENT (describe substance, e.g. solid, liquid, gas. State approx. quantity)	No sign of spillage/escape - investigating Spillage/escape of unknown substance - investigating Spillage/escape of (name substance)
RESCUE INCIDENT (provide brief description of incident, e.g. *2 vehicle head on MVA with 2 persons trapped*)	MVA - investigating Person trapped No persons trapped Multiple persons trapped (state number)

Table 6A Standard radio message format

6.5 First situation report

6.5.1 The first arriving officer in charge must send an informative message or situation report (sitrep) after sizing up the incident. This first sitrep can be sent either with the ‘on scene’ message or, where the incident conditions are not immediately evident, within 2 minutes.

6.5.2 At active incidents, the message should contain the following information:

- appliance or resource radio callsign;
- any assistance required, including other services or agencies;
- confirmation of the address (if different to call address);
- incident type and description;
- any obvious incident conditions;
- incident size/dimensions/construction (if relevant), any special hazards or exposures, rate of spread;
- occupancy (if a structure) and whether persons are reported trapped;
- action being taken including basic strategy (for structure fires see SOG 4.3, for bushfires see SOG 3.3); and
- establishment of a Control Point and the title/position of the Incident Commander.

Example:

Appliance: *“Sydney Comms, Super Pumper 36 Blue”*.

ComCen: *“Sydney Comms, Super Pumper 36 pass your message”*.

Appliance: *“Sydney Comms, Super Pumper 36 Blue from 50 Mount Street, North Sydney.*
Smoke issuing from the front of a two-level brick and tile house, approximately 15 metres by 20 metres.
Persons reported.
In offensive mode, conducting search and rescue.
Pumper and BA crews at work.
SO 36 is Mount Street Incident Commander.
Further message to follow”.

ComCen: *“Sydney Comms, received your message Super Pumper 36 at 2025 hours. Channel clear”*.

6.6 Assistance message

6.6.1 When the first or subsequently attending officer arrives on scene, a size-up must be conducted (see *SOG 3.3, Bushfire size-up* and *SOG 4.1, Structure fire size-up*). If the size-up indicates that more resources are urgently required to bring the situation under control, a priority (Red) message must be transmitted without delay.

6.6.2 Assistance messages must state the number and type of resources required on scene.

6.6.3 Assistance messages can be sent prior to the arrival of the first attending resource if conditions on approach indicate that additional resources will be necessary.

6.6.4 In Sydney, Newcastle, the Illawarra and the Central Coast the message must state the level of alarm required. (see *SOG 2.3 Alarm response protocols*).

6.7 Situation reports

6.7.1 Situation reports (sitreps) should be transmitted by the Incident Controller to the ComCen at regular intervals during the incident. As a guide sitreps should be transmitted 5 minutes after the first informative message and then every 15 to 20 minutes. At some protracted incidents the situation will not change markedly over this timeframe.

6.7.2 Depending on the type of incident, sitreps may include the following information:

- appliance callsign followed by Control Point name, e.g. *Sydney Comms, Pumper 64, Smith Street Control, Blue*;
- any assistance required, including other services or agencies;
- incident type and description; including incident size/dimensions/construction;
- occupancy and any life risk or casualties;
- exposures;
- incident status, e.g. spreading, contained, position in hand, etc;
- brief description of operations (including basic strategy for structure fires - offensive, defensive or marginal); and
- the measures put in place to ensure operational safety.

⚠ **NOTE**

There is no need to repeat the address or any other static details each time a sitrep is transmitted. Informative messaging should only report changes to actions or conditions. If the details have not changed from the previous Sitrep, or from the printout, use the phrase 'As previously stated …'.

6.8 Stop message

6.8.1 The Incident Controller sends a Stop message to the ComCen when the incident has been controlled and resources are being released – for example, when a fire has been extinguished or a hazmat spill has been rendered safe. The Stop should be sent when operations are completed, and Code 4 (available for response – an intended destination must be included) is implicit in the Stop message unless otherwise stated.

6.8.2 The contents of Stop messages for working incidents will depend on the incident type. As an example, for a structure fire the Stop message will include: the address, occupancy, building size, the action taken to extinguish the fire (including the number of pumps, aerials and jets), details of any injuries, and subsequent actions required e.g. the establishment of a fire duty.

6.8.3 If the Stop is for a false alarm generated by an automatic fire alarm, it must include an AIRS false alarm Stop code as given in SOG 2.5.

6.9 Stop messages – minor incidents

6.9.1 For minor incidents, such as small rubbish, grass and bush fires, and false alarm calls not involving automatic fire alarm systems, a simple Stop message is permissible. This is because the incident type and relevant information has already been recorded in FireCAD. Minor incident Stop messages only need to contain the appliance callsign, the word 'Stop' and the address of the incident.

Example:

Appliance:	"*Aerial Pumper 86 Green*".
ComCen:	"*Aerial Pumper 86, Pass your Stop*".
Appliance:	"*Aerial Pumper 86, Stop from Smith St Penrith*".
ComCen:	"*Received your Stop Aerial Pumper 86, 1145 hours. Channel clear*".

⚠ **NOTE**

Stops for hoax and good intent calls will be given in plain language eg 'Malcious false alarm' and 'False alarm given in good faith'.

7 STANDARD TERMINOLOGY

7.1 Introduction

7.1.1 The use of standard radio message terminology ensures that all network users readily understand critical information.

7.2 Application

7.2.1 This SOG applies to all NSWFB personnel, Communication Centres (ComCens) and appliances using NSWFB radio communication systems.

7.3 Terminology

7.3.1 Use plain language (see Table 7A) in NSWFB radio messages. Only use codes to convey priority and status as identified in SOGs 2.5 *Standard Radio Codes* and 2.6. *Standard Radio Messages*.

⚠ **NOTE**

Slang, profanities and obscenities are not to be used, and if used could result in disciplinary action.

Term	Meaning
Affirmative	Yes, or that is correct.
All clear	Search and rescue have been completed and the Incident Controller is satisfied that all occupants have been accounted for.
Copied	The information or instruction I received from you and am now reading back to you is (repeat back message).
Copy so far?	Part of a message has been sent, and the sender is awaiting confirmation of receipt (used by person sending message).
Confirm	Confirm your message or the portion indicated.
Contained	The entire perimeter of a bushfire is behind identifiable control lines. Mop up and patrol have started (also refer to SOG 3.2). Also used in relation to structure fires where fire spread has been stopped.
Correction	I made a mistake, the correct message is:
Disregard	Ignore my last transmission.
ETA	Estimated Time of Arrival.
ETD	Estimated Time of Departure.
Going	A bush or grass fire spreading on one or more flanks; effective control strategies not in place for the entire perimeter (also refer to SOG 3.2).

Term	Meaning
In defensive mode	An exterior attack / exposure protection e.g. structure fire or bushfire threatening property.
In marginal mode – persons reported	Search and rescue at a heavily fire-involved structure while other crews prepare for a defensive attack (see SOG 4.3).
In offensive mode	An interior attack at a structure fire perhaps including search and rescue and intended to quickly bring the fire under control and to rescue occupants.
Investigating	No sign of fire or emergency. Further investigation is required to establish the status of the fire, alarm or incident.
I say again	I will repeat my last transmission.
I spell	I will spell using the phonetic alphabet.
Negative	That is not correct or permission is not granted.
Nothing Heard	No answer received.
Over	Finished transmitting and expect a reply (*only* used if the end of your message is not obvious).
Received	Message received and understood (*not* to be used where read back is required or where affirmative or negative is required as an answer).
Say again	Repeat your last transmission or the portion specified.
Stand by	Await further instructions.
Unable to	Unable to comply with instruction (details are read back and the reason for the inability is to be given).
Under control	Incident contained and no further assistance is required.
Will do	Message received and understood and will be complied with.

Table 7A Standard terminology

7.4 Phonetic alphabet

7.4.1 If a name or word needs to be spelled, use the phonetic alphabet as given in Table 7B to avoid any confusion due to accent, pronunciation or radio interference.

⚠ **NOTE**

This is especially important at hazmat incidents where incorrect spelling of a substance name could have grave consequences.

Term	Meaning
A	Alpha
B	Bravo
C	Charlie
D	Delta
E	Echo
F	Foxtrot
G	Golf
H	Hotel
I	India
J	Juliet
K	Kilo
L	Lima
M	Mike
N	November
O	Oscar
P	Papa
Q	Quebec
R	Romeo
S	Sierra
T	Tango
U	Uniform
V	Victor
W	Whiskey
X	X-ray
Y	Yankee
Z	Zulu

Table 7B Phonetic alphabet

7.5 Numbers

7.5.1 Numbers below one hundred should be stated as the number e.g. Pumper 37 is stated as *Pumper thirty-seven*.

7.5.2 Numbers above one hundred should generally be stated individually, except for multiples of tens, hundreds and thousands. For example, 347 should be stated as *three-four-seven*, 300 as *three-hundred* and 260 as *two-sixty.*

7.5.3 Decimals should be stated as point. For example, 22.6 is stated as *twenty-two point six.*

⚠ **NOTE**

The correct pronunciation of numbers is important. The pronunciation of number 5 and number 9 should be exaggerated so that they are not confused with each other.

8 INCIDENT CALLSIGNS – CONTROL POINTS

8.1 Introduction

8.1.1 Control Point callsigns are used to identify which incident a radio message is coming from.

8.2 Application

8.2.1 This SOG applies to all NSWFB personnel, Communication Centres (ComCens) and appliances using NSWFB radio communication systems.

8.3 Establishing a Control Point

8.3.1 A Control Point should be established for protracted incidents and any incident where assistance is requested, including fires, hazmat incidents and rescues (see *SOG 1.2)*.

8.3.2 The Incident Controller should set up a Control Point at all working incidents where more than two units are responded.

8.3.3 Depending on the size and complexity of the incident, the Control Point may operate from:

- a fire appliance:
- a Senior Officer's vehicle;
- an Incident Control Vehicle; or
- an established Emergency Operations Centre.

8.3.4 The officer who establishes a Control Point gives the Control Point a radio callsign. This callsign is used to identify the incident and stays the same throughout the incident, unless the Control Point moves.

⚠ **NOTE**

Widespread disasters or emergencies, such as major bushfires or storm damage operations, may not be easily managed from a single location and are not subject to this requirement.

8.3.5 At all incidents, the Incident Controller must ensure that a firefighter is detailed to monitor and receive radio communications at all times.

8.4 Control Point callsigns

8.4.1 Control Point callsigns usually use the street name, premises name or suburb name (for large incidents). This name will be used in communications between units at the incident.

Control Point Type / Locality	Callsign
Street name	Wyndham Street Control
Suburb name (large incident)	Ingleburn Control
Premises name	Shell Refinery Control

Table 8A Examples of Control Point callsigns

⚠ **NOTE**

Control Point callsigns are not programmed into FireCAD and must therefore be preceded by the normal appliance callsign e.g. *Sydney Comms, Pumper 53 Ernest St Control Blue*, to ensure that ComCen operators assign messages to the correct incident.

The callsign stays the same throughout the incident, unless the Control Point is moved, regardless of the transfer of control between officers. This eliminates confusion for later arriving appliances.

9 STRIKE TEAMS, TASK FORCES AND SPECIAL RESPONSE GROUPS

9.1 Introduction

9.1.1 During major operations appliances may be formed into Strike Teams or Task Forces (see *SOG 1.9*) for tactical deployment. For long term or remote assignments Special Response Groups (SRGs) may be formed (see *SOG 1.10*). The purpose of this SOG is to provide a standard method of assigning radio callsigns in these circumstances.

9.2 Application

9.2.1 This SOG applies to all NSWFB personnel, Communication Centres (ComCens) and appliances using NSWFB radio communication systems.

9.3 Callsign allocation

9.3.1 Each Strike Team, Task Force and SRG will be allocated a callsign by the Response Coordinator, or by the Major Incident Coordination Centre (MICC), if activated.

9.4 Strike Team callsigns

9.4.1 A Strike Team is a group of four or more appliances with a leader that can be assigned to an incident. Strike Team callsigns are assigned alphabetically starting from Alpha, e.g. Strike Team Alpha/Bravo/Charlie, etc.

9.4.2 Where a Strike Team is formed from an area outside the greater Sydney area, the callsign will indicate the Zone from which the Strike Team resources have been drawn, e.g. Strike Team N5 Alpha.

9.5 Task Force callsigns

9.5.1 A Task Force is a group of appliances assembled for a specific task at an incident, as opposed to Strike Teams that can be used for any purpose. Task Force callsigns are also assigned alphabetically but starting from Mike so as not to duplicate Strike Team callsigns, e.g. Task Force Mike/November/Oscar.

9.5.2 Where a Task Force is formed from an area outside the greater Sydney area, the callsign indicates the Zone from which the Task Force resources have been drawn, e.g. Task Force N5 Mike.

9.6 Special Response Group callsigns

9.6.1 Special Response Group callsigns (SRGs) comprise a number of Strike Teams and/or Task Forces and are assembled for long distance or long term deployment. An SRG does not require a radio callsign as each Strike Team, Task Force and Leader will be assigned a unique callsign.

9.6.2 All appliances within an SRG retain their normal callsigns.

9.6.3 All communications to an SRG should be directed to the SRG Commander.

10 RADIO INFRASTRUCTURE AND TALKGROUPS

10.1 Introduction

10.1.1 The NSW Fire Brigades (NSWFB) maintain communications between mobile appliances and Communication Centres (ComCens) by a number of different means.

10.1.2 For incident response, depending on location, the main methods of communication are:

- Government Radio Network (GRN);
- Private Mobile Radio Networks (PMR); and
- satellite phones.

10.2 Government Radio Network talkgroup and channel allocation

10.2.1 Talkgroups in GRN radios (‘channels’) are programmed in blocks called Zones. The NSWFB has access to many GRN talkgroups and simplex frequencies. Some GRN talkgroups and simplex channels permit inter-service communication.

10.2.2 Each NSWFB Zone is allocated a channel on the GRN, each with a number of talkgroups.

10.2.3 Incident ground or tactical channels (e.g. the 500 group) are not connected to the GRN. This means users can not transmit to a ComCen (‘simplex’ operation).

10.3 Zones 100 to 400 - regional communications

10.3.1 The talkgroups for Zones 100 to 400 are shown in Tables 10A to 10D below:

Zone 100 SYD	Greater Sydney Area (gSa)
100 SYD GRP	Scan channel for 101 to 104
101 SYD 01	Normal communications for North Region gSa - N1, N2
102 SYD 02	Normal communications for West Region gSa - W1, W2, W6
103 SYD 03	Normal communications for South Region gSa - S1, S2, S6
104 SYD 04	Normal communications for Region gSa - TBA
105 SYD HT N	Harbour Tunnel North gSa - linked to SYD 101
106 SYD HT SO	Harbour Tunnel gSa Special Operations - linked to SO 601
107 SYD 07	Normal communications for gSa Zone - TBA
108 SYD 08	Normal communications for gSa Zone - TBA
109 SYD 09	Normal communications for gSa Zone - TBA
110 SYD 10	Normal communications for gSa Zone - TBA
111 SYD 11	Normal communications for gSa Zone - TBA
112 SYD 12	Normal communications for gSa Zone - TBA

Table 10A Zone 100 - Greater Sydney area

Zone 200 NEW	Newcastle, Hunter and Central Coast
200 NEW GRP	Scan channel for 201 to 205
201 NEW 1	Newcastle/Lake Macquarie area
202 NEW 2	Newcastle/Lake Macquarie area
203 GOS 1	Gosford/Central Coast area
204 GOS 2	Gosford/Central Coast area
205 HUNT 1	Hunter area
206 HASTINGS 1	Allocated for GRN expansion
207 SUMERLND 1	Allocated for GRN expansion
208 PEEL 1	Allocated for GRN expansion

Table 10B Zone 200 - Newcastle, Hunter and Central Coast

Zone 300 WOL	Illawarra, Southern Highlands, Goulburn
300 WOL GRP	Scan channel for 301 to 304
301 WOL 1	Wollongong area
302 WOL 2	Wollongong area
303 STH HIGH 1	Southern Highlands
304 GOULB 1	City of Goulburn and Queanbeyan
305 MONARO 1	Allocated for GRN expansion
306 STH CST 1	Allocated for GRN expansion
307 STH CST 2	Allocated for GRN expansion
308 GRIFFITH 1	Allocated for GRN expansion

Table 10C Zone 300 - Illawarra, Southern Highlands, Goulburn

Zone 400 KAT	Katoomba and Central West
400 KAT GRP	Scan channel for 401 to 403
401 CEN WST 1	Central West of NSW
402 BLU MTNS 1	Blue Mountains area
403 BLU MTNS 2	Blue Mountains area
404 BOGAN 1	Allocated for GRN expansion
405 LACHLAN 1	Allocated for GRN expansion

Table 10D Zone 400 - Katoomba and Central West

10.4 Zone 500 – incident ground communications

10.4.1 At both routine and major incidents, the Incident Controller (IC) will allocate a specific 500 talkgroup for communications between the IC and the incident resources. The 500 series are simplex channels, meaning that they are not on the GRN, are one-way communication at a time, cannot talk directly to and are not monitored by a ComCen, and are therefore not routinely recorded. They should be used only for tactical communications between crew leaders and their crews.

⚠ **NOTE**

Channels 506 to 510 are to be used in preference to channels 501 to 505. Channels 501 to 505 should only be used when all incident ground frequencies have been allocated, since the performance of these frequencies cannot be guaranteed. 510 is the default simplex channel.

10.4.2 Incident Ground Repeater (IGR) channels are to be used in conjunction with the repeaters installed in the Incident Control Vehicles (ICV)s. These repeaters rebroadcast the signals received from the radios (such as the XTS3000 portables) to increase the radio coverage available at the incident. When this is required, all portable radios at the incident need to be switched to the channel assigned (either 511 or 512). ICV operators may use the repeater to communicate with these radios by selecting the correct channel on the consoles provided.

10.4.3 The Incident Ground Repeaters in the ICV are intended for use at incidents involving a large area. The antenna for the repeater needs to be mounted on the extended hydraulic mast for this facility to be affective. The ICV also needs to be positioned in a location providing the best possible radio coverage of the incident - factors such as distance and elevation with respect to the incident need to considered when locating the ICV.

Zone 500	Incident Ground Communications
501 INCIDENT 01	Allocated by ComCen to active incidents
502 INCIDENT 02	Allocated by ComCen to active incidents
503 INCIDENT 03	Allocated by ComCen to active incidents
504 INCIDENT 04	Allocated by ComCen to active incidents
505 INCIDENT 05	Allocated by ComCen to active incidents
506 INCIDENT 06	Allocated by ComCen to active incidents
507 INCIDENT 07	Allocated by ComCen to active incidents
508 INCIDENT 08	Allocated by ComCen to active incidents
509 INCIDENT 09	Allocated by ComCen to active incidents
510 INCIDENT 10	Allocated by ComCen to active incidents
511 INC RPT 1	Incident Ground Repeater (IGR) channel
512 INC RPT 2	Incident Ground Repeater (IGR) channel

Table 10E Zone 500 - Incident Ground communications

10.5 Zone 600 - Special Operations talkgroups

10.5.1 When a major incident with significant resource commitment occurs, the ComCen may allocate a special operations talkgroup for communications between the Control Point and incident resources. The 600 series channels are recorded by the ComCen but they are not routinely monitored. They should be used for command-level communications between the Incident Management Team (IMT) e.g. between the IC and Sector Commanders.

Zone 600	Special Operations
601 SO 1	Sydney - Special Operations
602 SO 2	Sydney - Special Operations
603 SO 3	Sydney - Special Operations
604 SO 4	Sydney - Special Operations
605 SO 5	Newcastle - Special Operations
606 SO 6	Newcastle - Special Operations
607 SO 7	Wollongong - Special Operations
608 SO 8	Wollongong - Special Operations
609 SO 9	Katoomba - Special Operations
610 SO 10	Katoomba - Special Operations

Table 10F Zone 600 - Special Operations talkgroups

10.5.2 When resources are proceeding to a pre-determined assembly or staging area to form a Strike Team or Task Force (*SOG 1.9*), all appliances, unless otherwise instructed, will remain on their normal talkgroup until allocated an incident talkgroup.

10.5.3 Once assembled, the ComCen will advise the Strike Team/Task Force Leader and appliances of the talkgroup allocated to the incident to which they are assigned. The Incident Controller at the incident will advise of any other relevant aspects of the incident communications plan upon arrival.

10.6 Zone 700 - incident talkgroups

Zone 700	Incident Channels
701 SO 11	Sydney Incident Channel
702 SO 12	Sydney Incident Channel
703 SO 13	Sydney Incident Channel
704 SO 14	Sydney Incident Channel
705 SO 15	Newcastle - Incident Channel
706 SO 16	Newcastle - Incident Channel
707 SO 17	Wollongong - Incident Channel
708 SO 18	Wollongong - Incident Channel
709 SO 19	Katoomba - Incident Channel
710 SO 20	Katoomba - Incident Channel

Table 10G Zone 700 - Incident Channel talkgroups

10.7 Zone 800 - country area talkgroups (Private Mobile Radio channels)

10.7.1 The NSWFB's country PMR system is used in all areas outside of the GRN footprint. Each radio base is assigned a channel within the range 801 to 816 or 901 to 916. These channels are normally used when an appliance is stationary; however radio communication can be maintained with the 'scan channels' provided in zones 1500-2100. For further information, please refer to the *Radio User Channel Guide* for the area in which you are operating.

Zone 800	Country Area PMR Channels
801 NSWFB 01 to 816 NSWFB 16	Allocated for use outside GRN footprint
901 NSWFB 01 to 916 NSWFB 16	Allocated for use outside GRN footprint

Table 10H Zone 800 - Country Area talkgroups

10.8 Zone 1000 - Logistics Support talkgroups

Zone 1000 OS	Logistics Support
1000 OPSUP GRP	Logistics Support announcement talkgroup
1001 COMMS	Communications Section, Logistics Support
1002 PROPTY	Property Services Section, Logistics Support
1003 FLEET	Fleet Operations Section, Logistics Support
1004 ADMIN	Administration Section, Logistics Support
1005 MECH	Mechanical Workshops, Logistics Support
1006 ENG	Engineering Services Section, Logistics Support

Table 10I Zone 1000 - Logistics Support talkgroups

10.9 Zone 1100 - Specialised State Operations talkgroups

Zone 1100 OPS	Specialised State Operations
1100 OPNS GRP	Specialised State Operations announcement talkgroup
1101 OP COMMS	Communications between ComCens
1102 BA HAZMAT	Breathing Apparatus/Hazmat Section
1103 BUSH RES	Bushfire/Natural Hazards and Rescue Sections
1104 FIU	Fire Investigation and Research Unit
1105 FIRE PREV	Fire Prevention
1106 TRNG	Training and Vocational Development Division

Table 10J Zone 1100 - Specialised State Operations talkgroups

10.10 Zone 1200 - joint operations within Emergency Services Organisations

10.10.1 Joint operations talkgroups for use between emergency services are assigned by the GRN's Network Operations Control Centre (NOCC) as required.

Zone 1200 ESO	Inter-Service
1201 ESO 1 to 1210 ESO 10	Assigned by Network Operations Control Centre (NOCC)

Table 10K Zone 1200 - Joint operations talkgroups

10.10.2 NSWFB 1200 talkgroup numbers correspond with channels used by other emergency services as shown in Table 10L.

NSWFB	NSW RFS	Ambulance	SES
1201	147 ESLO 1	Z6 ELSO 1	Z1 94-LO-ES-1
1202	148 ELSO 1	Z6 ELSO 2	Z1 95-LO-ES-1
1203	149 ELSO 1	Z6 ELSO 3	Z1 96-LO-ES-1
1204	150 ELSO 1	Z6 ELSO 4	Z1 97-LO-ES-1
1205	151 ELSO 1	Z6 ELSO 5	Z1 98-LO-ES-1
1206	152 ELSO 1	Z6 ELSO 6	Z1 99-LO-ES-1
1207	153 ELSO 1	Z6 ELSO 7	Z1 100-LO-ES-1
1208	154 ELSO 1	Z6 ELSO 8	Z1 101-LO-ES-1
1209	155 ELSO 1	Z6 ELSO 9	Z1 102-LO-ES-1
1210	156 ELSO 1	Z6 ELSO 10	Z1 103-LO-ES-1

Table 10L Zone 1200 - Other emergency service channels

⚠ **NOTE**

Use of the 1200 zone trunked (GRN) liason channels must be arranged through your ComCen. They will in turn make arrangements with the GRN NOCC for their use.

10.11 Zone 1300 - joint operations (simplex) - other emergency services

Zone 1300	Joint Operations - Simplex (short range)
1301 GRN SMPX 1	Simplex - Inter-service
1302 GRN SMPX 2	Simplex - Inter-service
1303 GRN SMPX 3	Simplex - Inter-service
1304 GRN SMPX 4	Simplex - Inter-service
1305 GRN SMPX 5	Simplex - Inter-service

Table 10M Zone 1300 - Simplex channels for inter-service communication

⚠ **NOTE**

Channels 1301 – 1305 are not trunked, i.e. they are not relayed through the GRN network. This means communications are limited to GRN radios in a local area and provide an ideal means of inter-service and intra-service communication at multi-agency incidents.

Simplex channels are available when needed. Remember that other agencies may be using these channels for other purposes.

10.11.1 Arrangements for which particular talkgroups are to be used should be agreed at the scene between the services. Each agency has implemented their own numbering system for the simplex talkgroups.

10.11.2 NSWFB 1300 talkgroup numbers correspond with channels used by other emergency services as shown in Table 10N.

NSWFB	NSW RFS	Ambulance	SES
1301	13	124	225
1302	14	125	226
1303	15	126	227
1304	16	127	228
1305	17	128	229
1306*			
1307*			

Table 10N Simplex channels used by other emergency services

10.11.3 In Table 10N, channels marked with an * are used as “Ambulatory Repeater” channels. These function in the same way as the ICV repeater channels described in paragraphs 10.4.2 and 10.4.3, but are intended for use by multiple agencies. The equivalent channels in other agency radio profiles will be advised when known.

10.11.4 The radio repeaters installed in the ICVs are set up to operate on channels 1306 and 1307 if required.

10.12 Zone 1400 – disaster recovery talkgroups

10.12.1 Disaster recovery talkgroups permit radio communications between ComCens and appliances or portable radios in the event the GRN is operating in ‘SITE TRUNKING’ mode. During site trunking all GRN radio sites operate as independent radio sites (not linked to any other). By selecting the Disaster Recovery talkgroup for the GRN radio site nearest to you, communications with the ComCen may be maintained.

Talkgroup	GRN Site
1401 DISREC 01	Belrose
1402 DISREC 02	Cowan
1403 DISREC 03	Central Business District
1404 DISREC 04	Kurrajong
1405 DISREC 05	Horsley Park
1406 DISREC 06	Razorback
1407 DISREC 07	Chullora
1408 DISREC 08	Heathcote

Talkgroup	GRN Site
1409 DISREC 09	Mt Tomah
1410 DISREC 10	Mt Lambie
1411 DISREC 11	Mt Penang
1412 DISREC 12	Mt Sugarloaf
1413 DISREC 13	Mt Arthur
1414 DISREC 14	Maddens Plains
1415 DISREC 15	Berkley Tops
1416 DISREC 16	Mt Gibralter

Table 10O Zone 1400 -Disaster recovery talkgroups

10.13 Zones 1500 to 2100 – voting scan channels country PMR

10.13.1 Voting scan permits radio users to select a ‘scan channel’ for the area they are in which allows the radio to automatically select the best received radio base for the location. This reduces the impact of terrain on radio coverage and the need for firefighters to have knowledge of the radio site location.

10.13.2 The scan channel should be manually changed on arrival in another town that is listed to ensure that the radio is always searching for the strongest signal.

Talkgroup	Designation	Brigade Area
1501	ALBURY	Albury
1502	BATLW/TUM	Batlow, Tumut
1503	GOOMBRGNA	Corowa, Culcairn
1504	GUNDAGAI	Gundagai
1505	HOLBROOK	Holbrook
1506	LOCK/COOL	Lockhart, Coolamon, Henty
1507	MULWALA	Mulwala
1508	RYAN HILL	Tocumwal, Berrigan, Finley
1509	TARCUTTA	Hume Highway coverage, Tarcutta area
1510	TUMBARMBA	Tumbarumba
1511	WAGGA	Wagga Wagga
1512	BATLOW	Batlow (not available as at September 2003)
1601	BATEMANS	Batemans Bay
1602	BEGA	Bega
1603	DELEGATE	Bombala

Talkgroup	Designation	Brigade Area
1604	COOMA	Cooma
1605	EDEN	Eden
1606	JINDABYNE	Jindabyne
1607	MERIMBULA	Merimbula
1608	MORUYA	Moruya
1609	NAROOMA	Narooma
1610	NOWRA	Nowra
1611	PK ALONE	Princes Highway coverage Narooma to Cobargo
1612	PERISHER	Perisher Valley
1613	THREDBO	Thredbo
1614	TIMBILLCA	Princes Highway coverage, Victoria border to Eden
1615	ULLADULLA	Ulladulla
1616	BEWONG	Princes Highway coverage, Between Nowra and Ulladulla
1617	BOYNE	Princes Highway coverage, Between Ulladulla and Batemans Bay
1618	BOMBALA	Bombala (not available as at September 2003)
1619	BATEMANS	Batemans Bay (not available as at September 2003)
1701	ARRAWDGEE	Newell Highway coverage, Jerilderie
1702	COOTA	Cootamundra
1703	GRIFFITH	Griffith
1704	HARDEN	Harden
1705	JERILDRIE	Jerilderie
1706	JUNEE	Junee
1707	LEETON	Leeton, Narrandera
1708	TEMORA	Temora
1709	ULANDRA	Olympic Way coverage, Junee to Cootamundra Hume Hwy coverage, Gundagai area
1710	YOUNG	Young

Talkgroup	Designation	Brigade Area
1801	BERRICO	Gloucester
1802	CABBAGE T	Princes Highway, Bulahdelah, Forster
1803	COFFS	Coffs Harbour
1804	COMBOYNE	Oxley Highway cover, west of Wauchope
1805	DUNGOG	Dungog
1806	GLOUCESTR	Gloucester
1807	LAURIETON	Laurieton
1808	MIDDLE BR	Princes Highway coverage, Taree to Port Macquarie turn-off
1809	MT MOOMBL	Bellingen, Sawtell, Urunga
1810	PORT MACQ	Port Macquarie
1811	PORTRS CP	Oxley Highway coverage- east of Walcha (Yarrowitch)
1812	TAREE	Taree, Wingham
1813	WAUCHOPE	Wauchope, Kempsey
1814	WOOLGOOLG	Woolgoolga
1815	YARRAHAP	Macksville, South West Rocks, Nambucca Heads, Kempsey
1816	DORRIGO	Dorrigo
1817	KEMPSEY	Kempsey (not available as at September 2003)
1901	BALLINA	Ballina
1902	BURRINGBR	Murwillumbah
1903	CASINO	Casino
1904	GRAFTON	Grafton
1905	HAYSTACK	Tabulam- Bonalbo area (west of Casino)
1906	HAYTERS	Byron Bay, Bangalow, Mullumbimby, Brunswick Heads
1907	KYOGLE	Kyogle
1908	LISMORE	Lismore
1909	MEERSCHM	Alstonville, Evans Head, Coraki
1910	TWEED	Tweed Heads, Kingscliff

Talkgroup	Designation	Brigade Area
1911	YAMB/MACL	Yamba, Maclean
2001	ARMIDALE	Armidale
2002	BARRABA	Barraba
2003	BN LOMOND	Guyra
2004	BINGARA	Bingara
2005	GLN INNES	Glenn Innes
2006	GUNNEDAH	Gunnedah
2007	INVERELL	Inverell
2008	MAGISTRTE	New England Highway coverage Glen Innes to Tenterfield
2009	MANILLA	Manilla
2010	MOONBI	New England Highway, Tamworth to Uralla
2011	SOMA	Werris Creek, Quirindi
2012	TAMWORTH	Tamworth
2013	TENTERFLD	Tenterfield
2014	TOPPER	Highway coverage, Inverell area
2015	WALCHA	Walcha
2016	WARIALDA	Warialda
2017	URALLA	Uralla
2101	BOGGABILA	Boggabilla area (for Moree Hazmat)
2102	KAPUTAR	Narrabri, Wee Waa, Boggabri Highway coverage
2103	LAURL VLE	Garah area (for Moree Hazmat)
2104	MOREE	Moree area
2105	MUNGINDI	Mungindi area (for Moree Hazmat)
2106	TERRY HIE	Highway coverage, Narrabri to Moree

Table 10P Zones 1500 to 2100 - Voting scan channels for country PMR

11 DISASTER RECOVERY FOR GRN RADIO COMMUNICATIONS

11.1 Introduction

11.1.1 The Government Radio Network (GRN) is operated by Telstra and is managed from the Network Operations Control Centre (NOCC) in Goulburn Street, Sydney. Many State Government agencies, including the NSW Fire Brigades (NSWFB), use the GRN.

11.1.2 At present, approximately 20% of the State has GRN coverage. For those areas outside GRN coverage the NSWFB provides Private Mobile Radio (PMR) networks and satellite telephones.

11.1.3 Two types of GRN outages that may occur and which will affect radio coverage are:

- partial loss of the GRN due to single or multiple site failure; and
- total loss of the GRN.

⚠ **NOTE**

Outages may be planned (for maintenance or equipment upgrading) or unplanned (as might happen during a failure).

11.2 Application

11.2.1 The procedures outlined in this document apply only to the GRN.

11.2.2 This SOG applies to all NSWFB personnel, Communication Centres (ComCens) and appliances using NSWFB radio communication systems connected to the GRN.

11.3 Indications of GRN failure

11.3.1 Mobile and portable radios operating in an area affected by an outage will revert to ‘site trunking’.

11.3.2 Site trunking occurs when the GRN has experienced a failure, and may involve a single radio transmitter site or the entire network. When site trunking occurs the network reverts from wide area to single site operations only. This means that communication is only available between radios on the same talkgroup which are transmitting through that site.

11.3.3 The radio will indicate wide area trunking has failed by flashing the words **SITE TRUNKING** on the display. This display will flash every 5 seconds until the problem is fixed. The GRN private call facility is inoperative during site trunking.

Figure 1 GRN radio display for 'site trunking'

11.4 Disaster recovery for gSa stations

11.4.1 ComCens will be aware that the GRN outage has occurred and will implement procedures to recover radio communications. This involves the ComCen selecting alternative disaster recovery (DISREC) radio talkgroups on which to communicate. These talkgroups are in the 1400 zone i.e. 1401, 1402 etc. (see *SOG 2.10 Radio infrastructure and talkgroups)*. Each of the four ComCens has been allocated a number of DISREC talkgroups depending on the extent of GRN coverage in their dispatch areas.

⚠ **NOTE**

DISREC allocations are listed at the end of this SOG.

11.4.2 When a ComCen selects a particular DISREC talkgroup, it transmits directly to a specific GRN site which, in turn, will communicate with resources (portable or mobile) operating within range of that particular site. Figure 2 demonstrates this principle.

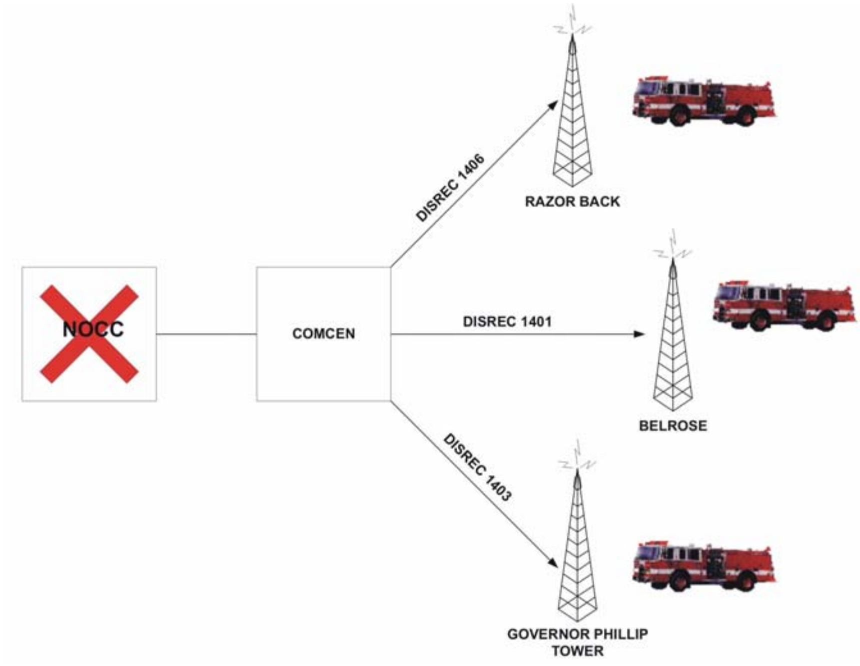

Figure 2 Site trunking

11.4.3 NSWFB resources affected by the outage (that is, the indication 'SITE TRUNKING' is observed on their radio) must immediately take the following actions:

- change the GRN mobile and GRN portable radios to the talkgroup indicated in the attached tables, and
- contact your ComCen by telephone to determine the extent and likely duration of the outage. Advise your ComCen that you have changed radio settings.

11.4.4 ComCens will reinforce this procedure by:

- including the DISREC talkgroup on dispatch printouts for any calls during the outage; and
- attempting to contact affected stations by phone, administration print, fax or pager to alert them to the outage.

11.4.5 The tables at the end of this SOG show stations and their appropriate DISREC talkgroups for each ComCen. First and second choices are included where applicable. If difficulties are experienced with the first choice selection then the second choice DISREC talkgroup should be selected. The ComCen monitors both choices. If difficulties are experienced changing talkgroups on your radio (e.g. from 101 to 1403) please contact your Principal Instructor or Senior Instructor.

11.5 Actions for stations outside gSa

11.5.1 Some stations in Zones S5, S7, W3, W4, W5 and W7 use the GRN. During GRN outages, some of these stations do not have DISREC talkgroups available. The affected stations are as follows:

No.	Station	Zone
224	Berry	S5
232	Boorowa	S7
236	Braidwood	S5
271	Crookwell	S7
305	Goulburn	S7
428	Queanbeyan	S5
511	Yass	S7

11.5.2 If an emergency dispatch occurs during an outage these stations are required to do the following:

- leave one firefighter in the station watchroom to operate the station radio;
- conduct incident communications between resources on scene and the station watchroom;
- telephone all requests for assistance, informative messages, stops and other incident related information to the local ComCen; and
- manage automatic fire alarms in the normal manner with all radio communications being handled as above.

Table 11A Sydney Communication Centre – GRN outage disaster recovery talkgroups

			1st Choice		2nd Choice	
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	DISREC	TALKGROUP
1	City of Sydney	Sydney	DISREC 3	1403	DISREC 1	1401
3	The Rocks	Sydney	DISREC 3	1403	DISREC 1	1401
4	Darlinghurst	Sydney	DISREC 3	1403	DISREC 1	1401
5	Newtown	Sydney	DISREC 3	1403	DISREC 1	1401
6	Mona Vale	Sydney	DISREC 1	1401	DISREC 3	1403
7	Horningsea Park	Sydney	DISREC 6	1406	DISREC 5	1405
8	Liverpool	Sydney	DISREC 6	1406	DISREC 5	1405
10	Redfern	Sydney	DISREC 3	1403	DISREC 1	1401
11	Woollahra	Sydney	DISREC 3	1403	DISREC 1	1401

			1st Choice		2nd Choice	
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	DISREC	TALKGROUP
12	Balmain	Sydney	DISREC 3	1403	DISREC 1	1401
13	Alexandria	Sydney	DISREC 3	1403	DISREC 1	1401
14	Ashfield	Sydney	DISREC 3	1403	DISREC 1	1401
15	Burwood	Sydney	DISREC 3	1403	DISREC 1	1401
16	Concord	Sydney	DISREC 3	1403	DISREC 1	1401
17	Drummoyne	Sydney	DISREC 3	1403	DISREC 1	1401
18	Glebe	Sydney	DISREC 3	1403	DISREC 1	1401
19	Silverwater	Sydney	DISREC 7	1407	DISREC 3	1403
20	Hurstville	Sydney	DISREC 8	1408	DISREC 3	1403
21	Kogarah	Sydney	DISREC 8	1408	DISREC 3	1403
22	Leichhardt	Sydney	DISREC 3	1403	DISREC 1	1401
23	Gladesville	Sydney	DISREC 3	1403	DISREC 1	1401
24	Manly	Sydney	DISREC 1	1401	DISREC 3	1403
25	Mosman	Sydney	DISREC 3	1403	DISREC 1	1401
26	Mascot	Sydney	DISREC 3	1403	DISREC 1	1401
27	Parramatta	Sydney	DISREC 3	1403	DISREC 1	1401
28	Marrickville	Sydney	DISREC 3	1403	DISREC 1	1401
29	Rockdale	Sydney	DISREC 8	1408	DISREC 3	1403
30	Lidcombe	Sydney	DISREC 3	1403	DISREC 1	1401
31	Busby	Sydney	DISREC 6	1406	DISREC 5	1405
32	Mt Druitt	Sydney	DISREC 5	1405	DISREC 4	1404
33	Engadine	Sydney	DISREC 8	1408	DISREC 3	1403
34	Riverwood	Sydney	DISREC 8	1408	DISREC 3	1403
35	Botany	Sydney	DISREC 3	1403	DISREC 1	1401
36	Crows Nest	Sydney	DISREC 1	1401	DISREC 3	1403
37	Gordon	Sydney	DISREC 3	1403	DISREC 1	1401
38	Pyrmont	Sydney	DISREC 3	1403	DISREC 1	1401
39	Randwick	Sydney	DISREC 3	1403	DISREC 1	1401
40	Willoughby	Sydney	DISREC 3	1403	DISREC 1	1401
41	Smithfield	Sydney	DISREC 7	1407	DISREC 5	1405
42	Ryde	Sydney	DISREC 3	1403	DISREC 1	1401
43	Seven Hills	Sydney	DISREC 5	1405	DISREC 4	1404

			1st Choice		2nd Choice	
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	DISREC	TALKGROUP
45	Miranda	Sydney	DISREC 8	1408	DISREC 3	1403
46	Sutherland	Sydney	DISREC 8	1408	DISREC 3	1403
47	Revesby	Sydney	DISREC 3	1403	DISREC 1	1401
48	Mortdale	Sydney	DISREC 8	1408	DISREC 3	1403
49	Cabramatta	Sydney	DISREC 7	1407	DISREC 5	1405
50	Hornsby (North Part)	Sydney	DISREC 2	1402	DISREC 1	1401
50	Hornsby (South Part)	Sydney	DISREC 3	1403	DISREC 1	1401
51	Forestville	Sydney	DISREC 1	1401	DISREC 3	1403
52	Campsie	Sydney	DISREC 3	1403	DISREC 1	1401
53	Neutral Bay	Sydney	DISREC 1	1401	DISREC 3	1403
54	Cronulla	Sydney	DISREC 8	1408	DISREC 3	1403
55	Guildford	Sydney	DISREC 7	1407	DISREC 5	1405
56	Matraville	Sydney	DISREC 3	1403	DISREC 1	1401
57	Wentworthville	Sydney	DISREC 7	1407	DISREC 5	1405
58	Beecroft	Sydney	DISREC 3	1403	DISREC 1	1401
59	Eastwood	Sydney	DISREC 3	1403	DISREC 1	1401
60	Avalon	Sydney	DISREC 3	1403	DISREC 1	1401
61	Lane Cove	Sydney	DISREC 3	1403	DISREC 1	1401
62	Bankstown	Sydney	DISREC 3	1403	DISREC 1	1401
63	Blacktown	Sydney	DISREC 5	1405	DISREC 4	1404
64	Lakemba	Sydney	DISREC 3	1403	DISREC 1	1401
65	Rydalmere	Sydney	DISREC 3	1403	DISREC 1	1401
66	Rhodes	Sydney	DISREC 3	1403	DISREC 1	1401
67	Northmead	Sydney	DISREC 3	1403	DISREC 1	1401
68	Narrabeen	Sydney	DISREC 3	1403	DISREC 1	1401
69	Dee Why	Sydney	DISREC 1	1401	DISREC 3	1403
70	Maroubra	Sydney	DISREC 3	1403	DISREC 1	1401
71	Castle Hill	Sydney	DISREC 3	1403	DISREC 1	1401
72	Merrylands	Sydney	DISREC 7	1407	DISREC 5	1405
73	Fairfield	Sydney	DISREC 7	1407	DISREC 5	1405
75	Berowra	Sydney	DISREC 2	1402	DISREC 1	1401

			1st Choice		2nd Choice	
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	DISREC	TALKGROUP
76	Bondi	Sydney	DISREC 3	1403	DISREC 1	1401
77	St. Marys	Sydney	DISREC 5	1405	DISREC 4	1404
78	Dunheved	Sydney	DISREC 5	1405	DISREC 4	1404
79	Ingleburn	Sydney	DISREC 6	1406	DISREC 5	1405
80	Bundeena	Sydney	DISREC 8	1408	DISREC 3	1403
81	Windsor	Sydney	DISREC 4	1404	DISREC 5	1405
82	Richmond	Sydney	DISREC 4	1404	DISREC 5	1405
83	Riverstone	Sydney	DISREC 5	1405	DISREC 4	1404
84	Macquarie Fields	Sydney	DISREC 6	1406	DISREC 5	1405
85	Chester Hill	Sydney	DISREC 3	1403	DISREC 1	1401
86	Penrith	Sydney	DISREC 5	1405	DISREC 4	1404
87	Rosemeadow	Sydney	DISREC 6	1406	DISREC 8	1408
88	Campbelltown	Sydney	DISREC 6	1406	DISREC 8	1408
90	Menai	Sydney	DISREC 8	1408	DISREC 3	1403
92	St Andrews	Sydney	DISREC 6	1406	DISREC 3	1403
93	Narellan	Sydney	DISREC 6	1406	DISREC 5	1405
94	Kellyville	Sydney	DISREC 4	1404	DISREC 5	1405
96	Schofields	Sydney	DISREC	1404	DISREC	1405
97	Huntingwood	Sydney	DISREC 5	1405	DISREC 4	1404
101	Bonnyrigg Heights	Sydney	DISREC 5	1405	DISREC 4	1404
102	Regentville	Sydney	DISREC 5	1405	DISREC 4	1404
177	RAS Showground	Sydney	DISREC 3	1403	DISREC 1	1401
248	Camden	Sydney	DISREC 6	1406	DISREC 8	1408
421	Picton	Sydney	DISREC 6	1406	Try any other DISREC talkgroup	
489	Warragamba	Sydney	DISREC 6	1406	DISREC 5	1405

Table 11B Newcastle Communication Centre – GRN outage disaster recovery talkgroups

			1st Choice			2nd Choice
FIRE STN NO.	**FIRE STATION NAME**	**COMCEN**	**DISREC**	**TALKGROUP**	**GRN BASE SITE**	
228	Berkeley Vale	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
245	Budgewoi	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
287	Ettalong	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
292	Doyalson	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
304	Gosford	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
340	Umina	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
341	Kariong	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
351	Bateau Bay	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
450	Saratoga	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
459	Terrigal	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
460	The Entrance	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
470	Toukley	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
504	Woy Woy	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
509	Wyoming	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
505	Wyong	Newcastle	DISREC 11	1411	Mt Penang	No 2nd choice site available
202	Abermain	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
220	Bellbird	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
222	Belmont	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
231	Boolaroo	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
237	Branxton Greta	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
251	Cardiff	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available

			1st Choice			2nd Choice
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	GRN BASE SITE	
252	Carrington	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
254	Cessnock	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
255	Charlestown	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
373	East Maitland	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
320	Hamilton	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
344	Kearsley	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
349	Kurri Kurri	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
357	Lambton	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
374	Maitland	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
376	Merewether	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
377	Minmi	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
383	Morisset	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
382	Morpeth	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
402	Nelson Bay	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
404	New Lambton	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
260	Newcastle	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
432	Raymond Terrace	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
444	Singleton	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
455	Telerah	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
458	Teralba	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
462	Tighes Hill	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available

			1st Choice			2nd Choice
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	GRN BASE SITE	
464	Toronto	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
484	Wallsend	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
485	Wangi Wangi	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
486	Waratah	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
498	West Wallsend	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
497	Weston	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
500	Windale	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
208	Aberdeen	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
283	Denman	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
392	Muswellbrook	Newcastle	DISREC 12	1412	Mt Sugarloaf	No 2nd choice site available
443	Scone	Newcastle	DISREC 13	1413	Mt Arthur	No 2nd choice site available

Table 11C Wollongong Communication Centre – GRN outage disaster recovery talkgroups

			1st Choice		2nd Choice	
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	DISREC	TALKGROUP
210	Balgownie	Wollongong	DISREC 14	1414	DISREC 15	1415
241	Bulli	Wollongong	DISREC 14	1414	DISREC 15	1415
258	Coledale	Wollongong	DISREC 14	1414	DISREC 15	1415
269	Corrimal	Wollongong	DISREC 14	1414	DISREC 15	1415
325	Helensburgh	Wollongong	DISREC 14	1414	DISREC 8	1408
422	Warrawong	Wollongong	DISREC 15	1415	DISREC 14	1414
461	Thirroul	Wollongong	DISREC 14	1414	DISREC 15	1415
503	Wollongong	Wollongong	DISREC 14	1414	DISREC 15	1415
207	Albion Park Rail	Wollongong	DISREC 15	1415	DISREC 14	1414
277	Dapto	Wollongong	DISREC 15	1415	DISREC 14	1414
346	Kiama	Wollongong	DISREC 15	1415	DISREC 14	1414

			1st Choice		2nd Choice	
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	DISREC	TALKGROUP
442	Scarborough	Wollongong	DISREC 14	1414	DISREC 15	1415
474	Unanderra	Wollongong	DISREC 15	1415	DISREC 14	1414
488	Shellharbour	Wollongong	DISREC 15	1415	DISREC 14	1414
234	Bowral	Wollongong	DISREC 16	1416	No 2nd choice site available	
242	Bundanoon	Wollongong	DISREC 16	1416	No 2nd choice site available	
378	Mittagong	Wollongong	DISREC 16	1416	No 2nd choice site available	
385	Moss Vale	Wollongong	DISREC 16	1416	No 2nd choice site available	

Table 11D Katoomba Communication Centre – GRN outage disaster recovery talkgroups

			1st Choice		2nd Choice	
FIRE STN NO.	FIRE STATION NAME	COMCEN	DISREC	TALKGROUP	DISREC	TALKGROUP
226	Blackheath	Katoomba	DISREC 9	1409	DISREC 10	1410
301	Glenbrook	Katoomba	DISREC 9	1409	DISREC 10	1410
343	Katoomba	Katoomba	DISREC 10	1410	No 2nd choice site available	
359	Lawson	Katoomba	DISREC 9	1409	DISREC 10	1410
361	Leura	Katoomba	DISREC 9	1409	DISREC 10	1410
386	Mt.Victoria	Katoomba	DISREC 9	1409	DISREC 10	1410
445	Springwood	Katoomba	DISREC 9	1409	DISREC 10	1410
495	Wentworth Falls	Katoomba	DISREC 9	1409	DISREC 10	1410
363	Lithgow	Katoomba	DISREC 10	1410	No 2nd choice site available	
364	Lithgow West	Katoomba	DISREC 10	1410	DISREC 9	1409
411	Oberon	Katoomba	DISREC 10	1410	DISREC 9	1409
423	Portland	Katoomba	DISREC 10	1410	DISREC 9	1409
483	Wallerawang	Katoomba	DISREC 10	1410	DISREC 9	1409

NSW FIRE BRIGADES

Standard Operational Guidelines

WILDFIRES (BUSHFIRES)

Section Three

1 BUSHFIRE ALERTS

1.1 Introduction

1.1.1 Bushfire Alerts are declared on days when adverse fire weather is forecast or occurs. Alerts enable fire agencies to establish a high state of readiness in anticipation of increased levels of fire activity, and to facilitate co-ordination of resources.

1.2 Application

1.2.1 The information contained in this guideline relates primarily to the NSW RFS Central East Region, which includes the GSA, Central Coast, Blue Mountains, Wollongong and west to Bathurst.

1.2.2 In other areas, similar guidelines apply and are co-ordinated by the NSW RFS regional Co-ordinator. Details of local procedures are contained in local operations plans prepared by District Bush Fire Management Committees. All NSWFB officers are required to be conversant with plans prepared pursuant to *Section 52* of the *Rural Fires Act 1997* covering their areas of responsibility.

1.3 Stages of Alert

1.3.1 There are two stages of Bushfire Alert.

1.4 Stage 1

1.4.1 A Stage 1 Bushfire Alert shall be declared by the Commissioner of the NSW RFS when, on the advice of the Bureau of Meteorology, any locality within the Central East Region (includes Sydney Fire District, Central Coast, Blue Mountains and Wollongong), is experiencing seasonal conditions that result in either:

(a) A drought factor of 8 or more on the Macarthur Forest Fire Danger Meter (provided that it is accompanied by a fire danger index of 30 or more - **Very High**), and either:

- a Byram Keetch drought index of 120 or more; or

- open grass lands (not crops) 90% cured or more.

OR

(b) A Class 3 fire occurs.

1.4.2 A Stage 1 Bushfire Alert may be declared at the discretion of the Commissioner of the NSW RFS, or at the request of the DSO, NSWFB, when prevailing or forecast conditions are conducive to the outbreak, or spread of fires, and are likely to require co-ordination of resources regionally.

NSWFB Actions - Stage 1

1.4.3 The NSWFB are always at a stage of preparedness appropriate for a Stage 1 Bushfire Alert and no special arrangements are required.

1.5 Stage 2

1.5.1 A Stage 2 Bushfire Alert shall be declared at the discretion of the Commissioner of the NSW RFS, or at the request of the DSO, NSWFB when the following conditions apply:

- on days for which extreme bushfire danger has been forecast;
- on days of extreme bushfire danger;
- when a Total Fire Ban has been declared within the Central East Region; or
- when a declaration under *S.44* has been made within the Central East Region.

⚠ **NOTE**

A Stage 2 Alert will be declared whether or not a Stage 1 is already in force.

1.5.2 If a Stage 2 Alert has been declared on forecast conditions which do not eventuate, the Alert may be revoked by the Commissioner of the NSW RFS in consultation with the DSO, NSWFB. When so revoked, a Stage 1 Bushfire Alert applies unless specifically notified otherwise.

NSWFB Actions - Stage 2

1.5.3 **Station Commanders** - Station Commanders are responsible for ensuring that the following actions are carried out:

- drinking water containers are full;
- all equipment is functional and spare equipment is available for use in an emergency;
- all appliances to remain in their station areas and avoid unnecessary radio traffic; and
- any activities which may hinder immediate response are cancelled.

⚠ **NOTE**

Station Commanders should consult with their Operational Commanders or Zone Commanders if there is any doubt regarding a planned activity.

1.5.4 **Operational Commanders -** Operational Commanders are responsible for ensuring that the following actions are carried out:

- all Station Commanders are made aware of the Stage 2 Alert and their responsibilities;
- pre-plan for possible major outbreaks by identifying hazardous areas and discussing strategies and tactics with the relevant Station Commanders;
- the Operational Commander’s vehicle has the necessary resources (maps, tactical worksheets, white boards etc) to support command activities;
- identify locations of staff who may be released to staff reserve appliances, and notify Senior Supervisor Sydney Communications Centre of such availability by 0900 hours;
- respond to bushfires involving 3 or more appliances, or in consultation with the Communications Centre, respond to the initial call if weather conditions and call details suggest that a rapidly escalating fire is likely;
- implement the Incident Control System (ICS) and command NSWFB operations at bushfires while ensuring close liaison with other fire services;
- determine classification and status of bushfires and advise the Communication Centre when giving regular information radio messages;
- establish an Incident Control Point from which incident communications, operations and liaison will be managed;
- implement the ICS (refer to *SOG 1.1*) by establishing clearly defined Sectors, appointing Sector Commanders and operating at the strategic level of control.

1.5.5 **Zone Commanders (country) -** Zone Commanders stationed in country areas are responsible for ensuring that the following actions are carried out:

- ensuring that all Station Commanders within their Zone are aware of the Stage 2 Alert and their responsibilities;
- liaise with Station Commanders and the Communications Centre regarding state of readiness, staff availability, possible staffing of Major Emergency Fleet (MEF) and Service Exchange Vehicles (SEV);
- contact relevant RFS officers and establish the best means of communication and contact during the Alert;
- establish location and availability of the Senior Instructor to respond to incidents or to assist as a member of the Incident Management Team;
- monitor fire occurrence within the Zone and the need for co-ordination;

- notify the Regional Commander, Communications Centre and OIC Rescue/ Bushfire Section of Class 2 and Class 3 fires;

- participate as Incident Controller or as a member of an Incident Management Team as required; and

- be aware of movement of NSWFB resources.

1.5.6 **Zone Commanders (GSA) -** Zone Commanders stationed in the GSA are responsible for ensuring that the following actions are carried out:

- pre-plan for possible major outbreaks by identifying hazardous areas and discussing strategies and tactics with the relevant Station Commanders;

- notify the Executive Officer of relevant District Bushfire Management Committees of availability and contact details for the period of the Stage 2 Alert;

- respond to major outbreaks (if necessary); and

- when a fire reaches Class 2, ensure that the NSWFB *S.44* nominee responds to the designated Bushfire Control Centre in order to liaise with other members of the Executive regarding co-ordination and the possible need for a *S.44* appointment.

1.5.7 **OIC Rescue/Bushfire Section -** The OIC Rescue/Bushfire Section is responsible for ensuring that the following actions are carried out:

- attend Sydney Communications Centre (if necessary) and monitor resource requirements in consultation with Manager Operational Communications;

- liaise closely with Manager Operations, NSW RFS State Operations Centre;

- determine availability of Senior Instructors - Bushfire, to respond to fires as technical advisers or to establish Forward Controls;

- monitor the bushfire situation statewide and advise the Commissioner and Assistant Commissioners of developments;

- in consultation with managers and directors, determine the availability of command staff, staff for MEF and SEV appliances and logistics support;

- organise specialised assistance to Incident Management Teams; and

- after consultation with DSO, nominate a senior officer to act as Liaison Officer at NSW RFS State Operations Centre, Rose Hill.

1.5.8 **Manager Operational Communications -** The Manager Operational Communications (MOC) is responsible for ensuring that the following actions are carried out:

- Communications Centre notify the following personnel of declaration of the Stage 2 Alert:
  - Commisioner;
  - Assistant Commissioners;
  - OIC Rescue/Bushfire Section;
  - Zone Commanders;
  - Operational Commanders;
  - all affected Fire Stations (by teleprinter if available);
  - Manager State Operations;
  - Manager Training;
  - Manager Fire Prevention;
  - Director Operational Support;
  - Fleet Officer Operations; and
  - Chaplain.
- monitor bushfire situations in consultation with OIC Rescue/Bushfire Section;
- consider the need to form Strike Teams and Task Forces (refer to *SOG 1.9*), for deployment to major bushfires or for strategic staging;
- liaise with directors and managers regarding release of command personnel and firefighters from specialised areas for operational deployment;
- monitor the need to supplememnt staffing in Communications Centre;
- in order to enhance co-ordination, ensure that Incident Control Units are withdrawn from the incident ground where fires deteriorate to Class 2 or Class 3, and that the NSWFB forward communications are then managed from the relevant Bushfire Control Centre; and
- after consultation with the OIC Rescue/Bushfire Section, recommend to DSO activation of the Major Incident Co-ordination Centre at the State Communications Centre.

1.5.9 **General -** On declaration of a Stage 2 Bushfire Alert, all operational, specialised and support areas of the NSWFB will prepare for the possibility of major bushfire outbreaks by carrying out the following actions:

- ensuring key personnel are available and readily contactable;
- preparing to abandon non operational duties at short notice (if required); and
- notifying the Senior Supervisor Sydney Communications Centre of staff, equipment and appliance availability by 0900 hours on the day of the Alert

BUSHFIRE ALERTS CHECK SHEET

The purpose of this Check Sheet is to provide a list of the NSWFB actions to be carried out during Bushfire Alerts.

STAGE 1

- The NSWFB are always at a stage of preparedness appropriate for a Stage 1 Bushfire Alert and no special arrangements are required.

STAGE 2

- **Station Commanders** are responsible for ensuring that the following actions are carried out:
  - ☐ drinking water containers are full;
  - ☐ all equipment is functional and spare equipment is available for use in an emergency;
  - ☐ all appliances to remain in their station areas and avoid unnecessary radio traffic; and
  - ☐ any activities which may hinder immediate response are cancelled;

⚠ **NOTE**

Station Commanders should consult with their Operational Commanders or Zone Commanders if there is any doubt regarding a planned activity.

- **Operational Commanders** are responsible for ensuring that the following actions are carried out:
  - ☐ all Station Commanders are made aware of the Stage 2 Alert and their responsibilities;
  - ☐ pre-plan for possible major outbreaks by identifying hazardous areas and discussing strategies and tactics with the relevant Station Commanders;
  - ☐ the Operational Commander's vehicle has the necessary resources (maps, tactical worksheets, white boards etc) to support command activities;
  - ☐ identify locations of staff who may be released to staf reserve appliances, and notify Senior Supervisor Sydney Communications Centre of such availability by 0900 hours;
  - ☐ respond to bushfires involving 3 or more appliances, or in consultation with the Communications Centre, respond to the initial call if weather conditions and call details suggest that a rapidly escalating fire is likely;
  - ☐ implement the Incident Control System (ICS) and command NSWFB operations at bushfires while ensuring close liaison with other fire services;
  - ☐ determine classification and state of bushfires and advise the Communication Centre when giving regular information radio messages;
  - ☐ establish an Incident Control Point from which incident communications, operations and liaison will be managed; and
  - ☐ implement the ICS (refer to SOG 1.1) by establishing clearly defined Sectors, appointing Sector Commanders and operating at the strategic level.
- **Zone Commanders (country)** are responsible for ensuring that the following actions are carried out:
  - ☐ ensuring that all Station Commanders within their Zone are aware of the Stage 2 Alert and their responsibilities;
  - ☐ liaise with Station Commnaders and the Communications Centre regarding state of readiness, staff availability, possible staffing of Major Emergency Fleet (MEF) and Service Exchange Vehicles (SEV);
  - ☐ contact relevant RFS officers and establish the best means of communication and contact during the Alert;
  - ☐ establish location and availability of the Senior Instructor to respond to incidents or to assist as a member if the Incident Management Team;
  - ☐ Monitor fire occurrence within the Zone and the need for co-ordination;
  - ☐ notify the Regional Commander, Communication Centre and OIC Rescue/Bushfire Section of Class 2 and Class 3 fires;
  - ☐ participate as Incident Controller or as a member of an Incident Management Team as required; and
  - ☐ be aware of the movement of NSWFB resources.
- **Zone Commanders (GSA)** are responsible for ensuring that the following actions are carried out:
  - ☐ pre-plan for possible major outbreaks by identifying hazardous areas and discussing strategies and tactics with the relevant Station Commanders;
  - ☐ notify the Executive Officer of relevant District Bushfire Management Committees of availability and contact details for the period of the Stage 2 Alert;
  - ☐ respond to major outbreaks (if necessary); and
  - ☐ when a fire reaches Class 2, ensure that the NSWFB S.44 nominee responds to the designated Bushfire Control Centre in order to liaise with other members of the Executive regarding co-ordination and the possible need for a S.44 appointment.

⚠ **NOTE**

If a Zone Commander designated as the NSWFB representative on a District Bushfire Management Committee Executive is on the incident ground when it deteriorates to Class 2,

they must immediately appoint an Operations Officer, and respond to the relevant Bushfire Control Centre to participate as a member of the Incident Management Team.

- OIC Rescue/Bushfire Section is responsible for ensuring that the following actions are carried out:
  - ☐ attend Sydney Communications Centre (id necessary) and monitor resource requirements in consultation with the Manager Operational Communications;
  - ☐ liaise closely with Manager Operations, NSW RFS State Operations Centre;
  - ☐ determine availability of Senior Instructors - Bushfire, to respond to fires as technical advisors or to establish Forward Controls;
  - ☐ monitor the bushfire situation statewide and advise the Commissioner and Assistant Commissioners of developments;
  - ☐ in consultation with managers and directors, determine the availability of command staff, staff for MEF and SEV appliances and logistic support;
  - ☐ organise specialised assistance to Incident Management Teams; and
  - ☐ after consultation with DSO, nominate a senior officer to act as Liaison Officer at NSW RFS State Operations Centre, Rosehill.
- **Manager Operational Communications** is responsible for ensuring that the following actions are carried out:
  - ☐ Communications Centre notify the following personnel of declaration of the Stage 2 Alert:
    - Commissioner;
    - Assistant Commissioners;
    - OIC Rescue/Bushfire Section;
    - Zone Commanders;
    - Operational Commanders;
    - all affected Fire Stations (by teleprinter if available);
    - Manager State Operations;
    - Manager Training;
    - Manager Fire Prevention;
    - Director Operational Support;
    - Fleet Officer Operations; and
    - Chaplain.
  - ☐ monitor bushfire situations in consultation with OIC Rescue/Bushfire Section;
  - ☐ consider the need to form Strike Teams and Task Forces (refer to *SOG 1.9*), for deployment to major bushfires or for strategic staging;
  - ☐ liaise with directors and managers regarding release of command personnel and firefighters from specialised areas for operational deployment;
  - ☐ monitor the need to supplement staffing in Communications Centre;
  - ☐ in order to enhance co-ordination, ensure that Incident Control Units are withdrawn from the incident ground where fires deteriorate to Class 2 or Class 3, and that the NSWFB forward communications are then managed from the relevant Bushfire Control Centre; and
  - ☐ after consultation with the OIC Bushfire/Rescue Section, recommend to DSO activation of the Major Incident Co-ordination Centre at the State Communications Centre.
- **General** - On declaration of a Stage 2 Bushfire Alert, all operational, specialised and support areas of the NSWFB will prepare for the possibility of major bushfire outbreaks by carrying out the following actions:
  - ☐ ensuring key personnel are available and readily contactable;
  - ☐ preparing to abandon non operational duties at short notice (if required); and
  - ☐ notifying the Senior Supervisor Sydney Communications Centre of staff, equipment and appliance availability by 0900 hours on the day of the Alert.
-

2 CLASSIFICATION AND STATUS

2.1 Introduction

2.1.1 There is a common system for describing the seriousness of bushfires which is used by all fire authorities in NSW. Using this system assists the co-ordination of fire authorities and support agencies.

2.2 Application

2.2.1 The Incident Controller must determine the classification and status of bushfires and send regular informative messages to the communication centre. This is particularly important:

- during bushfire alerts;
- during periods of very high and extreme fire danger; or
- whenever a bushfire is escalating beyond the capability of local resources.

2.3 Determing the Seriousness of a Bushfire

2.3.1 The potential seriousness of a bushfire is determined by its:

- **CLASSIFICATION** - resource commitment;
- **SIZE -** in hectares; and
- **STATUS** - the extent to which it is under control and the degree of threat to life and property.

2.4 Classification

2.4.1 Bushfire classification is determined by the level of resources committed to the fire, **not** its size.

2.4.2 The classification may reflect the potential for the fire to escalate dramatically, or that the location or fire history could make it difficult to control the fire.

2.4.3 There are three classes of bushfire:

Class 1 - A fire under the control of the responsible fire authority, whether or not incidental/ low level assistance is provided by other agencies.

Class 2 - A fire which, by necessity, involves more than one agency, and where the Bush Fire Management Committee have appointed a person to take charge of fire fighting operations.

Class 3 - A major bushfire or fires where an appointment is made or is imminent under the provisions of *Section 44* of the *Rural Fires Act, 1997.*

2.5 Status

2.5.1 The status of a bushfire is the degree to which it is under control. Table 1A details bushfire status.

TERM	DEFINITION
Going	The fire is spreading on one or more flanks, and effective control strategies are not in place for the entire perimeter
Being Controlled	Effective strategies are in operation or planned for the entire perimeter
Contained	The entire perimeter is behind identifiable control lines. Mop up and patrol have started
Patrol	Fire fighting resources are only required for patrol purposes and major reignition is unlikely
Out	The fire can be removed from the list of current fires

Table 2A Bushfire Status

2.6 Communications

2.6.1 NSWFB Incident Controllers must send regular informative messages to the Communication Centre, giving the clasification and status of bush and grass fires within fire districts. For example:

Going Class 2

Class 1 Patrol

2.7 Contact for Assistance

2.7.1 Incident Controllers may contact the Senior Supervisor at Sydney Communications for assistance in determining the classification or status of bushfires.

2.8 Co-operation with other Authorities

2.8.1 Where other fire authorities are involved at bush and grass fires within fire districts, NSWFB officers should consult with officers from those authorities about resource commitment. This action will enable the classification and status of the fire to be correctly determined.

3.2 CLASSIFICATION AND STATUS

All fire authorities in NSW use a common system for describing the *seriousness* of a bushfire, based on its *classification*, *size* and *status*. This assists coordination between fire authorities and support agencies.

Classification

The **classification** of a bushfire is determined by the required *level of resources* committed to the incident – **not** its size.

Class	Description
Class 1	A bushfire under the control of the responsible fire authority, whether or not incidental or low-level assistance is provided by other agencies.
Class 2	A bushfire which, by necessity, involves more than one agency, and where the Bush Fire Management Executive has appointed a person to take charge of firefighting.
Class 3	A major bushfire or fires where an appointment is made, or is imminent, under the provisions of Section 44 of the *Rural Fires Act 1997.*

The classification may reflect the potential for the fire to escalate dramatically, or that the location could make it difficult to control.

Size

A **size** of a bushfire is determined by the area involved in *hectares*.

Status

The **status** of a bushfire is the degree to which it is under control.

Status	Description
Going	The fire is spreading on one or more flanks, and effective control strategies are not in place for the entire perimeter
Being controlled	Effective strategies are in operation or planned for the entire perimeter.
Contained	The entire perimeter is behind identifiable control lines. Mop up and patrol have started.
Patrol	Firefighting resources are only required for patrol purposes and major re-ignition is unlikely.
Out	The fire can be removed from the list of current fires.

The Incident Controller must:

- ☐ *Determine* the classification and status of a bushfire.
- ☐ *Regularly inform* the ComCen of classification and status.
- ☐ Where other fire authorities are involved, *consult* regarding resource commitment – to accurately determine classification and status of the bushfire.

3 SIZE UP

3.1 Introduction

3.1.1 The process of determining and considering the factors which will influence development of combat strategies and tactics at any type of fire is termed *size up*.

3.2 Application

3.2.1 The Incident Controller must conduct an initial size up on arrival at an incident, then continually review action plans as conditions change and strategies are implemented.

3.3 Factors to Consider

3.3.1 When conducting a size up the Incident Controller should consider the following factors:

- the weather **conditions** and fire **rating**;
- the fire **behaviour** and **rate of spread**;
- the **topography and fuel conditions**;
- any **property endangered**;
- is the fire **spotting**?
- is a smoke column **visible**? What are its **characteristics**?
- **access** routes;
- **egress** routes;
- **water** supplies; and
- any **assistance** required.

3.4 Property Protection

3.4.1 In terms of property protection the Incident Controller should identify:

- structures that **can be protected;**
- structures that are **not threatened**;
- structures that are **not savable**; and
- the **direction** of fire spread and exposures.

3.5 Resources

3.5.1 In terms of resources the Incident Controller should determine the requirements for:

- fire fighting **crews**;
- water **supplies**; and
- additional **pumpers, tankers and/or bulk tankers**.

3.5.2 The Incident Controller should consider:

- the **response time** for support;
- requesting **ambulances;**
- **lighting** arrangements;
- requirements for **relief crews, rest** and **refreshments**; and
- change of **shift.**

3.5.3 The Incident Controller should consider if there is a need to call for:

- the **Police** for traffic or crowd control;
- technicians to shut off the **gas or electricity** supplies;
- an **Incident Control Unit;**
- additional **senior officers for ICS;**
- assistance from **other fire services**; and
- fire **boats**.

3.6 Planning

3.6.1 The Incident Controller should develop an **incident action plan** based on the critical factors identified during the initial size up.

3.6.2 There is normally no need for a formal written plan unless the incident:

- is very **large**;
- is particularly **complex**;
- involves a **change of shift**; or
- is likely to generate a **Coronial Inquiry**.

3.6.3 To be effective Incident Controllers should continuously seek additional information related to the fire from a variety of sources:

- their own senses;
- firefighter's reports;
- weather reports; and
- information from other agencies.

3.6.4 **Local knowledge** of fire history, topography and fire behaviour is invaluable for planning and developing strategies.

3.7 Plan Review

3.7.1 As the fire progresses and more information is received, the Incident Controller must **continually revise the incident action plan** by reviewing the incident ground conditions.

3.7.2 A review should always be conducted whenever control passes to a new Incident Controller in accordance with *SOG 1.2*.

SIZE UP CHECK SHEET

The purpose of this Check Sheet is to provide a list of actions and factors to consider by the Incident Controller when conducting a size up at an incident.

FACTORS TO CONSIDER

- The Incident Controller should consider the following factors:
  - ☐ the weather **conditions** and **fire rating;**
  - ☐ the fire **behaviour** and rate of **spread**;
  - ☐ the **topography and fuel conditions**;
  - ☐ any **property endangered**;
  - ☐ is the fire **spotting?**
  - ☐ is a smoke column **visible?** What are its **characteristics?**
  - ☐ **access** routes;
  - ☐ **egress** routes;
  - ☐ **water** supplies; and
  - ☐ any **assistance** required.

PROPERTY PROTECTION

- In terms of property protection the Incident Controller should identify:
  - ☐ structures that **can be protected;**
  - ☐ structures that are **not threatened;**
  - ☐ structures that are **not savable;** and
  - ☐ the **direction** of fire spread and exposures.

RESOURCES

- In terms of resources the Incident Controller should determine the requirements for:
  - ☐ fire fighting **crews;**
  - ☐ water **supplies;** and;
  - ☐ additional **pumpers, tankers and/or bulk tankers.**

- The Incident Controller should consider:
  - ☐ the **response time** for support;
  - ☐ requesting **ambulances;**
  - ☐ **lighting** arrangements;
  - ☐ requirements for **relief crews, rest** and **refreshments;** and
  - ☐ change of **shift.**

- The Incident Controller should consider if there is a need to call for:
  - ☐ the **Police** for traffic or crowd control;
  - ☐ technicians to shut off the **gas or electricity** supplies;
  - ☐ an **Incident Control Unit;**
  - ☐ additional **senior officers for ICS;**
  - ☐ assistance from **other fire services;** and
  - ☐ fire **boats.**

PLANNING

- The Incident Controller should develop an **incident action plan** based on the critical factors identified during the initial size up.

- There is normally no need for a formal written plan unless the incident:
  - is very **large;**
  - is particularly **complex;**
  - involves a **change of shift;**or
  - is likely to generate a **Coronial Enquiry**.

- To be effective Incident Controllers should continuously seek additional information related to the fire from a variety of sources:
  - their own senses;
  - firefighter's reports;
  - weather reports; and
  - information from other agencies.

- **Local knowledge** of fire history, topography and fire behaviour is invaluable for planning and developing strategies.

PLAN REVIEW

- As the fire progresses and more information is received, the Incident Controller must continually revise the incident action plan by reviewing the incident ground conditions.

- A review should always be conducted whenever control passes to a new Incident Controller in accordance with *SOG 1.2.*

4 STRATEGIES AND TACTICS

4.1 Introduction

4.1.1 The purpose of this SOG is to provide a framework for the development of strategies and tactics to combat bush and grass fires.

4.2 Application

4.2.1 A combat strategy must be put in place on the arrival of the first appliance and following initial size up.

4.3 Responsibilities

4.3.1 The Incident controller (first arriving officer), is responsible for determining the appropriate strategy. The principles of risk management and conditions on the incident ground determine the choice of strategy.

4.3.2 Where the NSWFB is engaged in joint fire fighting operations with other fire fighting agencies, development of strategies should be done co-operatively, witht the final decision resting with the Incident Controller.

4.3.3 At bush and grass fires within Fire Districts, where the NSW RFS assists the NSWFB, the senior RFS officer may be appointed as Operations Officer to assist the NSWFB Incident Controller. This appointment is in accordance with procedures contained in the *Memorandum of Understanding for NSW Fire Services (October 1997)*.

4.4 Risk Management

4.4.1 The Incident Controller has to decide the level of risk to fire fighting personnel on the incident ground based on:

- fire and smoke conditions;
- weather and fuel conditions;
- spotting;
- danger to people and property; and
- resource availability.

4.4.2 Once the level of risk has been determined, the Incident Controller has to decide how best to deploy fire fighting crews, bearing in mind that:

- the first priority is the safety of firefighters;
- the second priority is protecting *savable* lives;
- the third priority is protecting *savable* property; and

- there is no advantage in commiting resources to save what is already lost.

4.5 Basic Strategies

4.5.1 There are two basic incident ground strategies implemented at bush and grass fires:

- offensive; and
- defensive.

4.5.2 An **offensive** strategy centres on containing the fire to its area of origin. A precondition for this choice of strategy is that weather, fuel and fire conditions will enable firefighters to safely mount a direct attack, and that escape routes/refuge areas are available.

4.5.3 A **defensive** strategy is based on the decision that the risks involved in an offensive strategy are too high, and that it is not possible to mount a direct attack. Resources are therefore concentrated on **property protection**, or other defensive tactics such as backburning or structure triage.

4.5.4 The choice of an appropriate strategy provides the framework for safety at the incident scene.

4.6 Offensive Strategy

4.6.1 When it is safe to do so, the NSWFB initiates offensive operations at bush and grass fires. The basic factors that determine the success of an offensive operation are:

- the location of the attack;
- the size of the attack; and
- support for the attacking crew.

4.6.2 The Incident Controller develops an effective attack through the management of these factors. Decisions about attack size and position must be balanced against judgements about fire conditions, risks and resources.

4.6.3 Offensive operations are to be conducted within the following guidelines:

(a) As far as possible, determine the location and extent of the fire before starting operations.

(b) Protect life and property by initiating the attack where fire intensity is highest, or where there is the greatest danger of spread or property damage.

(c) Analyse the hazards of unburnt areas to which the fire may spread. Establish cut offs.

(d) Analyse the speed and spread of the fire and determine where it is critical to allocate resources to limit the fire spread. Critical factors may include:

- the level of risk to firefighters;
- fuel and topography;
- resources available and en-route; and
- property protection.

(e) Get fire fighting operations ahead of the fire by analysing the fire spread and positioning resources where the fire will be, rather than following the fire.

(f) Write off property that is already lost and go on to protect exposed property based on the most dangerous direction of fire spread. Do **not** continue operations in positions that are essentially lost.

(g) If safe to do so, establish an attack plan that results in fighting the fire directly.

(h) Consider the possibility of the fire spreading through spotting.

(i) Begin mopping up operations as soon as possible after the fire spread is contained.

4.7 Defensive Strategy

4.7.1 The first priority in defensive operations is personnel safety.

4.7.2 Whenever backburning operations are to take place, all crews must be briefed on the operation.

4.7.3 OICs must account for their crews and advise their Sector or Group Commander of their status.

4.7.4 When a major fire is spreading freely, all efforts may have to be concentrated on property protection, with containment becoming a secondary consideration until weather and fire conditions ease.

4.7.5 The Incident Controller will report to the Communications Centre when the fire is under control. This target is reached when the forward progress of the fire has been stopped and the remaining fire can be contained with on-scene resources.

4.8 Communication

4.8.1 It is the responsibility of the Incident Controller to ensure that everyone on the incident ground understands the basic strategy chosen, and that everyone is operating within that strategy.

4.8.2 All personnel on the incident ground must be informed immediately of any change in strategy.

4.8.3 As control is transferred to later arriving officers (refer to *SOG 1.2*), they must be informed of the current strategy and must evaluate the strategy against the current situation.

3.4 STRATEGIES AND TACTICS

There are two basic firefighting strategies for dealing with bush and grass fires – **offensive** and **defensive** – and associated tactics.

Offensive strategy

An **offensive** strategy centres on containing the fire to its area of origin – firefighters mount a *direct attack* on the fire.

Firefighter safety is the first priority. Consider whether firefighters can safely mount a direct attack, given the following:

- ⇨ *Location* and *extent* of fire – assess danger to people and property
- ⇨ Fire *speed* and spread, including spotting
- ⇨ Fuel, topography and weather
- ⇨ Availability of *escape routes* or *refuge* areas
- ⇨ *Resources* available or en-route

Tactics

- ☐ Initiate the attack where the fire is *most intense*, or where there is the greatest danger of spread or property damage.
- ☐ Establish *cut off points*.
- ☐ Position firefighters *ahead* of the fire.
- ☐ *Write off* property that is already lost.
- ☐ Begin *mop up* as soon as possible after the fire is contained.

Defensive strategy

A **defensive** strategy is adopted when the risks involved in an offensive strategy are too high – firefighters concentrate on *property protection* and other defensive tactics such as *backburning* and *structural triage*.

Firefighter safety is the first priority.

At all bush and grass fires, the Incident Controller (IC) must:

- ☐ *Determine* the appropriate strategy and inform the ComCen.
- ☐ Where other fire authorities are involved, *cooperatively develop* strategies. The final decision rests with the IC.
- ☐ Ensure all personnel on the incident ground *understand* the strategy chosen and *are operating* within that strategy – communicate any strategy changes.
- ☐ Account for all crews.
- ☐ Advise the ComCen when the fire is under control.
- ☐ If transferring control to a later arriving officer, *advise* current strategy, for re-evaluation.

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FILE: W:\STRATEGY & PLANNING\LLC\PUBLICATIONS\SOGS\3 BUSHFIRES\3.04 STRATEGIES AND TACTICS\CHECK SHEETS\SOG 3-4 BUSHFIRE - STRATEGIES AND TACTICS CHECK SHEET (VER 01).DOC
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5 FIREFIGHTER SAFETY

5.1 Introduction

5.1.1 The purpose of this SOG is to provide a framework for safe bush and grass fire fighting operations.

5.2 Application

5.2.1 When a combat strategy has been put into place, the Incident Controller must ensure that all officers and firefighters are aware of the plan and their part in achieving tactical and strategic objectives.

5.2.2 ICS provides a framework for effective communication and delegation, and therefore a framework for safe fire fighting operations.

5.3 Responsibilities

5.3.1 ICS will be implemented by the NSWFB at all bush and grass fires. ICS is flexible enough to enable the Incident Controller to implement only those aspects of the system necessary for a particular fire.

5.3.2 At bush and grass fires within Fire Districts, where the NSW RFS assists the NSWFB, the senior RFS officer may be appointed as Operations Officer to assist the NSWFB Incident Controller. This appointment is in accordance with procedures contained in the *Memorandum of Understanding for NSW Fire Services.*

5.4 Risk Management

5.4.1 There are several different ways in which a person can suffer injury or death in a bush or grass fire:

- the body’s heat regulation system fails;
- the person is overcome by smoke and lack of oxygen (anoxia);
- the person is poisoned by carbon monoxide or other toxic gases;
- the lungs are seared by superheated gases;
- the body is burnt; and
- trauma/injury caused by falling trees and limbs

5.4.2 Incident Controllers, Operations Officers, Division, Sector and Group Commanders must be aware of the above hazards, and must ensure that the safety of firefighters is foremost in incident action plans.

5.5 Clothing

5.5.1 All firefighters must be correctly dressed at all times while engaged in bush or grass fire fighting.

5.5.2 Correct clothing is deemed to include the following items:

- helmet (baseball cap may be worn at grass fires if there are no trees present that are above head height - helmets **must** be worn at all bushfires);
- woollen fire fighting trousers;
- workshirt or bushfire jacket (sleeves must **not** be rolled up unless working away from the fire front);
- fire fighting boots;
- fire fighting gloves when engaged in direct attack; and
- goggles.

5.5.3 There is a balance necessary in providing essential protection from physical injury, and enabling dissipation of body heat.

5.5.4 When on rest breaks or away from the fire front, clothing should be loosened or removed to enable the body to cool.

5.6 Fluids

5.6.1 To avoid the effects of heat stress, heat exhaustion and heat stroke, firefighters and officers must pay particular attention to maintaining fluid levels in the body.

5.6.2 The body can lose up to 1 litre per hour through sweating during bushfire operations. Dehydration can occur in as little as 1 or 2 hours of hard physical work.

5.6.3 Officers in command positions must ensure that all firefighters have access to, and take advantage of adequate supplies of clean drinking water.

5.6.4 Fluids containing sugar should be avoided as they can under certain circumstances exacerbate dehydration.

5.7 Food

5.7.1 During prolonged periods of hard, physical work, the body requires fuel in the form of food.

5.7.2 Officers in command positions must ensure that all firefighters have access to, and take advantage of, adequate supplies of food, and in particular, carbohydrates.

5.8 Rest, Recovery and Rehabilitation

5.8.1 To remain effective on the incident ground, firefighters must have regular rest periods, particularly during hot weather conditions.

5.8.2 Rest areas should be as far as possible in a shaded area with a breeze.

5.8.3 Items of protective clothing should be loosened or removed during rest periods to aid cooling.

5.9 Escape Routes and Safe Areas

5.9.1 All firefighters must pay attention to the terrain in which they are working and note escape routes and safe refuges.

5.9.2 If at all possible, fires should be *anchored* to a road, trail, creek or expanse of rock so that firefighters can make their own way over burnt ground to safety, if conditions deteriorate.

5.9.3 Vehicles operating off road should be reversed into their normal operating position so that they can be driven away rapidly if the need arises.

5.10 Survival on Foot

5.10.1 If a firefighter engaged in fire fighting operations becomes trapped by fire, he/she should endeavour to find a vehicle or building in which to shelter as the fire passes. If a shelter cannot be found, the following principles should be adhered to:

- never run uphill away from an approaching fire - work across the slope;
- do not run through flames unless the other side is clearly visible - rule of thumb: flames are as deep as they are high; and
- find an open space or creek to shelter in. Lie down and cover the face and all exposed skin by whatever means is available. Radiation barriers such as rocks or logs should be used.

CAUTION

Never take shelter in an elevated water tank - you will not survive!

5.11 Survival in a Vehicle

5.11.1 If caught by a bush or grass fire in a vehicle, the following actions should be taken:

- park in a large open area on the opposite side of the road from the fire’s approach;
- send a radio message giving location and circumstances;
- turn ignition off but ensure headlights are switched on;
- wind up windows and close air vents;

- lie on the floor and cover all exposed skin;
- stay in the vehicle until the fire passes; this could take up to 4 mins. During this time door linings may produce dense smoke, however the outside environment will not be survivable; and
- when the fire front has passed, leave the vehicle and stay on burnt ground.

5.12 Watch Out Situations

5.12.1 Firefighters should maintain an awareness of weather and fire conditions at all times, particularly changes in wind direction, spot fire activity or rapid fire spread.

5.12.2 Experience has indicated that there are a number of situations which firefighters should always *watch out* for as they may indicate danger. These situations include:

- fire not scouted and sized up;
- in unfamiliar terrain not seen in daylight;
- on a steep slope with fire burning down below;
- safety zones and escape routes not identified;
- unfamiliar with local weather, fuel and fire behaviour;
- uninformed on strategies and tactics;
- instructions and assignments not clear;
- no communications with other crew, commanders;
- constructing hand tool lines without a safe anchor point (road, trail, creek or rocks);
- building fire line downhill with fire below;
- attempting frontal attack on intense fire;
- unburnt fuel between you and the fire;
- unable to view main fire and not in contact with anyone who can;
- on a hillside where rolling material can ignite fire below;
- weather becoming hotter and drier; wind velocity increasing; wind direction changing;
- frequent spotting occurring;

- sleeping near the fire line;
- low level smoke blowing directly overhead;
- a sudden drop in wind speed; this can mean that a wind change is imminent, or you are directly downwind of an intense fire;
- the fire sends up puffs of intense black smoke occasionally, or the fire pulsates; and
- the relative humidity drops to below 25%.

FIREFIGHTER SAFETY CHECK SHEET

The purpose of this Check Sheet is to provide a list of actions that should be carried out by all firefighters when involved in bushfire incidents.

CLOTHING

- All firefighters must be correctly dressed at all times while engaged in bush or grass fire fighting.
- Correct clothing is deemed to include the following items:
  - ☐ helmet (baseball cap may be worn at grass fires if there are no trees present that are over head height - helmets **must** be worn at all bushfires);
  - ☐ wollen fire fighting trousers;
  - ☐ workshirt or bushfire jacket (sleeves must **not** be rolled up unless working away from the fire front);
  - ☐ fire fighting boots;
  - ☐ fire fighting gloves when engaged in direct attack; and
  - ☐ goggles.
- There is a balance necessary in providing essential protection from physical injury, and enabling dissipation of body heat.
- When on rest breaks or away from the fire front, clothing should be loosened or removed to enable the body to cool.

FLUIDS

- To avoid the effects of stress, heat exhaustion and heat stroke, firefighters and officers must pay particular attention to maintaining fluid levels in the body.
- The body can lose up to 1 litre per hour through sweating during bushfire operations. Dehydration can occur in as little as 1 or 2 hours of hard physical work.
- Officers in command positions must ensure that all firefighters have access to, and take advantage of adequate supplies of clean drinking water.
- Fluids containing sugar should be avoided as they can under certain circumstances exacerbate dehydration.

FOOD

- During prolonged periods of hard, physical work, the body requires fuel in the form of food.
- Officers in command positions must ensure that all firefighters have access to, and take advantage of, adequate supplies of food, and in particular, carbohydrates.

REST, RECOVERY AND REHABILITATION

- To remain effective on the incident ground, firefighters must have regular rest periods, particularly during hot weather conditions.
- Rest areas should be as far as possible in a shaded area with a breeze.
- Items of protective clothing should be loosened or removed during rest periods to aid cooling.

ESCAPE ROUTES AND SAFE AREAS

- All firefighters must pay attention to the terrain in which they are working and note escape routes and safe refuges.
- If at all possible, fires should be *anchored* to a road, trail, creek or expanse of rock so that firefighters can make their own way over burnt ground to safety, if conditions deteriorate.
- Vehicles operating off road should be reversed into their normal operating position so that they can be driven away rapidly if the need arises.

SURVIVAL ON FOOT

- If a firefighter engaged in fire fighting operations becomes trapped by fire, he/she should endeavour to find a vehicle or building in which to shelter as the fire passes. If a shelter cannot be found, the following principles should be adhered to:
  - ☐ never run uphill away from an approaching fire - work across the slope;
  - ☐ do not run through flames unless the other side is clearly visible - rule of thumb: flames are as deep as they are high; and
  - ☐ find an open space or creek to shelter in. Lie down and cover the face and all exposed skin by whatever means is available. Radiation barriers such as rocks or logs should be used.

CAUTION

Never take shelter in an elevated water tank - you will not survive!

SURVIVAL IN A VEHICLE

- If caught by a bush or grass fire in a vehicle, the following actions should be taken:
  - ☐ park in a large open area on the opposite side of the road from the fire's approach;
  - ☐ send a radio message giving location and circumstances;
  - ☐ turn ignition off but ensure headlights are switched on;
  - ☐ wind up windows and close air vents;
  - ☐ lie on the floor and cover all exposed skin;
  - ☐ stay in the vehicle until the fire passes; this could take up to 4 mins. During this time door linings may produce dense smoke, however the outside environment will not be survivable; and
  - ☐ when the fire front has passed, leave the vehicle and stay on burnt ground.

WATCH OUT SITUATIONS

- Firefighters should maintain an awareness of weather and fire conditions at all times, particularly changes in wind direction, spot fire activity or rapid fire spread.

- Experience has indicated that there are a number of situations which firefighters should always *watch out* for as they may indicate danger. These situations include:
  - ☐ fire not scouted and sized up;
  - ☐ in unfamiliar terrain not seen in daylight;
  - ☐ on a steep slope with fire burning down below;
  - ☐ safety zones and escape routes not identified;
  - ☐ unfamiliar with local weather, fuel and fire behaviour;
  - ☐ uninformed on strategies and tactics;
  - ☐ instructions and assignments not clear;
  - ☐ no communications with other crew, commanders;
  - ☐ constructing hand tool lines without a safe anchor point (road, trail, creek or rocks);
  - ☐ building fire line downhill with fire below;
  - ☐ attempting frontal attack on intense fire;
  - ☐ unburnt fuel between you and the fire;
  - ☐ unable to view main fire and not in contact with anyone who can;
  - ☐ on a hillside where rolling material can ignite fire below;
  - ☐ weather becoming hotter and drier; wind velocity increasing; wind direction changing;
  - ☐ frequent spotting occurring;
  - ☐ sleeping near the fire line;
  - ☐ low level smoke blowing directly overhead;
  - ☐ a sudden drop in wind speed; this can mean that a wind change is imminent, or you are directly downwind of an intense fire;
  - ☐ the fire sends up puffs of intense black smoke occasionally, or the fire pulsates; and
  - ☐ the relative humidity drops to below 25%.

6 SECTION 44 APPOINTMENTS

(PURSUANT WITH THE RURAL FIRES ACT 1997)

6.1 Introduction

6.1.1 *Section 44* of the *Rural Fires Act 1997* enables the Commissioner of the NSW RFS, via appointees, to take charge of bushfire prevention and suppression operations under certain circumstances.

6.2 Application

6.2.1 This guideline applies to all officers and members of the NSWFB, who are required to comply with any directions given by a *S.44* Appointee.

6.3 Responsibilities

Incident Controllers

6.3.1 NSWFB Incident Controllers should advise Communications Centres of the classification and status of all but the most minor bush and grass fires (refer *SOG 1.2*).

Zone Commanders

6.3.2 Zone Commanders are responsible for the following actions:

- ensuring that they are readily contactable during Bushfire Alerts;
- when advised from within their Zone of a Class 2 bushfire, they must ensure that the appropriate Communication Centre is advised;
- when informed of a Class 2 fire within, adjoining or likely to affect a Fire District, they should make contact with the Executive Officer of the District Bush Fire Management Committee and the NSWFB *S.44* nominee;
- co-ordinate NSWFB resources within their Zones (**country only**), and in consultation with the relevant Communications Centre, form Strike Teams within their Zone as necessary (refer *SOG 1.9*); and
- if necessary, respond to the appropriate Bush Fire Control Centre and participate as a member of the Incident Management Team (IMT).

Communication Centres

6.3.3 Communication Centres are responsible for the following actions:

- monitoring bushfire activity during Bushfire Alerts, very high and extreme fire danger periods;
- informing Zone Commanders of any Class 2 bushfires in their Zones; and
- informing the Response Co-ordinator of any Class 2 bushfire.

Response Co-ordinator, Sydney Communications Centre

6.3.4 The Response Co-ordinator is responsible for the following actions:

- maintaining close liaison with NSWFB Communications Centres and the NSW RFS State Operations Centre;
- notifying nominated NSWFB personnel of *S44* Appointments; and
- advising the State Co-ordinator (DSO), Regional Commanders, MOC, MSO and OIC NSWFB Bushfire Section of Class 2 and 3 bushfire situations as they develop.

OIC NSWFB Bushfire Section

6.3.5 The OIC NSWFB Bushfire Section is responsible for the following actions:

- maintaining close liaison with the Response Co-ordinator and if necessary NSW RFS State Operations Centre; and
- seeking intelligence on all Class 2/Class 3 fires and advising the State Co-ordinator (DSO).

Regional Commanders/Deputy Regional Commanders

6.3.6 Regional Commanders/Deputy Regional Commanders are responsible for the following actions:

- monitoring bushfire situations in their Region and being aware of developing situations in other Regions;
- ensuring an appropriate officer is in place at a Zone level if a NSWFB senior officer is appointed as a *S.44* Appointee or deputy (refer to 6.4.4);
- in consultation with State Co-ordinator (DSO), co-ordinating support to NSWFB operations within the Region; and
- assisting the State Co-ordinator (DSO) as required with the operation of the Major Incident Co-ordination Centre (MICC).

State Co-ordinator (DSO)

6.3.7 The State Co-ordinator (DSO) is responsible for the following actions:

- monitoring bushfire situations statewide;
- appointing a Liaison Officer for NSW RFS State Operations Centre as required;
- liaising with the Manager State Operations, NSW RFS;
- activating the MICC as required;

- co-ordinating support to NSWFB operations statewide and resolving competing resource demands in consultation with Regional Commanders;

- overseeing the dispatch of senior officers to assist members of IMTs as required; and

- ensuring that the NSWFB Commissioner is advised of all *S44* Appointments, and briefing the NSWFB Commissioner on situations as they develop.

6.4 Appointees

6.4.1 NSWFB officers appointed to take charge of operations under *S.44* of the *Rural Fires Act 1997*, must be aware that their role is to co-ordinate the activities of many agencies, with reporting lines to the NSW RFS Commissioner.

6.4.2 Appointees should nominate deputies in accordance with Bush Fire Co-ordinating Committee guidelines, usually from the other combat (fire) agencies.

6.4.3 Appointees will implement ICS including Operations, Planning and Logistics Functional Sections, in accordance with current Bush Fire Co-ordinating Committee policies.

6.4.4 When accepting an appointment, the officer should hand over control of NSWFB operations and their area of responsibility (in consultation with Regional Commander), to another NSWFB officer and also appoint a NSWFB liaison officer at the Incident Control Centre.

6.4.5 Appointees should form both a day and night IMT using officers with appropriate expertise from all of the involved fire agencies. One of the Deputy Appointees should relieve the Appointee as Incident Controller on the night shift.

6.4.6 The Appointee should work from an appropriate Incident Control Centre with adequate facilities for all involved agencies. This will normally be a NSW RFS facility.

6.4.7 Close liaison must be established with local and district Emergency Operations Controllers, and they should be invited to attend planning sessions.

6.4.8 Regular SITREPS must be forwarded to the NSW RFS State Operations Centre in accordance with NSW RFS requirements. These should be the subject of regular briefings at the Incident Control Centre, thus ensuring that all Liaison Officers are appraised of the current situation.

6.4.9 The Appointee should ensure that the appropriate communications infrastructure is established to manage incident communications and incoming fire calls (refer to 6.6).

6.5 NSWFB Officers and Firefighters

6.5.1 All NSWFB officers and firefighters are required to comply with instructions given by a *S.44* Appointee in relation to the suppression of a bushfire.

6.6 Management of Incoming Fire Calls

6.6.1 Fire calls received via **000** or other means to bush and grass fires (and structure fires resulting from), in an area covered by a *S.44* Appointment, will be logged immediately by the Communications Centre and passed to the Incident Control Centre nominated by the Appointee.

6.6.2 Appointees should ensure that the Communications Centres are provided with a reliable (secure) means of contact to the Incident Control Centre.

6.6.3 Any details relating to response to fire calls that have been actioned by the Incident Control Centre, are to be communicated back to the appropriate NSWFB Communication Centre.

6.6.4 Emergency calls not relating to the fire for which a *S.44* Appointment has been made, will be managed in the normal manner by the relevant combat agency.

SECTION 44 APPOINTMENTS CHECK SHEET

The purpose of this Check Sheet is to provide a list of responsibilities and actions that should be carried out by certain members and Sections of the NSWFB under *S.44* of the *Rural Fires Act 1997.*

RESPONSIBILITIES

Incident Controllers

- NSWFB Incident Controllers should advise Communications Centres of the classification and status of all but the most minor bush and grass fires (refer *SOG 1.2*).

Zone Commanders

- Zone Commanders are responsible for the following actions:
  - ☐ ensuring that they are readily contactable during Bushfire Alerts;
  - ☐ when advised from within their Zone of a Class 2 bushfire, they must ensure that the appropriate Communication Centre is advised;
  - ☐ when informed of a Class 2 fire within, adjoining or likely to affect a Fire District, they should make contact with the Executive Officer of the District Bush Fire Management Committee and the NSWFB *S.44* nominee;
  - ☐ co-ordinate NSWFB resources within their Zones (**country only**), and in consultation with the relevant Communications Centre, form Strike Teams within their Zone as necessary (refer *SOG 1.9*); and
  - ☐ if necessary, respond to the appropriate Bush Fire Control Centre and participate as a member of the Incident Management Team (IMT).

Communication Centres

- Communication Centres are responsible for the following actions:
  - ☐ monitoring bushfire activity during Bushfire Alerts, very high and extreme fire danger periods;
  - ☐ informing Zone Commanders of any Class 2 bushfires in their Zone; and
  - ☐ informing the Response Co-ordinator of any Class 2 bushfire.

Response Co-ordinator, Sydney Communications Centre

- The Response Co-ordinator is responsible for the following actions:
  - ☐ maintaining close liaison with NSWFB Communications Centres and the NSW RFS State Operations Centre;
  - ☐ notifying nominated NSWFB personnel of *S44* appointments; and
  - ☐ advising the State Co-ordinator (DSO), Regional Commanders, MOC, MSO and OIC NSWFB Bushfire Section of Class 2 and 3 bushfire situations as they develop.

OIC NSWFB Bushfire Section

- The OIC NSWFB Bushfire Section is responsible for the following actions:
  - ☐ maintaining close liaison with the Response Co-ordinator and if necessary NSW RFS State Operations Centre; and
  - ☐ seeking intelligence on all Class 2/Class 3 fires and advising the State Co-ordinator (DSO).

Regional Commanders/Deputy Regional Commanders

- Regional Commanders/Deputy Regional Commanders are responsible for the following actions:
  - ☐ monitoring bushfire situations in their Region and being aware of developing situations in other Regions;
  - ☐ ensuring an appropriate officer is in place at a Zone level if a NSWFB senior officer is appointed as a *S.44* Appointee or deputy (refer 6.4.4);
  - ☐ in consultation with State Co-ordinator (DSO), co-ordinating support to NSWFB operations within the Region; and
  - ☐ assisting the State Co-ordinator (DSO) as required with the operation of the Major Incident Co-ordination Centre (MICC).

State Co-ordinator (DSO)

- The State Co-ordinator (DSO) is responsible for the following actions:
  - ☐ monitoring bushfire situations statewide;
  - ☐ appointing a Liaison Officer for NSW RFS State Operations Centre as required;
  - ☐ liaising with the Manager State Operations, NSW RFS;
  - ☐ activating the MICC as required;
  - ☐ co-ordinating support to NSWFB operations statewide and resolving competing resource demands in consultation with Reg.Cmdrs;
  - ☐ overseeing the dispatch of senior officers to assist members of IMTs as required; and
  - ☐ ensuring that the NSWFB Commissioner is advised of all *S44* Appointments, and briefing the NSWFB Commissioner on situations as they develop.

APPOINTEES

- NSWFB officers appointed to take charge of operations under *S.44* of the *Rural Fires Act 1997*, must be aware that their role is to co-ordinate the activities of many agencies, with reporting lines to the NSW RFS Commissioner. Additionally, they should carry out the following actions:
  - ☐ nominate deputies in accordance with Bush Fire Co-ordinating Committee guidelines, usually from the other combat (fire) agencies;
  - ☐ implement ICS including Operations, Planning and Logistics Sections, in accordance with current Bush Fire Co-ordinating Committee policies;
  - ☐ on acceptance of appointment hand over control of NSWFB operations and their area of responsibility (in consultation with Regional Commander), to another NSWFB officer and also appoint a NSWFB Liaison Officer at the Incident Control Centre;
  - ☐ form both a day and night IMT using officers with appropriate expertise from all of the involved fire agencies. One of the Deputy Appointees should relieve the Appointee as Incident Controller on the night shift;
  - ☐ work from an appropriate Incident Control Centre with adequate facilities for all involved agencies. This will normally be a NSW RFS facility;
  - ☐ establish and maintain a close liaison with local and district Emergency Operations Controllers, who should be invited to attend planning sessions; and
  - ☐ forward regular SITREPS to the NSW RFS State Operations Centre in accordance with NSW RFS requirements. These should be the subject of regular briefings at the Incident Control Centre, thus ensuring that all Liaison Officers are appraised of the current situation.
  - ☐ ensure that the appropriate communications infrastructure is established to manage incident communications and incoming fire calls (refer to **Management of Incoming Fire Calls**)

NSWFB OFFICERS AND FIREFIGHTERS

- All NSWFB officers and firefighters are required to comply with instructions given by a *S.44* Appointee in relation to the suppression of a bushfire.

MANAGEMENT OF INCOMING FIRE CALLS

- Fire calls received via **000** or other means to bush and grass fires (and structure fires resulting from), in an area covered by a *S.44* Appointment, will be logged immediately by the Communications Centre and passed to the Incident Control Centre nominated by the Appointee.
- Appointees should ensure that the Communications Centres are provided with a reliable (secure) means of contact to the Incident Control Centre.
- Any details relating to response to fire calls that have been actioned by the Incident Control Centre, are to be communicated back to the appropriate NSWFB Communication Centre.
- Emergency calls not relating to the fire for which a *S.44* appointment has been made, will be managed in the normal manner by the relevant combat agency.

3.7 COMMUNITY FIRE UNITS

1 Introduction

The Fire and Rescue NSW Community Fire Unit (CFU) Program assists Fire and Rescue NSW in achieving its goal to increase the community's preparedness and resilience to hazards, emergencies and disasters.

CFU members are not firefighters. They are residents living in the bushland urban interface who are taught basic skills to protect and defend their homes from spot fires and ember attack during a bushfire, using supplied firefighting equipment. CFU activities follow national 'Prepare. Act. Survive.' strategies.

All CFU members must act in accordance with the Fire Danger Ratings (FDR) for their area. CFU members are not permitted to activate on days with a FDR of *Catastrophic*, regardless of their level of preparation.

CFU members must follow directions given to them by Fire and Rescue NSW Incident Controllers and firefighters, or firefighters from another fire service, which are consistent with the aims, policies and standard operational guidelines of the CFU Program.

2 Application

This guideline applies to Incident Controllers, firefighters and all other personnel in relation to the activities of a CFU.

3 Area of activity

Each CFU has a designated *area of activity* determined by Fire and Rescue NSW.

Area of activity maps for each CFU are located on Station Portal under CFU.

CFU members are *only permitted* to undertake work inside their area of activity. The area of activity does not include bushland bordering residential properties.

Fire and Rescue NSW firefighters or other fire services *must not* direct CFUs to undertake work outside of their area of activity.

WARNING

CFUs must not activate in areas with a FDR of *Catastrophic*.

4 CFU member roles

There are three types of CFU members: *operational* members, *associate* members, and *cadet* members who are aged 16 or 17. Cadet members trained in safe equipment use may act as operational members; otherwise they act as associate members.

Operational members

Operational members are *trained* in the safe use of supplied equipment to:

- Prepare and protect their home and other properties in their area of activity from spot fires and ember attack in accordance with 'Prepare. Act. Survive.' strategies.

- Assist with mop up in their area of activity after the fire front passes, releasing fire services to respond to the fire front.

Associate members

Associate members are *not trained* in equipment use. Instead, they provide the following *support* functions to the CFU team:

- Monitor public warnings on bushfire activity and relay information to the team.
- Patrol the area of activity, to alert operational members to outbreaks of spot fires and ember attacks.
- Pass information between operational members, and other communication tasks.
- Assist in the coordination of food and drink supplies for CFU members.
- Provide appropriate first aid where trained.

5 Notification and activation of CFUs

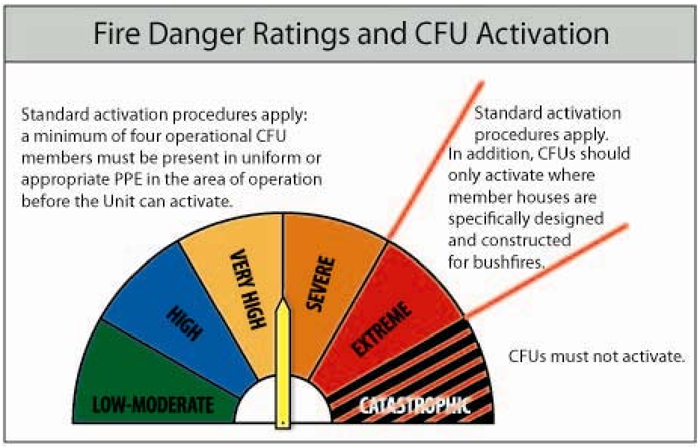
Following receipt by the Bushland Urban Interface Section of a 2nd Alarm (or higher) bush or grass fire from the Communication Centre (ComCen), the following occurs:

1. The Bushland Urban Interface (BUI) Section sends SMS notifications to CFUs about bushfire alerts close to their area of activity.
2. Incident Controllers can request that a CFU be notified of bushfire threat close to their area of activity by contacting the ComCen and requesting that the BUI Section send an SMS notification to the CFU.
3. On receiving an SMS notification and depending upon the prevailing FDR and local conditions, CFU members decide whether they will *monitor the situation*, *stay and activate*, or *leave early*.
4. If the CFU decides to *stay and activate*, one member calls the CFU Activation Line on 1300 000 CFU (1300 000 238). This call is received by the ComCen – or the Bushfire Incident Control Centre if operating – and the CFU is logged as active in FireCAD.
5. The BUI Section arranges for active CFUs to be monitored.

A CFU can only activate if it has a minimum of *four operational members* present in the area of activity and in CFU uniform or appropriate PPE.

CFUs are not permitted to activate in areas where the FDR is *Catastrophic*.

If the FDR is *Extreme*, CFU members should only activate if their houses are specifically designed and constructed for bushfires.



6 CFU activities during bushfires

During a bushfire incident, CFUs undertake the following in their area of activity:

- Prior to the arrival of the fire front – prepare their properties and extinguish spot fires in their area of activity.
- As the fire front approaches – take shelter until the fire front has safely passed.
- Once the fire front has passed – assist with mop up and recovery in their area of activity.

CFU members who have activated operate under the following limits:

- CFU members do not have any authority, responsibility or role in Fire and Rescue NSW bushfire operations.
- Incident Controllers and firefighters on active duty at bushfire incidents should treat CFU members in exactly the same way as they would any other member of the public.
- CFU members must act in accordance with the FDR for their area and follow evacuation orders given by the Police or other authorised personnel.
- CFU members must not engage in direct firefighting attack on a bushfire – CFU members are not trained, equipped or permitted to do so.
- CFU members must not undertake internal firefighting or major external structural firefighting – CFU members are not trained, equipped or permitted to do so. (For the purposes of this SOG, a major external structural fire is any fire greater than an area equivalent to 3 metres by 3 metres involving the exterior of a structure.)
- CFU members may enter the garden of a property within their area of activity to undertake CFU operations when the owner of the property is absent.
- CFU members may only enter buildings with the permission of the building owner or occupier, but not for the purpose of structural firefighting.

7 Stand down/deactivation

CFUs deactivate or are stood down under one of the following circumstances:

- The BUI Section sends a ‘stand down’ SMS message to CFU members.
- An Incident Controller contacts the ComCen and requests that the BUI Section send an SMS notification to stand down a particular CFU.

- An Incident Controller or other firefighter verbally directs a particular CFU to stand down. Where this occurs, the Incident Controller or firefighter should inform the ComCen, so that the CFU is logged as inactive on FireCAD.
- The CFU self-deactivates, under the following circumstances:
  - The number of active operational members in the area of activity falls below four members, ie the minimum safe working number.
  - The CFU team decides it is otherwise unsafe to continue activities.
  - The CFU team decides there is no longer a reason to be active in the area of activity, eg there is no bushfire or ember activity.

8 Attendance at debriefs

Incident Controllers may invite relevant CFU team coordinators or other CFU members to incident debriefs, where appropriate.

3.7 COMMUNITY FIRE UNITS

The Community Fire Unit (CFU) program assists Fire and Rescue NSW in achieving its goal to increase the community's preparedness and resilience to hazards, emergencies and disasters.

CFU members are not firefighters. Like all other members of the public, CFU members must always act in accordance with the Fire Danger Ratings (FDR) for their area and the national 'Prepare. Act. Survive.' Strategy.

CFU *area of activity*

⇨ Each CFU has a designated *area of activity* determined by Fire and Rescue NSW.

⇨ CFU members are *only permitted* to undertake work inside their area of activity – which does not include bushland bordering residential properties.

⇨ CFU members do not have any authority, responsibility or role in Fire and Rescue NSW bushfire operations.

CFU member roles

⇨ *Operational members* – are *trained* in the safe use of supplied equipment to prepare and protect their homes and other properties in their area of activity from spot fires and ember attack; and to assist with mop ups.

⇨ *Associate members* – are *not trained* in equipment use but provide *support* functions.

⇨ *Cadet members* – are aged 16 or 17 and may undertake operational or support activities depending upon their training.

Notification and activation

ComCen

☐ Notify Bushland Urban Interface (BUI) Section of a 2nd Alarm bush or grass fire.

☐ Log activation calls from CFUs on the 1300 000 CFU number in FireCAD.

☐ Pass on requests from Incident Controllers to the BUI Section, to notify CFUs of a bushfire threat or to stand down CFUs.

☐ Deactivate CFUs in FireCAD when BUI Section sends a stand down SMS.

Bushfire Officer (Bushland Urban Interface Section)

☐ Send notification SMS to CFUs as part of bushfire alert.

☐ Organise monitoring of activated CFUs.

☐ Respond to requests from Incident Controllers (relayed through the ComCen), to notify CFUs of the bushfire threat or to stand down CFUs.

Management at incidents

Incident Controllers and firefighters on active duty at bushfire incidents should treat CFU members in exactly the same way as they would any other member of the public.

Incident Controller

- ☐ Request via the ComCen that BUI notify CFUs about bushfire threat or stand down CFUs.
- ☐ Provide direction to CFUs present at a bushfire, consistent with the aims, policies and standard operational guidelines of the CFU Program.
- ☐ Where appropriate, verbally direct CFUs to stand down, ensuring that the ComCen is notified to log the CFU as inactive in FireCAD.
- ☐ Invite relevant CFU team coordinators or other CFU members to incident debriefs, where appropriate.

Firefighters

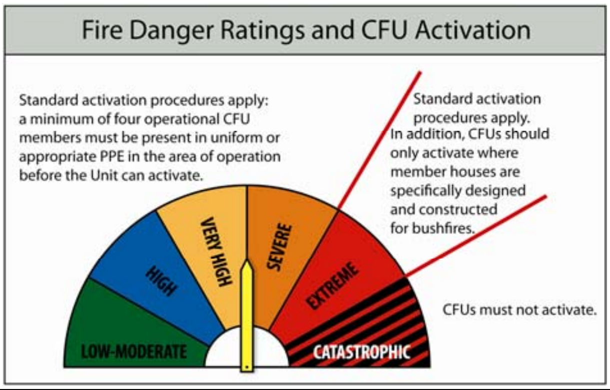
- ☐ Provide direction to CFUs present at a bushfire, consistent with the aims, policies and standard operational guidelines of the CFU Program.
- ☐ Where appropriate, verbally direct CFUs to stand down, ensuring that the ComCen is notified to log the CFU as inactive in FireCAD.

Fire Danger Ratings and CFU activation

In order to activate, a CFU must have at least the safe working number of *four operational members* in CFU uniform and PPE.

CFUs are not permitted to activate in areas where the FDR is *Catastrophic*.

If the FDR is *Extreme*, CFU members should only activate if their houses are specifically designed and constructed for bushfires.



3.10 PRESCRIBED BURNING OPERATIONS

1 Introduction

Prescribed burning is one method of managing the bushfire hazard at the urban/bushland interface by reducing the amount of fine fuel in the burn zone.

2 Application

This guideline applies to all NSWFB personnel involved in prescribed burning operations.

NOTE All participants in a prescribed burn must have received training in wildfire behaviour and suppression.

Prescribed burning can be dangerous. This guideline must be strictly followed.

3 Legal and other requirements

The following legal restrictions apply to prescribed burn operations.

Prescribed burning is not allowed:

- on *Environment Protection Authority* (*EPA*) **No Burn** days
- during Total Fire Bans (Toban), and
- during inappropriate weather.

Approval for any prescribed burning is through:

- the local Bushfire Management Committee or
- a Bush Fire Hazard Reduction Certificate issued by the appropriate authority, eg Council, Rural fire Service.

The NSWFB is exempt from water restrictions but every effort must be made to conserve and use water effectively

Where the NSWFB is the responsible agency, a *NSWFB Prescribed burn plan* must also be completed for each burn.

4 Control of prescribed burn operations

4.1 Incident Control System

The Incident Control System (ICS) must be implemented at all prescribed burns.

Strategies for **joint** prescribed burns are controlled by the agency responsible for the area where the burn is taking place.

4.2 Responsibilities of Incident Controller

The Incident Controller (IC) is responsible for:

- primarily, protecting life and property in a fire including a prescribed burn

- developing and documenting the NSWFB Prescribed Burn Plan (which includes a Bushfire Risk Assessment and Operational Risk Assessment)
- undertaking the prescribed burn in line with the requirements of the appropriate Bushfire Management Committee or land manager
- supervising and directing the prescribed burn, and
- ensuring the safety of all firefighters and staff involved in the prescribed burn.

4.3 Safety

The IC must ensure that:

- a Safety Officer (*SOG 1.6*) is appointed when four or more appliances are in attendance ,and
- the Incident Control Management System (ICMS) (*SOG 18.2*) is used.

5 Pre-burn activities

5.1 Notifications

The following notifications must occur at least 24 hours before a prescribed burn:

1. Residents, schools, hospitals and businesses that may be affected by smoke or road closure in writing.
2. Land Managers within 8 kilometres, such as the National Parks and Wildlife Service, Department of Land and Water Resources or State Forests, by phone or fax at least 24 hours before the burn. Receipt of the message should be confirmed.
3. Transport authorities, if there is a risk of smoke affecting flight paths, roads or rail services, in writing.
4. Transgrid, if high voltage power lines may be affected.
5. NSWFB Bushfire/Natural Hazards Section and the appropriate Communication Centre (ComCen), in writing

At the location, during a prescribed burn, the following signage must be erected:

1. Road signage to warn traffic of the possible smoke hazard.
2. NSWFB barrier tape to restrict public access to the area.

5.2 Property protection

The IC must ensure that crews:

- place and charge lines of hose between the fire line and property
- monitor exposures for ember attack and spot fires, eg roofs, gutters and adjoining land
- advise the IC of any fire escape immediately.

6 Prescribed burn documents

A written *NSWFB Prescribed burn plan* must be completed for each planned prescribed burn.

7 Communications

Communications (either visual contact or by radio) must be maintained with all firefighters working within the fire area at all times.

Communication blackspots within the burn area must be identified and noted.

Alternate means of communication must be provided if possible.

The ComCen should be asked for a logged communications channel, eg GRN 600 Talkgroups.

Three blasts on a vehicle horn or similar will indicate that everyone involved in the burn must retreat immediately to a point of safety, eg vehicle, refuge area.

8 Conducting a prescribed burn

NOTE The safety of personnel is paramount in all operations.

8.1 Actions before starting the prescribed burn

Before starting the prescribed burn, the IC must:

- obtain weather details from the Bushfire/Natural Hazards Section or ComCen and ask the ComCen to advise of any expected weather changes
- cancel the burn if the Fire Danger Index is above 12 or severe fire behaviour is expected
- confirm that the prescribed conditions and other details are within the limits on the burn plan
- revise the Burn Plan if necessary and communicate changes to all involved
- conduct a test burn in a typical fuel area and communicate the results to all involved
- log actual local weather conditions before and during the burn, and
- ensure that all those involved inspect their area of operations and are briefed on the burn plan.

8.2 During the prescribed burn

NOTE Ignition must be approved by the IC and directly supervised by officers in the chain of command.

All personnel involved in the burn and the appropriate ComCen must be notified of ignition.

Control lines must be adequately patrolled at all times to ensure that the fire remains within the burn area.

Personnel must not be positioned in any area potentially vulnerable to fire overrun.

The IC must constantly monitor progress of the prescribed burn, review operation and vary strategies, tactics and tasks, as necessary.

Regular sitreps should be sent to the ComCen

All team leaders should record relevant details of the prescribed burn in a logbook.

Where the weather, fuel or topography produce fire behaviour reaching the limits of control or flame height in excess of that prescribed, re-evaluate the operation.

8.3 Drip torch operation

The torch must only be used as prescribed in the *NSWFB Drip Torch Recommended Practice*.

NOTE The ignition pattern specified in the burn plan must be followed.

The drip torch operator must be aware of all refuge areas.

Drip torch operators must always work with an observer or be in line of sight of other crews.

The IC must approve all ignitions.

9 Post-burn operations

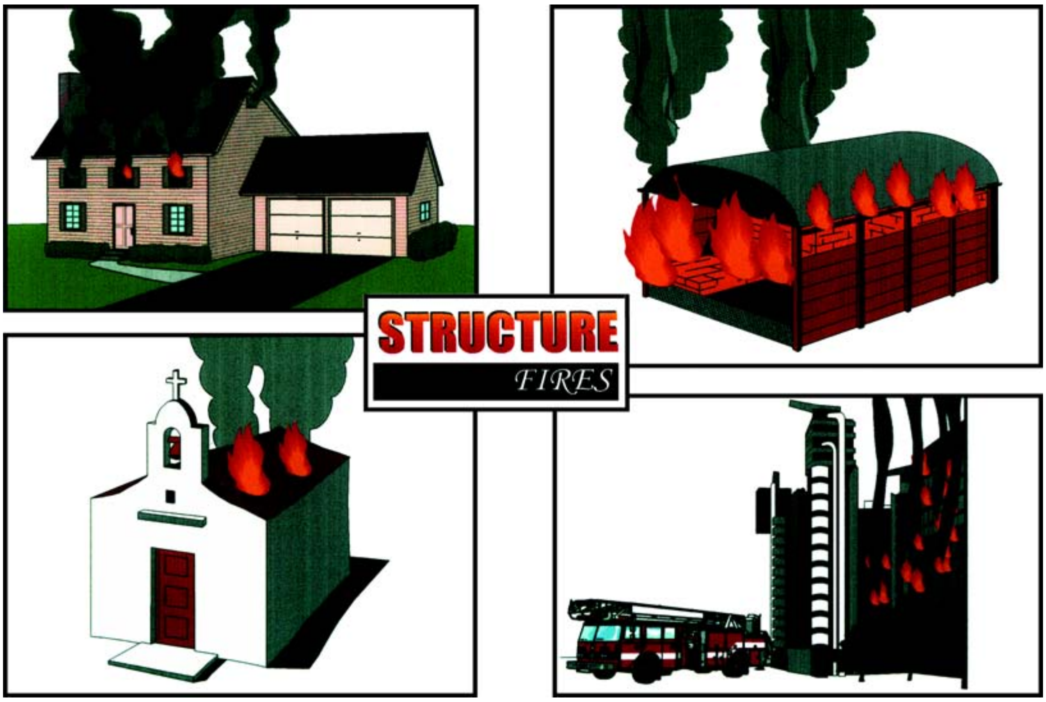
To reduce smoke output, burnt areas should be mopped up immediately once the required amount of fuel hazard has been reduced.

After the burn is complete, those involved must ensure that all points listed in the burn plan are addressed.

NSW FIRE BRIGADES

Standard Operational Guidelines

STRUCTURE FIRES



Section Four

1 STRUCTURE FIRE SIZE-UP

1.1 Introduction

1.1.1 The purpose of this SOG is to provide Incident Controllers (ICs) with a check list of the basic factors involved in the initial size-up and ongoing review of conditions at a structure fire.

1.2 Application

1.2.1 A comprehensive size-up is essential for the development of appropriate objectives, strategies and tactics to combat a structure fire.

1.3 Size-Up

1.3.1 Size-up refers to the process by which firefighters rapidly appraise an emergency situation, leading to a safe and effective combat plan.

1.3.2 The mnemonic BELEA is used to assist ICs in remembering the factors which should be considered in an effective size-up.

B uilding
E xposures
L ocation of fire
E xtinguishment
A ssistance

1.3.3 **Building**

Consider the following points:

- the need for **rescue** operations;
- the type of **occupancy** e.g. factory, hospitals, residential etc;
- if all **occupants** have been **accounted for**;
- if there should be an **evacuation**, who is in **most danger** and the best **way** to get them **out**;
- whether it is safe to do a **search**;
- the type of **construction**;
- the building **use** and any industrial or commercial **processes**;
- whether the building is **safe to enter**;
- **access** routes;

- **egress** routes;
- installed **fire protection** - sprinklers, hydrants, gas extinguishing systems - and whether they are working;
- whether the structure has **compartmentation**;
- the presence of **fire walls**; and
- the **fire load and contents**.

1.3.4 Exposures

Identify the following:

- **internal exposures**; e.g. large buildings with multiple occupancies. Consider mushrooming, stack effect, flame impingement, radiant heat, smoke travel etc;
- **external structures** that are threatened;
- likely **means of spread**; e.g. radiant heat, convection, conduction, flying embers and flame impingement;
- **hazardous areas** or high risk occupancies nearby e.g. LPG tanks, timber structures, aged care facilities etc;
- the risk of **water pollution**;
- the risk of **air pollution**;
- **weather conditions** that may affect fire spread or smoke plume travel; and
- **topography** and **distance between structures**.

1.3.5 Location of Fire

Consider the following points:

- the **protection** of firefighters; implement Incident Control System (ICS - *SOG 1.1*), use SCBA as required and appoint a Safety Officer;
- the exact **location** of the fire;
- the best **access** to the fire;
- how far the **fire has spread** and **how fast it is going**;
- the risk of **building collapse**;
- the **effect** of fire suppression and techniques on **building structure**;

- the **effect of heat** on contents (e.g. smoke production, intense heat); and
- locations for effective **cut off points**.

1.3.6 Extinguishment

Consider the following points:

- what the **fuel** is;
- what **extinguishing agent** is most appropriate;
- whether **special extinguishing methods** will be necessary;
- how much **smoke** there is, how dense it is, and how fast it is spreading;
- the need for positive pressure or natural **ventilation** and the need for additional openings (ensure hose line protection); and
- **special hazards** to firefighters e.g. toxic fumes, electrical hazards, flashover, backdraught, explosions.

1.3.7 Assistance

Determine the requirements for:

- additional fire fighting **crews** (NSWFB or other fire services);
- **aerial appliances**;
- **fire/rescue crews** (for rescue of trapped firefighters);
- **USAR** Reconnaissance Team or Task Force (*SOG 11.5*);
- additional **senior officers for ICS;**
- **breathing apparatus support**
- appliances for **relay** pumping or water **tankers**;
- **special appliances**;
- **Incident Control Unit**;
- **foam** or $\mathbf{CO_2}$;
- **HazMat** support;
- **additional** crews for salvage work;

- **lighting**;
- **chaplain or CID Team**; and
- specialised **technical advisors** e.g. FSD, FIRU etc.

Determine if there is a need to call for:

- **Police** for traffic or crowd control;
- **Ambulance Service** for existing or possible casualties;
- **water supply** authority;
- technicians to shut off the **gas or electricity** supplies;
- **fire fighting support vessels** (*SOG 7.2*);
- **helicopters**;
- **State Rail Authority**;
- **Council** or **Department of Public Works and Services engineers**;
- **Port Authority**;
- **aviation** or **airport authorities**;
- **airport rescue** and **fire fighting service**;
- **Environment Protection Authority**;
- **Local Emergency Operations Controller/Local Emergency Management Officer**; and
- **interpreters**.

When developing objectives, strategies and tactics, consider the following points:

- the **response time** for requested support;
- the requirements for **relief crews** and **refreshments**; and
- whether a **change of shift** might be necessary.

1.4 Action Plan

1.4.1 The IC must develop an **incident action plan** based on the critical factors identified during the initial size-up. There is usually no need for a formal written plan unless the incident is very large, protracted, particularly complex, involves a change of shift, or is likely to generate a Coronial Inquiry.

1.4.2 The incident action plan will be based on incident:

- objectives (e.g. rescue, protect exposures, contain spread etc);
- strategies (offensive, defensive, marginal);
- tactics (deployment of crews and appliances); and
- tasks (individual work assignments to crews and individuals).

1.4.3 Incident **objectives** lead to a choice of **strategy,** which is then implemented through **tactics** and **tasks** (see Fig 1.1).

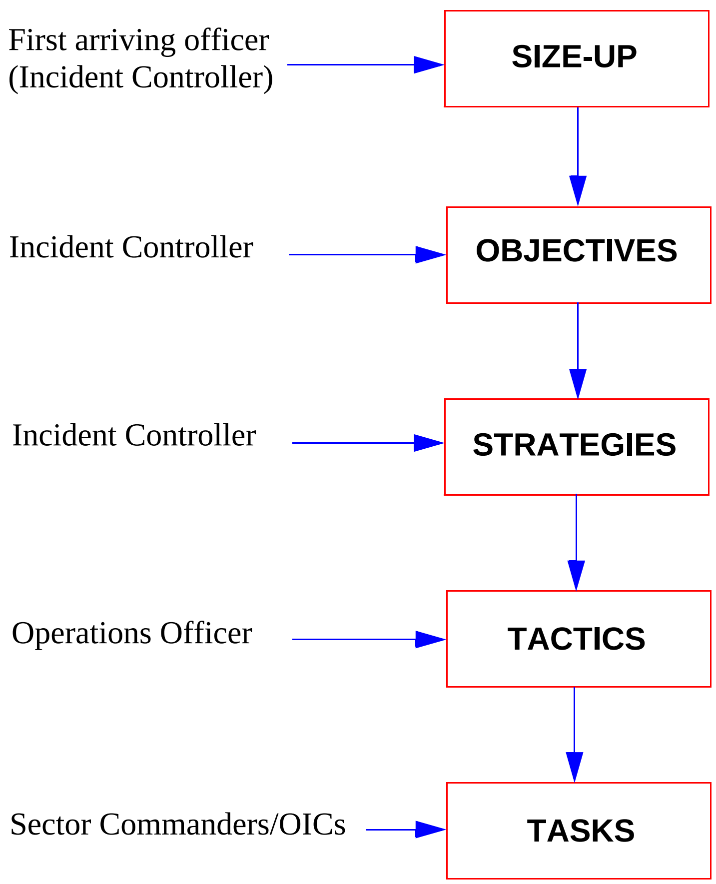


Fig 1.1 Incident Action Plan

1.4.4 ICs must **continuously seek more information** about the fire from their own observations, from the reports of members of the Incident Management Team (IMT), firefighters, technical advisors and external agencies.

1.5 Plan Review

1.5.1 As the fire progresses and more information is received, the IC must **continuously revise the incident action plan** by reviewing the conditions on the incident ground. A review must be conducted whenever control passes to a new IC.

1.6 Referenced Documents

1.6.1 The following documents have been referenced within this document and should be read in conjunction with this SOG:

- *SOG 1.1 Incident Control System;*
- *SOG 7.2 Fire Fighting Support Vessels; and*
- *SOG 11.5 Urban Search and Rescue.*

STRUCTURE FIRE SIZE-UP - CHECK SHEET

The purpose of this Check Sheet is to provide details of the actions required by Incident Controllers (ICs) when carrying out a structure fire size-up.

SIZE-UP

- Size-up refers to the process by which firefighters rapidly appraise an emergency situation, leading to a safe and effective combat plan.
- The mnemonic BELEA is used to assist ICs in remembering the factors, which should be considered in an effective size-up.

B uilding
E xposures
L ocation of fire
E xtinguishment
A ssistance

Building

- Consider the following points:

☐ the need for **rescue** operations;
☐ the type of **occupancy** e.g. factory, hospitals, residential etc;
☐ if all **occupants** have been **accounted for**;
☐ if there should be an **evacuation**, who is in **most danger** and the best **way** to get them **out**;
☐ whether it is safe to do a **search**;
☐ the type of **construction**;
☐ the building **use** and any industrial or commercial **processes**;
☐ whether the building is **safe to enter**;
☐ **access** routes;
☐ **egress** routes;
☐ installed **fire protection** - sprinklers, hydrants, gas extinguishing systems - and whether they are working;
☐ whether the structure has **compartmentation**;
☐ the presence of **fire walls**; and
☐ the **fire load and contents**

Exposures

- Identify the following:

☐ **internal exposures**; e.g. large buildings with multiple occupancies. Consider mushrooming, stack effect, flame impingement, radiant heat, smoke travel etc;
☐ **external structures** that are threatened;
☐ likely **means of spread**; e.g. radiant heat, convection, conduction, flying embers and flame impingement;
☐ **hazardous areas** or high risk occupancies nearby e.g. LPG tanks, timber structures, aged care facilities etc;
☐ the risk of **water pollution**;
☐ the risk of **air pollution**;
☐ **weather conditions** that may affect fire spread or smoke plume travel; and
☐ **topography** and **distance between structures**.

Location of Fire

- Consider the following points:

  - ☐ the **protection** of firefighters; implement Incident Control System (ICS - *SOG 1.1*), use SCBA as required and appoint a Safety Officer;
  - ☐ the exact **location** of the fire;
  - ☐ the best **access** to the fire;
  - ☐ how far the **fire has spread** and **how fast it is going**;
  - ☐ the risk of **building collapse**;
  - ☐ the **effect** of fire suppression and techniques on **building structure**;
  - ☐ the **effect of heat** on contents (e.g. smoke production, intense heat); and
  - ☐ locations for effective **cut off points**.

Extinguishment

- Consider the following points:

  - ☐ what the **fuel** is;
  - ☐ what **extinguishing agent** is most appropriate;
  - ☐ whether **special extinguishing methods** will be necessary;
  - ☐ how much **smoke** there is, how dense it is, and how fast it is spreading;
  - ☐ the need for positive pressure or natural **ventilation** and the need for additional openings (ensure hose line protection); and
  - ☐ **special hazards** to firefighters e.g. toxic fumes, electrical hazards, flashover, backdraught, explosions.

Assistance

- Determine the requirements for:

  - ☐ additional fire fighting **crews** (NSWFB or other fire services);
  - ☐ **aerial appliances**;
  - ☐ **fire/rescue crews** (for rescue of trapped firefighters);
  - ☐ USAR Reconnaissance Team or Task Force (*SOG 11.5*);
  - ☐ additional senior officers for ICS;
  - ☐ breathing apparatus support
  - ☐ appliances for **relay** pumping or water **tankers**;
  - ☐ **special appliances**;
  - ☐ **Incident Control Unit**;
  - ☐ **foam** or **CO_2**;
  - ☐ **HazMat** support;
  - ☐ **additional** crews for salvage work;
  - ☐ **lighting**;
  - ☐ **chaplain or CID Team**; and
  - ☐ specialised **technical advisors** e.g. FSD, FIRU etc.

- Determine if there is a need to call for:

  - ☐ **Police** for traffic or crowd control;
  - ☐ **Ambulance Service** for existing or possible casualties;
  - ☐ **water supply** authority;
  - ☐ technicians to shut off the **gas or electricity** supplies;
  - ☐ **fire fighting support vessels** (*SOG 7.2*);
  - ☐ **helicopters**;

- ☐ **State Rail Authority**;
- ☐ **Council** or **Department of Public Works and Services engineers**;
- ☐ **Port Authority**;
- ☐ **aviation** or **airport authorities**;
- ☐ **airport rescue** and **fire fighting service**;
- ☐ **Environment Protection Authority**;
- ☐ **Local Emergency Operations Controller/Local Emergency Management Officer**; and
- ☐ **interpreters**.

• When developing objectives, strategies and tactics, consider the following points:

- ☐ the **response time** for requested support;
- ☐ the requirements for **relief crews** and **refreshments**; and
- ☐ whether a **change of shift** might be necessary.

ACTION PLAN

• The IC must develop an **incident action plan** based on the critical factors identified during the initial size-up. There is usually no need for a formal written plan unless the incident is very large, protracted, particularly complex, involves a change of shift, or is likely to generate a Coronial Inquiry.

• ICs must **continuously seek more information** about the fire from their own observations, from the reports of members of the Incident Management Team (IMT), firefighters, technical advisors and external agencies.

PLAN REVIEW

• As the fire progresses and more information is received, the IC must **continuously revise the incident action plan** by reviewing the conditions on the incident ground. A review must be conducted whenever control passes to a new IC.

4.2 STRUCTURE FIRE RISKS AND PRECAUTIONS

1 Introduction

The purpose of this SOG is to provide Incident Controllers (ICs) with an appreciation of risk management at a structure fire.

2 Application

In conducting the initial size-up and managing ongoing operations, the IC must be aware of possible risks and the precautions necessary to address them.

3 Risk Management

The IC must continuously monitor and evaluate the level of risk on the incident ground based on:

- fire and smoke conditions
- rescue requirements
- the types of structures, industrial processes and hazards involved
- structural integrity
- the fire load
- weather conditions
- resources on scene and available.

Once the level of risk has been determined, the IC must decide how to deploy fire fighting crews, bearing in mind that:

- the first priority is the safety of firefighters
- the second priority is protecting *savable* lives
- the third priority is protecting *savable* property
- there is no advantage in committing resources to save what is already lost.

Within the risk management framework, the IC should identify options to deal with specific risks:

- accept risk—do nothing
- mitigate risk—do something.

4 Precautions

Where there is an unacceptable level of risk to firefighters, a defensive strategy may be advisable. Personnel should be immediately withdrawn from positions of unacceptable risk.

Where people are reported trapped and they may be saved, an offensive or marginal strategy will be initiated. The IC should ensure that SCBA is used (*SOG 9.1*), and that search and rescue crews are supported by protecting hose lines, positive pressure and manual ventilation.

At an incident involving four or more stations, the IC must appoint a Safety Officer (*SOG 1.6*). At complex or dangerous incidents with less than four stations, the IC may also decide that a Safety Officer is required.

Where it is possible that threatened or involved property can be saved, the IC will usually initiate an offensive strategy. The IC may consider removing stock and initiating salvage to protect contents from heat, smoke and water etc.

The IC should gather information about the structure, its contents and exposures. If necessary, technical advisors and references should be used to help identify combustion characteristics and necessary precautions.

5 Referenced Documents

The following documents have been referenced within this document and should be read in conjunction with this SOG:

- *SOG 1.6 Safety Officer*
- *SOG 9.1 Use of respiratory protective equipment*.

4.2 STRUCTURE FIRE RISKS AND PRECAUTIONS

The purpose of this Check Sheet is to provide Incident Controllers (ICs) with an appreciation of risk management at a structure fire.

Risk management

The IC has to continuously monitor and evaluate the level of risk on the incident ground based on:

- ⇨ fire and smoke conditions;
- ⇨ rescue requirements;
- ⇨ the types of structures, industrial processes and hazards involved;
- ⇨ structural integrity;
- ⇨ the fire load;
- ⇨ weather conditions; and
- ⇨ resources on-scene and available.

Once the level of risk has been determined, the IC has to decide how to deploy fire fighting crews, bearing in mind that:

- ⇨ the first priority is the safety of firefighters;
- ⇨ the second priority is protecting savable lives;
- ⇨ the third priority is protecting savable property; and
- □ there is no advantage in committing resources to save what is already lost.

Within the risk management framework, the IC should identify options to deal with specific risks:

- ⇨ accept risk - do nothing; or
- ⇨ mitigate risk - do something.

Precautions

- Where there is an unacceptable level of risk to firefighters, a defensive strategy may be advisable. Personnel should be immediately withdrawn from positions of unacceptable risk.
- Where persons are reported trapped and it is possible that they can be saved, an offensive or marginal strategy will be initiated. The IC should ensure that SCBA is used (SOG 9.1), and that search and rescue crews are supported by protecting hose lines, positive pressure and manual ventilation.
- At an incident involving four or more stations, a Safety Officer will be appointed by the IC (SOG 1.6). At complex or dangerous incidents with less than four stations, the IC may also determine that a Safety Officer is required.
- Where it is possible that threatened or involved property can be saved, the IC will usually initiate an offensive strategy. The IC may consider removing stock and initiating salvage to protect contents from heat, smoke and water etc.
- The IC should gather information about the structure, its contents and exposures. If necessary technical advisors and references should be sourced to help identify combustion characteristics and necessary precautions.

3 STRUCTURE FIRE STRATEGIES

3.1 Introduction

3.1.1 The purpose of this SOG is to provide a framework for the rapid determination of basic strategies at structure fires.

3.2 Application

3.2.1 A combat strategy must be put in place following the initial size-up by the Officer-in-Charge (OIC) of the first arriving appliance. The OIC takes the role of Incident Controller (IC) until relieved by a more senior ranked officer, and is responsible for determining the incident objectives, strategy, tactics and initial tasking. The principles of risk management and conditions on the incident ground determine the choice of strategy.

3.3 Basic Strategies

3.3.1 There are three basic fire fighting strategies:

- offensive;
- defensive; and
- marginal.

3.3.2 **Offensive** - An **offensive** strategy centres on **search and rescue**, **internal fire attack**, and **containing the fire** in its area of origin. A pre-condition for this choice of strategy is the size-up indicating internal conditions will be reasonably tenable.

3.3.3 **Defensive** - A **defensive** strategy is adopted when the size-up indicates that the risks involved in an offensive strategy are too high and that it may not be possible to enter the structure. Resources are therefore concentrated on **exposure protection**.

3.3.4 **Marginal** - A **marginal** strategy is employed where search and rescue operations are necessary in a situation where fire conditions would normally require a defensive strategy. Once a rapid primary search has been completed or aborted the IC will normally change to defensive mode.

3.4 Offensive Strategy

3.4.1 *When it is reasonably safe to do so*, the NSWFB will initiate offensive operations at structure fires. The basic factors that determine the success of an offensive operation are:

- the location of the attack;
- the size of the attack; and
- support for the attacking crew.

3.4.2 The IC develops an effective attack through the management of these factors. Decisions about attack size and position must be balanced against judgements about fire conditions, risks and resources.

3.5 Defensive Strategy

3.5.1 When fire conditions or other factors such as structural integrity preclude an offensive internal attack, the NSWFB will initiate defensive operations at a structure fire.

3.5.2 The first priority in defensive operations is personnel safety. All crews should be withdrawn from the sectors inside the structure which will be affected by the defensive operation. OICs must account for their crews and advise their Sector or Group Commander of their status. Sector and Group Commanders will notify the IC/Operations Officer of the status of their crews. Everyone must keep a safe distance from the structure.

3.5.3 The second priority is protecting exposures. Identify and protect all actual and possible exposures. Consider the reach of various jets and ensure sufficient water supplies are available to maintain coverage. Hose lines may have to be deployed inside exposed buildings to cover openings such as windows. Operate drencher systems and boosters if available.

3.5.4 The third priority is to knock down the main body of the fire. This may assist in the protection of exposures but does not replace it as a higher priority.

3.5.5 The IC will report to the ComCen when the fire is under control. This is when fire spread has been stopped and the remaining fire can be extinguished with on-scene resources.

3.6 Marginal Strategy

3.6.1 There will be times when, if the building were unoccupied, the IC would immediately choose a defensive strategy but, because persons have been reported trapped, a rapid search and rescue operation is necessary.

⚠ NOTE

The only reason to adopt a marginal strategy is rescue. Hose lines to secure paths of egress must support search and rescue crews.

3.6.2 In marginal situations, the IC will ensure search and rescue crews are supported by hose lines while simultaneously preparing for operations outside. The IC needs to constantly evaluate interior conditions and withdraw crews if the risks become too great.

3.6.3 Immediately withdraw crews if:

- conditions deteriorate or become untenable, threatening the safety of crews;
- the structure is unsafe and may collapse;
- search and rescue operations have been completed and the situation is still marginal; or

- the **all clear** is given, or any remaining occupants cannot possibly be saved.

3.7 Communication Plan

3.7.1 It is the responsibility of the IC to ensure that everyone on the incident ground understands which of the three basic strategies are being employed and that everyone is operating within that strategy. This communication is facilitated by the implementation of ICS (*SOG 1.1*).

3.7.2 The IC must include the fire fighting strategy in the first radio message e.g. *in offensive mode*, and inform the ComCen if the strategy changes. This enables responding crews and senior officers to prepare for the type of operation in progress.

3.7.3 All personnel on the incident ground must be informed immediately of any change in strategy.

3.7.4 **Combined Strategies** - Because of the risks to firefighters inside the structure if hose streams are deployed from the outside, a combination of offensive and defensive strategies must not be used in the same incident sector at the same time.

3.7.5 As control is transferred to officers who arrive later, they must be informed of the current strategy and evaluate the strategy against the current situation.

3.8 Referenced Documents

3.8.1 The following documents have been referenced within this document and should be read in conjunction with this SOG:

- *SOG 1.1 Incident Control System.*

STRUCTURE FIRE STRATEGIES - CHECK SHEET

The purpose of this Check Sheet is to provide Incident Controllers (ICs) with a framework for the rapid determination of basic strategies at structure fires.

BASIC STRATEGIES

- There are three basic fire fighting strategies:
  - offensive;
  - defensive; and
  - marginal.

OFFENSIVE STRATEGY

- *When it is reasonably safe to do so*, the NSWFB will initiate offensive operations at structure fires. The basic factors that determine the success of an offensive operation are:
  - the location of the attack;
  - the size of the attack; and
  - support for the attacking crew.
- The IC develops an effective attack through the management of these factors. Decisions about attack size and position must be balanced against judgements about fire conditions, risks and resources.

DEFENSIVE STRATEGY

- When fire conditions or other factors such as structural integrity preclude an offensive internal attack, the NSWFB will initiate defensive operations at a structure fire.
- The first priority in defensive operations is personnel safety:

☐ All crews should be withdrawn from the sectors inside the structure which will be affected by the defensive operation.
☐ OICs must account for their crews and advise their Sector or Group Commander of their status.
☐ Sector and Group Commanders will notify the IC/Operations Officer of the status of their crews.
☐ Everyone must keep a safe distance from the structure.

- The second priority is protecting exposures:

☐ Identify and protect all actual and possible exposures.
☐ Consider the reach of various jets and ensure sufficient water supplies are available to maintain coverage.
☐ Hose lines may have to be deployed inside exposed buildings to cover openings such as windows.
☐ Operate drencher systems and boosters if available.

- The third priority is to knock down the main body of the fire. This may assist in the protection of exposures but does not replace it as a higher priority.
- The IC will report to the ComCen when the fire is under control. This is when fire spread has been stopped and the remaining fire can be extinguished with on-scene resources.

MARGINAL STRATEGY

- There will be times when, if the building were unoccupied, the IC would immediately choose a defensive strategy but, because persons have been reported trapped, a rapid search and rescue operation is necessary.

NOTE

The only reason to adopt a marginal strategy is rescue. Hose lines to secure paths of egress must support search and rescue crews.

- In marginal situations, the IC will ensure search and rescue crews are supported by hose lines while simultaneously preparing for operations outside. The IC needs to constantly evaluate interior conditions and withdraw crews if the risks become too great.

- The IC should immediately withdraw crews if:

  - ☐ conditions deteriorate or become untenable, threatening the safety of crews;
  - ☐ the structure is unsafe and may collapse;
  - ☐ search and rescue operations have been completed and the situation is still marginal; or
  - ☐ the **all clear** is given, or any remaining occupants cannot possibly be saved.

COMMUNICATION PLAN

- It is the responsibility of the IC to ensure that everyone on the incident ground understands which of the three basic strategies are being employed and that everyone is operating within that strategy. This communication is facilitated by the implementation of ICS (*SOG 1.1*).

- The IC must:

  - ☐ include the fire fighting strategy in the first radio message e.g. *in offensive mode*, and inform the ComCen if the strategy changes. This enables responding crews and senior officers to prepare for the type of operation in progress.
  - ☐ inform all personnel on the incident ground immediately of any change in strategy.

- **Combined Strategies -** Because of the risks to firefighters inside the structure if hose streams are deployed from the outside, a combination of offensive and defensive strategies must not be used in the same incident sector at the same time.

- As control is transferred to officers who arrive later, they must be informed of the current strategy and evaluate the strategy against the current situation.

4 STRUCTURE FIRE TACTICS

4.1 Introduction

4.1.1 This SOG sets out the tactical priorities for fire fighting operations and their usual order of implementation.

4.2 Application

4.2.1 Once incident objectives have been determined, leading to a choice of strategy (offensive, defensive, or marginal), tactical priorities drive incident operations.

4.2.2 Sometimes there may be an overlap of activities. For example, an extensive fire attack may be necessary to make it possible to carry out search and rescue operations inside a structure.

4.3 Tactical Priorities

4.3.1 It is the responsibility of the Incident Controller (IC) to ensure that in general, each tactical priority has been addressed, or sufficient resources have been assigned to deal with each priority, before proceeding to the next.

4.3.2 The mnemonic RECEOS is used to assist ICs in remembering the tactical priorities:

- **R escue** - save and protect people's lives (including firefighters);
- **E xposures** - confine the fire to the building/compartment of origin;
- **C ontainment** - stop the spread of fire;
- **E xtinguish the fire** - deploy sufficient resources to overwhelm the fire;
- **O verhaul** - ensure that all pockets of fire are totally extinguished; and
- **S alvage** - commence damage control operations.

4.4 Tactical Considerations

4.4.1 The IC should consider the following:

(a) As far as possible, determine the **exact location and extent of the fire** before commencing operations.

(b) **Protect rescue and escape routes** by putting the first attack hose line between the occupants/rescue team and the fire.

(c) Analyse the **speed and spread** of the fire and determine where it is critical to allocate resources to limit the fire spread. Critical factors may include:

- the **level of risk** to firefighters;
- **rescue** activities;
- **fire load** in structure;
- efforts required to **confine the fire** including **ventilation** and establishment of **cut offs**; and
- **exposure** protection.

(d) Get fire fighting operations **ahead of the fire** by analysing the fire spread and positioning resources where the fire will be, rather than following the fire.

(e) Write off **property that is already lost** and go on to protect exposed property based on the most dangerous direction of fire spread. **Do not** continue to operate in positions that are essentially lost.

(f) Establish an attack plan that results in **fighting the fire directly**.

(g) Fight the fire from the **unburned side** of the structure.

(h) Avoid attacking the fire from the **burning side** of the structure, because an attack from the burning side will generally drive the fire, smoke and heat back into the building and spread the fire.

(i) Consider the **"seven sides"** of the fire: front, rear, both sides, top, bottom and inside.

(j) Avoid using **outside hose streams** at an incident ground sector where firefighters are operating **inside**.

(k) Consider the possibility of fire spreading through **concealed spaces**.

(l) Begin **salvage and overhaul** operations as early as possible during the fire attack to reduce the effects of heat, smoke and water.

STRUCTURE FIRE TACTICS - CHECK SHEET

The purpose of this Check Sheet is to detail the tactical priorities that the Incident Controller (IC) should consider for structure fire fighting operations.

TACTICAL PRIORITIES

- It is the responsibility of the IC to ensure that in general, each tactical priority has been addressed, or sufficient resources have been assigned to deal with each priority, before proceeding to the next.

  - **R escue** - save and protect people's lives (including firefighters);
  - **E xposures** - confine the fire to the building/compartment of origin;
  - **C ontainment** - stop the spread of fire;
  - **E xtinguish the fire** - deploy sufficient resources to overwhelm the fire;
  - **O verhaul** - ensure that all pockets of fire are totally extinguished; and
  - **S alvage** - commence damage control operations as soon as possible during fire attack.

TACTICAL CONSIDERATIONS

- The IC should consider the following:

☐ As far as possible, determine the **exact location and extent of the fire** before commencing operations.

☐ **Protect rescue and escape routes** by putting the first attack hose line between the occupants/rescue team and the fire.

☐ Analyse the **speed and spread** of the fire and determine where it is critical to allocate resources to limit the fire spread. Critical factors may include:

- the **level of risk** to firefighters;
- **rescue** activities;
- **fire load** in structure;
- efforts required to **confine the fire** including **ventilation** and establishment of **cut offs**; and
- **exposure** protection.

☐ Get fire fighting operations **ahead of the fire** by analysing the fire spread and positioning resources where the fire will be, rather than following the fire.

☐ Write off **property that is already lost** and go on to protect exposed property based on the most dangerous direction of fire spread. **Do not** continue to operate in positions that are essentially lost.

☐ Establish an attack plan that results in **fighting the fire directly**.

☐ Fight the fire from the **unburned side** of the structure.

☐ Avoid attacking the fire from the **burning side** of the structure, because an attack from the burning side will generally drive the fire, smoke and heat back into the building and spread the fire.

☐ Consider the **"seven sides"** of the fire: front, rear, both sides, top, bottom and inside.

☐ Avoid using **outside hose streams** at an incident ground sector where firefighters are operating **inside**.

☐ Consider the possibility of fire spreading through **concealed spaces**.

☐ Begin **salvage and overhaul** operations as early as possible during the fire attack to reduce the effects of heat, smoke and water.

4.5 HIGH-RISE STRUCTURE FIRES

1 Introduction

High-rise structure fires present unique problems for firefighters. They are mainly those of access, rescue, fire control, exposure protection, ventilation, and personal safety. Successful high-rise fire-fighting operations use offensive strategies and tactics.

2 Application

This SOG is specific to high-rise multi storey structure fires and other buildings with numerous essential services eg large shopping centres. It applies to all personnel who respond to these types of fires.

High-rise buildings are generally described as being more than 25 metres high or having more than 10 levels.

⚠ **NOTE**

Refer to SOG 4.6 Low Rise Structure Fires for dealing with fires in multi storey buildings less than 25 metres with few or no essential services eg no smoke control, sprinklers, lifts or hydrants.

3 Response

The Communication Centre (ComCen) will respond appliances and resources according to the Alarm Response Protocol (ARP) in nominated areas or according to the risk in other areas (*SOG 2.3*).

4 Size up

Size up the incident (*SOG 4.1*).

5 Essential services

The building could have one or more essential services. These services are listed on a Fire Safety Certificate for the building. The availability and correct operation of these services will greatly assist in achieving the incident objectives.

The following SOGs provide guidelines on the use of these services:

- SOG 4.9 Wardens and Emergency Response Teams
- SOG 4.10 Emergency Warning and Intercommunication Systems
- SOG 4.11 Hydrant Systems
- SOG 4.12 Sprinklers
- SOG 4.14 Fire Control Centres and Rooms
- SOG 4.15 Mechanical Venting and Air Handling Systems.

⚠ **NOTE**

It is essential that the Incident Controller (IC) identify and use these services as appropriate to assist fire operations.

6 Exclusion Zone

In the event of a major fire, the IC must establish an exclusion zone to protect personnel from the risk of windows, panels and debris that become dislodged by heat, wind pressure or water jets. Any external Control Point (eg Incident Control Vehicle) must be located outside this zone.

The exclusion zone will extend:

- upwind, minimum 50 metres
- downwind, a minimum distance of twice the height of the highest fire floor. (eg a fire on the 20th floor, allowing 3m per floor, requires an exclusion zone of 120m).

⚠ **NOTE**

Wind direction is based on the direction of smoke travel at the fire floors, as it can be different to that at street level.

7 Responsibilities

Fire and Rescue NSW is the combat authority at fires in high-rise buildings.

The responsibilities of personnel vary depending on the size of the incident, the ARP implemented and which of the following are involved:

- first attending pump
- second attending pump
- third attending pump
- aerial appliances
- first senior officer
- HazMat officer
- Incident Management Team
- all other attending officers and appliances.

Individual responsibilities for each of these categories are detailed below.

8 Actions of first arriving crews

⚠ **NOTE**

Because the first-arriving crew needs to commence operations on the fire floor as soon as possible, the Station Commander will accompany them.

8.1 First pump

The first Station Commander becomes the Sector Commander for the fire floor, establishes a Forward Control Point and commences fire operations from the floor below the fire.

The first crew will take a High-rise (Remote) Access Pack.

The Sector Commander will:

- identify the fire location from the Fire Indicator Panel (FIP), Sub Indicator Panel (SIP) or occupants
- brief the Pump Operator according to the situation. Actions may include:
  - monitor communications
  - establish BA Control
  - leave lift/fire control room/pump room keys for next arriving stations
  - send a sitrep message to the ComCen as instructed by the Station Commander and provide a sitrep to next arriving officer.
- go to the reported fire floor with the crew using the emergency lift to the floor below the fire floor—if safe to use—or the fire stairs
- familiarise the crew with floor layout
- charge a line of 38mm hose from the fire stairs or the floor below before entering the fire floor
- use the fire stairs to the fire floor
- conduct fire operations on the fire floor.

⚠ **NOTE**

All personnel reporting to or above a fire floor must wear full structural firefighting ensemble, SCBA and carry a portable radio.

8.2 Second pump

The Station Commander becomes the IC. The second crew assists the first crew on the fire floor.

The IC will:

- establish a control point, receive an update and advise the transfer of control

⚠ **NOTE**

The Fire Control Room (FCR) provides a safe location with building communications, control equipment and plans. The IC will establish a control point in the FCR or send a firefighter there to operate the equipment and liaise with wardens.

- send a firefighter to return lifts to the ground floor with the Recall Fire Service switch
- send a crew with High-rise (Remote) Access Pack and other required equipment to the fire floor Sector Commander
- send a sitrep to the ComCen
- convey additional equipment to the fire floor
- brief and task arriving personnel
- allocate both Pump Operators to access the booster and set up in:
  - stand by mode—connect hose but do not charge it (*SOG 4.11*), or
  - activation mode—pressurise the hydrant system. (*SOG 4.11*)

The crew will proceed to the floor below the fire, and be tasked by the Sector Commander.

8.3 Third pump

The Station Commander becomes Sector Commander on the floor above the fire floor and commences fire operations with their crew, unless tasked otherwise by the IC.

The Station Commander:

- contacts the IC
- proceeds with crew to High-rise Staging with High-rise (Remote) Access Pack and hooligan tool.

The Pump Operator collects a BA Control Board and BA Tally Cards for all crews, proceeds to High-rise Staging and relocates BA Control to High-rise Staging.

⚠ **NOTE**

> **High-rise Staging will be two floors below the lowest fire floor, unless the IC decides otherwise.**

Sector Commander and crew will:

- note the floor layout and position of fire services, proceed to the floor above the incident and commence fire operations
- check the floor for signs of fire spread:
  - through service ducts around the building core and perimeter, eg garbage chutes, toilet exhausts, electrical and plumbing
  - through gaps between the floor and external wall
  - up the building façade
  - through lift shafts.

The Sector Commander sends a sitrep to the IC.

8.4 Aerial appliances

The aerial crew:

- contacts the IC
- identifies a location for setting up
- determines the field of operations for the appliance and advise the IC.

8.5 All other attending crews

All other appliances will pre-deploy at least 50m or one block from the incident until tasked by the IC or a Staging area is established (*SOG 1.8*)

⚠ **NOTE**

> **All crews must adapt their SCBA to Extended Duration Breathing Apparatus (EDBA), if available, prior to reporting for deployment as BA crews.**

8.6 First senior officer

⚠ **NOTE**

Any confirmed high-rise building fire in an ARP area is an automatic Structure Fire Second Alarm, which will provide the Incident Management Team for that zone. In other areas, local arrangements will apply.

On arrival, the first senior officer will:

- Receive an update, and accept transfer of control
- review and implement the Incident Action Plan
- review Communications Plan
- allocate a staging area for further attending crews (SOG 1.8)
- appoint arriving IMT members to roles required within the ICS (Sec 8.1)
- establish close liaison with building management and other agencies.

8.7 HazMat Officer

On arrival, the HazMat Officer will become the BA Commander and perform the following duties:

- establish a main BA Control Area, on street level
- provide reserve BA cylinders for servicing and regenerating EDBA and SCBA
- manage contaminated water run-off
- monitor smoke plumes.

8.8 Specialist officers

On arrival, specialist officers report to the IC for tasking.

9 Major Fire

9.1 Incident Control System (ICS)

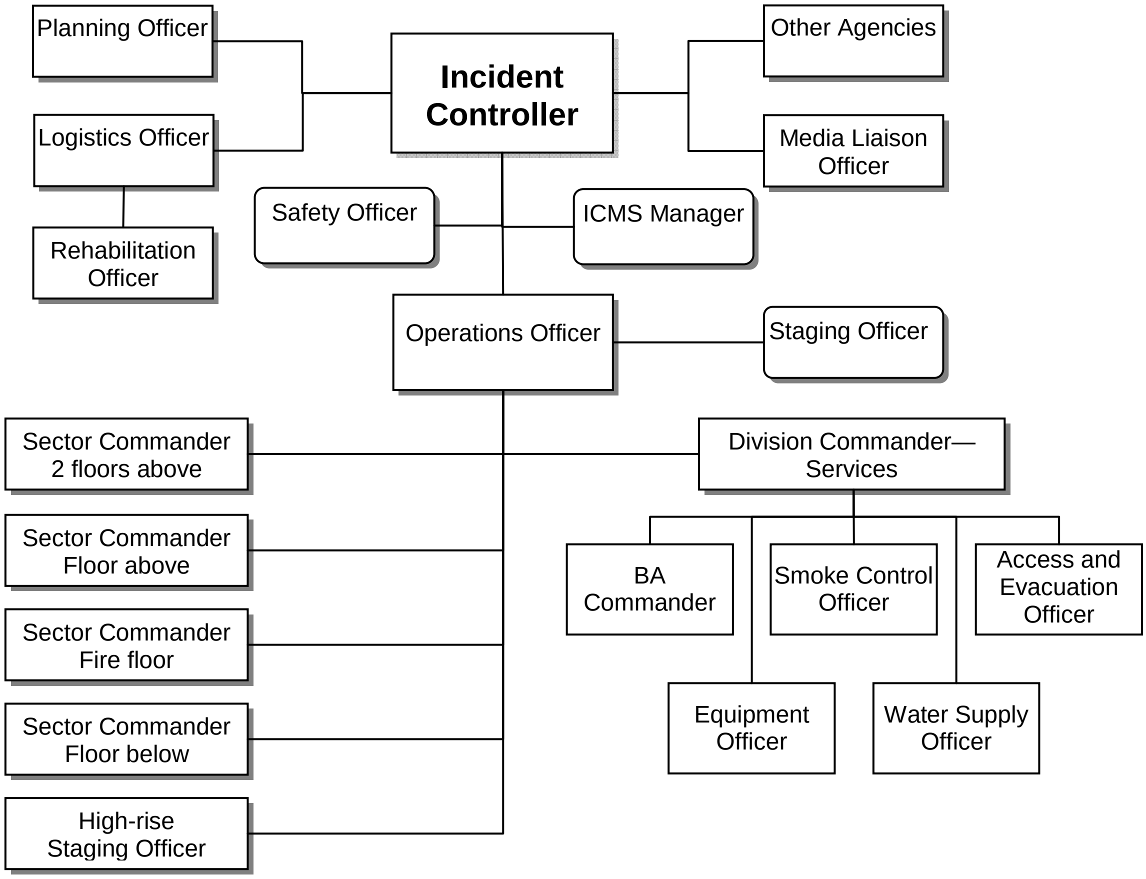


Figure 1 Suggested Incident Control System for major High-rise Structure Fire

NOTE

If individual officers are unavailable, a Station Officer and crew can be assigned to each position under the Division Commander –Services as required to fulfil each role. This will ensure crew accountability and provide sufficient resources.

The IC should appoint an Operations Officer as soon as possible, then relocate to the Incident Control Vehicle (ICV), Duty Commander's vehicle or other Control Point outside the exclusion zone and establish tactical communications with the Operations Officer.

Incident Controller

Location: ICV or other Control Point outside the exclusion zone.

Role: Ref *SOG 1.2.*

Operations Officer

Location: Where tactical and task communications can be established, eg Fire Control Room.

Role: Ref *SOG 1.3.*

Sector Commander

Location: Fire floor, near fire exit/WIP.

Responsible for: All fire operations on the floor.

Role:

- maintain communications with BA crews and Operations Officer
- provide regular sitreps to the Operations Officer
- ensuring all firefighters have HHTs on the correct channel
- depending on the objectives for the floor, manage crews in the following:
  - search and rescue
  - fire fighting
  - salvage.

High-rise Staging Officer

Location: Usually two floors below the lowest fire floor.

Responsible for: ensuring crews on fire floors are maintained during the incident.

Role:

- brief crews on the fire, including location of exits, hydrants, lifts, shafts, WIPs, fire location
- liaise with the BA Commander or BACO to ensure sufficient stocks of cylinders and refreshments are available
- liaising with the Equipment Commander to ensure refreshments and additional equipment is available at High-rise Staging for use on the fire floors
- maintain a Rapid Intervention Team capability on the floor (SOG 18.2).

Division Commander—Services

Location: Fire Control Room/mobile.

Responsible for: Maintaining essential services for the duration of the incident.

Role: Manage the following tasks or groups:

- BA Commander
- Smoke Control Officer
- Access and Evacuation Officer
- Water Supply Officer
- Equipment Officer.

BA Commander

Location: Street level.

Responsible for: Maintaining BA crews for the duration of the incident.

Role: Ref *SOG 9.4*, including:

- maintain BA Control at High-rise Staging
- ensure EDBA are correctly fitted
- liaise with Access Commander re use of lift to transport cylinders/relief BA crews/refreshments to High-rise Staging
- ensure supply of SCBA cylinders.

Smoke Control Officer

Responsible for: maintaining the removal of smoke from the building and preventing smoke entry to non fire floors and exits. (*SOG 4.15*).

Role:

- liaise with Air Conditioning Engineer
- monitor reports from fire floors about smoke conditions
- determine type of smoke control and other ventilation systems in the building
- monitor HV AC panel in automatic mode
- take manual control of HV AC panel if the system fails
- prepare a positive pressure ventilation (PPV) plan in case of a smoke system failure
- check smoke exhaust from building vents and advise the Media Officer
- maintain stair pressurisation, including use of PPVs at ground level exit.

Access and Evacuation Officer

Location: FCR/mobile.

Responsible for: Control of occupants being ‘protected in place’ or being evacuated and managing the use of stairs and lifts.

Role:

- take control of the EWIS (SOG 4.10)
- liaise with the ECO for information on disabled occupants/number of occupants in the building (SOG 4.9)
- maintain a communication link via the WIPs from Sector Commanders to the Operations Officer
- maintain PA and WIP communications to occupied floors. Advise the Chief Warden when it is safe to return to the building
- take control of the lifts and determine the safety and location of:
  - emergency lifts
  - stretcher facilities in lifts
  - lift motor rooms
- establish and control the Lift Rescue Crew
- establish allocation of stairs for
  - fire operations
  - occupant evacuations
- control the staged evacuation of occupants if required.

Water Supply Officer

Responsible for: maintaining an adequate water supply to hydrants and sprinklers.

Role:

- determine the type of hydrant system, including hydrant locations, mains sizes, pump sets and tank capacity (SOG 4.11)
- determine the type of sprinkler system, including valve locations, pump sets and tank capacity (SOG 4.12)
- deploy pumps to Booster inlets and activate if required
- liaise with Water Authority officer for public water supply
- locate static water supplies
- establish relay pumping if required.

Equipment Officer

Responsible for: Supplying equipment to crews on fire floors.

Role:

- create an Equipment Dump for gear expected to be required from appliances in attendance or at the staging area
- receive and record requests for equipment from the Operations Officer and Sector Commanders
- allocate firefighters to retrieve, test and transport equipment to High-rise Staging
- allocate firefighters to remove equipment from High-rise Staging, service it and return to the equipment dump
- maintain a stock of charged portable radios for the duration of the incident.

10 Communications

It is possible that normal portable radios will have poor reception in the building. The IC may be able to improve communications by the following means:

- tactical (eg 600 group)—use:
  - mobile phones
  - a transportable radio in the Fire Control Room or mobile (vehicle) radio
  - the local exchange phone in the FCR for the IC to communicate with the OO. (Note, these phones often cannot dial mobile phone numbers)
- task (eg 500 group)—use:
  - Warden Intercommunication Point (WIP) phones.
  - ‘Talk Through’ channels 511 or 512, which will be available when either of the following resources are in attendance:
    - ICV Incident Ground Repeater Radio
    - Portable Incident Ground Repeater Radio (*SOG 2.10*).

4.5 HIGH-RISE STRUCTURE FIRES

High-rise structures are *25 metres or more* in height, with *10 or more* levels, and numerous essential services.

Exclusion zone

Establish an *exclusion zone* that extends:

⇨ *50 metres* upwind, and

⇨ Minimum distance *twice the height of fire floor* downwind

The high-rise structure is likely to have more than one essential service – *understand the services available* and how they operate.

NOTE

All firefighters on or above the fire floor must wear full structural firefighting ensemble and SCBA, and carry a portable radio.

Firefighters should switch their SCBA to EDBA (extended duration breathing apparatus, if available, prior to reporting for deployment.

Communication

Normal NSWFB portable radios may have poor reception in a high-rise structure.

Consider use of Talk Through channels 511 and 512 – available from a portable Incident Ground Repeater radio or on the Incident Control Vehicle.

Actions

First attending pump

Station Commander becomes *Sector Commander* for the fire floor, establishes a Forward Control Point, and commences operations from the floor *below* the fire.

Sector Commander activities:

- ☐ Attend the Fire Control Room (FCR) and determine fire location.
- ☐ Brief the Pump Operator. According to incident, have Pump Operator monitor communications, establish BA control, leave lift and FCR keys for next arriving pump, and send a sitrep to the ComCen.
- ☐ Go to the floor below the fire with crew. Brief the crew on the fire floor layout.
- ☐ Charge 38 mm hose from internal hydrants.
- ☐ Use the fire stairs to access the fire and commence operations.

Second attending pump

Station Commander becomes *Incident Controller (IC).* The second crew assists the first crew on the fire floor.

IC activities:

- ☐ Establish a Control Point (usually in the FCR).
- ☐ Have lifts returned to ground level.
- ☐ Send crew with required equipment to fire floor.

- □ Send a sitrep to ComCen.
- □ Brief and task arriving personnel.
- □ Have Pump Operators access boosters and set up in either stand-by or active modes.

Third attending pump

Station Commander becomes *Sector Commander* on the floor *above* the fire and commences fire operations (unless otherwise tasked by the IC).

Sector Commander activities:

- □ Check for vertical fire extension.
- □ Have Pump Operator commence Stage 1 BA Control at a ***High-Rise Staging Area*** *two floors below* the fire. Have all BA transferred to the staging area.
- □ Monitor communications.
- □ Send a sitrep to the IC.

Other attending appliances

Pre-deploy at least 50 metres, or one block, from the incident and wait until tasked by the IC.

Aerial appliances

Upon arrival, contact the IC. Identify set up location and determine suitability and readiness, then contact the IC.

First senior officer

A *confirmed* high-rise structure fire triggers an automatic *2nd Alarm*, which will respond the Incident Management Team (IMT).

First senior officer activities:

- □ Transfer control.
- □ Review and implement the Incident Action Plan.
- □ Review the Communications Plan.
- □ Allocate a Staging Area for further attending crews.
- □ Appoint arriving IMT members to ICS roles.
- □ Establish close liaison with building management and other agencies.

Hazmat Officer

Assume the role of *BA Controller*.

- □ Establish BA Control at street level
- □ Monitor smoke plumes and run-off.
- □ Provide specialist advice to the IC.

Specialist officers

Upon arrival, report to the IC for tasking.

4.9 WARDENS AND EMERGENCY RESPONSE TEAMS

1 Introduction

An Emergency Control Organisation (ECO) is an organised team of wardens consisting of occupants of a building. They are trained to respond to emergencies requiring evacuation or other occupant assistance until emergency services arrive.

An Emergency Response Team may be present at industrial and other high-risk locations. They provide initial fire attack, hazmat containment or isolation and other specialist skills relating to the incident.

2 Application

This SOG outlines the roles and use of members of an ECO or Emergency Response Team by NSWFB in an emergency. It applies at any incident where an ECO or Emergency Response Team is present.

3 Authority

As employees, wardens have a duty of care to themselves and others to ensure that nobody in the workplace is affected by their acts or omissions at work.

In an emergency, the powers of ECO personnel should override all normal non-emergency management procedures. These powers ensure that life safety takes precedent over asset protection and production matters.

Wardens have authority to direct and evacuate all occupants in their area. If a person refuses to evacuate they should be referred to the emergency services.

Emergency Response Teams are authorised under the Fire Brigades Act 1989 (Section 31) to:

- extinguish fires at their premises, and
- render safe hazardous materials owned or transported by them, on or off site.

4 Identifying members of an ECO

The Emergency Control Organisation may consist of the following people identified by coloured helmets, hats, caps, vests or tabards:

Chief warden Deputy chief warden Communications officer	White
Floor warden Area wardens	Yellow
Wardens	Red
First aid officer	White cross on a green background

⚠ **NOTE**

In some instances security staff may have roles in the emergency procedures.

5 Roles of ECO members

Members of the ECO are to ensure that life safety takes precedence over asset protection. The roles of ECO, on becoming aware of an emergency, are as follows:

Chief warden

The chief warden is in charge of all other members of the ECO and:

- reports to the master Emergency Control Panel or other agreed location
- determines the location and type of emergency
- advises wardens and order an evacuation if necessary
- briefs and assists emergency services personnel if requested.

Deputy chief warden

The deputy chief warden assists the chief warden or, if the chief warden is unavailable fulfils those duties.

Communications officer

The communications officer operates the Emergency Warning and Intercommunication System (EWIS) to advise wardens or evacuate occupants.

Floor or area wardens

Floor or area wardens are in charge of emergency operations on their floors and:

- report to the Warden Intercommunication Point (WIP) phone or other agreed location and maintain contact with the chief officer for instructions
- direct wardens to check the floor or area for any abnormal situation or evacuation occupants if required.

Wardens

Wardens:

- report to the floor/area warden at the WIP or other agreed location for instructions
- conduct searches and evacuate occupants if required.

6 Use of ECOs

The Incident Controller (IC) should use the local knowledge of the ECO members, while ensuring their safety at an incident. Examples of this may include:

- Receiving a briefing on the location and type of emergency, any initial fire attack and evacuations in progress.
- Having the chief warden continue the evacuation under the IC's authority.
- Advising the wardens on non fire-affected floors of the incident and having them reassure occupants.
- Determining the location of unusual hazards and disabled occupants.

⚠ **NOTE**

Under no circumstances should wardens be exposed to higher risks than any other occupants.

7 Use of Emergency Response Teams

Emergency Response Teams have varying levels of skills, equipment and training. Depending on the hazards involved, the IC must determine, from Pre Incident Planning and discussion with the Emergency Response Team Leader, their role at an incident.

Examples of Emergency Response Team participation can include:

- Specialist advice to the IC relating to hazards, industrial processes and installed fire systems.
- Operation of valves and other industrial processes.
- Fire attack under the control of NSWFB officers.

⚠ **NOTE**

If off-duty NSWFB members are part of the Emergency Response Team, the IC should advise them that they are part of the Emergency Response Team and not being recalled to duty.

The IC must:

1. Ensure that the Emergency Response Team knows that the NSW Fire Brigades is in control at the incident and no actions affecting the emergency should be taken by the Emergency Response Team unless authorised by the IC.
2. Establish a communications link within the ICS structure with the Emergency Response Team Leader.
3. Monitor the safety of the Emergency Response Team members and other specialist staff who are assisting the NSWFB.

⚠ **NOTE**

Use of SCBA or gas suits should only be considered if an Emergency Response Team member:

- **produces a current (ie before expiry) NSWFB card or certificate from BA/Hazmat Training or ComSafe Training Services, indicating that they have received training in these matters, or**
- **is an off-duty NSWFB member, with photo ID, or recognised by the IC.**

The IC should ensure that Emergency Response Team members are always accompanied by a firefighter during SCBA or gas suit operations.

4.9 WARDENS AND EMERGENCY RESPONSE TEAMS

At structure fire incidents there may be an *Emergency Control Organisation* or an *Emergency Response Team*. The Incident Controller uses these teams in various ways at an incident.

Emergency Control Organisation – Buildings

An *Emergency Control Organisation (ECO)* is a *team of wardens* who are occupants of a building and who are trained to respond to emergencies within the building which require evacuation or other assistance, until the emergency services arrive.

At the incident, use the ECO's *local knowledge*, while ensuring their safety:

- ☐ Receive a briefing from the ECO on the location and type of emergency, any initial fire attack, and evacuations in progress.
- ☐ Determine if there are disabled occupants. Determine the location of unusual hazards.
- ☐ Have the Chief Warden continue the evacuation process.
- ☐ On non-fire affected floors, have wardens reassure the occupants.

⚠ **NOTE**

At no time are wardens to be exposed to risks higher than other occupants.

Identification

The ECO may have the following roles, identified with coloured helmets, hats, caps, vest or tabards:

Chief warden Deputy warden Communications officer	White
Floor warden Area warden	Yellow
Warden	Red
First aid officer	White cross on green background

Emergency Response Team – Industrial and other high-risk locations

An *Emergency Response Team* provides initial fire attack, hazmat containment or isolation, or other specialist skills at industrial and other high-risk locations.

The *role* of the Emergency Response Team at an incident should have been determined in Pre Incident Planning, and varies according to their skills, equipment and training.

At the incident:

- ☐ If the Emergency Response Team's role has not been determined in Pre Incident Planning, discuss the role with the team leader.
- ☐ Take control and ensure that the Emergency Response Team knows that the NSWFB is in control.
- ☐ Receive specialist advice from the Emergency Response Team relating to hazards, industrial processes and installed fire systems.
- ☐ Have the Emergency Response Team operate valves and other industrial processes.
- ☐ Establish a communication link within the ICS with the Emergency Response Team leader.
- ☐ While assisting the NSWFB, ensure that all Emergency Response Team actions related to the emergency are authorised by the Incident Controller.
- ☐ Monitor the safety of the Emergency Response Team members.

An Emergency Response Team member *can only use SCBA or a gas suit* if:

- The team member produces a *current* NSWFB card or certificate from BA/Hazmat Training or ComSafe Training Services; or is an off-duty NSWFB member, with photo ID or recognised by the Incident Controller.
- The team member is accompanied by a firefighter during SCBA or gas suit operations.

⚠ **NOTE**

If an off-duty NSWFB member is part of the Emergency Response Team, advise the member that he or she is part of the Emergency Response Team and is not being recalled to duty.

4.10 EMERGENCY WARNING AND INTERCOMMUNICATION SYSTEMS

1 Introduction

An Emergency Warning and Intercommunication System (EWIS) is installed in a building to warn of an emergency, provide a communications link and enable orderly evacuation of the building if necessary.

The EWIS can operate in automatic modes when activated by an alarm or manually by the Emergency Control Organisation or NSWFB.

NOTE: Some premises may only have an Emergency Warning System (alarms), without the Public Address and Warden Intercommunication Point.

2 Application

This SOG explains the purpose and use of the EWIS by the NSWFB.

3 Purpose and features of an EWIS

An EWIS is connected with a Fire Indicator Panel where one is provided and usually consists of the following features:

3.1 Master Emergency Control Panel

A Master Emergency Control Panel consists of:

- a master Warden Intercommunication Point phone (WIP)
- a microphone
- switches and signals to control and indicate:
  - which Fire Indicator Panel or Emergency Alarm Initiating Device activated the EWIS
  - which areas are in Alert, Evacuation or PA mode
  - WIP calls.
  - if each floor is staffed by wardens or evacuated
- Key switch. There are three modes indicated by the position of switch:
  - Automatic Mode: activation of the Fire Indicator Panel or an Emergency Alarm Initiating Device will sound the Alert then Evacuation tone, either throughout the entire building or cascading throughout groups of floors.
  - Manual Mode: allows the operator to cancel and sound alarm tones or make PA announcements on all or selected areas.
  - Isolate Mode: the EWIS is disabled, although the WIPs will still operate. This mode is used by technicians and for training.

NOTE: The system should remain in the AUTOMATIC position at all times until another mode is required

3.2 Secondary Emergency Control Panel

A Secondary Emergency Control Panel is identical to a Master Emergency Control Panel and is located in a more accessible position. However it is overridden by the Master Emergency Control Panel.

3.3 Speakers

Speakers can generate the following signals:

- public address messages
- alert tone is a repeating **beep–beep** sound, increasing in volume until the sixth tone burst
- evacuation tone (automatic mode) is four bursts of a rising **whoop whoop** tone, usually followed by a verbal message instructing occupants to evacuate the building
- evacuation tone (manual mode) is continual bursts of a rising **whoop whoop** tone.

3.4 Visible signals

Where required, (e.g. hospital wards) flashing lights for alert (amber) and evacuation (red) replace the speakers.

3.5 Warden Intercommunication Point phone (WIP)

A red WIP phone is located on each level or zone. It can be rung from or automatically call the Emergency Control Panel when picked up.

The system allows the master WIP to:

- accept calls and ring individual WIP phones, which can talk back
- call to all WIP phones, with only the Master WIP able to talk while the other WIPs can only listen.

3.6 Emergency Alarm Initiating Device

The Emergency Alarm Initiating Device is a white Break Glass device, labelled **Emergency Alarm** which activates the EWIS automatic mode.

They are located beside WIPs.

NOTE: Emergency Alarm Initiating Devices will not activate the Fire Indicator Panel or call external emergency services (e.g. NSWFB,) automatically

4 Using the EWIS

In non emergencies: The building owner and representatives can operate the EWIS for general messages and training

During fire alarm and emergencies: The Emergency Control Organisation can take manual control of the EWIS and operate all functions until the emergency services arrive. The IC then determines who operates the EWIS.

NOTE: EWIS tones are often ignored by occupants, due to false alarms. Therefore it is critical for the NSWFB to cancel any automatic tones and advise occupants by a PA message of actions to take.

The EWIS should be used by the NSWFB to:

- cancel automatic mode by switching to manual mode and cancelling all tones
- check if an Emergency Alarm Initiating Device activated the EWIS without the Fire Indicator Panel being in alarm
- inform occupants of the location and type of incident
- conduct evacuations
- communicate with NSWFB crews through the WIP and PA system, when radio systems will not function.

NOTE: If any defects are noted, advise the NSWFB Fire Safety Division to have the matter investigated. Do not initiate any action yourself.

4.10 EMERGENCY WARNING AND INTERCOMMUNICATION SYSTEMS

The Emergency Warning and Intercommunication System (EWIS) is installed in a building to warn of an emergency and provide emergency communications.

The EWIS is activated *automatically* by an alarm, or can be *manually* activated by the Emergency Control Organisation or the NSWFB.

EWIS features

An EWIS is connected to the Fire Indicator Panel (if one is provided) and usually consists of:

- ☐ *Master Emergency Control Panel* – containing master Warden Intercommunication Point (WIP) phone, microphone, and controls and switches, indicating which Fire Indicator Panel or Emergency Alarm Initiating Device activated the EWIS.
- ☐ *Secondary Emergency Control Panel* – identical to the Master Emergency Control Panel, but in a more accessible position.
- ☐ *Speakers and/or visible signals* – to generate public address messages and alert and evacuation tones.
- ☐ *WIP phones* – on each level or zone, to communicate with the Master Emergency Control Panel.
- ☐ *Emergency Alarm Initiating Device* – a white Break Glass device which activates the EWIS automatic mode.

During an incident, the EWIS may be operated manually by the Emergency Control Organisation (ECO).

Upon arrival, the Incident Controller checks the cause of alarm via the EWIS, and has crews investigate**.**

- ☐ If the ECO is operating the EWIS, determine who continues to operate it.
- ☐ If not done so already, switch the EWIS to *manual* mode.
- ☐ Check if an Emergency Alarm Initiating Device activated the EWIS without the Fire Indicator Panel being in alarm.
- ☐ Once the situation is known, inform the building occupants by PA message and any actions to take.
- ☐ When it confirmed that there is no longer an emergency, cancel the automatic alarm tones.
- ☐ Maintain communications with wardens and NSWFB crews using the WIP and/or PA.

⚠ **NOTE**

EWIS tones are often ignored by occupants due to false alarms – it is critical that the NSWFB cancel automatic tones and advise the occupants by PA message.

4.11 HYDRANT SYSTEMS

1 Introduction

Hydrant systems are an extension of street hydrants, with the advantages of being in underground steel pipes to reduce hose laying, avoid clutter and provide greater flows and pressures than street mains. They can be boosted up to 1000 kPa by the NSWFB to achieve the pressures required for monitors, aerials, foam and compartment fire fighting.

2 Application

This SOG applies whenever a hydrant system is located on a fire ground.

3 Location of hydrant systems

Hydrant systems are commonly found in:

- buildings greater than 500 m² in area
- buildings higher than 25 m
- open yards larger than 500 m² containing combustibles
- tall buildings being constructed or demolished except for the top two levels.

Hydrant boosters can also be found:

- where internal hydrants are installed
- especially where static water supplies (e.g. tanks) are used.

4 Identifying hydrant systems

There are three basic hydrant system models with numerous variations, all with pillar hydrants located internally or externally. They are:

4.1 HOBAC and Ordinance 70 (Spec 10) systems

These systems are no longer installed. However, these systems are still in service and are characterised by:

- single head hydrants
- minimum flow of 4.5 L/s @ 275 kPa from a hydrant
- the hydrant booster only has supply hydrants if the nearest street hydrant is more than 60 m away, a maximum of four booster inlets and possibly no main wheel valve
- internal hydrants are usually located on a floor or within a fire compartment.

4.2 AS 2419.1 systems

This is the design currently installed and is characterised by:

- a minimum flow from each hydrant of 10 L/s @ 150 kPa (external locations) or 250 kPa (internal locations)
- twin head hydrants at external locations

- the hydrant booster will have supply hydrants, up to eight booster inlets and a main wheel valve part of the hydrant booster. It should have a block plan
- internal hydrants are usually located in fire exits and stair landings.

NOTE: The total minimum flow for this type of hydrant system can be calculated by allowing 10 L/s for each booster inlet e.g. 4 booster inlets indicates 4 hydrants will each provide 10 L/s without operating the booster.

4.3 Dry riser systems

Dry risers are hydrant systems that are not charged with water, relying on the NSWFB to charge them from street hydrants. They are no longer installed in NSW.

If a dry riser is identified, notify the NSWFB Fire Safety Division, to initiate a possible upgrade to an AS2419.1 system.

NOTE: Ensure hydrants are closed before charging the system to the required pressure.

5 Hydrant boosters

Hydrant boosters are installed to increase pressure and flow to hydrants. A building is usually covered by a single booster. However, high rise buildings may have hydrant boosters for each 50 m of height, to serve only hydrants at those levels.

5.1 HOBAC and Ordinance 70 Specification 10 hydrant boosters

These usually consist of:

- booster inlets
- a pressure gauge
- a single head pillar supply hydrant within 30 m, unless street hydrants are within 60 m of the booster.

5.2 AS 2419.1 systems

These consist of:

- supply hydrants
- main wheel valve
- non return valve
- booster inlets (one for each supply hydrant)
- pressure gauge showing pressure on the boosted side of the connection
- block plan—which shows:
  - a diagram of the site
  - street mains or static supplies (tanks/reservoirs)
  - installed fire pumps
  - location of hydrants, booster connections and isolation valves
  - any connections to other installed fire protection systems.

Figures 11.1a and 11.1b show typical AS 2419.1 hydrant boosters.

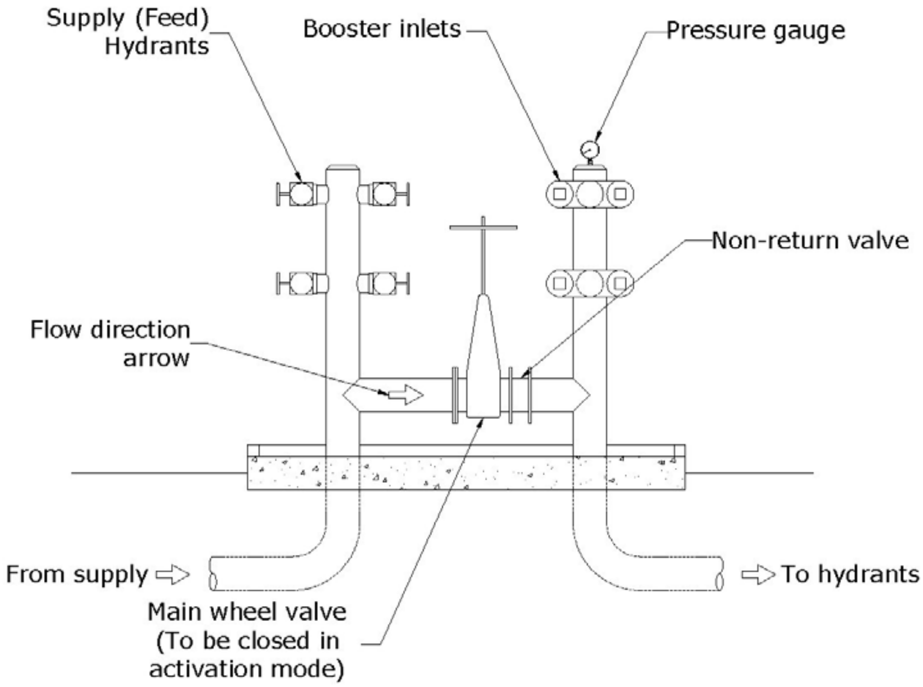


Fig 11.1a A Typical AS 2419.1 hydrant booster

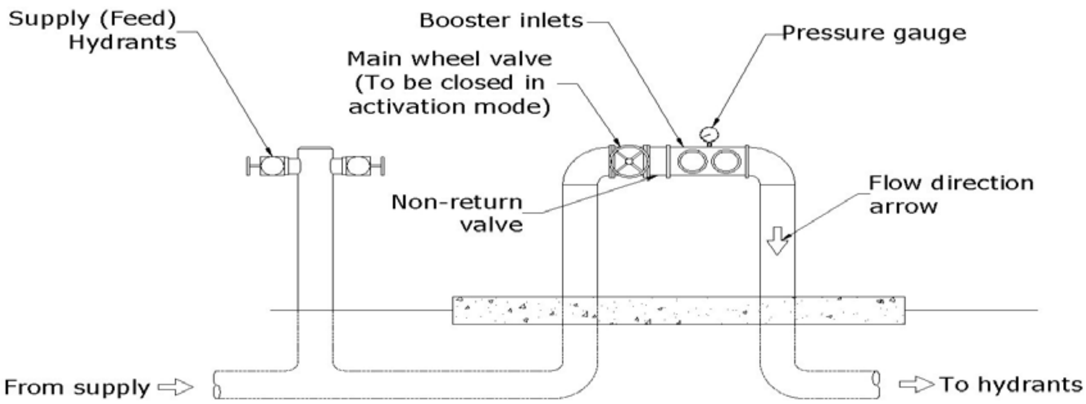


Fig 11.1b Another Typical AS 2419.1 hydrant booster

5.3 Internal hydrant boosters

Buildings over 75 m high may have internal boosters for portable pumps to be used in series with the hydrant booster at ground level to maintain pressure.

They consist of:

- two feed hydrants
- main wheel valve
- two booster inlets
- exhaust flue.

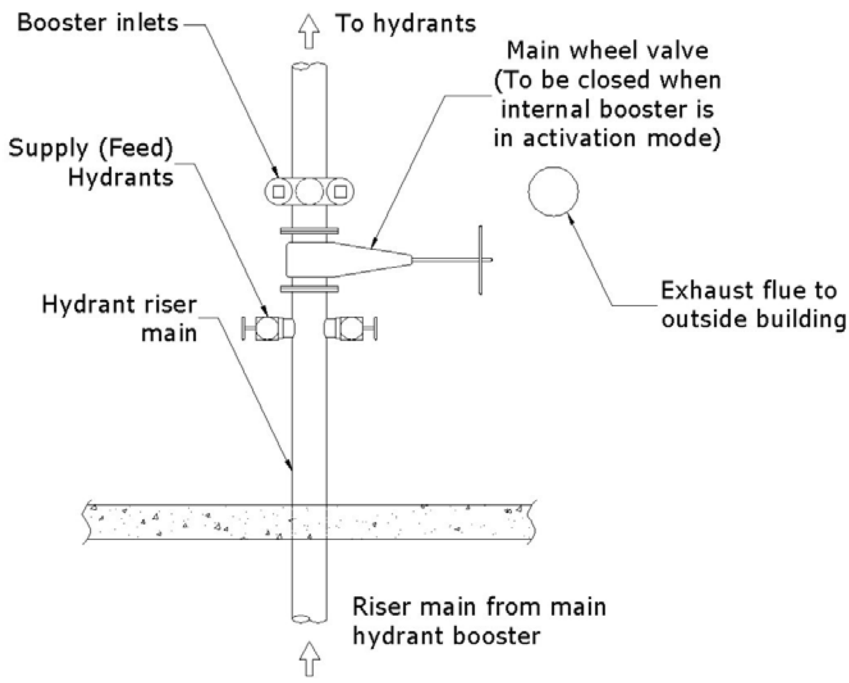


Fig 11.2 A Typical AS 2419.1 internal hydrant booster

They can either have:

- an installed fire pump, supplied by the building owners, or
- the facility for the NSWFB to connect a high capacity portable pump.

NOTE The current NSWFB high capacity pump is a Rotax Darley Portable Pump, a 4-person lift pump with 20 L/s flow, short 70mm hose and exhaust pipe.

6 Hydrant pump

If the town's main or static supply cannot supply hydrants at the required pressure and flow, a hydrant pump is installed. These can be diesel or electric powered. They start automatically when a hydrant is opened and are closed manually at the pump or from the Fire Control Room.

Hydrant Pumps can be located on the roof near tanks, or at ground level to boost street mains or static supplies.

NOTE: The hydrant pump should be left running when possible as it will often help maintain hydrant pressure and flow even when a booster system is used.

The IC must monitor the hydrant pump and shut it down manually if:

- the hydrant pump overheats or cavitates
- there is excess pressure is at the branch.

The IC will advise the pump operator to stop the hydrant pump and reduce pressure if required.

7 Tanks and reservoirs

Buildings over 25 m, or any building without adequate town's mains, will have a water tank or reservoir to provide water until the system can be supplemented (usually 90 minutes). The water is usually supplied through hydrant pumps. However in high rise buildings, pressure is often achieved by the height of the tank above lower hydrants. Pressure reducing valves avoid excessive pressure.

Their locations and capacities may be shown on the block plan.

The IC must

- determine likely water demand during the incident
- monitor the water levels of tanks and arrange alternative supplies if necessary.

8 Isolating valves

These can be found on buildings with more than 12 hydrants or higher than 25 m. They allow the ring main to be isolated in 25% sections.

Their locations are shown on the block plan.

- the IC must ensure that if a hydrant or main is damaged, a firefighter is directed to isolate the affected zone by closing the isolation valves on each side.

9 Hydrant booster use

NOTE: A pumper with the highest capacity is preferred to operate a hydrant booster. Boosters with more than 4 inlets may require 2 pumpers to run the booster at full capacity.

The IC will instruct the pump operator to run the hydrant booster system in one of three modes:

9.1 Stand by mode

1. Connect up to four 70 mm hoses from the feed or street hydrant to the collector.
2. Connect an equal number of 70 mm hoses from the deliveries to booster inlets.
3. Remove leather strap and test movement of the main wheel valve.
4. Note the reading on the booster pressure gauge.
5. Advise IC 'Hydrant/Sprinkler booster is now in Standby mode'.
6. Await instructions from the IC to go to another mode.

9.2 Activation mode

1. Determine the required operating pressure from the IC.
2. Connect up to four 70 mm hoses from the feed or street hydrant to the collector and open the feed hydrants.
3. Connect an equal number of 70 mm hoses from the deliveries to the boost inlets and open the deliveries.

NOTE: The pump is bypassing the main wheel valve and supplying water at the same pressure

4. Remove leather strap and close the main wheel valve.
   (This will prevent backflow and contamination of the public water supply)
5. Increase pressure to the required level (allow 30 kPa per floor).
6. Advise IC 'Hydrant booster is now in Activation mode at … kPa'.
7. Maintain pressure and flow, especially when hydrant pump is running.
8. Await instructions from the IC to vary the pressure or go to another mode.

9.3 Deactivation mode

1. Reduce pressure and disengage the pump.
2. Open the main wheel valve and restore the leather strap.
3. Shut off the feed hydrants to the collectors.
4. Shut down the deliveries to the boost inlets.
5. Remove the hose.
6. Shut down the hydrant pump to further reduce pressure if required.

10 Hydrants

10.1 External hydrants

External hydrants:

- can be single or twin head
- located to cover buildings using two lengths of hose and a 10 m water jet
- AS 2419.1 systems are protected from fire by being 10 m from building or having a 90-minute fire rated section of wall behind them.

10.1.1 Using external hydrants

NOTE: The IC will decide whether hydrants will be used to supply pumpers or as deliveries to branches and monitors, so a standard pressure can be supplied

1. Ensure FF safety from building collapse, traffic.
2. Flush hydrant to remove debris.
3. Connect hose to a pumper or directly to a branch or monitor.
4. Advise IC if pressure needs to be adjusted.

10.2 Internal hydrants

These hydrants are generally located to cover the protected area with a 30 m length of hose and 10 m jet of water. They can be located in fire stairs and corridors, or other locations in the building.

10.2.1 Using internal hydrants

Hydrants in fire stairs or corridors

1. Connect and flake hose from the hydrant, up the fire stairs and back to the entry door.
2. Charge hose, check flow from the branch.

3. If compartment fire fighting techniques are likely, ensure sufficient pressure is available (i.e. 700 kPa at 115 L/m).
4. Request the hydrant system be boosted if necessary.

Hydrants in other locations

These hydrants can be within 4 m of the exit or in cupboards around the floor.

1. Determine if the hydrant can be used safely, due to fire conditions.
2. If necessary, choose a hydrant on a lower floor or away from the fire.
3. Flake and connect hose from the hydrant, above the entry point and back to the entry door.
4. Charge hose, check flow from the branch.
5. If compartment fire fighting techniques are likely, ensure sufficient pressure is available (i.e. 700 kPa at 115 L/m).
6. Request the hydrant system be boosted if necessary.

11 Combined sprinkler/hydrant systems

These systems feature a single booster and fire main for hydrants and sprinklers.

These can be identified in two ways:

- a label at the booster connection ‘COMBINED HYDRANT AND SPRINKLER BOOSTER’, or
- a single pipe, usually in the fire stairs, feeds a hydrant and sprinkler control valve on each level.

This system features:

- one booster used for hydrants and sprinklers for each building or zone, and
- sprinklers can be shut off at each level, without affecting the hydrant supply.

NOTE: If sprinkler operation on a floor is overrunning the supply, consider shutting down the sprinklers on that level and have additional hose lines on stand by to suppress and extinguish the fire. Be prepared to open sprinkler valves again if conditions deteriorate and fire crews have to withdraw.

4.14 FIRE CONTROL CENTRES AND ROOMS

1 Introduction

Fire Control Centres and Fire Control Rooms are equipped to control installed fire safety systems and command of NSWFB operations in buildings.

2 Application

This SOG describes the features of Fire Control Centres and Fire Control Rooms, as well as their use during fires and other emergencies. It should be referenced whenever they are present in a building.

3 Definitions

A Fire Control Centre is a lobby area or alcove in a building, usually located in buildings 25 m to 50 m high or with a large floor area.

A Fire Control Room is a specific fire-isolated room for NSWFB use, usually located in buildings higher than 50 m or with a large floor area.

4 Fire Control Centre features

A Fire Control Centre is at or near ground level, and can house the:

- Fire Control Panel
- Fire Fan Control Panel
- Master Emergency Control Panel
- Security Alarm and Control panels.

NOTE: A FCC is not fire isolated from the surrounding area. Therefore, be prepared to relocate or take other action (e.g. ventilation) if fire conditions worsen.

5 Fire Control Room features

A Fire Control Room is usually at or below ground level.

Features include:

- a fire isolated room with a 2-hour fire rating and separate ventilation
- two exit points, to the front of the building and directly into a fire exit
- Fire Indicator Panel
- Fire Fan Control Panel
- Master Emergency Control Panel
- controls for fire pumps
- Security Alarm and Control Panels
- telephone (direct line outside)
- whiteboard, corkboard and plan table
- Tactical Fire Plans (maps and schematics).

NOTE: If defective or unauthorised equipment is found, advise the NSWFB Fire Safety Division to have the matter investigated. Do not initiate any action yourself.

6 Operational use

During fire operations, the Incident Controller goes to the Fire Control Centre/Fire Control Room to:

- receive a handover from the Emergency Control Organisation or Security staff
- monitor and operate the control panels as required
- establish strategic and task communications links as required through the Warden Intercommunication Point phone/Hand-held Transceivers/Phones
- manage the incident
- monitor the safety of the location regularly.

If the Incident Controller relocates to an Incident Control Vehicle or Operational Commander's vehicle, the Operations Officer and other officers should remain at the Fire Control Centre/ Fire Control Room.

4.14 FIRE CONTROL CENTRES AND ROOMS

Buildings may have a *Fire Control Centre* or *Fire Control Room*, equipped to control the fire safety systems installed in the building.

Fire Control Centre

⇨ Usually a lobby or alcove in buildings *25-50 metres high* or with a large floor area.

⇨ Is *not fire-isolated.*

Features:

⇨ Fire Indicator Panel

⇨ Fire Fan Control Panel

⇨ Master Emergency Control Panel for EWIS

Fire Control Room

⇨ Usually in buildings *higher than 50 metres* or with a large floor area.

⇨ Is a *specific fire-isolated room* for NSWFB use, with a 2-hour fire rating and separate ventilation.

Features:

⇨ Fire Indicator Panel

⇨ Fire Fan Control Panel

⇨ Master Emergency Control Panel for EWIS

⇨ *Control for fire pumps*

⇨ *Phone* (direct line outside)

⇨ Whiteboard, corkboard, plan table

⇨ Tactical Fire Plans (maps and schematics)

⇨ *Two exit points* – one to the front of the building and the other to a fire escape

Upon arrival, the Incident Controller (IC) proceeds to the fire control centre or room.

- ☐ Receive handover from the Emergency Control Organisation or Security staff.
- ☐ Monitor and operate the control panels as required.
- ☐ Establish strategic and task communication links as required though the Warden Intercommunication Point (WIP) phone, hand-held receivers, or other phones.
- ☐ Manage the incident.
- ☐ Regularly monitor the safety of the location.

If the IC relocates to an Incident Control Vehicle or Operational Commander's vehicle, the Operations Officer and other officers remain at the fire control centre or room.

4.16 BUILDINGS WITH INSULATED SANDWICH PANELS

Supporting information is contained in a Guideline Support Document (GSD).

1 Introduction

Fires in insulated sandwich panel (ISP) buildings can be challenging and dangerous, especially if the ISPs have expanded polystyrene (EPS) cores.

ISPs can be found in cold stores, food processing plants, pharmaceutical production facilities and, to a lesser extent, supermarkets, shops and residential buildings.

Some cold stores operate at extremely low temperatures, presenting additional risks.

Fires involving ISPs can become protracted operations that require substantial water supplies, fire break construction, crew rotation and rehabilitation. Smoke plumes and water runoff may present environmental hazards.

Experience shows that, unless the fire is extinguished quickly, only well-protected exposures are likely to be saved because of rapid fire spread and early structural collapse of the affected building.

⚠ **Note**

Many firefighter fatalities have occurred overseas in fires involving buildings with ISPs. Firefighter safety must be the foremost consideration at all times, with property protection a secondary consideration.

2 Application

This SOG applies to fires in buildings constructed wholly or in part with ISPs.

3 Size-up

The Incident Controller's size-up and risk assessment, shall consider any Pre Incident Plan and the:

- location and size of fire
- degree of ISP involvement in fire and form of ISP construction (GSD Section 2)
- the type of insulating material used in the panels (i.e. EPS or other)—assume EPS until confirmed otherwise
- premises' Emergency Plan and Dangerous Goods Manifest
- type and quantity of refrigerant gas used—assume it is hydrocarbon and flammable until confirmed otherwise
- access and egress distances and any need for extended duration breathing apparatus
- the type of product and how it is stored
- hydrants, sprinklers, and other installed fire protection
- smoke control systems
- need for Hazmat, additional Rapid Intervention Teams, Safety Officers and ICMS to ensure firefighter safety
- establishment of collapse zones

- Hazards as listed in GSD Section 4.

4 Tactics

If the fire has taken hold, it is very unlikely that the spread of the fire can be easily and quickly stopped so direct all effort toward protecting exposures.

General tactics to be considered are:

1. Advise the ComCen that the fire involves ISPs and request an increased appliance response, which includes hazmat and heavy rescue appliances.
2. Consult on-site technical experts, particularly on shutting down services (e.g. refrigeration, electricity) and use of CCTV.
3. Assume the panel core is EPS, unless advised otherwise, and ensure all tactics consider the associated hazards (rapid/intense fire spread, early structural collapse).
4. All crews entering the building must wear SCBA and be observant for sign of refrigerant gas release.
5. Hazmat crews should monitor the atmosphere for signs of refrigerant gas leak and environmental issues (water run-off and smoke).
6. Rescue crews to provide technical support and equipment required for cutting panels (GSD Section 5).
7. Implement a communication strategy that will consider issues of large distances and noisy environments (eg use of portable incident ground repeater at large or complex sites).
8. Determine fire spread using:
   * thermal imaging cameras (see warning below)
   * signs of ISP heating (discoloration, delamination, deformation)
   * smoke issuing from ISP joints and ceiling spaces.

   Crews must not be assigned past the point where signs of fire spread occur.

⚠ **WARNING**

Due to the insulating properties of ISPs thermal imaging cameras will have limited ability to detect hidden fire spread.

9. Implement appropriate strategies and tactics as outlined in 4.1, 4.2 or 4.3

4.1 Small fire not involving ISPs

Offensive strategy

Utilise handlines to rapidly extinguish the fire before it affects nearby panels. After extinguishing the fire, check for hidden fire spread in any ISPs exposed to the fire.

4.2 Fire in a freestanding ISP structure inside a fire resistant building

Offensive strategy

Utilise handlines to extinguish the involved panels while protecting internal exposures. Be aware of early collapse of ISP structure etc (see GSD 4.3). Ensure adequate ventilation occurs and that sprinkler system operation is maintained.

4.3 Major fire in a building largely constructed of ISP

Defensive strategy

If the fire involves ISPs, use a defensive strategy. The rate of fire development—much of which occurs within the cavities and is not visible—renders standard structural firefighting tactics unsafe or ineffective.

1. Withdraw all crews from the ISP structure immediately.
2. Isolate all services.
3. Establish aerial appliances and ground monitors, including the required water supplies.
4. Consider aerial reconnaissance by aerial appliances or helicopter.
5. Monitor atmosphere and water run-off for toxicity.

Defensive operations must be located where there is a clear break in the ISPs e.g.

- in a small freestanding structure, (e.g. supermarket cold store) this may be **internal**, i.e. beyond the bounds of the cold store, but inside the building
- in frame-supported structures, this will be **external**, i.e. beyond the collapse zone for the building.

4.4 Cutting insulated sandwich panels

Before cutting any ISP, conduct a risk assessment. Important issues to consider include:

- if there is sufficient time and resources available.
- leaked refrigerant gas which may be pocketed behind panels or in ducting
- electrical wiring or refrigerant gas pipes that may be located behind the panels
- the potential to generate sparks that could ignite flammable refrigerant gas or ESP panel cores
- Weakening of the structure when multiple panels are cut.
- An increase in fire activity due to the introduction of air;

Have a charged line of hose in place for protection before cutting ISPs.

(Additional information contained in GSD Section 5)

4.5 Persons reported missing

Marginal strategy

If persons are reported missing in an ISP structure, a marginal strategy may be employed after carefully considering the risks.

Incident Controllers must only commit resources to saving saveable lives.

If a marginal strategy is adopted, identify clearly established egress paths before committing crews inside the building.

In other words, there is no point committing crews to search and rescue where the building is already well alight or thick black smoke is issuing from it. Unprotected occupants cannot survive in such conditions and firefighters face extreme risks.

4.6 Tactics in cold environments

Additional precautions when operating in extremely cold environments are:

- create an equipment staging area and replace equipment as soon as its performance deteriorates
- start and warm up powered tools before entering the cold area
- ensure all skin is covered
- advise firefighters to walk ‘flat footed’ to maintain stability on slippery floors
- avoid using fine spray, as the water may freeze
- place firefighters at the exit points to guide firefighters from the cold store as their masks may ice up and reduce visibility
- relieve all crews after 20 minutes or immediately if they get wet
- carry out rehabilitation checks with ambulance officers.

4.16 BUILDINGS WITH INSULATED SANDWICH PANELS

Fires in buildings constructed wholly or in part with *insulated sandwich panels* (ISPs) can be challenging and dangerous, especially if the ISPs have *expanded polystyrene* (EPS) cores.

NOTE

Outside Australia there have been many firefighter fatalities in fires in buildings with ISPs. *Firefighter safety* must be the foremost consideration.

Risk assessment

Size up the following:

- ☐ Form of ISP *construction* – frame-supported or freestanding, or both.
- ☐ The *type of insulating material* used in the panels – assume EPS unless advised otherwise.
- ☐ Degree of ISP involvement in the fire.
- ☐ Type and quantity of *refrigerant gas* used – assume hydrocarbon and flammable (explosive) if unsure.
- ☐ Firefighter *access and egress* distances and any need for extended duration breathing apparatus.
- ☐ The Emergency Plan and Dangerous Goods Manifest for the premises.
- ☐ Information from onsite technical experts.
- ☐ *Fire spread* – look for signs of ISP heating or smoke issuing from ISP joints and ceiling spaces, or use thermal imaging cameras.

WARNING

Due to the insulating properties of ISPs, thermal imaging cameras have limited ability to detect hidden fire spread.

Resources

- ☐ Advise Communication Centre that the fire involves ISPs.
- ☐ Request *more appliances* including:
  - *Hazmat* to monitor for refrigerant gas leaks
  - *Heavy rescue* for technical support and cutting panels
- ☐ Consider establishing additional Rapid Intervention Teams and Safety Officers.

- ☐ *Don't assign crews* past the point where signs of fire spread occur.
- ☐ Ensure crews entering the building *wear SCBA* and have charged hoselines.
- ☐ Establish *collapse zones*.
- ☐ Implement a *communications strategy*.

Small fire, not yet involving ISPs
Offensive strategy

- ☐ Rapidly *extinguish* the fire before it affects nearby panels.
- ☐ Check for *hidden fire spread* in ISPs exposed to the fire.

Fire in freestanding ISP structure, inside a fire-resistant building
Offensive strategy

- ☐ *Extinguish* the involved panels, while protecting internal exposures.
- ☐ Beware of *early collapse* of the ISP structure.
- ☐ Maintain sprinkler system operation.
- ☐ Ventilate the building to prevent smoke build up.

Major fire, in building largely constructed of ISP
Defensive strategy

Rate of fire development renders standard firefighting tactics *unsafe or ineffective*.

- ☐ *Withdraw* all crews immediately.
- ☐ Isolate utilities and services in consultation with onsite technical experts.
- ☐ Establish aerial appliances and ground monitors, including required water supplies.
- ☐ Monitor atmosphere and water run-off for toxicity.
- ☐ Consider reconnaissance by aerial appliances or helicopter.

Tactics – cold environments

ISPs are often found in cold stores where additional precautions are necessary:

- ☐ Create an *equipment staging area* and replace equipment as soon as its performance deteriorates.
- ☐ Start and *warm up* powered tools before entering the cold area.
- ☐ Ensure all skin is covered.
- ☐ Advise firefighters walk *'flat footed'* to maintain stability on slippery floors.
- ☐ Avoid using fine spray as the water may freeze.
- ☐ Place firefighters at the exit points to guide firefighters from the cold store as masks may ice up.
- ☐ Relieve and rehabilitate crews after 20 minutes, or immediately if they get wet.

Cutting ISPs

***Before cutting* any ISP conduct a risk assessment:**

- ☐ Is there sufficient *time* and *resources* available?
- ☐ Could leaked refrigerant gas be *pocketed* behind panels or in ducting?
- ☐ Are *electrical wires* or *gas pipes* behind the panels?
- ☐ Could *sparks* ignite refrigerant gas or ISP cores?
- ☐ If multiple panels are cut, could it *weaken* the structure?
- ☐ Will the introduction of *air* increase fire activity?

***Have a charged line* of hose in place before cutting ISPs.**

GUIDELINE SUPPORT DOCUMENT

FOR SOG 4.16: BUILDINGS WITH INSULATED SANDWICH PANELS

1 Introduction

Fires in insulated sandwich panel (ISP) buildings can be challenging and dangerous, especially if the ISPs have expanded polystyrene (EPS) cores.

ISPs can be found in cold stores, food processing plants, pharmaceutical production facilities and, to a lesser extent, supermarkets and shops. It should be noted that ISPs are increasingly being used for residential applications.

Some cold stores operate at extremely low temperatures, presenting additional risks.

Fires involving ISPs can become protracted operations that require substantial water supplies, fire break construction, crew rotation and rehabilitation. Smoke plumes and water runoff may present environmental hazards.

Experience shows that, unless the fire is extinguished quickly, only well-protected exposures are likely to be saved because of rapid fire spread and early structural collapse of the affected building.

⚠ **Note**

Many firefighter fatalities have occurred overseas in fires involving buildings with ISPs. When ISPs are involved, firefighter safety must be the foremost consideration at all times, with property protection a secondary consideration.

2 Insulated sandwich panels

Insulated sandwich panels consist of two flat or profiled metal faces or skins (usually factory pre-painted aluminium or steel) bonded to a fully insulating core by adhesive.

The ISPs can be used in two forms of construction:

1. **Frame-supported**: The ISP is part of the external wall and/or roof, attached directly to a steel frame and often protected by tilt slabs, bricks or iron sheeting, disguising the presence of ISPs.
2. **Freestanding:** The ISPs are assembled into a standalone structure inside a larger building, often creating a large void above. The structure may be supported by mechanical fastenings to the building's ceiling, e.g. a small cold store in a supermarket.

Often, both construction methods are used in a large building to provide an inner envelope for storage and an outer envelope used as a transition area.

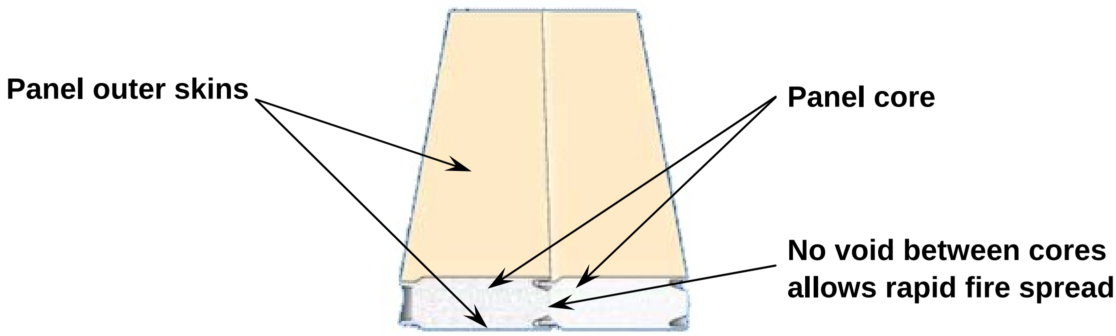


Figure 1 Insulated sandwich panels

3 Hazards

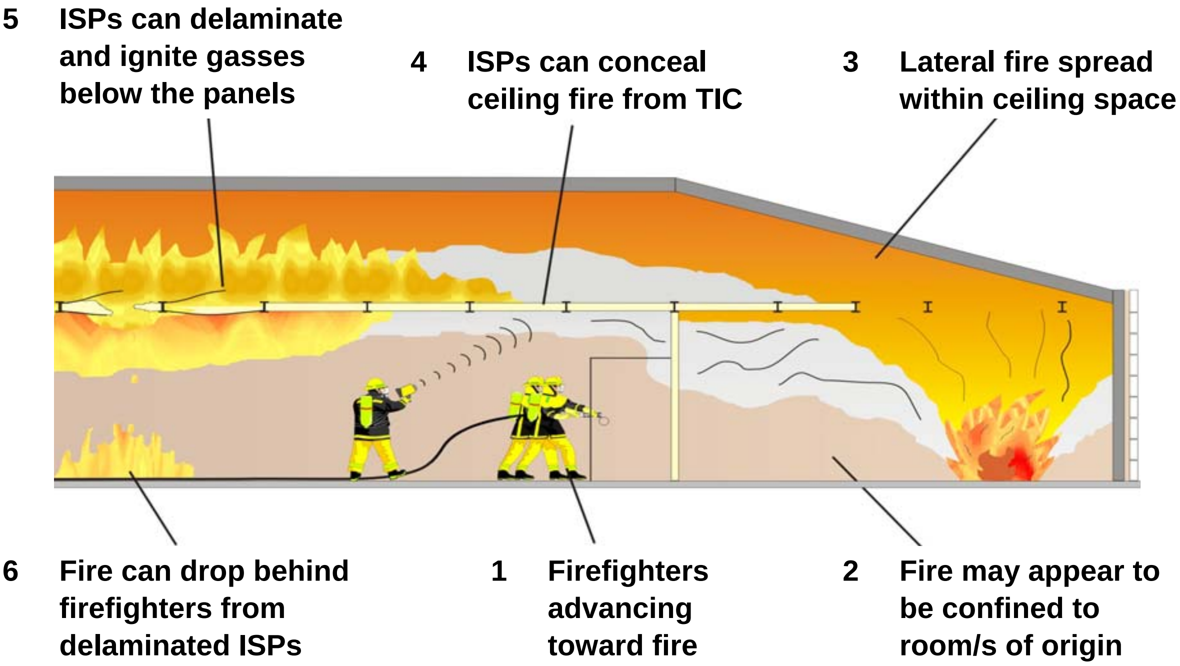


Figure 2 Hazards of ISPs with EPS cores

ISPs, especially those with EPS cores, create an extremely hazardous environment for firefighters and may force adoption of a defensive strategy at an early stage, for the following reasons:

1. EPS melts and flows like a liquid. It is highly flammable, inducing rapid fire spread, which is undetectable with thermal imaging cameras (due to the insulating properties of the panels) and can spread to areas remote from the fire origin.
2. Panel delamination, where the hot metal panel skins bow and open up, rapidly increases the rate of fire spread, which heats the ceiling void, creates secondary pool fires from melted EPS, and causes panels to collapse (Figure 2).
3. There is an increased risk of flashover and backdraught.
4. Large volumes of toxic, thick, black, acrid smoke are produced.
5. Sudden, loss of structural integrity may cause substantial building collapse.

⚠ **Note**

Other types of panel core materials may char and, although the rate of fire spread is greatly reduced, they still produce smoke and flammable gases.

The following table provides a guide about various core materials. The actual characteristics in a fire situation may vary from those listed below:

Core Materials	Characteristics in fire
Expanded Polystyrene (EPS)	High heat release, significant flaming, rapid fire spread, large volumes of toxic smoke leading to flashover.
Polyurethane	Less dangerous that EPS, however still hazardous. Tendancy to char. Hidden fire spread within panels may occur.
Polyisocyanurate	Will usually char. Releases decomposition gases explosively, producing jets of flame when affected by fire.
Phenolic Foam	Will usually char. hidden fire spread can still occur.
Mineral Wool	Smoulders. Does not contribute significantly to fire load.

3.1 Extreme cold temperatures

It is common for cold storage facilities to operate at temperatures as low as –30 °C.

Even though the temperature may be extremely low, fires can still involve frozen product, e.g. animal carcasses or margarine, and its packaging.

Access to the cold areas may be by airlocks and hermetically sealed doors which will make hose-laying and radio communications difficult.

When using the installed hydrants, additional hose lengths may be required to reach all areas due to the complex internal layout.

A thick fog will form and floors become very slippery if moist, warm outside air is introduced (e.g. during smoke extraction).

Water run-off may also freeze making floors slippery.

Due to the adverse effect on firefighter welfare (e.g. frostbite, hypothermia and wet PPE freezing) crew rotation should be increased.

Generally NSWFB equipment (SCBA, chemical suits and radios) will function normally at reduced temperatures, however firefighters should monitor performance. As a guide:

- gas detection equipment has limitations within cold areas. Specialist advice should be obtained from Hazmat Specialists
- petrol powered and oil filled equipment (e.g. power saws, hydraulic tools) may operate intermittently or slowly
- hose lines and branches may become blocked by the formation of ice
- when taken outside, all equipment will be affected by severe condensation and ice formation.

3.2 Refrigerant systems

The type and quantity of refrigerant gases and liquids will vary. Small cool rooms may contain 3-5 kg, whilst large complexes may have up to 20 tonnes.

Several hazards may arise, depending on the type of refrigerant being used, including:

- **asphyxiation**: eg: fluorocarbon based gases (e.g. R22) and carbon dioxide

- **toxicity**: eg: ammonia
- **flammable/explosive mixtures**: eg: ammonia, hydrocarbon based gases and some fluorocarbon gases.

Leaks of these gases, either due to a fire or mechanical failure, may not be monitored automatically at small and older cold stores.

The Orion Gas Detector has limited ability to detect refrigerant gases and should not be used to detect ammonia. Specialised detectors carried on Hazmat appliance are best suited for this task.

High pressure refrigerant gas leaks also present a hazard to firefighters.

3.3 Other hazards

Other hazards of ISP structures include:

- early collapse of the ISP structure without the 'traditional' signs of structural failure
- large and heavy air conditioning equipment, compressors, etc, mounted on roofs of cold stores falling
- forklifts with wet cell batteries (in cold stores) or LPG, and recharging bays
- high racking collapse in extreme fires
- risk of falls due to rapid change in floor levels at loading docks, etc
- food processing equipment may cause entrapment
- voids that can allow fires to continue to burn undetected
- long travel distances and complex internal corridors
- damage to the sprinkler system if attached to the collapsed ISP structure.

4 Cutting of ISPs

A power saw, reciprocating saw or similar will be essential for cutting ISP when there is a need to:

- create a physical break in the panel to stop the spread of fire
- open the panel to detect fire spread or extinguish hidden fires
- affect a rescue.

Implementing a tactic that involves creating a physical break in ISPs to stop fire travel should only be considered if there is sufficient time and resources available as it is a slow and dangerous task.

To be performed safely you may require:

- a safe working platform such as an aerial appliance
- a charged hose line for fire protection
- a suitable saw and blade
- personnel wearing appropriate PPE (ie: Stuctural Firefighting Ensemble & SCBA).

Before cutting any ISP, conduct a risk assessment. Important issues to consider include:

- leaked refrigerant gas which may be pocketed behind panels or in ducting
- electrical wiring or refrigerant gas pipes that may be located behind the panels
- the potential to generate sparks that could ignite flammable refrigerant gas or ESP panel cores
- weakening of the structure when multiple panels are cut
- an increase in fire activity due to the introduction of air.

5 Pre-incident planning

Pre incident plans (PIPs) are an important part of risk management. Stations should prepare PIPs for buildings in their station area that contain ISPs.

PIPs should identify:

- the type of insulating material used in the panels
- access and egress (this is important due to possible rapid fire spread)
- any site Emergency Plan and Dangerous Goods Manifest
- type and quantity of refrigerant gas and on-site isolation procedures
- the type of product and how it is stored. Pallet racking and flammable packaging will promote rapid fire spread. Consider also that products containing frozen fats will readily melt and burn.
- smoke control systems
- major water supplies in case of extended defensive operations and any need for water relay
- booster fitting and hydrants, sprinklers, and other installed fire protection
- water run-off or other environmental issues
- consider collapse zones and suitable locations for control points.

With the PIP information gathered, arrange site visits to large ISP structures and conduct combined exercises with neighbouring stations.

Zone management should review the PIP and liaise with the ComCen as to whether an elevated pre-determined attendance is required for the site.

4.20 CONCRETE WALL PANEL CONSTRUCTION

1 Introduction

This Standard Operational Guideline helps firefighters to deal safely with incidents in buildings with tilt-slab or pre-cast concrete wall panels.

2 Application

This SOG applies to incidents where the external walls of one or two storey buildings have been constructed using concrete panels. It does not apply to buildings of more than two storeys.

3 Use of concrete wall panels

Concrete wall panels are typically found in shopping complexes (large and small, retail and wholesale), factories, warehouses, and industrial complexes (single or mixed use). They are also being used to construct residential buildings. When rendered and painted, there may be nothing to distinguish these residential buildings from ones with masonry walls.

NOTE

A 10 m high, 6 m wide, 200 mm thick concrete wall panel weighs about 30 tonnes.

4 Hazards

Because cracks may not form in concrete wall panels, firefighters may not be able to see fire and smoke from outside the building.

WARNING

Concrete wall panels collapse with little or no warning, and as a single panel, resulting in a large collapse zone.

Collapsed wall panels may:

- compromise fire suppression systems (eg hydrants and sprinklers)
- affect access for appliances and other vehicles.

5 Time to collapse

The time taken for concrete wall panels to collapse can vary considerably and is difficult to predict. It depends on:

- fire intensity and fire load
- duration of fire
- ventilation
- efficacy of suppression systems
- fire resistance of structural members and connections.

6 Building collapse

Building collapse is more likely if:

- the building does not have a sprinkler system, or the sprinkler system has failed
- the present fuel load leads to prolonged fire activity
- the fire is intense.

Collapse indicators

Signs that a structure may collapse *outward* are:

- outward bowing and leaning of some wall panels together with smoke staining
- external smoke staining is indicative of either thermal bowing of the panels or detachment between the panel and the steel frame within the structure
- gaps forming between wall panels along vertical joints, especially towards the top of wall panels adjacent to the fire affected area
- damage near wall panel connections.

Signs that a structure may collapse *inward* are:

- severe sagging of steel transverse roof beams
- inward deflection of steel columns or twisted steel columns
- inward lean of some wall panels
- severe spalling of concrete beams, particularly near connections
- cracks near connection points of steel beams to concrete columns or wall panels.

7 Pre incident planning

Stations should prepare PIPs for buildings in their area constructed with tilt-slab or pre-cast concrete wall panels. If possible, PIPs should be prepared as the building is constructed, so that construction methods may be recorded.

PIPs should include the potential internal fire loads and the building construction methods, which may help to predict the likelihood of building collapse.

Take particular note of the installed fire safety systems, including the location of isolating valves for external hydrants.

PIPs should also address the size up issues listed in section 8.

8 Size up

When conducting a size up, consider:

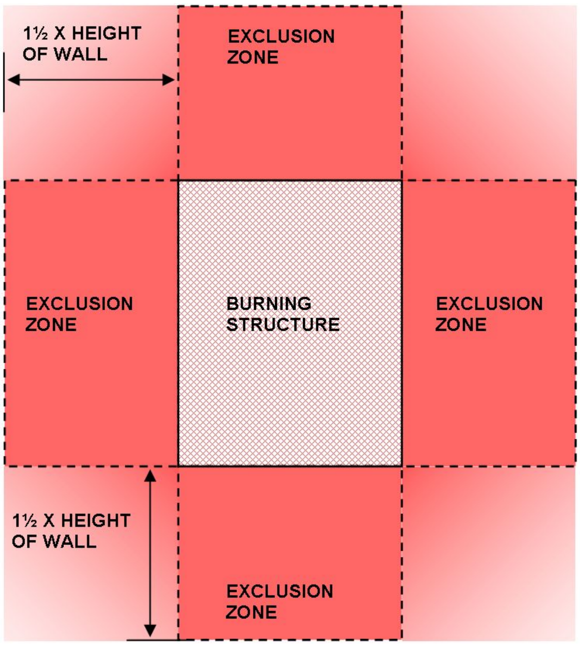
- The PIP, noting specific risks associated with the premises.
- The effect of building collapse on installed fire suppression systems, eg hydrant systems, sprinkler systems, fire service pump sets, fire water tanks, booster location, isolating valves.
- The impact of wall panel collapse on egress and access points.
- The risk of nearby external exposures being subject to additional radiant heat/impact damage in the event of wall panel collapse.
- The magnitude and location of the fire in relation to wall panels.
- The careful placement of firefighters, appliances and hose lines for the Incident Action Plan (IAP).
- The use of additional Safety Officers and expert technical advisors such as structural engineers.

9 Strategies and tactics

The Incident Controller should:

- Adopt a strategy appropriate to the risks identified during size up. Ensure that the strategy is communicated to all personnel.
- Implement ICS and conduct a dynamic risk assessment (DRA).
- Consider the need for RIT and ICMS crews

9.1 Exclusion Zone



An Exclusion Zone is an unsafe area where **no level of PPE gives adequate protection**, and where **nobody must enter**.

- Establish an Exclusion Zone 1½ times the height of the wall, clearly identified with barrier tape and communicated to all crews.
- Appoint a Safety Officer to monitor incident conditions and behaviour of the fire affected structure, including indicators of wall collapse, and to enforce the Exclusion Zone. Appoint additional Safety Officers if needed.
- Ensure that the location of the Exclusion Zone is clearly marked on the IAP, for the information of personnel arriving at the Incident Control Point.

9.2 Firefighting

- Cool steel elements exposed to fire with hose streams to improve their integrity.

Consider:

- If the building is provided with a ring main, isolating hydrants within the Exclusion Zone.
- Using ground and/or roof mounted monitors.

CAUTION

Exercise care with direction of large diameter water streams from ground monitors and aerial appliances as impact may collapse weakened walls.

9.3 Handover

CAUTION

Wall collapse may occur hours or days after extinguishment. Ensure that this hazard is included in the handover form.

4.20 CONCRETE WALL PANEL CONSTRUCTION

Concrete exterior wall panels are:

- Typically used to construct shopping complexes, factories, warehouses and industrial complexes
- Also being used to construct residential buildings.

NOTE

A 10 m high, 6 m wide, 200 mm thick concrete wall panel weighs about 30 tonnes.

Hazards

Firefighters may not be able to see fire and smoke from outside the building.

WARNING

Concrete wall panels collapse with little or no warning, and as a single panel, resulting in a large collapse zone.

Time to collapse

The time taken to collapse depends on:

- fire intensity and fire load
- duration of fire
- ventilation
- efficacy of suppression system
- fire resistance of structural members and connections.

Building collapse

Building collapse is more likely if:

- The building does not have a sprinkler system, or the sprinkler system has failed.
- The present fuel load leads to prolonged fire activity.
- The fire is intense.

Outward collapse indicators

- Outward bowing and leaning of some wall panels together with external smoke staining.
- Gaps forming between wall panels along vertical joints, especially towards the top of wall panels adjacent to the fire affected area.
- Damage near wall panel connections.

Inward collapse indicators

- Severe sagging of steel transverse roof beams.
- Inward deflection of steel columns or twisted steel columns.
- Inward lean of some wall panels.
- Severe spalling of concrete beams, particularly near connections
- Cracks near connection points. of steel beams to concrete columns or wall panels.

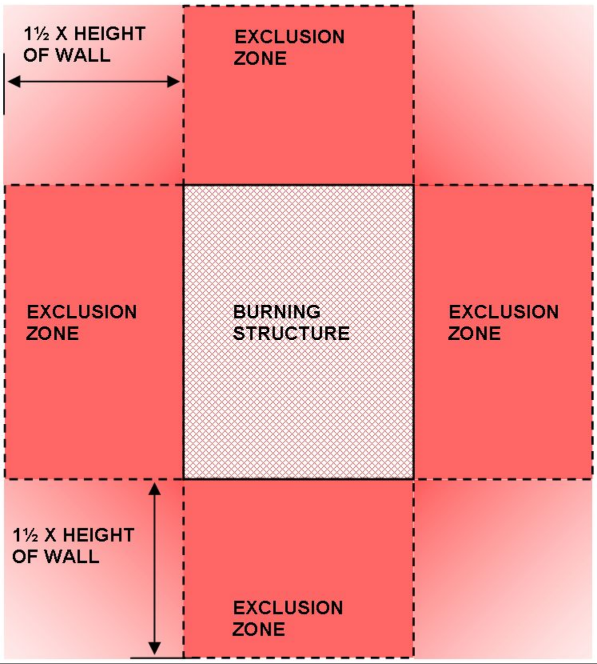
Size up

Consider:

- ☐ The PIP – note specific risks associated with the premises.
- ☐ Effect of building collapse on installed fire suppression systems.
- ☐ Impact of wall panel collapse on egress and access points.
- ☐ Risk of nearby external exposures being subject to additional radiant heat/impact damage in the event of wall panel collapse.
- ☐ Magnitude and location of the fire in relation to wall panels.
- ☐ Careful placement of firefighters, appliances and hose lines for the IAP.
- ☐ Use of additional Safety Officers and technical experts.

Exclusion Zone

⇨ An unsafe area where **no level of PPE gives adequate protection**, and where **nobody must enter**.



Strategies and tactics

- ☐ Establish an Exclusion Zone 1½ times the height of the wall.
- ☐ Appoint a Safety Officer to monitor incident conditions and behaviour of the fire affected structure, including indicators of wall collapse, and to enforce the Exclusion Zone.
- ☐ Ensure that the location of the Exclusion Zone is clearly marked on the IAP.

Firefighting

Consider:

- ☐ Cooling steel elements exposed to fire with hose streams to improve their integrity.
- ☐ If the building is provided with a ring main, isolating hydrants within the Exclusion Zone.
- ☐ Using ground and/or roof mounted monitors.

CAUTION

Exercise care with direction of large diameter water streams from ground monitors and aerial appliances as impact may collapse weakened walls.

Handover

CAUTION

Wall collapse may occur hours or days after extinguishment. Ensure that this hazard is included in the site handover form.

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FILE REF: NFB/09606

GUIDELINE SUPPORT DOCUMENT FOR SOG 4.20 CONCRETE WALL PANEL CONSTRUCTION

1 Introduction

This document applies to incidents in one and two storey buildings where the external walls have been constructed using tilt-slab or pre-cast concrete wall panels.

2 Definitions

Tilt-slab concrete wall panels are generally cast horizontally next to their final positions and tilted into position after the concrete has cured.

Pre-cast concrete wall panels are cast off-site and lifted into their final position.

3 Use of concrete wall panels

Concrete wall panels are typically found in shopping complexes (large and small, retail and wholesale), factories, warehouses, and industrial complexes (single or mixed use). Pre-cast concrete slabs, beams and columns may also be used to construct these types of buildings.

Concrete wall panels are also being used to construct residential buildings. When a residential building constructed from concrete wall panels has been rendered and painted, there may be nothing to distinguish it from those with masonry walls.

Figure 1. Concrete wall panels used in a residential building

4 Fire performance

The fire performance of buildings with concrete wall panels that have one and two storeys differs from those of more than two storeys, where the wall panels are typically connected to intermediate floors as well as to the roof structure.

The fire performance of walls made from concrete panels differs from that of masonry walls.

Masonry walls deflect and crack before collapsing, giving firefighters adequate visual warning to escape from danger. They also develop horizontal cracks and folds while collapsing. This limits the distance from the building where firefighters may be struck.

Concrete wall panels may not crack or deflect before falling, giving little or no visual warning. They usually fall as a single panel. However, pre-cast concrete wall panels with hollow core sections (see section 5.3.1) may crack and collapse in small sections before collapsing entirely. Exterior wall panels fall away from the building, covering an area at least as large as they are.

Figure 2. A fallen wall panel

5 Building elements

The buildings this document applies to typically have:

- a non fire-rated steel frame and roof structure and fire-rated, non load-bearing external concrete wall panels,
- fire-rated, load-bearing external concrete wall panels and a non fire-rated roof structure, or
- non load-bearing external concrete wall panels between steel columns.

Concrete wall panels can be partly or completely supported by non fire-rated connections to non fire-rated structural columns or roof members. This creates the risk that a concrete wall panel may collapse as a single panel, resulting in a large collapse zone.

Safety measures to prevent outward collapse were legislated in 1990. These require top connections of wall panels to steel frames and wall panel-to-footing connections to be able to resist impact and exposure to fire. Buildings constructed before 1990 may not meet these requirements.

5.1 Building collapse

A fire in the centre of the building of sufficient intensity will heat the transverse roof beam enough to expand and push the wall panel slightly outwards. As heat builds up, the beams lose their strength and sag, pulling the columns and wall panels inwards.

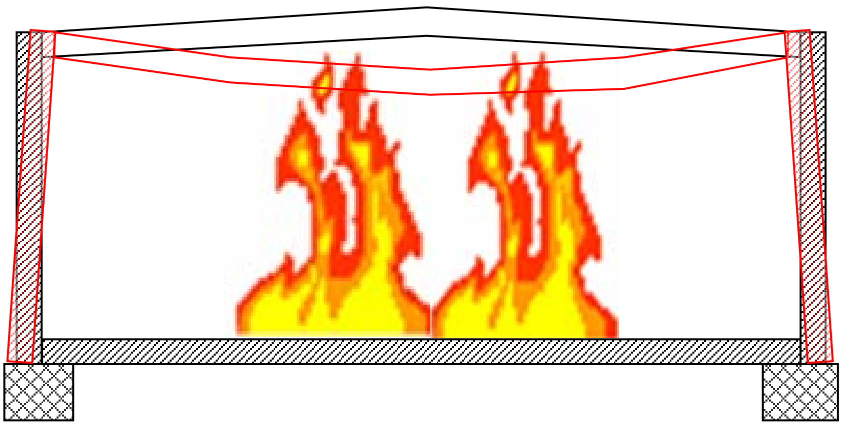


Diagram 1. Inwards wall panel collapse

When fire affects adjoining steel columns and wall panels in a building, the thermal gradient in the wall panel will cause the panel to bow and curve outwards. The exposed columns and connections will gradually lose their strength and if the connections fail prior to the steel column, the wall panels will fall outwards.

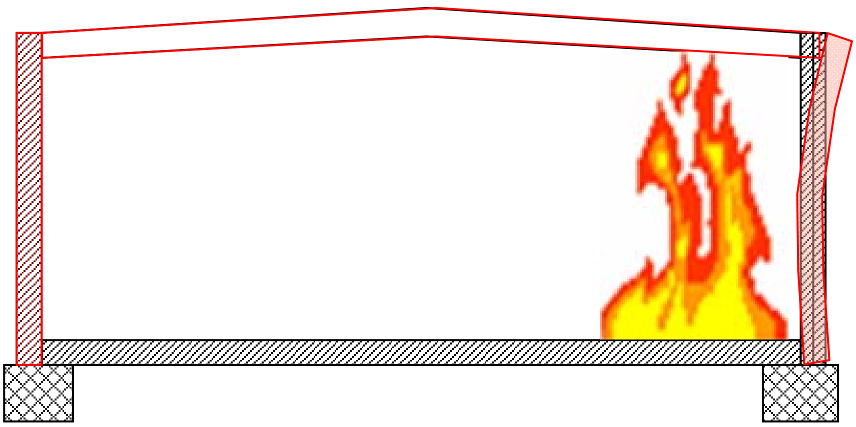


Diagram 2. Outwards wall panel collapse

Wall panels are typically connected at the bottom to footings and at the top to roof structures. If there are mezzanine or office floors next to a panel, they may be connected to these intermediate floors, which can increase their stability (depending on the fire performance of the floor slab and the connections).

The main hazard in a fire is the structural stability of wall panels partly or completely connected by non fire-rated connections to structural columns or roof structures, which themselves may not be fire-rated.

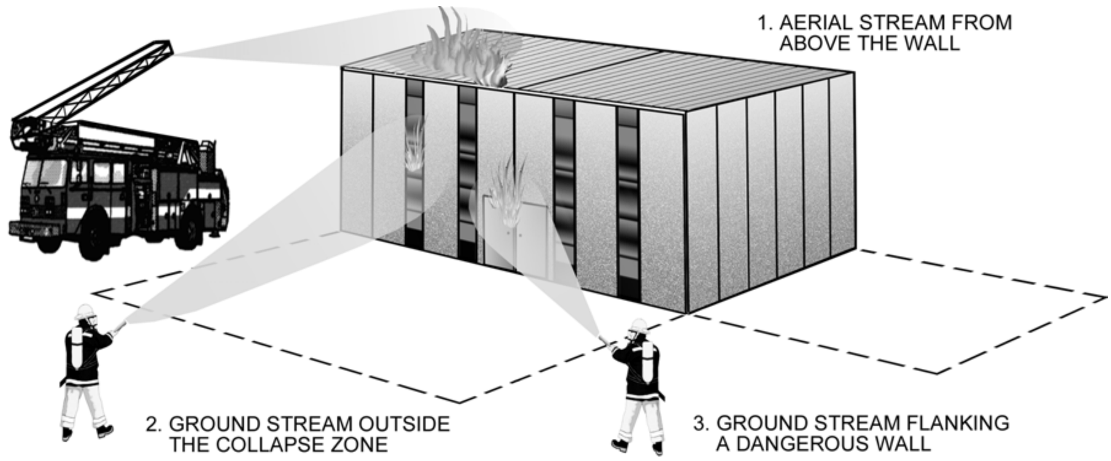
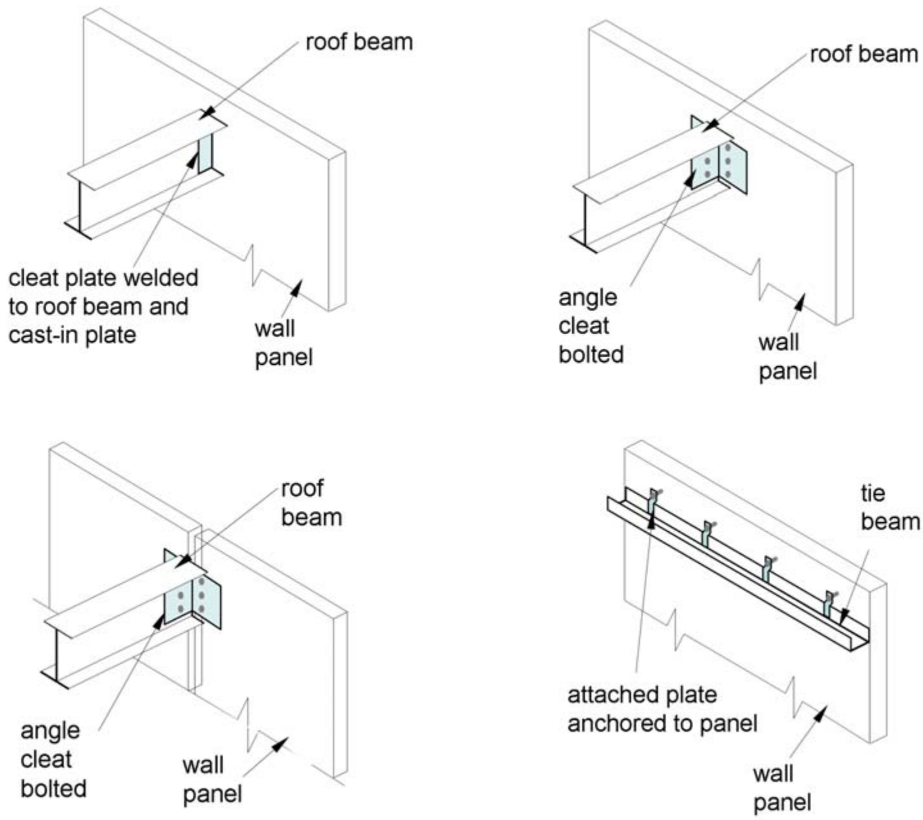


Diagram 3. Three positions of attack lines when there is a danger of wall collapse
(Source: Safety and Survival on the Fireground, Vincent Dunn 1992)

5.2 Panel to roof connections

Connections between roof structures and wall panels allow load transfer between roof structures and wall panels and provide lateral stability to the wall panels. Examples of the various connections are in the following diagram:



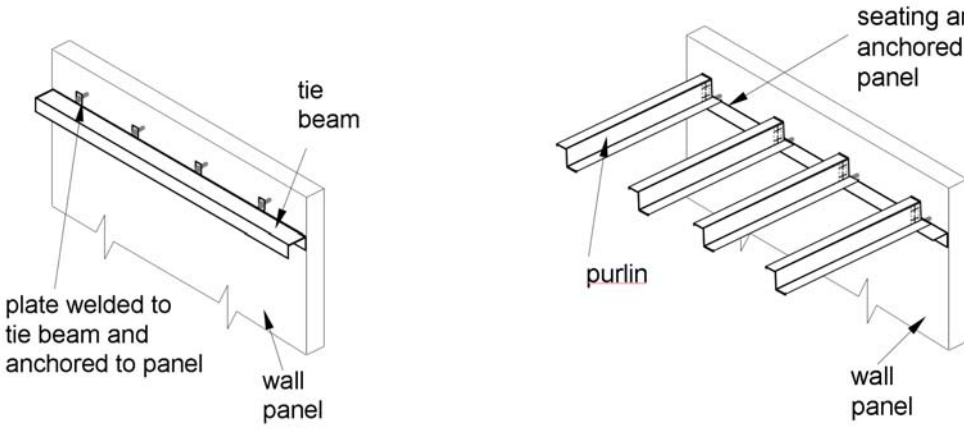


Diagram 4. Panel to roof connections

A wall panel to roof connection exposed to fire may fail in ways that include:

- bolts connecting the roof structure to the wall panels losing their strength and failing
- anchors connecting wall panels pulling out of the concrete
- brackets attached to wall panels slipping out of tie beam connection cleats.

If the wall panel to roof connection fails, the wall panel will tilt from the base, and will be stable only if the wall panel to base connection provides sufficient resistance. If not, the wall panel will tend to fall outward, as it would already be leaning outward due to thermal bowing (see Figure 3).

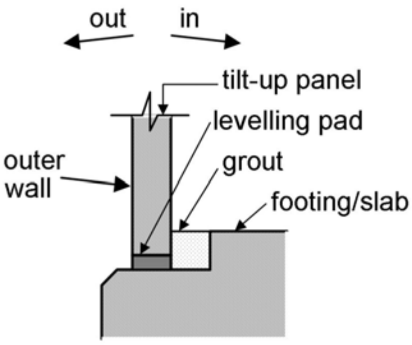
If the wall panel to roof connection stays intact, the wall panel will probably be pulled inward due to roof structure sagging.

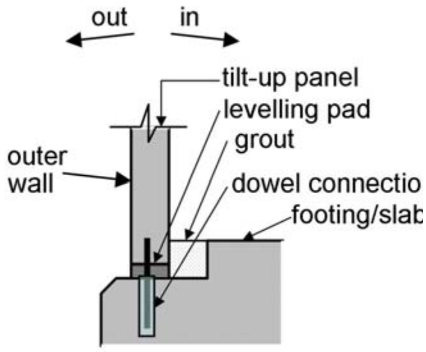
Figure 3. Thermal bowing

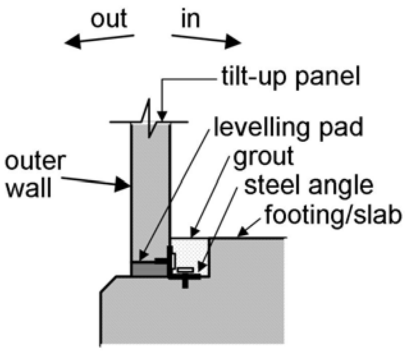
5.3 Panel to footing connections

Panel to footing connections are designed to align wall panels correctly, prevent horizontal displacement of wall panels under load and transfer lateral forces to the foundation.

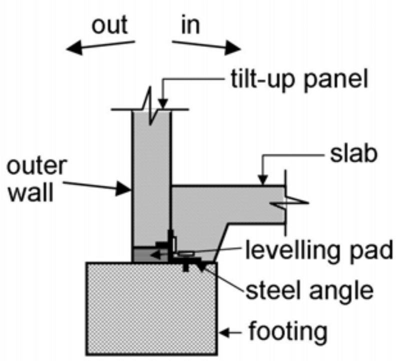
Wall panels with the following types of connections are likely to collapse inwards or outwards:

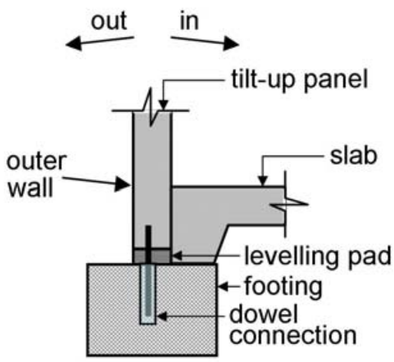




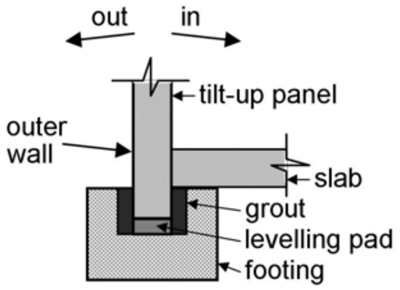


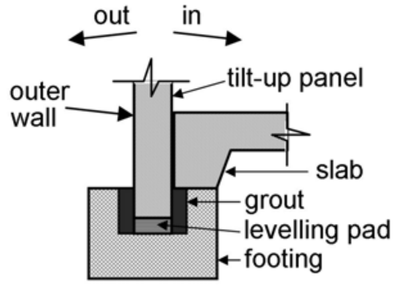
Wall panels with the following types of connections are more likely to collapse outwards:



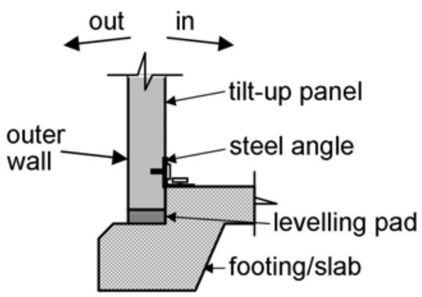


Wall panels with the following types of connections are also more likely to collapse outwards, but are better able to resist collapse than wall panels with the above connections, depending on the depth of the recess in the footing:

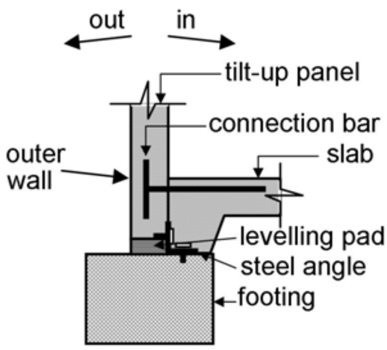


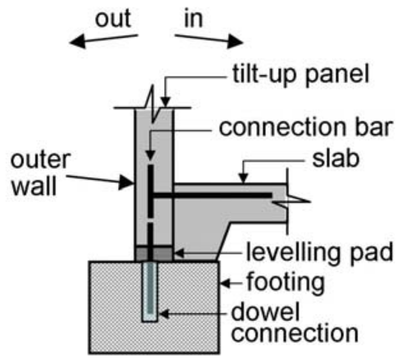


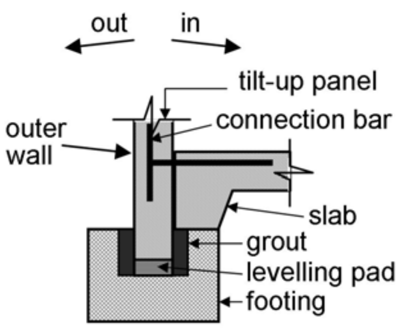
A wall panel with this type of connection is more likely to collapse inwards:



Wall panels with these types of connections are least likely to collapse inwards or outwards:







5.3.1 Hollow core section concrete wall panels

Pre-cast concrete wall panels with hollow core sections, if installed vertically, often have grouting cement placed in them from the top of the panel. This may form a weak connection with footing dowels and connecting bars, increasing the likelihood of panel collapse.

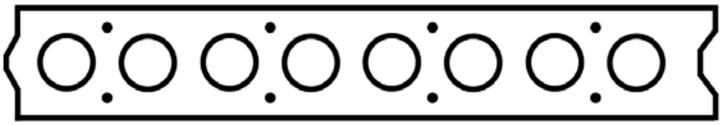


Diagram 5. Typical hollow core panel (top view)

NSW FIRE BRIGADES

Standard Operational Guidelines

AIRCRAFT INCIDENTS

Section Five

5.8 FIRE PROTECTION FOR HELICOPTER HOT REFUELLING

1 Introduction

From time to time the NSWFB is asked to provide fire protection for helicopter hot refuelling at airbases during emergencies such as major bushfires.

Hot refuelling is the refuelling of a helicopter while its engine or engines are running and its rotors are usually still turning.

Under Australian Civil Aviation Safety Authority (CASA) regulations, only helicopters using JET A1 (aviation turbine fuel) can be hot refuelled. Hot refuelling of helicopters using AVGAS (aviation gasoline) is forbidden.

NOTE: Only helicopters using JET A1 fuel are approved for firefighting.

2 Application

This guideline is for NSWFB personnel who have been asked to provide fire protection for helicopter hot refuelling at airbases during emergencies.

3 Roles and responsibilities

During bushfire operations, airbases are usually operated by the NSW Rural Fire Service (RFS) or the NSW National Parks and Wildlife Service, although the operation may be delegated to another agency with the required expertise, such as the Australian Defence Force.

The Airbase Manager is responsible for appointing trained hot refuellers and having suitable firefighting equipment available.

If the Airbase Manager requests NSWFB support, the NSWFB is responsible for providing fire protection to the airbase in case of a fire or fuel spillage.

NOTE: NSWFB personnel must *not* become involved in refuelling operations or providing direct fire protection with extinguishers at the actual refuelling point.

4 Risk assessment

In consultation with the Airbase Manager, the NSWFB Commander must ensure that appropriate firefighting appliances, personnel, water and B Class foam concentrate are available for the airbase category and risk.

The Airbase Manager must provide:

- a briefing on the operational and safety arrangements at the site
- a copy of the airfield emergency plan
- material Safety Data Sheets for fuels and hazardous materials on site
- an effective means of radio communication between the NSWFB Commander and the Airbase Manager.

The NSWFB Commander should consider the:

- number and size of helicopters using the landing site
- expected number of landings and take-offs
- amount and type of fuel stored on site, and
- availability of reticulated water for firefighting.

If required, the NSWFB Commander should request the attendance of additional appliances, foam trailers or bulk water supplies.

5 Personal protective equipment

Firefighters providing fire protection during refuelling must wear full personal protective equipment (PPE), including:

- full structural firefighting ensemble, including helmet and gloves
- flash hood
- SCBA
- ear plugs.

NOTE: NSWFB supplied ear plugs provide sufficient hearing protection when standing by with hoselines at least 50 metres from aircraft. Ear muffs are not recommended as they interfere with wearing helmets.

6 Fire protection operations

Locate the appliance uphill, upwind and at least 50 metres from:

- the helicopter landing site
- fuel pumps and fuel storage areas
- any incident on the airbase.

During refuelling, firefighters in full PPE will stand by with lines of hose charged, foam eductor attached and B Class foam ready to be inducted.

Prevent water or foam streams from hitting moving rotors as this may cause catastrophic failure of the rotors and cause serious injury or death for people nearby.

When life is not at risk, advice should be sought on how to minimise damage to the aircraft before applying foam or water streams.

When life is at risk, the NSWFB Commander should direct firefighters to apply foam to a fuel fire immediately.

5.8 FIRE PROTECTION FOR HELICOPTER HOT REFUELLING

Hot refuelling is the refuelling of a helicopter while its engines *are running* and the rotors usually *still turning*. The NSWFB may be asked to provide *fire protection* to the airbase in the case of fire or fuel spillage during helicopter hot refuelling.

- ⇨ Helicopters may be hot refuelled at airbases during emergencies such as bush fires.
- ⇨ Only helicopters using JET A1 can be hot fuelled.
- ⇨ An Airbase Manager appoints fully trained hot refuellers and has suitable firefighting equipment available.

Risk assessment

The NSWFB Commander must ensure that adequate *firefighting appliances, personnel, water supplies, and Class B form concentrate* are on site:

- ☐ Consider the number and size of helicopters using the site, the expected number of landings and take offs, and the amount and type of fuel stored.
- ☐ Request additional resources if required.

The Airbase Manager must provide:

- ☐ A briefing on the operational and safety arrangements at the site.
- ☐ The airfield emergency plan.
- ☐ Material safety data sheets for fuels and hazardous materials on site.
- ☐ Radio communication between the Airbase Manager and the NSWFB Commander.

Operations

- ☐ Wear full PPE:
  - Full structural firefighting ensemble, including helmet and gloves
  - Flash hood
  - SCBA
  - Ear plugs – which provide sufficient protection at 50 metres
- ☐ *Do not* become involved in refuelling or fire protection with extinguishers at the refuelling point.
- ☐ Locate the appliance *uphill, upwind, and at least 50 metres* from the landing site, fuel pumps and fuel storage areas, and any incident on the airbase.
- ☐ Stand by with lines of hose charged, foam eductor attached and Class B foam ready to be inducted.
- ☐ Prevent water or foam streams from hitting the *moving rotors*.

If there is no risk to life, before applying foam or water streams, *seek advice* on how to minimise aircraft damage.

If there is risk to life, commence fire attack immediately.

NSW FIRE BRIGADES

Standard Operational Guidelines

LAND TRANSPORT AND TUNNEL INCIDENTS

Section Six

6.6 ROAD TUNNEL INCIDENTS

1 Introduction

Road tunnels have special characteristics that responding firefighters must be aware of if the incident is to be controlled safely and effectively. In developing strategies and tactics to combat incidents in road tunnels the NSWFB Incident Controller (IC) must recognise specific factors including:

- tunnel length and the ability of crews to access an incident wearing SCBA either from the portals, i.e. vehicle entry point, or a pressurised cross passage near the incident
- installed systems for fire suppression, smoke management, containment of contaminated water and video surveillance
- communication with operators in the Tunnel Control Centre (TCC) using the installed emergency phones as well as communication with other emergency services.

2 Application

This guideline refers to the general procedures to be adopted by the NSWFB when responding to incidents in road tunnels.

The types of incidents that may occur within a road tunnel include:

- fire involving one or more vehicles, including spilled fuel
- hazmat incidents
- motor vehicle accident, persons trapped
- tunnel collapse, flooding or any other incident that requires the attendance of the NSWFB.

This guideline is intended to assist officers to implement safe and effective operational procedures at incidents in road tunnels, and to develop appropriate Pre-incident Plans for specific tunnels within their area of responsibility.

3 Fire safety design of road tunnels

There is no standard design that describes all fire safety features found in road tunnels throughout NSW. While modern tunnels have many systems designed to assist the egress (escape) of occupants and operations of the NSWFB, many older road tunnels have minimal installed fire protection. The fire safety design of road tunnels may include the following features.

3.1 Emergency egress/access

Twin bore tunnels, where traffic flows occur in separate tunnels, the tunnels are usually separated by 4-hour fire-resisting construction. Crossover passages between the tunnels are usually 120 metres apart and may be pressurised. These provide a safe egress path for evacuating occupants and assist firefighters to access the incident from the uninvolved tunnel as shown in Figure 1.

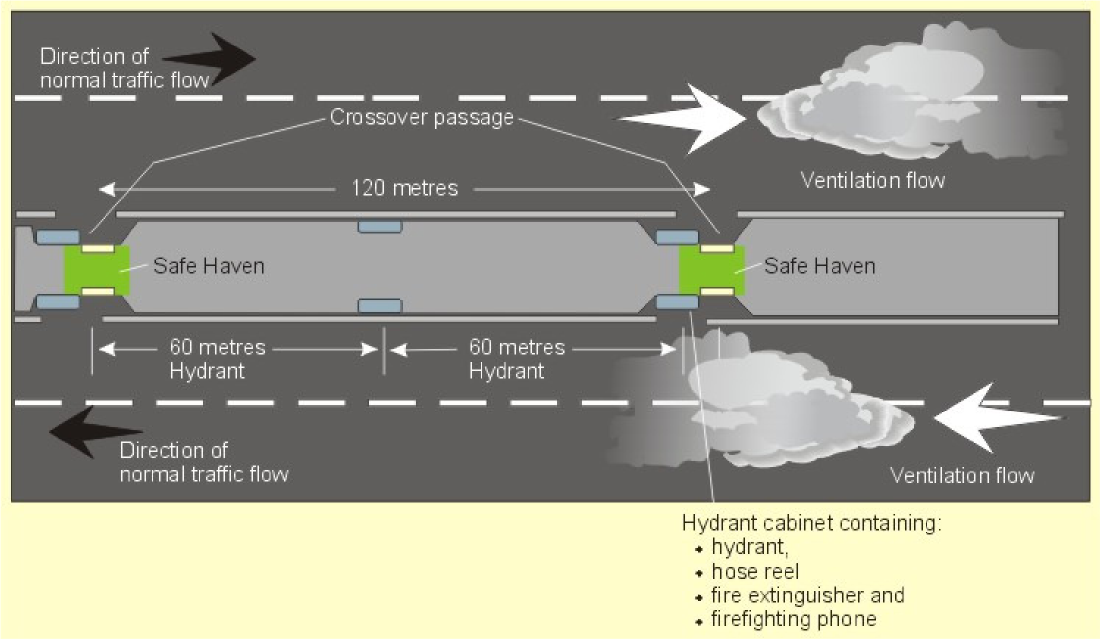


Figure 1 Plan view of road tunnel

Note that the tunnels may be located alongside one another (for example, M5 East Tunnel) or may be located one on top of the other (for example, Eastern Distributor Tunnel, where fire stairs are used to move between the tunnels).

In single bore road tunnels, traffic flow is in both directions and the egress path for evacuating occupants is via the tunnel portals. Access to the incident by firefighters will usually require travel by foot from the nearest portal.

3.2 Fire suppression systems

Some older road tunnels may have sprinklers installed. Modern road tunnels generally have drencher systems designed to deliver large volumes of water at high pressure over a fixed area of roadway. At least two deluge zones operate to cover the entire width of the roadway for 60 metres and in some tunnels it is possible to operate additional deluge zones by utilising the hydrant booster.

Fire hydrants are installed in all road tunnels except some very old or short tunnels. In modern tunnels they are spaced at 60 metre intervals and may be marked by reflective, blue indicators in the roadway or roadside barrier. Hydrant booster connections are located at the tunnel portals and can be used by the NSWFB to boost the pressure of the tunnel hydrant and deluge systems using NSWFB pumpers.

Most modern road tunnels also have fixed fire pumps that are designed to operate a minimum of two deluge zones and three hydrant outlets simultaneously.

3.3 Ventilation

Road tunnel smoke management systems may use:

- longitudinal ventilation (jet fans)
- ducted ventilation
- natural ventilation
- a combination of the above.

Ceiling mounted jet fans push the smoke in the direction of vehicle travel. TCC operators, guided by their operating procedures, will start the fans and cross passage pressurisation in a fire prior to the arrival of the NSWFB. The NSWFB IC must liaise with the TCC operators regarding the effectiveness of the smoke management system and whether its operation should be varied. For example, it may be possible to reverse the jet fans if needed.

3.4 Communications

NSWFB radios can be used in all modern road tunnels as the reception of the GRN network has been improved. Some problems may be experienced with simplex operation in tunnels, i.e. 500 series TalkGroups, and it is recommended that if a specific TalkGroup has not been provided (for example, as for the Harbour Tunnel) then Special Operations TalkGroups, i.e. 600 series, should be used.

In some tunnels, firefighter telephones are located in hydrant/hose reel cabinets at the cross passages between each tunnel. These provide direct communication with the TCC independently of the radio network. A typical cross-passage design is shown in Figure 2.

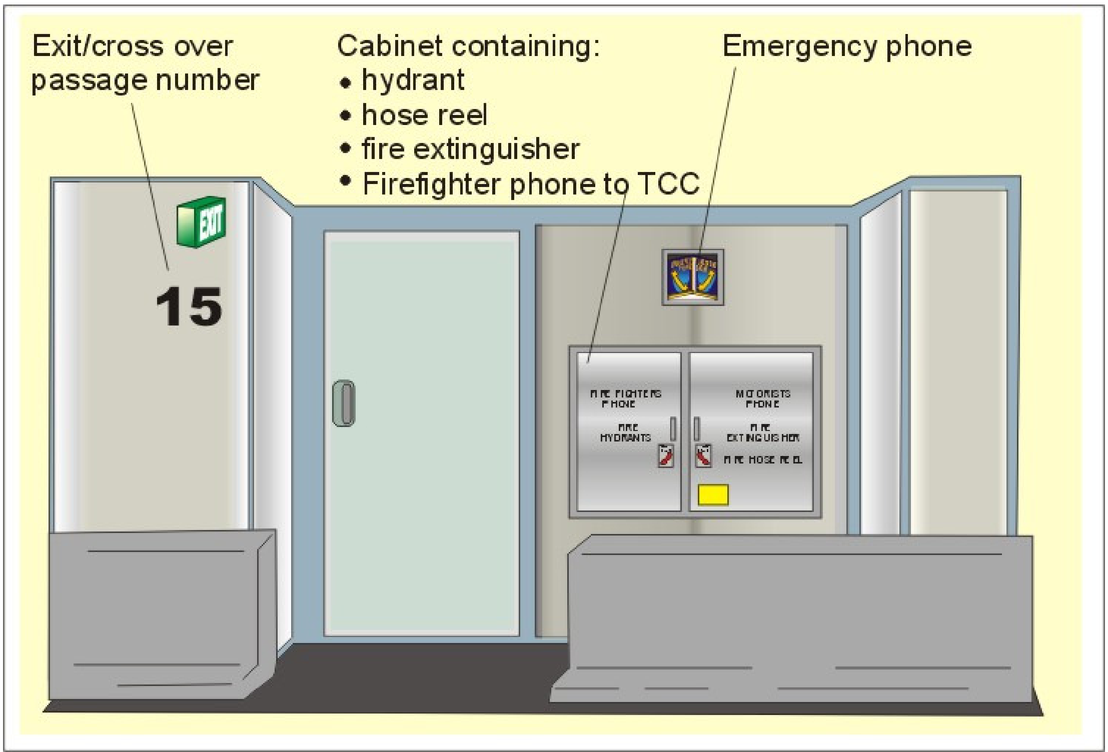


Figure 2 Typical cross passage

NOTE The cross passages between tunnels are protected by fire-resisting construction and provide a safe haven for firefighters

3.5 Emergency lighting

Emergency lighting is strategically located in most road tunnels, including any cross passages, to assist the evacuation of occupants and access by firefighters. Emergency lighting also illuminates the exit signs in the tunnel. Some tunnels also have strobe lights located above each emergency exit doors to indicate the tunnel cross passage to be used during an incident.

The TCC is staffed by trained operators who will activate the various installed systems prior to the arrival of the NSWFB. The NSWFB IC must liaise with the TCC operators to vary the operation of these systems if required.

4 Initial response to road tunnel incidents

Where there is a staffed TCC, the first arriving station should report to this centre. The Station Commander (Incident Controller) is to take control of the incident, direct additional NSWFB resources to the incident location and liaise with TCC operators and other emergency service officers until relieved by a more senior officer.

Where there are no TCC or operators, the first arriving station should report to the tunnel portal nearest to the incident (if the location is known). The IC is to take control of the incident and liaise with other on-site emergency personnel until relieved by a more senior officer.

The IC should also establish an appropriate staging area in accordance with *SOG 1.8* and inform the Communications Centre to deploy responding appliances to that area.

Second and subsequent arriving stations are to report to the Staging Area and await further instructions from the IC before responding to the incident.

5 Size-up

An incident in a road tunnel poses a significant challenge for ICs who will usually be unable to see the incident on arrival and therefore must rely on information gained from secondary sources. These sources may include the occupants of vehicles who have evacuated the tunnel or TCC operators.

The IC should consider the following during size-up:

- existing plans such as TCC emergency procedures and NSWFB Pre-incident Plans should be incorporated into the incident action plan
- the type of incident that has been reported. For example, a small fire in the engine compartment of a vehicle following a collision may become a fully developed fire involving more than one vehicle, including fully-laden trucks prior to firefighters being able to access the scene
- the number of vehicles and people in the tunnel. TCC Operators may be able to provide this information. The numbers could vary significantly according to the time of day
- the exact location of the incident and the most efficient means of access for firefighters. TCC operators should also be able to provide this information which may vary significantly according to whether the tunnel is a single or twin bore design
- the operation and effectiveness of installed fire protection such as sprinkler and drencher systems. Consider using the TCC video surveillance systems
- which procedures, evacuation, etc, have been implemented by the operators?

6 Incident management

To ensure effective management of any incident in a road tunnel, the IC should:

- implement the Incident Control System and the Incident Crew Management System (ICMS)
- appoint a Safety Officer
- sector the incident scene into Hot, Warm and Cold Zones and appoint Sector Commanders
- liaise with other attending services, including Police and RTA for traffic control, Police for Disaster Victim Registration if required and Ambulance for patient care and firefighter monitoring and rehabilitation
- locate the Forward Command Point away from any hazards, in a clear atmosphere as close as possible to the incident. For twin bore tunnels this will be in the non-incident tunnel adjacent to the nearest cross passage
- establish an equipment cache as close as possible to the incident and provide effective transport of personnel and equipment from the nearest portal
- ensure that Extended Duration BA and specialist equipment such as Thermal Imaging Cameras (TICs) is available. (*SOG 15*)
- consider establishing a rehabilitation area and appointing a Rehabilitation Officer to monitor the working time of personnel and arrange for relief firefighters as personnel operating within a tunnel environment are exposed to demanding conditions including high temperatures.

7 Safety

The IC must ensure that crews working in the tunnel are protected from traffic. This may mean:

- traffic must be stopped and ongoing communication established with the TCC before committing crews to an incident
- in the case of minor incidents, a safe area for firefighters working on the roadway must be maintained by effective appliance placement or assistance from Police or RTA Traffic Emergency Patrol crews on the scene.

The IC must ensure that regular ICMS checks are conducted.

Rapid Intervention Team(s) with appropriate PPE and equipment, including long duration SCBA and TIC must be deployed at all points where firefighters are working in the tunnel.

8 Access

For minor incidents it may be possible to drive the appliance directly to the combat area with the traffic flow. This requires that:

- traffic flow is not restricted
- visibility is not impeded
- SCBA is not required.

Where the traffic flow is severely restricted, alternate access will be necessary. If the traffic has been stopped, appliances may be able to proceed with caution in the opposite direction to normal traffic flow. The TCC must be consulted before contra-flow is attempted in any tunnel.

For major incidents, the appliance should not enter the affected tunnel. The IC must ensure that firefighters are able to access the incident safely and with a minimum of delay. This is usually achieved by:

- in the case of twin bore tunnels, the appliance approaching the incident using the opposite carriageway. Firefighters then use the dedicated tunnel crossover point that provides access as close as possible to the incident and located in a safe, smoke free area. See Figure 3.

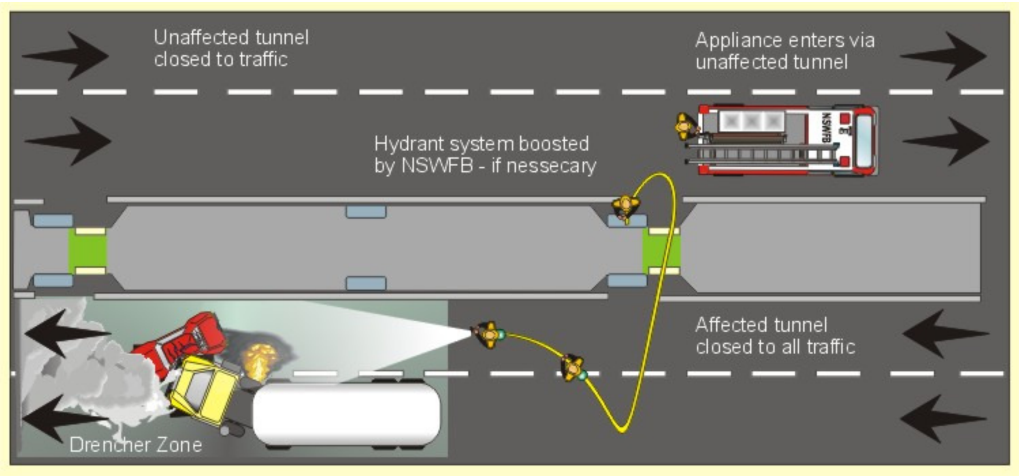


Figure 3 Typical accident scene

- in the case of single bore tunnels, firefighters entering from the portal nearest to the incident, minimising SCBA wearing time as far as possible. This may not always be possible due to heat and smoke conditions at the nearest portal.

The IC should consider advice offered by TCC operators regarding tunnel access, including the location of the incident, tunnel crossover points and breakdown bays for positioning appliances.

6.6 ROAD TUNNEL INCIDENTS

Road tunnels have varying designs and installed systems which affect NSWFB operations and egress of occupants.

Tunnel designs

Modern tunnels

- ⇨ *Twin bore* – traffic flows in separate tunnels (alongside one another or one on top of the other)
- ⇨ Have *crossover passages* 120 metres apart, with a 4-hour fire-resisting construction that may be pressurised – they provide a safe haven for evacuating motorists, and a means to access the incident from the uninvolved tunnel
- ⇨ Have *many* systems installed

Older tunnels

- ⇨ *Single bore* – traffic flows in both directions
- ⇨ *Access and egress* is through the tunnel portals
- ⇨ Have *limited* systems installed

First arriving station – officer-in-charge becomes the Incident Controller (IC):

- ☐ *Where there is a Tunnel Control Centre (TCC)*, report to the TCC and manage the incident from there.
- ☐ *Where there is no TCC*, report to the tunnel portal and manage the incident from there.
- ☐ Locate Forward Control Point – away from hazards, in clear atmosphere.
- ☐ Establish a staging area.

Installed systems

Systems that may be installed:

- ⇨ *Drencher systems* – deliver *large* volumes of water at high pressure over 60 metres of the roadway
- ⇨ *Sprinkler systems* in older tunnels.
- ⇨ *Fire hydrants* – generally spaced at 60 metre intervals (may be marked by reflective, blue indicators)
- ⇨ *Hydrant booster* connections – boost the pressure of the tunnel hydrant and deluge systems
- ⇨ *Fixed fire pumps* – operate at least two deluge zones and three hydrants simultaneously
- ⇨ *Jet fan ventilation* – ceiling mounted to push the smoke in the direction of vehicle travel
- ⇨ *Video surveillance and communication systems* – connected to the TCC
- ⇨ *Water containment systems*
- ⇨ *Emergency lighting*

Communications

- ⇨ GRN Special Operations TalkGroup 600 series.
- ⇨ Dedicated firefighter phones in crossover passages, connected to the TCC.

Risk assessment

It may *not be possible to see* the incident – the NSWFB may need incident information from the TCC or from evacuating motorists.

Size up the following:

- ⇨ *Existing plans* – TCC emergency procedures and NSWFB pre-incident plans
- ⇨ *Exact location* of the incident in the tunnel:
  - *Access* to the incident for appliances and for crews wearing SCBA
  - *Evacuation* of motorists
- ⇨ *Type of incident*, including the number of motorists in the tunnel.
- ⇨ *Resource and equipment requirements* (such as Thermal Imaging Camera (TIC) and extended duration BA).
- ⇨ *Installed systems* for fire suppression, smoke management, containment of contaminated water, and video surveillance
- ⇨ *TCC operator actions* – what actions have been taken by the TCC operators?

Access

- ☐ Follow TCC advice.
- ☐ For minor incidents (good visibility, SCBA not required, traffic flow not restricted) – it may be possible to drive the appliance directly to the incident.
- ☐ For major incidents – appliances *should not enter* the affected tunnel. Intervene from the non-incident tunnel if possible.

Safety

- ☐ For minor incidents – establish a safe work area on the road, to protect crews from traffic.
- ☐ For major incidents – ensure that traffic flow is stopped before sending crews in.
- ☐ Ensure ongoing communication with the TCC.
- ☐ Appoint a Safety Officer.
- ☐ Implement ICMS.
- ☐ Establish Rapid Intervention Teams (RITs), with TIC and extended duration BA.
- ☐ Rotate and rehabilitate crews.

NSW FIRE BRIGADES

Standard Operational Guidelines

SPECIAL INCIDENTS

Section Eight

1 BOMBS

1.1 Introduction

1.1.1 The NSWFB role at incidents involving bomb threats or detonations is to support the Police or the Army by protecting lives and property from fire, or the results of an escape of hazardous materials and by acting as the lead agency in urban search and rescue operations. ***Under no circumstances will NSWFB personnel assist directly with bomb searches or disposal.***

1.1.2 This Standard Operational Guideline (SOG) is designed to assist NSWFB Incident Controllers to protect NSWFB crews and the community during bomb incidents, and to co-ordinate NSWFB activities with those of other involved agencies.

1.2 Application

1.2.1 This SOG relates to incidents at which:

- a bomb or bombs have exploded,
- unexploded bombs are reported or located, and
- suspected bombs are reported.

1.2.2 Bombs include:

- improvised explosive, incendiary, irritant or poisonous gas bombs, grenades, rockets, missiles, mines or other devices;
- ordnance such as military weapons, mines or ammunition;
- non-military weapons and ammunition.

1.2.3 All suspected bombs must be treated as live bombs until proven otherwise.

1.2.4 Explosives that fall outside of the scope of this SOG are covered in *SOG No 10 Hazardous Materials*.

1.3 Incident Command and Control

1.3.1 Incidents involving bombs often involve unlawful acts and as such the NSW Police Service has overall control as the combat agency.

1.3.2 The senior NSW Police Officer fulfils the role of Incident Manager/Controller (see Fig 1.1). The NSW Police Service may call for the assistance of the NSWFB, Defence Forces and other emergency services depending on the nature of the incident.

1.3.3 The officer in charge (OIC) of all NSWFB personnel at the incident, takes the role of the NSWFB Commander and will organise NSWFB activities in accordance with the NSW Police Service requirements and this SOG.

1.3.4 The NSWFB Commander will liaise closely with the NSW Police Service Incident Manager/Controller. The best way to do this may be to appoint a liaison officer who will establish direct contact with the NSWFB Commander from the Police Command Post.

1.3.5 Where the NSWFB arrives at a bomb incident before the NSW Police Service, the NSWFB OIC will assume the role of Incident Controller until the arrival of the NSW Police Service.

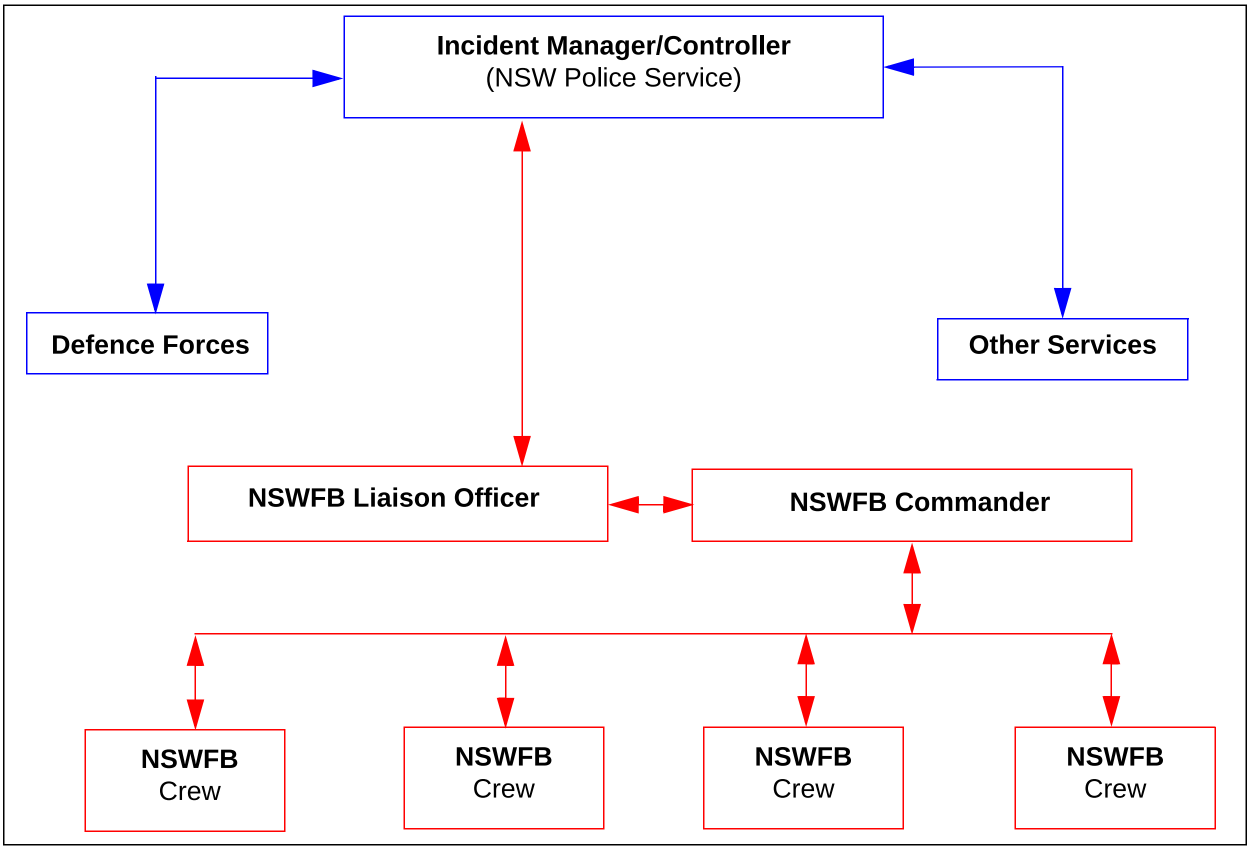


Fig 1.1 Incident Command Structure for Bomb Incidents

1.4 Roles and Responsibilities

NSW Police Service

1.4.1 The NSW Police Service is responsible for the following:

- overall co-ordination and control of involved agencies,
- establishing pre-identified rendezvous points for all emergency services,
- establishing restricted access zones,
- evacuation (local or large scale),
- site marshalling,
- searching for and dealing with bombs,

- investigating crime scenes and incidents which may result in a coronial investigation,
- collecting evidence, and
- site clearance upon completion of the incident.

NOTE

NSWFB Fire Investigation may be asked for assistance with investigations once the site is deemed to be safe.

Defence Forces

1.4.2 The Defence Forces have specialist bomb disposal squads who the NSW Police Service may call upon to assist at bomb incidents.

1.4.3 These specialist bomb squads are used at all incidents involving ordnance such as military weapons, bombs, mines or ammunition. They may also provide assistance at other bomb incidents.

1.4.4 Incidents at, or in the close vicinity of, military establishments are generally controlled by the appropriate Defence Force, who then may call on the assistance of the Police (Anti-terrorist Branch). In these instances a Military Liaison Officer is appointed and Specialist Explosives Officers to provide advice.

NSWFB

1.4.5 The role of the NSWFB at bomb incidents is to protect life and property from the effects of fires or hazardous material escapes that occur as the result of a bomb explosion. Its role also includes the co-ordination of large scale urban search and rescue operations under the overall control of the NSW Police Service.

1.4.6 If requested, the NSWFB may also assist in evacuation and assisting the Ambulance Service in multiple casualty incidents.

NOTE

The NSWFB is not responsible for searching for suspected bombs or bomb disposal. Under no circumstances will NSWFB members become involved in, or exposed to, activities (outside their normal duties) where their lives could be endangered.

1.5 Safety of Firefighters

1.5.1 The NSWFB Commander is responsible for the safety of all NSWFB personnel at the incident.

1.5.2 All personnel should keep the following points in mind:

- ensure the safety of firefighters and other emergency service personnel;
- protect **savable** lives;

- protect **savable** property;
- wear full fire fighting uniform including eye protection (visor or safety goggles) at **all** times;
- use the minimum number of firefighters possible for any operation;
- be conscious that secondary devices may have been planted;
- keep all access routes clear;
- stay in a safe place and **do not** move around unless to perform a specific task;
- where a detonation is possible, personnel and equipment should be staged at a safe distance behind substantial cover;
- when in a vehicle, keep the windows open and wear eye protection;
- audible warning devices must not be used in the vicinity of bomb incidents; and
- standby appliances are to be positioned at a safe distance from the incident until required.

1.5.3 The NSWFB Commander should consider appointing a Safety Officer in accordance with *SOG 1.6 Safety Officers*.

1.6 Responding to Bomb Incidents

1.6.1 When the NSWFB responds at the request of the NSW Police Service to a suspected bomb incident, lights and audible warning devices are not to be used unless otherwise directed.

NOTE

When responding without lights and sirens, the normal road rules apply.

1.6.2 The NSWFB is not to respond directly to the reported location of a suspected bomb. The NSW Police Service will give the NSWFB Communication Centre (ComCen) a rendezvous point to which all NSWFB personnel and appliances must report.

1.6.3 If the NSWFB becomes aware of a bomb incident before the NSW Police Service, the latter must be notified and their advice sought on a rendezvous point.

NOTE

Suspected bombs are not treated as emergencies unless there is a confirmed detonation, or the NSW Police Service requests urgent response e.g. to assist with evacuations.

1.7 Arrival at Incident

NSW Police Service in Attendance

1.7.1 If the NSW Police Service has already taken control of the incident by the time the NSWFB arrive, the NSWFB Commander must:

- report to the NSW Police Service Incident Manager/Controller for a briefing;
- liaise with the NSW Police Service Incident Manager/Controller in the development of the Incident Action Plan;
- act as directed by the NSW Police Service Incident Manager/Controller, provided NSWFB personnel are not placed in unnecessary danger; and
- implement Incident Control System (ICS) to command NSWFB operations in accordance with *SOG No 1*.

NOTE

The NSWFB Incident Commander must pay due regard to any advice, instructions, or information given by the NSW Police Service Incident Manager/Controller, before deploying personnel and appliances.

NSWFB First on Scene

1.7.2 If the NSWFB is the first emergency service to arrive at a bomb incident, the OIC should implement ICS in accordance with *SOG No 1*.

1.7.3 The NSWFB Incident Controller is responsible for:

- the safe positioning of all NSWFB personnel and equipment,
- initiating any required evacuations,
- establishing a restricted access zone,
- determining the general location of the suspected bomb (this will not involve a search by NSWFB personnel),
- considering the possibilities of other hazards or secondary devices,
- sending a priority prefix (red, red, red) to the ComCen (*SOG 2.3*), giving details of the incident and requesting urgent Police attendance, and
- in the event of fire, protecting exposures and attempting extinguishment from protected positions.

1.7.4 On arrival of the NSW Police Service, the NSWFB Incident Controller must brief the NSW Police Service Commander, hand over control and assume the role of NSWFB Commander. At this point the NSWFB Commander is to send a SITREP to the ComCen.

⚠ **NOTE**

The NSW Police Service does not use ICS for command and control and may not understand NSWFB procedures.

1.8 Restricted Access Zones

1.8.1 The NSW Police Service is responsible for establishing restricted access zones, which may have a radius of 600 m from the bomb.

1.8.2 The NSW Police Service Incident Manager/Controller must give permission before personnel or appliances can enter the restricted access zone.

1.9 Positioning of Fire Appliances

1.9.1 Under no circumstances should the NSWFB respond directly to the reported location of a suspected bomb. The information passed by the NSW Police Service to the NSWFB ComCen should include a specific rendezvous point where all NSWFB personnel and appliances must report.

⚠ **NOTE**

If the NSWFB is notified of a suspected bomb by other means e.g. members of the public, then the Police are to be notified immediately and agreement reached on the initial positioning of vehicles.

1.9.2 All NSWFB fire appliances should be positioned:

- outside the restricted access zone unless otherwise required by the NSW Police Service Incident Manager/Controller;

⚠ **NOTE**

The restricted access zone will be determined by the NSW Police Service and can be up to a radius of 600 m from the suspected bomb location dependant upon circumstances.

- facing away from the incident with windows fully open, preferably out of the line of sight and behind substantial cover;
- not in proximity to large areas of glazing, and
- as close as possible (within the above constraints) to a water supply.

1.9.3 The NSWFB Commander should consider the following points:

- appliances may have to be moved rapidly in an emergency,
- access routes must to be kept clear,
- parked vehicles may contain secondary devices, and

- the NSWFB ComCen is to be kept informed of the location of all appliances.

1.10 Secondary Devices

1.10.1 The possibility of secondary explosive devices should be taken into account during fire fighting and rescue operations at all bomb incidents. This is particularly important where no warning has been received.

1.10.2 Guidance should be sought as soon as possible from the NSW Police Service Incident Manager/Controller on safe distances and standby periods when explosives experts check for secondary devices.

1.10.3 Secondary devices are often intended to cause maximum damage or injury to emergency personnel. These devices are usually placed in a vehicle close to the scene and detonated after emergency personnel arrive.

1.11 Communications

1.11.1 The NSW Police Service are responsible for establishing communications systems at an incident. The NSWFB Commander must consult with the NSW Police Service Incident Manager/Controller before making any arrangements.

⚠ **NOTE**

NSW Police Service advice on all matters relating to the safe use of communication equipment must be followed.

1.11.2 Table 1A and Fig 1.2 identify the restricted areas for communication equipment at bomb incidents.

DISTANCE FROM BOMB	DO NOT USE	CAN USE
Within 15 m	Radio equipment Hand held radios Cellular phones Mobile phones	Pagers
Within 50 m	Vehicle radios Transportable radio equipment	Hand held radios Pagers Mobile phones Cellular phones
⚠ **NOTE** **If a vehicle fitted with a radio transmitter has to enter the 50 m radius, the radio equipment must be switched off so that no transmission of either speech or data is possible.**		

Table 1A Use of Communication Equipment at Bomb Incidents

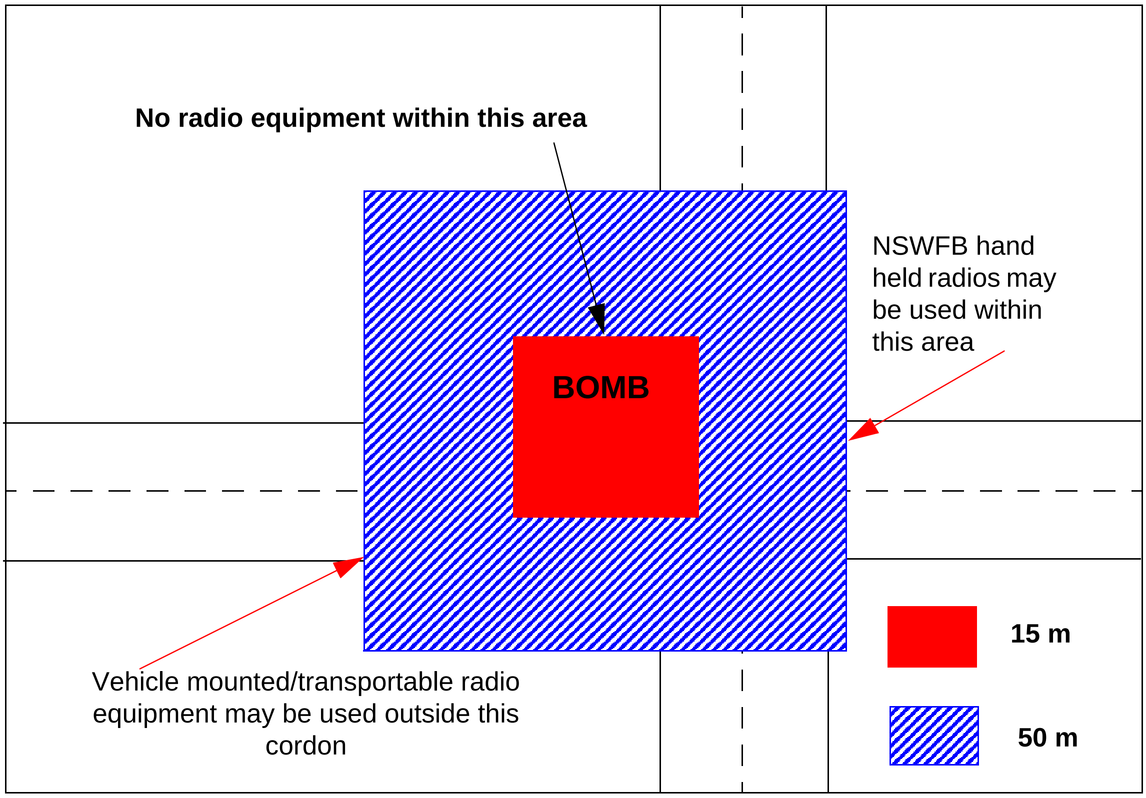


Fig 1.2 Communications Equipment at Bomb Incidents

NOTE

Unauthorised people can intercept radio communications. Messages which could contain classified or sensitive information must be sent by telephone (fixed or mobile).

1.12 Fire Fighting

1.12.1 The NSWFB Commander should ensure that NSWFB crews are not put at undue risk tackling fires when **property only** is involved, until an assurance is received from the NSW Police Service Incident Manager/Controller that there are no secondary devices.

1.12.2 If fire fighting is necessary, consideration should be given to the use of ground monitors and hydrants to restrict fire spread. Defensive rather than offensive strategies should be employed.

1.12.3 Use the minimum number of firefighters required for each task.

1.12.4 Do not extinguish vehicle fires unless instructed to do so by the NSW Police Service Incident Manager/Controller.

1.12.5 Use the minimum amount of water (where possible) to assist in the preservation of evidence.

1.12.6 Protect exposures from the main fire and only attempt extinguishment from protected positions outside buildings. Once the fire has been extinguished and spread stopped, turn off the water and leave the restricted access zone.

1.12.7 If suspect devices are found by NSWFB personnel, no attempt should be made to move them but report the fact to the Incident Commander for notification of the Police and/or Army. NSWFB personnel will immediately leave the area.

1.12.8 Keep fire appliances near a water supply to enable a constant supply of water to be relayed to the combat area.

1.12.9 NSW Police Service liaison is important to ensure free access and exit to/from the scene of operations and the casualty clearing area, particularly when heavy plant and machinery is being used. Positioning of fire appliances and heavy plant should be considered in consultation with the NSW Police Service.

1.13 Rescue/Casualties

1.13.1 The Police and, where appropriate, the Military should be consulted at the earliest opportunity regarding the presence of casualties or trapped people.

1.13.2 If rescue is required, a NSWFB Safety Officer (*SOG 1.6*) should be appointed to assist the NSWFB Commander and to check on the structural safety of affected and neighbouring buildings.

1.13.3 Use only the minimum number of firefighters required for the rescue.

1.13.4 During rescue operations use should be made of any available cover e.g walls, in order to minimise the risks to crews.

NOTE

Glazed areas should be avoided because of the risk from flying glass in the event of an explosion.

1.13.5 The NSWFB Incident Commander should take into consideration the use of aerial appliances to overview the incident scene. It is possible that casualties, limbs etc. may have been blown some distance by an explosion, including the tops of nearby buildings.

1.13.6 It is accepted that in the efforts to save life and rescue trapped people the scene may be disturbed, but care must be taken to preserve, as far as possible, potential forensic evidence.

1.13.7 Deceased persons must be left where discovered unless there are urgent safety or rescue reasons for their removal. If bodies have to be moved, the exact location and positioning of the bodies must be carefully recorded. Where possible, photographs should be taken.

1.13.8 When any trapped or injured person is rescued and removed, it is essential that their location is carefully recorded.

1.13.9 A logical search pattern should be established along with designated areas for depositing rubble clear of the search area, in order to prevent duplication of effort. The NSW Police Service should be informed immediately if any suspicious items are located.

⚠ **NOTE**

Such items must not be moved under any circumstances!

1.13.10 If rescue operations are likely to be large scale or protracted, consideration should be given to activating an Urban Search and Rescue (USAR) Task Force.

1.14 Rescue Personnel

1.14.1 NSWFB personnel deployed on rescue operations must wear full fire fighting uniform at all times.

1.14.2 At a major incident, particularly one at a military establishment, the NSWFB Commander should liaise with the Police and the military about the rescue role and the control of personnel who are to undertake any rescue task.

1.14.3 All NSWFB personnel who are deployed on rescue operations should be monitored for stress and fatigue at all times. Fresh teams should be held back in reserve at designated holding areas. Teams must be regularly relieved and briefed.

1.15 Preservation of Evidence

1.15.1 It should always be recognised that a bomb incident area will be treated as a crime scene and care must be taken to preserve potentially important forensic evidence.

⚠ **NOTE**

It is not a NSWFB responsibility to collect evidence or investigate incidents, but the NSW Police Service may call on the assistance of Fire Investigation.

1.15.2 To assist the NSW Police Service in the investigation of an incident:

- use the minimum amount of water required for the task;
- do not remove any bodies (see para 1.13.7 for exception);
- do not sweep or disturb any debris;
- leave the combat area as soon as the fire is extinguished, search and rescue is complete or hazardous materials are rendered safe; and
- do not re-enter the combat area unless requested by the NSW Police Service Incident Manager/Controller.

NOTE

Minute, fragmentary evidence from bomb incidents may enable the Police to apprehend those responsible.

1.16 Media Liaison and Visits

1.16.1 The NSW Police Service is responsible for all media liaison.

1.16.2 Firefighters may not release any information, photographs or films unless cleared by the NSW Police Service.

1.16.3 The NSW Police Service is responsible for handling any visits by VIPs to the incident.

1.17 Post Incident

1.17.1 The NSWFB Commander is to confirm with the NSW Police Service Incident Manager/ Controller that all necessary fire fighting/rescue duties have been completed in relation to the incident, before leaving the bomb incident scene.

NOTE

Site clearance is a NSW Police Service responsibility.

1.17.2 The NSWFB Incident Commander is responsible for organising operational debriefing of all NSWFB personnel (including ComCen operators) at the end of the incident.

1.17.3 Where personnel have been subjected to personal danger or exposed to deceased persons or body parts, the Incident Commander must organise critical incident debriefing for all personnel.

BOMBS CHECK SHEET

The purpose of this Check Sheet is to provide a list of actions that relate to Incident Command and Control, roles and responsibilities and safety issues associated with attending bomb incidents.

APPLICATION

- This check sheet relates to incidents at which:
  - a bomb or bombs have exploded;
  - unexploded bombs are reported or located; and
  - suspected bombs are reported.
- Bombs include:
  - improvised explosive, incendiary, irritant or poisonous gas bombs, grenades, rockets, missiles, mines or other devices;
  - ordnance such as military weapons, mines or ammunition; and
  - non-military weapons and ammunition.
- All suspected bombs must be treated as live bombs until proven otherwise.

INCIDENT COMMAND AND CONTROL

- Incidents involving bombs often involve unlawful acts and as such the NSW Police Service has overall control as the combat agency.
- The senior NSW Police Officer fulfils the role of Incident Manager/Controller. The NSW Police Service may call for the assistance of the NSWFB, Defence Forces and other emergency services depending on the nature of the incident.
- The officer in charge (OIC) of all NSWFB personnel at the incident, takes the role of the NSWFB Commander and will organise NSWFB activities in accordance with the NSW Police Service requirements and this check sheet.
- The NSWFB Commander will liaise closely with the NSW Police Service Incident Manager/Controller. The best way to do this may be to appoint a liaison officer who will establish direct contact with the NSWFB Commander from the Police Command Post.
- Where the NSWFB arrives at a bomb incident before the NSW Police Service, the NSWFB OIC will assume the role of Incident Controller until the arrival of the NSW Police Service

ROLES AND RESPONSIBILITIES

NSW Police Service

- The NSW Police Service is responsible for the following:
  - overall co-ordination and control of involved agencies,
  - establishing pre-identified rendezvous points for all emergency services,
  - establishing restricted access zones,
  - evacuation (local or large scale),
  - site marshalling,
  - searching for and dealing with bombs,
  - investigating crime scenes and incidents which may result in a coronial investigation,
  - collecting evidence, and
  - site clearance upon completion of the incident.

⚠ **NOTE**

NSWFB Fire Investigation may be asked for assistance with investigations once the site is deemed to be safe.

Defence Forces

- The Defence Forces have specialist bomb disposal squads who the NSW Police Service may call upon to assist at bomb incidents.
- These specialist bomb squads are used at all incidents involving ordnance such as military weapons, bombs, mines or ammunition. They may also provide assistance at other bomb incidents.
- Incidents at, or in the close vicinity of, military establishments are generally controlled by the appropriate Defence Force, who then may call on the assistance of the Police (Anti-terrorist Branch). In these instances a Military Liaison Officer is appointed and Specialist Explosives Officers to provide advice.

NSWFB

- The role of the NSWFB at bomb incidents is to protect life and property from the effects of fires or hazardous material escapes that occur as the result of a bomb explosion. Its role also includes the co-ordination of large scale urban search and rescue operations under the overall control of the NSW Police Service.
- If requested, the NSWFB may also assist in evacuation and assisting the Ambulance Service in multiple casualty incidents.

⚠ **NOTE**

The NSWFB is not responsible for searching for suspected bombs or bomb disposal. Under no circumstances will NSWFB members become involved in, or exposed to, activities (outside their normal duties) where their lives could be endangered.

SAFETY OF FIREFIGHTERS

- The NSWFB Commander is responsible for the safety of all NSWFB personnel at the incident.
- All personnel should keep the following points in mind:
  - ☐ ensure the safety of firefighters and other emergency service personnel;
  - ☐ protect **savable** lives;
  - ☐ protect **savable** property;
  - ☐ wear full fire fighting uniform including eye protection (visor or safety goggles) at **all** times;
  - ☐ use the minimum number of firefighters possible for any operation;
  - ☐ be conscious that secondary devices may have been planted;
  - ☐ keep all access routes clear;
  - ☐ stay in a safe place and **do not** move around unless to perform a specific task;
  - ☐ where a detonation is possible, personnel and equipment should be staged at a safe distance behind substantial cover;
  - ☐ when in a vehicle, keep the windows open and wear eye protection;
  - ☐ audible warning devices must not be used in the vicinity of bomb incidents; and
  - ☐ standby appliances are to be positioned at a safe distance from the incident until required.
- The NSWFB Commander should consider appointing a Safety Officer in accordance with *SOG 1.6 Safety Officers*.

RESPONSE

- When the NSWFB responds at the request of the NSW Police Service to a suspected bomb incident, lights and audible warning devices are not to be used unless otherwise directed.

⚠ **NOTE**

When responding without lights and sirens, the normal road rules apply.

- The NSWFB is not to respond directly to the reported location of a suspected bomb. The NSW Police Service will give the NSWFB Communication Centre (ComCen) a rendezvous point to which all NSWFB personnel and appliances must report.
- If the NSWFB becomes aware of a bomb incident before the NSW Police Service, the latter must be notified and their advice sought on a rendezvous point.

⚠ **NOTE**

Suspected bombs are not treated as emergencies unless there is a confirmed detonation, or the NSW Police Service requests urgent response e.g. to assist with evacuations.

ARRIVAL AT INCIDENT

NSW Police Service in Attendance

- If the NSW Police Service has already taken control of the incident by the time the NSWFB arrive, the NSWFB Commander must:
  - ☐ report to the NSW Police Service Incident Manager/Controller for a briefing;
  - ☐ liaise with the NSW Police Service Incident Manager/Controller in the development of the Incident Action Plan;
  - ☐ act as directed by the NSW Police Service Incident Manager/Controller, provided NSWFB personnel are not placed in unnecessary danger; and
  - ☐ implement Incident Control System (ICS) to command NSWFB operations in accordance with *SOG No 1*.

⚠ **NOTE**

The NSWFB Incident Commander must pay due regard to any advice, instructions, or information given by the NSW Police Service Incident Manager/Controller, before deploying personnel and appliances.

NSWFB First on Scene

- If the NSWFB is the first emergency service to arrive at a bomb incident, the OIC should implement ICS in accordance with *SOG No 1*.
- The NSWFB Incident Controller is responsible for:
  the safe positioning of all NSWFB personnel and equipment,
  - ☐ initiating any required evacuations,
  - ☐ establishing a restricted access zone,
  - ☐ determining the general location of the suspected bomb (this will not involve a search by NSWFB personnel),
  - ☐ considering the possibilities of other hazards or secondary devices,
  - ☐ sending a priority prefix (red, red, red) to the ComCen (*SOG 2.3*), giving details of the incident and requesting urgent Police attendance, and
  - ☐ in the event of fire, protecting exposures and attempting extinguishment from protected positions.
- On arrival of the NSW Police Service, the NSWFB Incident Controller must brief the NSW Police Service Commander, hand over control and assume the role of NSWFB Commander. At this point the NSWFB Commander is to send a SITREP to the ComCen.

⚠ **NOTE**

The NSW Police Service does not use ICS for command and control and may not understand NSWFB procedures.

RESTRICTED ACCESS ZONES

- The NSW Police Service is responsible for establishing restricted access zones, which may have a radius of 600 m from the bomb.
- The NSW Police Service Incident Manager/Controller must give permission before personnel or appliances can enter the restricted access zone.

POSITIONING OF FIRE APLIANCES

- Under no circumstances should the NSWFB respond directly to the reported location of a suspected bomb. The information passed by the NSW Police Service to the NSWFB ComCen should include a specific rendezvous point where all NSWFB personnel and appliances must report.

⚠ **NOTE**

If the NSWFB is notified of a suspected bomb by other means e.g. members of the public, then the Police are to be notified immediately and agreement reached on the initial positioning of vehicles.

- All NSWFB fire appliances should be positioned:
  - outside the restricted access zone unless otherwise required by the NSW Police Service Incident Manager/ Controller;

⚠ **NOTE**

The restricted access zone will be determined by the NSW Police Service and can be up to a radius of 600 m from the suspected bomb location dependant upon circumstances.

  - facing away from the incident with windows fully open, preferably out of the line of sight and behind substantial cover;
  - not in proximity to large areas of glazing, and
  - as close as possible (within the above constraints) to a water supply.

- The NSWFB Commander should consider the following points:
  - ☐ appliances may have to be moved rapidly in an emergency,
  - ☐ access routes must to be kept clear,
  - ☐ parked vehicles may contain secondary devices, and
  - ☐ the NSWFB ComCen is to be kept informed of the location of all appliances.

SECONDARY DEVICES

- The possibility of secondary explosive devices should be taken into account during fire fighting and rescue operations at all bomb incidents. This is particularly important where no warning has been received.
- Guidance should be sought as soon as possible from the NSW Police Service Incident Manager/Controller on safe distances and standby periods when explosives experts check for secondary devices.
- Secondary devices are often intended to cause maximum damage or injury to emergency personnel. These devices are usually placed in a vehicle close to the scene and detonated after emergency personnel arrive.

COMMUNICATIONS

- The NSW Police Service are responsible for establishing communications systems at an incident. The NSWFB Commander must consult with the NSW Police Service Incident Manager/Controller before making any arrangements.

⚠ **NOTE**

NSW Police Service advice on all matters relating to the safe use of communication equipment must be followed.

- Table 1and Fig 1 identify the restricted areas for communication equipment at bomb incidents

DISTANCE FROM BOMB	DO NOT USE	CAN USE
Within 15 m	Radio equipment Hand held radios Cellular phones Mobile phones	Pagers
Within 50 m	Vehicle radios Transportable radio equipment	Hand held radios Pagers Mobile phones Cellular phones
NOTE **If a vehicle fitted with a radio transmitter has to enter the 50 m radius, the radio equipment must be switched off so that no transmission of either speech or data is possible.**		

Table 1: Use of Communication Equipment at Bomb Incidents

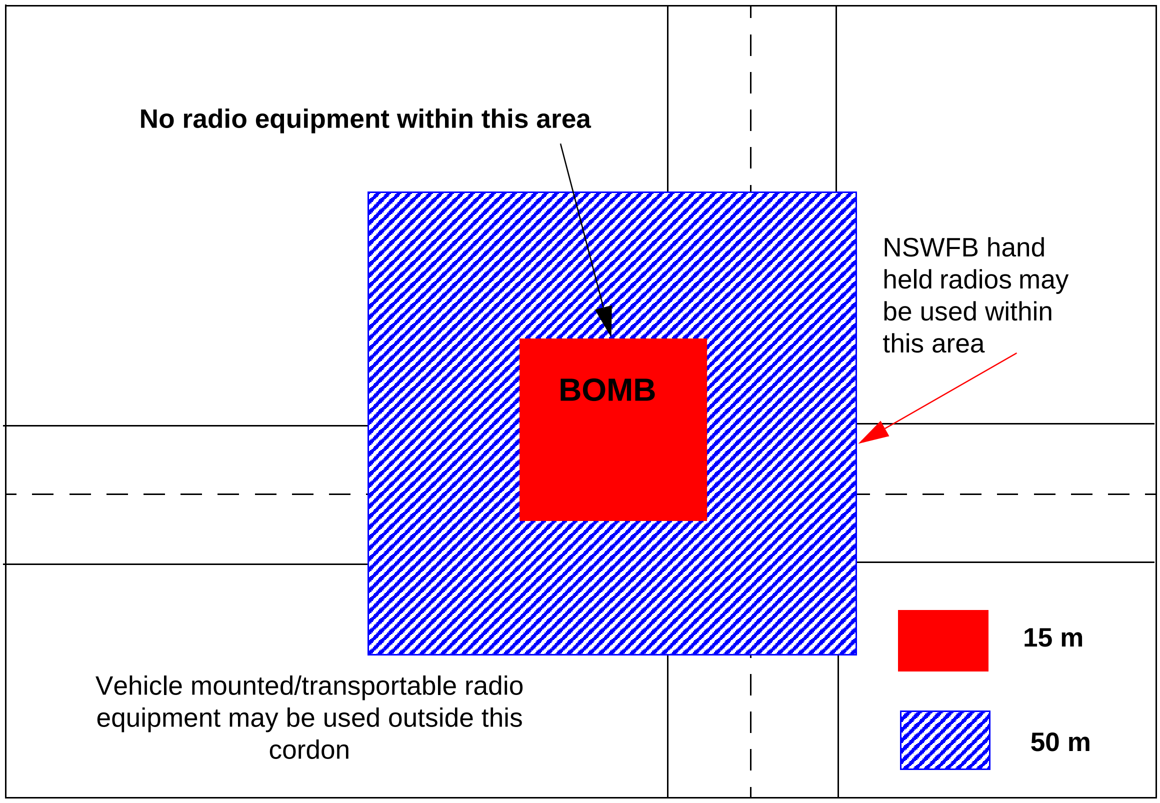


Figure 1 Communications Equipment at Bomb Incidents

NOTE

Unauthorised people can intercept radio communications. Messages which could contain classified or sensitive information must be sent by telephone (fixed or mobile).

FIRE FIGHTING

- The NSWFB Commander should ensure that NSWFB crews are not put at undue risk tackling fires when **property only** is involved, until an assurance is received from the NSW Police Service Incident Manager/Controller that there are no secondary devices.
- If fire fighting is necessary, consideration should be given to the use of ground monitors and hydrants to restrict fire spread. Defensive rather than offensive strategies should be employed.Use the minimum number of firefighters required for each task.
- Do not extinguish vehicle fires unless instructed to do so by the NSW Police Service Incident Manager/Controller.
- Use the minimum amount of water (where possible) to assist in the preservation of evidence.
- Protect exposures from the main fire and only attempt extinguishment from protected positions outside buildings. Once the fire has been extinguished and spread stopped, turn off the water and leave the restricted access zone.
- If suspect devices are found by NSWFB personnel, no attempt should be made to move them but report the fact to the Incident Commander for notification of the Police and/or Army. NSWFB personnel will immediately leave the area.
- Keep fire appliances near a water supply to enable a constant supply of water to be relayed to the combat area.
- NSW Police Service liaison is important to ensure free access and exit to/from the scene of operations and the casualty clearing area, particularly when heavy plant and machinery is being used. Positioning of fire appliances and heavy plant should be considered in consultation with the NSW Police Service.

RESCUE/CASUALTIES

- The Police and, where appropriate, the Military should be consulted at the earliest opportunity regarding the presence of casualties or trapped people.
- If rescue is required, a NSWFB Safety Officer (*SOG 1.6*) should be appointed to assist the NSWFB Commander and to check on the structural safety of affected and neighbouring buildings.
- Use only the minimum number of firefighters required for the rescue.
- During rescue operations use should be made of any available cover e.g walls, in order to minimise the risks to crews.

NOTE

Glazed areas should be avoided because of the risk from flying glass in the event of an explosion.

- The NSWFB Incident Commander should take into consideration the use of aerial appliances to overview the incident scene. It is possible that casualties, limbs etc. may have been blown some distance by an explosion, including the tops of nearby buildings.
- It is accepted that in the efforts to save life and rescue trapped people the scene may be disturbed, but care must be taken to preserve, as far as possible, potential forensic evidence.
- Deceased persons must be left where discovered unless there are urgent safety or rescue reasons for their removal. If bodies have to be moved, the exact location and positioning of the bodies must be carefully recorded. Where possible, photographs should be taken.
- When any trapped or injured person is rescued and removed, it is essential that their location is carefully recorded.
- A logical search pattern should be established along with designated areas for depositing rubble clear of the search area, in order to prevent duplication of effort. The NSW Police Service should be informed immediately if any suspicious items are located.

NOTE

Such items must not be moved under any circumstances!

- If rescue operations are likely to be large scale or protracted, consideration should be given to activating an Urban Search and Rescue (USAR) Task Force.

RESCUE PERSONNEL

- NSWFB personnel deployed on rescue operations must wear full fire fighting uniform at all times.
- At a major incident, particularly one at a military establishment, the NSWFB Commander should liaise with the Police and the military about the rescue role and the control of personnel who are to undertake any rescue task.
- All NSWFB personnel who are deployed on rescue operations should be monitored for stress and fatigue at all times. Fresh teams should be held back in reserve at designated holding areas. Teams must be regularly relieved and briefed.

PRESERVATION OF EVIDENCE

- It should always be recognised that a bomb incident area will be treated as a crime scene and care must be taken to preserve potentially important forensic evidence.

⚠ **NOTE**

It is not a NSWFB responsibility to collect evidence or investigate incidents, but the NSW Police Service may call on the assistance of Fire Investigation.

- To assist the NSW Police Service in the investigation of an incident:
  - ☐ use the minimum amount of water required for the task;
  - ☐ do not remove any bodies;
  - ☐ do not sweep or disturb any debris;
  - ☐ leave the combat area as soon as the fire is extinguished, search and rescue is complete or hazardous materials are rendered safe; and
  - ☐ do not re-enter the combat area unless requested by the NSW Police Service Incident Manager/Controller.

⚠ **NOTE**

Minute, fragmentary evidence from bomb incidents may enable the Police to apprehend those responsible.

MEDIA LIAISON AND VISITS

- The NSW Police Service is responsible for all media liaison.
- Firefighters may not release any information, photographs or films unless cleared by the NSW Police Service.
- The NSW Police Service is responsible for handling any visits by VIPs to the incident.

POST INCIDENT

- The NSWFB Commander is to confirm with the NSW Police Service Incident Manager/Controller that all necessary fire fighting/rescue duties have been completed in relation to the incident, before leaving the bomb incident scene.

⚠ **NOTE**

Site clearance is a NSW Police Service responsibility.

- The NSWFB Incident Commander is responsible for organising operational debriefing of all NSWFB personnel (including ComCen operators) at the end of the incident.
- Where personnel have been subjected to personal danger or exposed to deceased persons or body parts, the Incident Commander must organise critical incident debriefing for all personnel.

8.2 BULK SOLIDS STORAGE FACILITIES (SILOS)

1 Introduction

Fires in bulk solids storage facilities can be extremely hazardous. Most of these fires are slow, smouldering incidents that can be of long duration.

Some of these fires have resulted in unexpected explosions causing severe injuries and fatalities, as well as structural collapse of the container.

2 Application

This Standard Operational Guideline (SOG) applies to fire in any bulk storage container, flatbed storage, ventilated or sealed system or a combination of the two, or ancillary plant used for handling or moving a solid substance in bulk.

The Incident Controller (IC) should recognise that there may be *no quick fix* that can be applied.

3 Definitions

bulk more than 4 tonnes (net), or more than 4 cubic metres of a substance, not in individual packages.

container any type of container intended for the storage or handling of a solid substance in bulk (such as an industrial material or product, crop, forage, or stock feed), usually fitted with a discharge outlet. This includes a silo, field bin, or chaser bin, but does not include flatbed storage.

silo a bulk container that has all the following features:

- located in a fixed position
- equipped with discharge outlets
- capable of being emptied by gravity, mechanical or pneumatic means.

flatbed storage a single level building or other structure designed for the storage of solids in bulk of more than 40 tonnes.

ventilated containers open to the atmosphere, including silos with explosion vents that have activated

sealed a grain container is sealed during fumigation and semi sealed at other times – includes semi-sealed and oxygen limiting containers.

4 Pre Incident Planning

Station Commanders are responsible for producing and maintaining Pre Incident Plans (PIPs) for bulk solids storage facilities.

PIPs should address the points listed in Section 6.1.

With the PIP information gathered, conduct site visits and combined exercises with neighbouring stations.

It is recognised that these significant assets also fall outside NSWFB fire districts and PIPs should be conducted in conjunction with the Rural Fire Service under local arrangements.

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FILE: SOG 8-2 SILO FIRES (VER 02 AMD1).DOC
FILE REF: NFB/01784

5 Hazards

Be aware of the following hazards:

- explosions
- dust explosions
- spontaneous combustion, especially of high oil content products, eg copra
- possible flash fires in flatbed stores
- flammable or toxic gases, especially in crop and fodder storage, eg carbon dioxide, carbon monoxide, methane, hydrogen sulphide, nitrogen dioxide
- dangerous goods stored, eg ammonium nitrate fertiliser
- fumigation chemicals, eg Dichlorvos or Phosphine
- product may expand when wet and cause structural failure
- confined spaces and heights
- moving machinery such as conveyor belts and chains
- possible below ground levels containing machinery/stock
- venomous snakes – especially in grain storage

6 First arriving crews

⚠ **NOTE**

If the fire is in, or could spread to, a sealed storage container, evacuate non-essential personnel a minimum of 800 metres from the container.

Liaise with the senior Police Officer on evacuations and maintaining the 800 metre exclusion zone. Consider activating local emergency management arrangements to support these activities.

6.1 Size up

The Incident Controller's size up and risk assessment should consider any Pre Incident Plan and the following information:

- the location and type of storage containers, especially whether any are sealed
- the type and quantity of material stored
- exposures
- fixed fire protection
- atmospheric inspection ports used to monitor oxygen, lower explosive limits (LELs), and carbon monoxide in container
- fire/blast protection systems
- access to site
- nearest available airport or helicopter landing zone
- location and type of dangerous goods (including fumigation and pesticides)
- site management and emergency response teams (see SOG 4.9, *Wardens and Emergency Response Teams*)
- load carrying capacity of structures – required to establish the amount of water that can be used
- site emergency plans.

6.2 Initial tactics

- Establish a Three Zone System (see SOG 10.1, *Guidelines for all hazardous material incidents*).
- Ensure that all non-essential people are evacuated from the site.
- Ensure that all crews in the Hot Zone wear full firefighting uniform including self contained breathing apparatus.
- Ensure all non-operational personnel are wearing commensurate PPE.
- Set up the Incident Control System including BA Control.
- Sector the site according to exposures and whether the storage is ventilated or sealed.
- Call for extra resources, including specialist, as early as possible.

Before any personnel or equipment are positioned, the IC must confirm whether the storage container is ventilated, whether any process associated with it could create a sealed environment or whether the storage container has a combination of the two.

The IC must closely liaise with the facility operator to determine the contents of the storage container and devise tactics accordingly. The IC should request the Material Safety Data Sheets for all substances from the Site Operator.

The IC should request information on any dangerous goods, including UN numbers. Following this, the IC should check the properties of the substance(s) and refer to the Emergency Response Handbook, Chemdata or ChemKnowledge Free Text Search system (incorporating TOMES Plus).

Overall, precautions must be taken to prevent dust explosions and backdraught according to the construction of the container and the flammability of its contents.

7 Tactics for ventilated storage facilities

WARNING

If the storage container is producing considerable smoke or steam, or if it is vibrating or rumbling, leave the hatch alone and withdraw all personnel a minimum of 800 metres.

When dealing with ventilated storage container:

- Check the effect of water on the contents and structure and drainage points before applying large quantities of water.
- Use water spray, foam or inert gas to extinguish fires in ventilated storage.
- Isolate all ignition points (pilot flames, electricity, etc).
- Do not disturb dust or create dust clouds.
- If contents are to be unloaded when safe to do so, apply water spray as the substance is removed.
- Ensure that crews are not placed in, on or under any storage container or adjacent to access panels, doors, etc.
- Monitor temperatures and combustible gas levels.

8 Tactics for sealed storage facilities

WARNING

Do not allow air to enter a sealed storage container.

Do not use water or foam in a sealed storage container.

If the contents are to be unloaded, ensure remaining contents act as a seal to prevent air entering. Be aware of backdraught risks.

When dealing with a sealed storage container:

- Use nitrogen or carbon dioxide to extinguish the fire. If not available, consider allowing the fire to burn itself out.
- If roof hatches are open and smoke/steam is issuing, leave them open.
- Monitor and record temperatures and combustible gas levels inside the storage container where safe to do so.
- If contents are to be unloaded, ensure remaining contents act as seal to prevent air entering and be aware of backdraught risks.
- Maintain an 800 metre evacuation zone until the fire has been extinguished, regardless of incident duration..

9 Major incidents

Major incidents are those that could be protracted or have substantial impact on a local community. At a major incident:

- Activate the Local Emergency Operations Centre through the Local Emergency Operations Controller (LEOCON)
- establish an Incident Management Team including a Media Liaison Officer
- consider the need for a multi-agency response
- sector according to:
  - * exposures
  - * sealed storage
  - * ventilated storage
- confirm risks and review Incident Action Plan
- set up rehabilitation and organise relief crews
- arrange additional extinguishing medium
- request Police attendance
- send regular sitreps to the ComCen
- ensure all actions are tracked and recorded
- identify cost centres and a project code
- record all information

8.2 BULK SOLID STORAGE FACILITIES (SILOS)

WARNING

If the storage container is sealed, *evacuate to a minimum of 800 metres from the container.*

If the storage container is producing considerable smoke or steam, or is vibrating or rumbling, *leave any hatch alone* and withdraw all personnel to a minimum of 800 metres.

Hazards

- ☐ Explosions
- ☐ Dust explosions
- ☐ Hazardous materials – fumigation chemicals, flammable or toxic gases, dangerous goods
- ☐ Structural hazards:
  - flash fires in flatbed stores
  - moving machinery
  - below ground levels containing machinery
  - confined spaces and heights
  - structural failure due to expansion of contents when wet
- ☐ Venomous snakes

Size up

- ☐ Secure the site and establish a *Three Zone System*.
- ☐ Is the storage container *ventilated or sealed?*
- ☐ Are additional *resources* required? Consider Hazmat.
- ☐ Liaise closely with the *facility operator* to determine contents and hazards.
- ☐ Take precautions to prevent *dust explosions* and *backdraught*.

Tactics – ventilated storage

- ☐ Ensure crews are *not in, on* or *under* the storage container.
- ☐ Before applying large quantities of water, check the *effect of water* on the contents, structure and drainage.
- ☐ Use water spray, foam or inert gas.
- ☐ Isolate ignition points.
- ☐ Do not disturb dust or create dust clouds.
- ☐ If contents are to be unloaded, apply water spray during removal.
- ☐ Monitor temperatures and combustible gas levels.

Tactics – sealed storage

WARNING

Do not allow air to enter a sealed storage container.

Do not use water or foam in a sealed storage container.

If the contents are to be unloaded, ensure remaining contents act as a seal.

- ☐ Maintain an *800 metre evacuation zone* until the fire has subsided.
- ☐ Use *nitrogen or carbon dioxide* to extinguish the fire – if not available, consider allowing the fire to burn itself out.
- ☐ If *roof hatches are open* and smoke or steam is issuing, leave them open.
- ☐ If safe to do so, monitor temperatures and combustible gas levels inside the storage container.

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GUIDELINE SUPPORT DOCUMENT
FOR SOG 8.2 BULK SOLIDS STORAGE FACILITIES

This Guideline Support Document supports SOG 8.2, *Bulk Solids Storage Facilities (Silos).*

It has the following sections:

- Section A: *Bulk solids storage* – provides a description of bulk solids storage, defines the terms used in the industry, describes the Hazards of fires in bulk solids storage facilities, plus environmental considerations.
- Parts B, C and D – provide particular information for dealing with fires in:
  – Section B: *Ventilated storage containers*
  – Section C: *Sealed storage containers*
  – Section D: *Flatbed storage facilities*
- Section E: *Major incidents* – provides further information about major incidents.
- Section F: *Further reading* – lists further reading resources.

Section A: Bulk solids storage

1 Bulk solids storage

Where more than 4 tonnes (net) or more than 4 cubic metres of a material is stored, it is generally referred to as *bulk storage* or *bulk solids storage.* Industries such as manufacturing and agriculture use bulk storage.

Materials are stored in bulk storage *containers* (which can be *ventilated* or *sealed*), or in *flatbed storage*. Facilities for bulk storage generally have mechanised equipment for loading, unloading and moving the material.

A *silo* is a type of bulk storage container.

A range of materials with varying characteristics can be bulk stored – eg materials can have different weights, flammability, toxicity, type of processing, or perishability. This means that bulk storage facilities can be different in size, shape, construction, and location.

The following materials may be bulk stored:

- **Grains** – wheat, sorghum, barley, oats, rice
- **Oil seeds** – canola, sunflower seed, cotton seed
- **Silage** – clover
- **Semi-processed materials** – flour/starch, cotton seed meal, corn meal, fertilizer, cement, sugar, blue metal

In Australia, the main materials that are bulk stored are grain and seed.

2 Definitions

The following terminology is used in the bulk solids storage industry:

Auger	A mechanised screw-type conveyor used for moving grain.
Bulk storage	More than 4 tonnes (net), or more than 4 cubic metres of a material, not in individual packages
Chaser bin	A mobile storage container that is towed by a hauling vehicle while being loaded – primarily used to collect mechanically harvested crops. 
Container	A general term for anything intended for the storage or handling of a solid material in bulk – includes a silo, a field bin or chaser bin, but does not include flatbed storage.
Field bin	A small (approximately 40 tonne) storage container that is placed in a field to temporarily collect grain after it is harvested. It is moved when empty, on retractable or removable wheels. (Caution: The retraction mechanism may cause injury or death if incorrectly operated.) 
Flatbed storage	A single-storey building or other structure designed for the storage of more than 40 tonnes of bulk solid material.
Sealed container	A container that has its openings sealed to prevent oxygen from entering the container – includes containers that are semi-sealed and oxygen-limited.
Silage	Stock feed formed by the bacterial breakdown of vegetable matter (grasses, clover, etc) through fermentation after it has been harvested – in Australia it is used in the dairy and poultry industries.
Silo	A bulk storage container that has all the following features: • Located in a fixed position • Equipped with discharge outlets • Capable of being emptied by gravity, mechanical, or pneumatic means
Silo gas	The name given to lethal gases formed by the fermentation of chopped silage shortly after it has been placed in the silo – it mainly consists of carbon dioxide and nitrogen dioxide.
Ventilated container	A container which is open to the atmosphere.

3 Hazards

There are significant risks when working with bulk storage, including the following hazards:

- Entrapment or engulfment by material
- Confined spaces entry (eg asphyxiation)
- Working at heights (eg from roof tops and ladders)
- Explosions and fires due to the nature of the stored material
- Structural collapse and stability of foundations
- Equipment and machinery such as augers or conveyers (eg lack of suitable guarding)
- Toxic gases
- Creatures such as birds (mites and airborne bacteria) and venomous snakes

3.1 Entrapment or engulfment by material

A common cause of death in bulk storage facilities, particularly in containers such as silos, is suffocation as a result of engulfment in a flowing material like grain. Often the victim entered the container, unaware of the dangers.

Flowing grain is hazardous because it acts like quicksand. It can take 4-5 seconds to be trapped to knee level, and less than 20 seconds to become submerged.

Once trapped knee-deep in grain, a person is helpless to escape due to the immense force the flowing grain exerts on the body. For example, to rescue a 25 kg child caught in knee-deep grain, an adult would have to be able to lift 32 kg. If the same child were shoulder-deep in grain, the adult would have to lift 110 kg.

WARNING

Be aware that appearances can be deceiving. Grain may crust over and look solid, but there may be a cavity underneath the crust. Someone walking on top of the crust could break through and become submerged.

Emergency rescue of a trapped person may be necessary. Because of the danger of engulfment (and other hazards), a bulk storage container is classified as a *confined space* and special entry procedures are required. (See Confined spaces entry for more information.)

Remember the following:

- Examine the need to enter bulk storage containers, and eliminate or minimise the occasions when entry is necessary.
- Never work in front or below an outlet used for loading or unloading material.
- As firefighting techniques may cause unexpected failure of the container, an exclusion zone may need to be established.
- It is not safe to perform any task that requires a firefighter to stand or move on top of grain.

3.2 Confined spaces entry

The *Occupational Health and Safety Regulation 2001* cites silos, a type of bulk storage container, as an example of a confined space. A silo may contain toxic gas, respiratory irritants, or have restricted access. For those entering a silo, there is also the risk of entrapment or engulfment by the material in the silo.

Remember the following:

- Consult SOG 11.3, *Confined Space Operations*, prior to entering a bulk storage container.
- Apart from a rescue incident, firefighters should not enter a bulk storage container.
- Ensure the safety of personnel at all times.

Confined space notice at Gilgandra silos

3.3 Working at heights

NSWFB operations at a bulk storage container such as a silo may require firefighters to work at heights. When working at heights firefighters may be injured due to falls, contact with powerlines, fire development, or an explosion.

Remember the following:

- Implement appropriate measures which take into consideration the risks to firefighters working at heights.
- Consider changing the incident action plan so that working at heights is not required.

3.4 Explosions and fires

Fires and explosions in a bulk storage facility can cause severe injuries and deaths. In addition, there can be structural collapse of a bulk storage container, posing additional risks to firefighters.

Dust and other explosions

Dust explosions are a risk in any bulk storage container because of the type and size of the materials stored, and the way they are stored and moved. The materials are often finely-divided flammable materials which can easily form a dust cloud. If they also find the necessary ignition source a dust explosion can occur.

For example, as Canola grain was being emptied from a ventilated 10 tonne silo it congealed into a stalactite-type formation in the centre of the silo. The grain eventually collapsed as the level of grain subsided, causing large volumes of dust. This dust may easily have exploded had there been a source of ignition.

Other possible causes of explosions are the build-up of flammable gases within a silo (including those generated by rotting or decomposition), and the sudden introduction of oxygen to a burning sealed silo. Firefighting techniques should consider these possibilities.

Remember the following:

- **Do not disturb dust if possible.**
- Do not use Positive Pressure Ventilation (PPV) fans, or solid jet water streams, or any other action that may disturb dust.
- If water is used for extinguishment, use only gentle water sprays.
- Water sprays can prevent a dust explosion and have a cooling effect on hot layers of air, decreasing the chance of a backdraught.
- Isolate ignition sources.

Fires

Most fires in bulk storage facilities are caused by the equipment used to load and unload materials. This includes electrical problems with the equipment, overheated bearings, or friction from slipping belts. These ignition sources readily ignite dust or the dry materials stored.

Another cause of fires is spontaneous ignition within the stored material. This can occur through the fermentation of the material, or by oxidisation (for example, with oil seed products).

The exact location of a fire within a bulk storage container such as a silo will not be easy to determine, but remember that the fire is supported by air entering the container. This could be through cracks in the walls, around doors and hatches, and from air pockets formed when poorly-loaded material does not compact properly.

Remember the following:

- **Under no circumstances are firefighters to enter a fire-affected silo or chute.**
- Follow the firefighting tactics for the type of bulk storage container (ventilated, sealed, or flatbed), outlined in the following sections of this guideline support document.

3.5 Structural collapse

A bulk storage container such as a silo can collapse if it experiences loads beyond its design limits. For example, a silo may collapse if it is filled with materials that are too heavy for the silo, or filled with materials that are corrosive.

Also, an explosion or fire, and the subsequent extinguishment, can also weaken the structure and cause collapse. For example, water can add weight to materials in the container. Some materials may expand when wet, therefore increasing internal forces.

If a bulk storage container should fail, or become unstable, the hazards to a firefighter are obvious.

Remember the following:

- Be aware of the possibility of structural collapse.
- Select appropriate tactics to resolve the incident –for example, use inert gas over water, or establish collapse zones.

3.6 Equipment and machinery

All ancillary equipment and machines in bulk storage facilities should be appropriately guarded to prevent contact with moving parts. However, firefighter injuries and death can still occur. The risks include contact with belts, chains or other moving components, and/or electrocution.

For example, fatal and serious injuries have occurred when people have been unable to control the sudden change of loads on spring-assisted or electronically-operated levers, when lowering or lifting the wheels of field bins.

Remember the following:

- Properly isolate equipment and machinery before operations begin.

3.7 Toxic gases

Toxic gases are sometimes present in bulk storage facilities. They include gases that are produced by the material (eg silo gas from silage), gases added as part of the manufacturing process, or gases added as part of fumigation (eg insecticides).

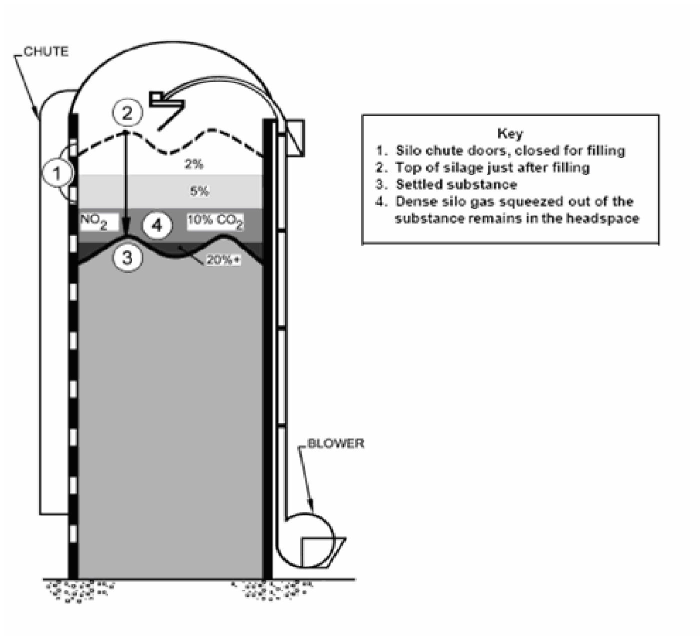
With silage, a variety of gases are formed, with nitrogen dioxide (NO_2) being the most abundant. This highly toxic gas is characterised by a strong, bleach-like odour and low-lying yellow, red and dark brown fumes.

Nitrogen dioxide starts forming within hours of the vegetative matter being placed in the bulk storage container. The gas levels reach a peak three days after harvesting, then decrease rapidly, particularly if the bulk storage container is ventilated. After two weeks it is unlikely that more gas will be produced, although a hazard remains if the gas has been unable to escape the container.

Bulk storage facilities can also contain toxic gases added as part of fumigation. A wide variety of fumigants are used to control pests and vermin, especially at facilities where grain is stored.

Remember the following:

- The NSWFB Orion 4 Head Gas Detector will not detect nitrogen dioxide formed from silage. Specialist detectors available on hazmat appliances must be used.
- Consult with onsite personnel to access Material Safety Data Sheets (MSDS), which will determine the hazards and the appropriate control measures.



Silo with silage, showing typical gas concentration three days after harvesting

Vermin mats at Cootamundra silo – the mats emit phosphine gas to kill vermin

4 Environmental considerations

When dealing with fires at bulk solids storage facilities:

- Monitoring of firefighting water run-off.
- Preventing run-off from entering water sources.
- Where smoke plumes affect populated areas, evacuation of the affected areas.

Section B: Ventilated storage containers

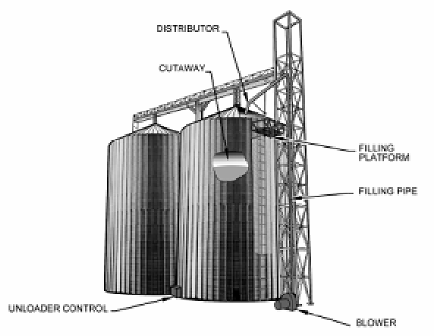
Ventilated silo

1 Construction

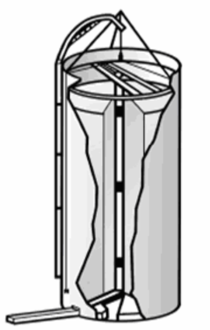
Ventilated bulk storage containers such as silos are typically constructed of concrete staves held together with pre-tensioned steel rods. However, they may be constructed of other materials such as wood, reinforced concrete, glazed tiles, steel, or brick.

The containers will have an unloading mechanism. Unloading doors typically have a latch mechanism and metal rungs which serve as a ladder inside the chute. A typical chute is approximately 1 metre wide by 7.5 metres deep.

Some ventilated silos have an inside chute which is formed as the silo is filled. When unloading, the stored material drops down the inside chute to a conveyor at the bottom.



A top-unloading ventilated silo



A ventilated silo with a formed central chute

2 Size up considerations

Note as many conditions about the fire as possible.

The exact location of the fire may not be known, but is likely to be *near the top* or *near the unloading doors* where air supports combustion.

Conduct a risk assessment, determining the following from onsite personnel:

- Confirmation that the silo is ventilated – if it is not ventilated, the tactics are different.
- The type and quantity of material stored and any technical data on the material.
- The location and type of dangerous goods and MSDS sheets.
- Whether the container has ports for monitoring of atmosphere within the container and records of monitored information.
- Type and capacity of any suppression systems – generally inert gas – and whether bulk supplies of the gas are onsite. If bulk supplies are required, liaise with the onsite staff to organise a supply as soon as possible.
- If inert gas is unavailable, the ability of the container to withstand water used for firefighting.
- The proximity of any exposures, including if an 800 metres exclusion zone from the container is implemented.
- Any site emergency plans or NSWFB pre-incident plans.

3 Tactics

3.1 Initial actions

- Establish a Three Zone System (see SOG 10.1, *Guidelines for all hazardous material incidents*), with consideration that an exclusion zone of 800 metres from the container may be required, depending upon incident conditions.
- Ensure that all non-essential personnel are evacuated from the site.
- Ensure that all crews in the hot zone wear full firefighting uniform, including self contained breathing apparatus.
- Ensure all non-operational personnel are wearing appropriate PPE.
- Set up the Incident Control System, including BA Control and ICMS.
- Sector the site according to exposures.
- Call for extra resources, including specialists, as soon as possible.

3.2 Attempt extinguishment

Inert gas

Use inert gas for extinguishment. This tactic should be considered first because it is effective without damaging the contents or structure.

Generally silos have a means of injecting the inert gas, with larger sites having bulk nitrogen or carbon dioxide onsite.

In all cases, establish the following, ideally in consultation with technical experts:

- Whether the fire can be extinguished by inert gas.

- If so, how long will it take for bulk supplies to be onsite.
- Whether the silo can hold the gas long enough to completely extinguish the fire.

Water

If inert gas is unavailable, *douse and ventilate* to keep the flames from spreading.

- Do not use water jets as dust clouds may be created – use fog or spray nozzles only.
- Be aware that dousing is only effective if the water reaches the fire, so it can only be used for surface burning. This can usually be done effectively from the filling platform or the chute.
- Do not attempt to extinguish the fire by pumping *large* quantities of water onto the surface of the stored material, hoping that it will soak in and cool the fire. Water will not penetrate the stored material well enough. Also, structural damage may occur as the silo may not be able to withstand the higher lateral pressure created by the water.

3.3 Temperature readings

One of the keys to extinguishing a fire in a ventilated silo is finding the exact location of the fire.

- Use a temperature probe, a thermal imaging camera (see SOG 15.1, *Thermal imaging camera*), or a laser thermometer.
- In consultation with technical experts, take several temperature readings, starting near obvious hot spots and moving around the external silo wall. If the fire is caught in its early stages only one hot spot may be present. However, later there may be several hot spots as the fire will follow air to support itself. Consequently, several readings are required.
- Confirm with site personnel, or another technical source, the normal temperature of the silo or material in the silo.
- Repeat the temperature reading every 2-3 hours, to check for dangerous heating.
- Once the temperature is 100^{o}C, or higher, the stored material will eventually char, smoulder or burn.

3.4 Unloading the silo

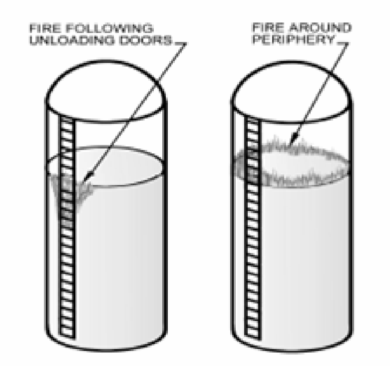
Where the inert gas has failed to extinguish the fire, the contents of the ventilated silo will need to be unloaded. **Do not unload a sealed silo.**

- Consult with onsite personnel for the most effective method of unloading the silo.
- If onsite personnel are to enter the hot zone, ensure that they must have PPE commensurate with the firefighters; otherwise keep them at a safe distance during the unloading process.
- As the silo is unloaded, apply a soft spray to the material being removed.
- Never place crews in a position directly in line with the unloading opening. Water applied to the top of the silo may accumulate within the silo and suddenly discharge under considerable pressure at the opening.

4 Advanced fires in ventilated silos

A silo fire may smoulder or burn for days or weeks before being discovered.

In these advanced stages, the fire rarely remains below the surface or deep within the mass of the stored material – it travels horizontally to the upper surface.



Advanced fire in a ventilated silo, showing fire travel

If the fire reaches dry fuel and abundant air it will burn freely rather than smoulder. This can occur in an advanced fire because:

- The stored material may shrink as it dries, becoming excellent fuel for the fire.
- There may be air space as much as several centimetres wide between the material and the silo wall.
- Smouldering material may form burned cavities which could collapse suddenly, causing an inrush of air and disturbing dust. This could cause a backdraught or dust explosion.
- Unloading doors may leak air and permit a column of material to dry and shrink for some distance within the silo. This leaves a column of potential fuel along the doors.

Where the fire is burning freely rather than smouldering, attack the surface fire, then attack the subsurface fire.

Letting the fire burn out

In some cases the fire may be so advanced that extinguishing is impractical.

For example, if the fire started near the bottom of the silo and has progressed to the top of the chute and several metres back into the stored material, it may be best to allow the fire to burn out on its own.

It may be possible to put out the fire, but it may reignite. This makes unloading dangerous.

If the fire is allowed to burn out:

- Take steps to prevent the spread of fire.
- Be aware that the fire may smoulder for several weeks or months.

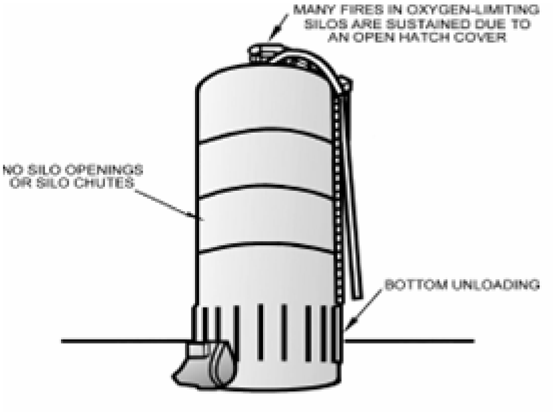
Section C: Sealed storage containers

Examples of sealed silos

1 Construction

A sealed bulk storage contained such as a silo is sealed from the outside atmosphere to prevent degradation of the materials due to atmospheric conditions or pests. This oxygen-limiting process is intended to:

- Reduce the possibility of pest infestation.
- Allow fumigants to be introduced into the silo to destroy pests.
- Reduce the risk of a dust explosion occurring in the silo.
- Allow forage crops to ferment in an oxygen-limited atmosphere.



A sealed silo – with an oxygen-limiting process

Silos which are sealed generally have no outside chute and unload from the bottom. The only vents are pressure-activated, allowing the silo to “breath”, so that pressure does not vary greatly from the outside atmosphere.

The basic rule for sealed silos is to keep all openings closed, except when filling the silo or operating the unloader.

Sealed silos may appear no different from a ventilated silo. Like ventilated silos, they can be constructed of concrete or steel.

2 Fires in sealed silos

There is usually insufficient oxygen in a sealed silo to support a fire after the silo is filled and sealed.

A slow, charring fire will sometimes suffocate due to insufficient oxygen.

Spontaneous ignition fires are rare, but can occur with improper management.

If a fire does occur, the air space above the stored material will contain smoke and carbon monoxide, along with other gases, but only limited oxygen. **Any action which introduces additional oxygen may produce an explosive atmosphere, which may be ignited by smouldering material.**

Fires in sealed silos may be discovered if burnt or burning material comes out of the unloader, or if smoke is escaping from the top hatch

3 Size-up considerations

Upon arrival, determine from onsite personnel whether the silo is sealed – if it is ventilated, the tactics are different.

4 Tactics

4.1 Initial actions

A fire in a sealed silo is potentially very dangerous.

- Prevent explosions:
  - **Do not allow oxygen to enter the silo.**
  - **Do not use water or foam to fight the fire.**
  - **Do not open the top hatch to apply water or foam** – this will allow oxygen to enter. Additionally, the steam formed when the water reaches the fire may contribute to an explosion.
  - **Do not close open hatches if there is smoke or steam coming from them, or if the silo is vibrating.**
- Establish a hot zone (see SOG 10.1, *Guidelines for all hazardous material incidents*). Only allow minimum personnel within the hot zone.
- Establish an exclusion zone of 800 metres from the container. Ensure that only NSWFB personnel are permitted within the exclusion zone.
- Liaise with the most senior Police officer on scene to ensure that all non-essential personnel are evacuated from the site.
- Ensure that all crews in the hot zone wear full firefighting uniform, including self contained breathing apparatus.

- Ensure all non-operational personnel are wearing appropriate PPE.
- Set up the Incident Control System, including BA Control and ICMS.
- Sector the site according to exposures.
- Call for extra resources, including specialists, as soon as possible.

4.2 Attempt extinguishment

If the silo is cool and quiet and if minimal smoke is escaping:

- Seal the unloader opening or hatch (but not if there is smoke or steam coming from it, or if the silo is rumbling or vibrating).
- Carefully climb the silo and close the top hatch or other openings. This will prevent oxygen entering the silo, yet pressure increases can still be relieved safely.
- **Do not lock the top hatch.**
- Seal all openings, such as manhole covers and drain caps used for maintenance.
- Where available, inject nitrogen or carbon dioxide to displace oxygen and combustible gases. Be careful not to introduce additional oxygen. Most sealed silos have pipe nipples for injecting these gases.

5 Advanced fires in sealed silos

If the silo is producing considerable smoke or steam and showing signs of an advanced fire, or if the silo is rumbling:

- **Leave any hatch alone**. Closing the hatch on an active fire could bring carbon monoxide and air mixtures into the explosive range.
- Withdraw all NSWFB personnel to a safe distance.
- Leave the silo isolated and maintain the 800 metre evacuation zone until observations indicate that the fire has subsided. *This may take weeks.* (See Section E: Major incidents for more information.)
- Take temperature readings where it is safe to do so. Continue to do so until the fire has subsided.

Section D: Flatbed storage facilities

Example of a flatbed storage facility

Flatbed storage refers to a single-storey building or other structure designed for the storage of more than 40 tonnes of bulk solid material.

Fires in flatbed storage facilities may have hazards and tactics as outlined in this guideline support document, while others may need to be dealt with as structure fires.

When attending a fire in a flatbed storage facility, use this guideline support document to conduct a systematic and dynamic risk assessment and size up.

Factors to consider include (but are not limited to):

- Wall strength of the structure
- Self-heating leading to the fire
- Type of material stored
- Access to the storage areas
- Use of associated plant equipment, such as front end loaders

Section E: Major incidents

Major incidents are those that could be protracted, or have a substantial impact on the community; for example, the silo incident at Cootamundra in 2007 lasted seven days.

- Liaise with Police and activate the Local Emergency Operations Centre (LEOC) through the Local Emergency Operations Controller (LEOCON) as soon as possible. This will ensure that Police help establish and maintain the 800 metre exclusion zone, to keep the population safely away from the incident.
- Establish and Incident Management Team (IMT), including Safety Officer and Media Liaison Officer:
  - Safety Officer is to maintain span of control and ensure that the Incident Crew Management System (ICMS) and other safety measures are adhered to.
  - Media Liaison Officer is to ensure a clear and direct link is established between the IMT and all media for accurate information flow.
- As the major incident will need multi-agency response, ensure that representatives of other agencies, as well as onsite technical experts, are included on the IMT.
- Develop and review an Incident Action Plan (IAP), including regular risk assessments, to ensure that effective handovers take place. Track and record all incident operations as well as IMT briefings and outcomes.
- Give early consideration to rehabilitation resources and relief personnel, including relief IMT and specialist officers. Liaise closely with the Response Coordinator (RESCO) and Major Incident Coordination Centre (MICC).
- Consider using T-cards to track the movements of all attending NSWFB personnel.
- Make all requests for additional resources, such as bulk extinguishing media, through the LEOC.

Section F: Further reading

Read more about fires in bulk solids storage facilities.

- WorkCover, 2006, *Safe use of bulk solids containers and flatbed storage facilities including silos, field bins and chaser bins: Code of practice*.
- WorkCover, 2005, *Safety aspects in the design of bulk solids containers and flatbed storage facilities including silos, field bins and chaser bins: Code of practice*.

8.3 CORRECTIONAL FACILITY INCIDENTS

1 Introduction

The NSW Department of Corrective Services (DCS) is responsible for the security, safety and rehabilitation of people sentenced to serve time in a correctional centre.

DCS properties include all classifications of buildings and involve all types of fires. There are 100–200 fires per year in DCS facilities across NSW that NSWFB personnel may be called to at any time.

2 Application

This guideline applies to all NSWFB personnel called to incidents at DCS facilities and is intended to provide NSWFB Commanders with information to assist strategic and tactical decision making during planning, response and recovery operations at fires and other incidents in DCS facilities. It defines the roles and responsibilities of the NSWFB in these incidents and recognises that each service is responsible for its own operations and the operational safety of its personnel while protecting inmates, staff and property.

3 Command and control

During an incident at a DCS facility, the Governor of the facility or the Officer in Charge of the DCS Security Unit is the Site Controller (SC).

The NSWFB Officer in Charge is the Incident Controller (IC).

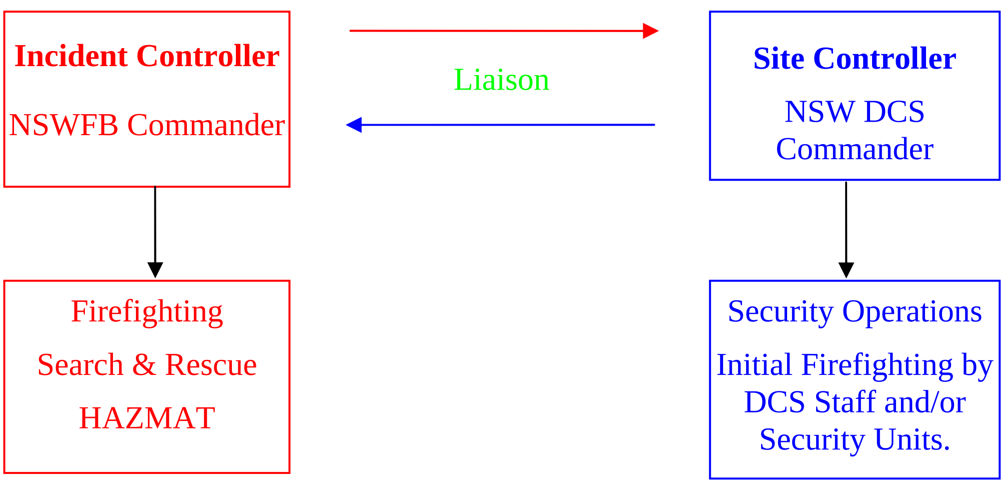
The NSWFB IC, in consultation with the DCS SC, is responsible for all firefighting operations.

The DCS IC is responsible for all security considerations and the safety of all NSWFB and DCS staff from possible danger by inmates.

DCS must act on the advice of NSWFB in relation to controlling fire and HazMat incidents within correctional centres.

NSWFB must act on the advice of DCS in relation to correctional facility security and inmate management.

NSWFB/DCS combined fire/security emergency operations



4 Major incidents

At a major incident, the NSWFB must implement the Incident Control System with the Incident Command Vehicle and liaise closely with the DCS Site Controller who will be identified by his/her DCS tabard.

The NSWFB Corrective Services Liaison Officer/DCS Fire Control Unit Manager must be notified of any incidents and take on the combined role of liaison officer and DCS fire team/firefighting specialist upon his/her arrival.

5 Incidents

On arrival, the IC must advise the NSWFB Communication Centre (ComCen). If the crew is not met at the main gate, the IC must contact DCS staff.

In a large complex, a Corrections Officer will meet the NSWFB at the main gate, guide them to the incident area or centre and provide all relevant information.

Upon agreement between the IC and the SC, NSWFB will either remain on standby or enter the correction centre and take charge of firefighting and search and rescue operations.

ComCen must be notified of all consultative decisions.

The IC and crew must not enter the centre until the SC confirms that the environment is safe and secure.

After consulting with the SC, the IC must inform ComCen of the safety and security of the facility and his/her intention to enter, or not to enter.

The IC must inform ComCen if entry to the facility is delayed for security reasons.

The SC and/or Fire Safety Manager, and a security unit if required, must escort the IC and crew upon entry to the facility.

The NSWFB officers and firefighters must be dressed in full firefighting uniform or as directed by the IC.

If the fire was extinguished prior to his/her arrival, the IC must enter the facility to confirm that there is no danger of re-ignition, to reset the Fire Indicator Panel (if applicable) and to take details for recording on the Australian Fire Incident Reporting System.

Note **Liaise with DCS officers to identify prisoners involved in the incident and their mode of dress.**

5.1 Protect-in-place strategy

A ‘Protect-in-Place’ strategy defines requirements such as risk management, fire safety, fire prevention, staff training and installed fire fighting equipment that minimise the need for building evacuation by containing a fire to the point of origin.

This strategy is needed because an egress system based on evacuation cannot ensure safety. Doors and gates cannot or will not be unlocked quickly due to the security problems associated with releasing or evacuating inmates en-masse.

6 Riots

Riots in DCS facilities are extremely dangerous and complex situations.

In the event of a riot, the NSWFB may be required to remain on standby outside a DCS facility while the DCS conducts security activities inside.

The NSWFB will be marshalled in a suitable staging area, remain on standby and be used only for firefighting operations, if required.

Requests from DCS personnel for standpipes, hose, branches, etc, may be met, provided that lending the equipment does not affect NSWFB capability.

Actions taken on arrival and for entry are the same as for Section 5.

7 Police court cell complexes

DCS personnel manage most Police Court Cell Complexes.

NSWFB officers must deal with Police Court Cell Complexes according to this SOG.

8.3 CORRECTIONAL FACILITY INCIDENTS

Correctional centres are controlled by the NSW Department of Corrective Services (DCS). DCS also manages most Police Court Cell complexes – where these guidelines also apply.

Command and control

DCS governor or officer-in-charge of the security unit:

- ⇨ Is the Site Controller (SC)
- ⇨ Is responsible for security of inmates and safety of NSWFB and DCS staff from possible danger from inmates
- ⇨ Advises NSWFB on facility security and inmate management

NSWFB officer-in-charge:

- ⇨ Is the Incident Controller (IC)
- ⇨ In consultation with SC, is responsible for firefighting operations
- ⇨ Advises DCS on fire, search and rescue, and hazmat operations

Protect-in-place strategy

Correctional centres have security problems with evacuating inmates en-masse – doors/gates will not be quickly unlocked:

- ⇨ A *protect-in-place strategy* minimises the need for evacuations.
- ⇨ The strategy defines requirements for early warning and containing a fire to its point of origin.

Arrival at centre

- ☐ Advise the ComCen of arrival.
- ☐ *Make contact* with DCS staff at the main gate. For a correctional complex – consisting of a number of centres – meet DCS staff at the complex main gate.
- ☐ Obtain information about the incident and its location.
- ☐ With agreement between SC and IC, either *remain* on standby, or *enter* the correctional centre. *Notify* the ComCen of the decision.

Entry

- ☐ **Do not enter** the centre until the SC confirms that the environment is *safe* and *secure.*
- ☐ Notify the ComCen of entry. Notify ComCen if entry is delayed for security reasons.

Safety

- ☐ Within the correctional centre, always be *escorted* by DCS staff and a security unit, if required.
- ☐ Liaise with DCS staff to identify inmates involved in the incident and their mode of dress.

⚠ **NOTE**

NSWFB officers and firefighters must wear full firefighting uniform, or as directed by the IC.

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Riots

If the incident is a riot:

□ Remain on *standby* at a safe location outside the centre, until required – NSWFB will only be used for firefighting operations.

□ If it does not affect NSWFB capability, *meet DCS requests* for standpipes, hose, branches, etc.

□ If entry is required, follow entry and safety guidelines (over the page).

Fire extinguished

If a fire is extinguished before NSWFB arrival, the IC must:

□ *Enter* the centre and confirm that there is no danger of re-ignition.

□ *Reset* the Fire Indicator Panel (if applicable).

□ *Take details* for the AIRS report.

5 DUST EXPLOSION HAZARDS

5.1 Introduction

5.1.1 The presence of combustible dust at an incident can indicate that there is a risk of a dust explosion and therefore a serious threat to life and safety. This SOG assists firefighters to identify the risks and choose the appropriate strategies and tactics for dealing with dust explosion hazards and dust fires.

5.2 Application

5.2.1 This SOG applies to any incident where there may be a dust explosion hazard. This may include fires, as well as rescues, hazardous materials and other incidents.

5.3 Dust explosion hazards

5.3.1 The combination of combustible dust, air and a source of ignition can produce a dust explosion. Dust explosions have the capacity to cause severe property damage, injury and death.

5.3.2 There is a dust explosion hazard at any incident in a dusty environment, whether it is a fire, rescue, hazardous materials or other type of incident. There does not have to be a fire or hazardous material present.

5.3.3 Dust explosions in a building or confined space, such as a vessel or silo, present greater hazards because of the pressure build up.

5.4 Risk assessment

5.4.1 During size up of an incident in a dusty environment, Incident Controllers must consider the following five factors:

- is a combustible dust present?
- is the dust exposed to the air?
- is there a source of heat or ignition?
- is there a dust cloud?
- is the dust confined in a vessel, silo, mine, or other enclosed structure?

5.4.2 The more of these factors that are present, the higher the risk of a dust explosion.

Number of factors present	Risk level
All five factors	Extreme
Four factors	High
Three factors	Medium
Only one or two factors	Low

5.4.3 The more factors you can eliminate, the lower the risk of a dust explosion.

5.5 Initial actions

5.5.1 Where there is a risk of a dust explosion, the Incident Controller must:

- establish a hot zone with a radius of at least 200 metres from the area of the dust explosion hazard;
- ensure all personnel who enter the hot zone are wearing full personal protective equipment including breathing apparatus, and that all their equipment is intrinsically safe;
- evacuate everyone;
- find out if there are any people trapped, and;
- decide whether to adopt a defensive, marginal or offensive strategy:

5.6 Strategies

5.6.1 **Defensive** - adopt a defensive strategy when all five factors are present (see 5.4.1), making the risk of a dust explosion extreme. This strategy concentrates on protecting life by evacuating the hot zone and surrounding structures and protecting exposures. Access to the hot zone must be tightly controlled.

5.6.2 **Marginal** - employ a marginal strategy where search and rescue operations are necessary in a situation where the risk would normally require a defensive strategy. Once careful search and rescue operations have been completed, the Incident Controller will normally change to defensive mode.

5.6.3 **Offensive** - an offensive strategy centres on lowering the risk of a dust explosion by removing the risk factors, then rendering the incident safe. A pre-condition for this strategy is the control or removal of at least one risk factor, preferably two.

5.7 Dust clouds

5.7.1 If there is a dust cloud, or it is suspected that there is one, and fires, heat sources or ignition points are present, the risk is **extreme**, and defensive strategies must be implemented.

5.7.2 Do not deploy crews into a dust cloud unless search and rescue operations are absolutely necessary on the basis of *confirmed* people missing. This would be a snatch and grab rescue only, to minimise exposure of crews to the risk.

5.7.3 Allow time for the dust cloud to settle before starting operations in the hot zone.

5.7.4 While the dust cloud is settling, take steps to reduce risks using remote tactics.

5.8 Tactics for controlling and removing ignition sources

5.8.1 The Incident Controller should consider the following tactics for controlling or removing ignition sources:

- do not introduce non-intrinsically safe equipment, such as communications equipment, rescue equipment or small engines, into the hot zone unless other risk factors are controlled;
- use pillar hydrants supported by a pumper at the booster assembly to avoid bringing the pumper into the hot zone or using on-site power systems;
- shut down power and other utilities, including essential services, using means outside the hot zone, if possible:
-

CAUTION

Remember that there may be stand-by power systems in place.

- shut down plant and processes, including mechanical ventilation processes, in consultation with plant operators.
- Be aware that shutting down some processes may create additional hazards.

NOTE

Safety considerations must override commercial considerations,

- avoid actions involving considerable metal to metal contact, such as opening roller doors.

5.9 Tactics for controlling dust

5.9.1 The Incident Controller should consider the following tactics for reducing the risks from the dust:

- restrict access to the hot zone to only those personnel absolutely necessary to perform operations
- if there is a dust cloud present, wait for it to settle
- do not stir up the dust
- do not use installed or portable mechanical ventilation
- ensure that pumpers have their delivery pressures set to provide low to moderate pressures (below 500 kPa) at the branch
- apply gentle low pressure water spray or a foam blanket to wet down dust. Do not use high pressure fog sprays.

5.10 Tactics for fighting dust fires

5.10.1 When the Incident Controller considers the risk low enough to adopt an offensive strategy, the following tactics should be employed for fighting fires in dusts:

- if the dust fire is in the open, or not in a confined area, gently apply low pressure spray or foam to wet down dust near the fire before attempting to extinguish the main fire.

WARNING

Do not use water on metal dust fires inside a building. If a metal dust fire is in a very open area, a gentle spray may be applied from a safe distance to accelerate the burning of the metal dust and consume the fuel. The fumes produced will be highly toxic.

- apply gentle spray or low pressure, low percentile foam to the dust fire.
- where safe to do so, use thermal imaging cameras to monitor the location of heat sources.
- for lingering fires, such as those involving spontaneous ignition, use gentle flooding, with open ended hose.
- do not open up stacked or bulk material unless it has been flooded or drenched for a significant period.

5.11 Dust fires in containers

5.11.1 Consider using monitors, or hoselines operating unattended, in a spray pattern to cool containers.

5.11.2 For spontaneous combustion fires where the product cannot be safely removed, keep the container sealed and isolated and cool the exterior while wetting down the immediate area.

5.11.3 Where safe to do so, monitor the external surface temperature of the container.

5.11.4 For large containers or vessels (exceeding 25 tonnes capacity), it may be possible, using extreme caution and protection, to open small hatches at the top, to introduce CO2 into the container. Ensure that prior to opening a small hatch, any dust cloud within the container has had time to settle or abate, and all systems of plant and power are isolated.

WARNING

Do not open any container or vessel, large or small, if the dust fire involves hazardous materials.

CAUTION

Bulk nitrogen may not be suitable, as it is normally delivered at very high pressures in order to avoid icing. High pressures may stir up the dust and increase the risk.

5.11.6 For additional information on fires in containers, see SOG 8.2 *Silo fires.*

8.5 DUST EXPLOSION HAZARDS

A dust explosion hazard exists at *any incident in a dusty environment* – there does not need to be fire or hazardous materials present. Dust explosions in a building or confined space (such as a vessel or silo) present greater hazards because of pressure build-up.

Risk assessment

Size up the following:

- ☐ Is a combustible dust present?
- ☐ Is the dust exposed to the air?
- ☐ Is there a source of heat or ignition?
- ☐ Is there a dust cloud?
- ☐ Is the dust confined in a vessel, silo, mine, or other enclosed structure?

The more factors present, the *higher* the risk of a dust explosion.

The more factors that you *eliminate*, the *lower* the risk.

Upon arrival, the Incident Controller (IC) must:

- ☐ Establish a Hot Zone with a radius of at least 200 m from the dust explosion hazard. Evacuate everyone.
- ☐ Ensure all personnel who enter the Hot Zone wear full PPE and SCBA – and that all equipment is intrinsically safe.
- ☐ Find out if anyone is trapped.
- ☐ Determine strategy – defensive, marginal, or offensive.

Dust clouds

If there is a dust cloud and ignition sources are present, the risk is **extreme.**

- ☐ Adopt a defensive strategy. Do not deploy crews into the dust cloud unless search and rescue operations are absolutely necessary.
- ☐ Allow time for the dust cloud to settle before starting operations in the Hot Zone. While dust is settling, use remote tactics to reduce risks.

Dust fires in containers

- ☐ Consider using monitors, or hoselines operating unattended, in a **spray pattern** to cool the container.
- ☐ For a spontaneous combustion fire where the product cannot be safely removed, keep the container sealed and isolated. Cool the exterior while wetting down the immediate area.
- ☐ Where safe to do so, monitor the external surface temperature of the container.
- ☐ For large containers it may be possible to open small hatches at the top, to introduce CO_2.

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WARNING

Do not open the container if the dust fire involves hazardous materials.

Tactics – controlling and removing ignition sources

- ☐ Use intrinsically safe equipment in the Hot Zone – don't use communications equipment, rescue equipment or small engines in the Hot Zone.
- ☐ Use pillar hydrants supported by a pumper at the booster assembly – avoid bringing the pumper into the Hot Zone, or using on-site power systems.
- ☐ Shut down power and other utilities. Remember there may be stand-by systems in place.
- ☐ Consult with plant operator to shut down plant and processes. Safety considerations must override commercial considerations.
- ☐ Avoid actions involving metal-to-metal contact.

Tactics – controlling dust

- ☐ Restrict access to the Hot Zone.
- ☐ Wait for any dust cloud to settle.
- ☐ Do not stir up dust.
- ☐ Do not use installed or portable mechanical ventilation.
- ☐ Have pumpers provide low to moderate pressure at the branch.
- ☐ Wet down dust with gentle low-pressure water spray or foam – do not use high pressure fog sprays.

Tactics – fighting dust fires

When the IC considers the risk low enough to adopt an offensive strategy:

- ☐ If the dust is in the open (not in a confined area), wet down dust *near the fire* with gentle low-pressure water spray or foam.
- ☐ Apply gentle water spray or low-pressure, low-percentile foam *to the dust fire*.
- ☐ Where safe to do so, use thermal imaging cameras to monitor the location of heat sources.
- ☐ For lingering fires, use gentle flooding with open-ended hose.
- ☐ Do not open stacked or bulk material unless it has been flooded or drenched for a significant period.

WARNING

Do not use water on metal dust fires inside a building.

If a metal dust is in a very open area, apply a gentle spray from a safe distance to accelerate the burning.

The fumes produced will be highly toxic.

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7 TERRORIST INCIDENTS

7.1 Introduction

7.1.1 Terrorists achieve their purposes through actions calculated to cause confusion, panic and loss of confidence in a targeted community.

7.1.2 Terrorists may use weapons of mass destruction or more subtle methods to cause deaths, injuries, and destruction.

7.2 Scope

7.2.1 The intent of this guideline is to provide NSWFB Commanders with guidance and information to facilitate strategic and tactical decision-making during planning for, response to, and recovery from terrorist incidents. Such incidents may include the actual or potential release or activation of:

- biological agents;
- nuclear or radiological devices or material;
- incendiary devices;
- chemical agents; or
- explosives.

7.2.2 This SOG complements and should be read in conjunction with

- SOG No 1 *Incident Control System*
- SOG No 8.1 *Bombs*
- SOG No 8.8 *Terrorism – Biological Incidents*
- SOG No 8.9 *Terrorism – Radiological Incidents*
- SOG No 8.10 *Terrorism – Incendiary Incidents*
- SOG No 8.11 *Terrorism – Chemical Incidents*
- SOG No 8.12 *Terrorism – Explosives Incidents*
- SOG No 10 *Hazardous Materials*
- SOG No 10.15 *Chemical Biological and Radiological Incidents*
- SOG No 16 *Clandestine Drug Laboratories*
- SOG No XX *Urban Search and Rescue Incidents*, and
- SOG No 19 *Emergency Management.*

7.3 Crisis and consequence management

7.3.1 Terrorist incidents are generally divided into two phases: *crisis* and *consequence*.

Crisis management

Crisis management (pre-event) is predominantly a law enforcement function, with emergency services playing a supporting role where necessary. The measures taken by law enforcement agencies include identifying, acquiring and planning the use of resources needed to anticipate, prevent, and/or resolve a threat or act of terrorism. In a terrorist incident, a crisis management response may include traditional law enforcement missions, such as intelligence, surveillance, tactical operations, negotiations, forensics, and investigations. Additionally, crisis management may include technical support missions, such as agent identification, search, render safe procedures, transfer and disposal, limited decontamination and assurance of public health and safety.

Consequence Management

Consequence management (post-event) is predominantly an emergency management function and includes measures to protect public health and safety, restore essential government services, and provide emergency relief to governments, businesses, and individuals affected by the consequences of a terrorist act.

7.4 Command and control

7.4.1 The NSWFB could be the first emergency service to arrive at the scene of a terrorist act. Depending on the scope and nature of the incident, NSWFB Commanders could be faced with complex and competing operational priorities. These could include:

- fire suppression
- search, rescue and extrication
- triage and first aid medical treatment
- crowd control and site security
- incident control and management; and
- hazmat and recovery operations.

7.4.2 Whatever the situation, NSWFB Commanders may need to take charge of the incident in the initial stages until a multi-agency command and control system can be established.

7.4.3 Central to effective management of any terrorist incident response is liaison between the emergency services, both at the incident scene and at the organisational control level. This is best achieved through the early establishment of a forward control point where all agencies can work together and liaise closely.

7.4.4 Where the NSWFB is in attendance and the situation is:

- a fire incident
- a hazardous materials incident (including CBR), or
- an impending hazardous materials incident (including an impending CBR incident)

the NSWFB Commander will immediately assume and maintain control of NSWFB operations on the incident ground.

7.4.5 It needs to be understood that the scope and implications of a terrorist act may mean that, in contrast to a routine hazmat or fire incident, law enforcement agencies may take a primary controlling role. The site will not only be a fire, rescue, or hazardous materials incident scene, but also a crime scene.

7.4.6 Where the scale and complexity of an incident normally under the legislative control of the NSWFB is beyond the capacity of the NSWFB, the NSWFB Commander must ensure that the Commissioner is immediately advised so that the State Disaster Plan (DisPlan) can be activated.

7.4.7 Commanders should not inappropriately seek to maintain control where a multi-agency approach and outside assistance are clearly required. The sooner that outside assistance is requested, the more speedily recovery operations will be organised.

7.5 Prorities

7.5.1 NSWFB Commanders must implement strategies to deal with a terrorist incident based on the following priorities, in the order stated:

- Quickly conduct a **Size Up and Risk Assessment** of the incident to identify obvious risks and possibilities of further risk.
- Set up and enforce an initial **hot zone.**
- Provide an **initial situation report** to the ComCen. If there is any possibility of a secondary explosive device, *all* communication equipment within 25m of the device or suspicious area must be turned off and not used.
- Establish a Multi Agency Incident **Control Point and Incident Management Team using ICS.**
- Call for **specialist support**.
- Implement a strict **PPE** regime.
- Nominate **Staging** arrangements and convey to ComCen.
- **Rescue**, assess decontaminate or provide first aid to victims.
- **Neutralise** or render safe the source of the incident where safe to do so.
- **Plan** for crew rotation to minimise exposure and fatigue.

- **Monitor** the site and environment to determine whether level of risk is increasing or decreasing.
- **Liaise** with Police, Ambulance, Health and support agencies.
- **Record** observations, times, tactics and strategies, by way of field notes diagrams etc.
- Manage **media** statements at site.
- Aim to r**estore** essential services to mitigate inconvenience.
- Preserve **evidence.**

These tasks are considered in more detail below.

7.6 Size up

7.6.1 Look for physical indicators to identify the hazards and assess the level of risk.

7.6.2 *Is there a debris field?* Indicates the use of an explosive or incendiary device, and the possibility of secondary devices.

7.6.3 *Are there mass casualties with minimal or no trauma-related injuries or thermal injuries?* Could indicate use of chemical agents.

7.6.4 *Are there victims exhibiting symptoms such as seizures?* Could indicate chemical agents including nerve agents.

7.6.5 *Is there blistering, reddening of skin, other discolouration or skin irritation?* Could indicate blister agents.

7.6.6 *Are victims having difficulty breathing?* Could indicate blister agents, choking agents, or asphyxiants.

7.7 Initial Situation Report

7.7.1 It is imperative that as much information as possible is passed to senior command officers and law enforcement agencies. Initial and ongoing situation reports are crucial

NOTE

Radio is not a secure form of communication for confidential or sensitive information.

7.7.2 Advise the ComCen as soon as possible about:

- immediately obvious circumstances, including approximate numbers of casualties and the extent of any physical damage to buildings or infrastructure.
- initial strategies and tactics.
- the location of the Incident Control Point.

7.8 Exclusion zone

7.8.1 First arriving officers must establish, cordon off and enforce a hot zone (see SOG 10.15).

7.8.2 To determine the size of the hot zone consider:

- the number people showing immediate symptoms of exposure to chemicals, burns, blast injuries etc;
- damage to buildings, structures, vehicles, vessels, and infrastructure,
- the size of the debris field following an explosion, and
- threats received in relation to an attack, including the location of primary and secondary devices

7.8.3 If the presence of chemical, biological or radiological materials is suspected, implement a warm zone.

7.8.4 When exclusion zones are established, plan to maintain the following staffing patterns:

- a minimal yet effective number of personnel in the Hot Zone, to minimise exposure to danger
- sufficient resources and logistics support in the Warm Zone to support Hot Zone operations, and
- plentiful resources staged nearby to provide regular relief for committed crews or to accommodate an escalation of the incident.

7.9 Incident Control

7.9.1 The Incident Control System (see SOG 1) must be implemented immediately upon arrival of the first appliance and expanded as additional resources arrive.

7.9.2 A Multi Agency Incident Management Team must be established so that the work of all agencies involved is coordinated.

7.9.3 Operations, Planning, Logistics and Safety Officers should be appointed as soon as possible.

7.9.4 The Incident Controller will also need to appoint officers to manage specific functions and tasks such as:

- personal protective equipment use
- maintenance of exclusion zones
- water supply
- structural monitoring or other urban search and rescue functions
- evacuation
- decontamination
- transport
- rehabilitation
- critical incident support

7.9.5 In the interests of effective control, such functions should be delegated sooner rather than later.

7.9.6 Do not underestimate the personnel resources needed to manage a major, complex incident. State Operations should be requested early in the operation to assist by sourcing and providing the personnel and facilities required for effective command and control.

NOTE

When working out how much assistance is required, remember that at least two firefighters will be needed to assist in removing each casualty.

7.10 Specialist support

7.10.1 When calling for support, think ahead in hours, and give the ComCen as much notice as possible of the resources required.

7.10.2 A terrorist incident may require some or all of the following resources:

- Hazmat support
- USAR teams
- additional crews and appliances
- senior commanders for ICS
- assistance from the Police, Ambulance, Health, Environment Protection Authority, Roads and Traffic Authority or State Rail Authority

7.11 Personal protective equipment

7.11.1 Assess the risks at the incident and implement PPE management accordingly.

7.11.2 Maintain strict management of PPE in the hot and warm zones.

7.11.3 Where the risk is not immediately obvious enforce the highest level of PPE.

7.11.4 Delegate the management of PPE to an officer in the ICS structure.

7.11.5 Be prepared to include PPE not usually required for firefighting, such as dust masks, goggles, industrial and rubber gloves, etc.

7.11.6 Provide advice to other agencies on the required level of PPE.

7.12 Stage resources

7.12.1 Staging areas for emergency services may present targets for secondary attacks.

7.12.2 Rather than establishing a single staging area, establish a number of smaller staging areas in reasonable proximity to the incident.

7.12.3 Similarly, if more than one incident occurs at a given location, the site of staging areas should be varied.

7.12.4 Conducting regular exercises using the same staging areas can provide terrorists with information that may be used for targeting secondary devices.

7.12.5 Pre-incident plans should list a number of possible staging areas rather than designating a particular site.

7.13 Rescue

7.13.1 The first priority is the safety of firefighters and other emergency workers.

7.13.2 The second priority is saving savable lives.

7.13.3 The nature of a terrorist act may mean that normal modes of operation are impractical, and would place the lives of firefighters and others in danger. For example it may not be possible to conduct immediate search and rescue, or removal, of victims.

7.13.4 Where there is any possibility of contamination, secondary devices, or further structural collapse a marginal strategy may be considered.

7.13.5 After a comprehensive size-up and assessment of the risk to emergency services personnel and the public, the Incident Controller must decide whether circumstances permit a fast primary search and rescue operation to rescue people with the greatest possibility of survival before returning to defensive mode.

CAUTION

The minimum level of personal protection to be worn when operating in marginal mode is full firefighting uniform and SCBA.

7.13.6 If safe to do so, the NSWFB should concentrate efforts on removing victims from danger to a triage area outside the hot zone.

7.14 Medical services and decontamination

7.14.1 Treatment at a mass casualty incident will need to be *prioritised according to the victims' prospects of survival*. For example during a chemical incident it may be necessary to reserve primary attention for those victims of the attack who are *not* exhibiting advanced symptoms of contamination.

7.14.2 The NSWFB is in charge of rescue and removal from the hot zone. Ambulance personnel are in charge of patient care.

7.14.3 Ambulance or health personnel who are trained in the use of NSWFB PPE may assist in triaging victims for removal.

7.14.4 NSWFB personnel may be required to assist Ambulance and Health personnel with initial treatment of the sick and injured. NSWFB personnel must heed the advice of Ambulance personnel when assisting with patient care.

CAUTION

Only decontaminated casualties should be presented to unprotected Ambulance Officers or for transport.

7.14.5 NSWFB resources may be required to provide decontamination at designated hospitals for self-reporting casualties.

7.15 Neutralise hazards

7.15.1 Any device found to be, or suspected of being, the source of chemical, biological or radiological contamination should be made safe or isolated as soon as possible.

⚠ **NOTE**

If the device has not activated it is the responsibility of the Police service to render it safe. Follow the procedures in SOG 8.1.

7.15.2 Where incendiary or explosive devices are suspected or confirmed, be alert to the possible existence of secondary devices.

7.15.3 Never position crews in close proximity to a suspected or confirmed incendiary or explosive device.

7.15.4 Adopt a defensive strategy. Attack fires from a distance, with fixed monitors if possible, and evacuate the area.

7.16 Rotate personnel

7.16.1 Rotate crews regularly, especially if they are exposed to bodies, body parts or injured people.

7.16.2 Fatigue, stress, and exposure will detract from operational efficiency.

7.16.3 Ideally crews should be replaced at three hourly intervals or less, except in the case of specialised units such as a USAR Task Force, which generally works on a 12 hour shift basis.

7.16.4 Ensure that the team leaders of specialised units such as USAR and CBR have implemented measures for relieving their crews.

7.16.5 The Planning Section should arrange for attendance of members of the Critical Incident Support Team.

7.16.6 Any recommendation from a CIS Team Member regarding management of stress or of individuals should be accommodated as far as possible.

7.16.7 Logistics should ensure that there is a covered, quiet rest area for crews away from incident operations. The area should have sufficient seating, heating or cooling, toilet facilities, washing facilities, food and drink, and means for firefighters to contact their families.

7.17 Monitor the situation

7.17.1 Hazmat crews, or other specialists such as USAR teams, should be appointed by the Incident Controller to establish detection capabilities and area monitoring and to report on a regular basis.

7.17.2 An officer should be appointed to monitor building stability and integrity pending arrival of specialist engineers.

7.17.3 A Hazmat Controller should be appointed to specifically monitor the environment, including the degree of contamination on casualties, water run off, and the presence of combustible gases (see SOG 10.15).

7.17.4 Monitoring may require deployment of combustible gas detectors, photo-ionisation detectors, thermal imaging cameras, chemical warfare and toxic industrial chemical detectors, etc.

7.17.5 All water run-off leaving the site should be monitored for signs of contamination if possible. Close liaison with the Environment Protection Authority should be established.

7.18 Liaise

7.18.1 Commanders from other services should be identified and briefed on NSWFB strategies and tactics. It is particularly important to establish early and ongoing liaison with the NSW Police.

7.18.2 At a CBR incident the NSWFB will usually control the hot and warm zones, however legislative responsibilities could be shared with the Police Service if it is a crime scene, or the Health Department if the NSW Health Plan is activated.

7.18.3 The Police Service is responsible for control of the overall emergency site, and will control access to and from the hot and warm zones on advice from the NSWFB.

7.18.4 Health officials will require as much information as possible about the extent, number and nature of casualties. The Ambulance Service is the NSWFB’s first point of contact.

7.19 Record observations

7.19.1 Clearly document and record all NSWFB actions for evidence during later inquiries.

7.19.2 Ensure that strategies and tactics associated with the incident, observations, statistics (eg number of persons affected), etc, are recorded by the Planning Officer and in officers' personal notebooks.

7.19.3 Any and all information and observations, no matter how small or seemingly irrelevant at the time, could assist with later investigations.

7.19.4 Any officer or firefighter may be called upon to account for their actions. Taking personal notes at the time of the incident will ensure that such questions can be readily answered.

7.20 Manage media

7.20.1 Terrorist incidents require specialist media support.

7.20.2 The State Disaster Plan will be activated for a major incident, and the NSW Police will control all media comment.

7.20.3 Never offer media comment from the incident scene, other than stating that the NSWFB is supporting the NSW Police.

7.20.4 The State Operations Liaison Officer will support the NSWFB incident management team by liaising with the combined services' media unit.

7.21 Restore services

7.21.1 Reduce the inconvenience and interruption to the public as quickly as possible.

7.21.2 The Incident Controller should liaise closely with the Police Service and utilities on restoration of essential services such as gas, water and electricity.

7.22 Preserve evidence

7.22.1 Any terrorist incident scene is also a crime scene under the control of law enforcement agencies.

7.22.2 The NSWFB should cooperate with investigating authorities.

7.22.3 All evidence will need to be preserved for subsequent investigations.

7.22.4 Clean up and overhaul operations should not be carried out without the approval of law enforcement agencies. Incident scenes should be disturbed as little as possible.

8 TERRORISM – BIOLOGICAL AGENTS

8.1 Introduction

8.1.1 The threatened or actual use of biological agents by terrorist groups to cause mass illness and death is calculated to cause fear and panic within a community.

8.2 Scope

8.2.1 This SOG complements SOG 8.7 which provides a general overview of terrorist incidents, as well as command and control considerations.

8.2.2 It is to be read in conjunction with:

- SOG No 10 *Hazardous Materials*
- SOG No 10.15 *Chemical Biological and Radiological Incidents*
- SOG No 1 *Incident Control System,* and
- SOG No 8.1 *Bombs.*

8.2.3 SOG 10.15 should be followed for combat and decontamination procedures.

8.3 Biological agents

8.3.1 Biological agents can come in the form of viruses and bacteria, however, because of the difficulty in maintaining and transporting viruses, the most common form of biological agents likely to be used by terrorists are bacterial.

8.3.2 The military in some countries have experimented for years with various biological agents for use in warfare. It is possible that terrorist groups with sufficient resources could source materials from some of these countries or abandoned stockpiles.

8.3.3 Biological organisms have varying effects and varying degrees of lethality. Some of the organisms that might be available to and used by terrorists could include:

- anthrax
- bubonic or pneumonic plague
- cholera
- ebola
- Q fever
- smallpox
- salmonella, and
- tularemia.

8.3.4 It is likely that there will be no warning or a covert release of such agents, in which case there would be little likelihood of NSWFB involvement as there will be no identified incident site in the initial stages. Indications of a release may occur sometime later when casualties self-present at health facilities.

8.4 Dispersal of biological agents

8.4.1 Bacteria and viruses can be dispersed in a number of ways, and enter the body by means of inhalation, ingestion, or skin exposure.

8.4.2 Ingestion and inhalation generally lead to the most severe symptoms. For example, anthrax causes blisters and sores between one and seven days after skin exposure, but is rarely fatal. However inhalation or ingestion of anthrax is often fatal unless recognised and treated at the earliest stages.

8.5 Safety of NSWFB personnel

8.5.1 The first priority is the protection of NSWFB personnel.

8.5.2 Spillage clothing and self-contained breathing apparatus is the recommended level of protection.

8.5.3 Personnel should be decontaminated thoroughly after possible exposure in accordance with SOG 10.15.

8.6 Tactics for managing biological releases

8.6.1 Position appliances uphill and away from building air-conditioning exhausts.

8.6.2 Secure the area and prevent entry of unauthorised or unprotected people.

8.6.3 Isolate the area of possible contamination and establish a hot zone.

8.6.4 Isolate all potentially exposed people in an area away from the hazard.

8.6.5 Be alert to the possibility of small explosive devices designed to disseminate an agent.

8.6.6 Gather information on the incident: type and form of agent (solid, liquid, gas), method of dispersal, location.

8.6.7 If dispersal through the air-conditioning is suspected, shut down the air-conditioning system. Removal and decontamination of filters may be necessary.

8.6.8 Avoid contact with puddles and wet surfaces.

8.6.9 Decontaminate personnel and victims if necessary.

8.6.10 Preserve possible evidence for subsequent criminal and forensic investigations – disturb incident scene as little as possible.

8.7 Risk assessment for unidentified substances

8.7.1 Use a risk assessment process to determine the strategy when the substance involved is unidentified, eg where a white powder or suspicious package has been reported.

8.7.2 Gather information and intelligence from as many sources as possible, including the Police, the Ambulance Service, owners, occupiers and people in the vicinity.

8.7.3 When determining risk, consider the following factors which can be remembered using the mnemonic **HOT UP**:

H Is the item **hidden**?

O Is the item **obviously** suspicious?

T Is the item **typical** and a common occurrence in that area?

U Is there evidence or reports of **unauthorised access** or activity?

P Is there **public** access to the area?

8.7.4 Other considerations should include:

- whether any threat was received,
- whether the type of building or the activity within presents a higher risk; and
- the legitimate activities of workers in the vicinity (eg plasterers).

8.8 Decontamination strategies

8.8.1 There are three levels of decontamination that may be adopted, depending on the risk involved.

Low risk	Level 1 Decontamination
Medium risk	Level 2 Decontamination
High risk	Level 3 Decontamination

8.9 Level 1 Decontamination

8.9.1 Situation:

- no visible release or spillage of powder or substance
- no-one obviously contaminated
- no-one showing physical reaction

8.9.2 Decontamination procedure:

- separate people in an isolated area
- investigate the site and, if there is no apparent evidence of a spill, then no decontamination is necessary.

8.10 Level 2 Decontamination

8.10.1 Situation:

- Release or spillage of powder or substance where people have a light powder cover on their limbs and clothes **but not on their heads or faces**,
- No-one is showing a physical reaction to the contamination

8.10.2 Decontamination procedure:

- Decontaminate people identified with powder contamination and *also* people who were in the same area as the contaminated people.
- Leave peoples' clothes on.
- Apply a light spray of water to persons and clothes to avoid atomising the substance.
- Wash peoples' hands, arms and faces with soap and water
- Spray BA solution on remainder of person and their clothes.
- Wait 10 minutes.
- Remove BA solution with a light water spray.

8.11 Level 3 Decontamination

8.11.1 Situation:

- release or spillage of powder or substance where people are heavily contaminated on their bodies and clothes and/or are showing some physical reaction to the exposure such as skin irritation.

8.11.2 Decontamination procedure:

- Full decontamination using portable decontamination shower or hoseline.
- Wet clothes using fine spray to avoid atomising the substance.
- Remove outer clothing.
- Use soap and water solution to wash hands and faces
- Spray BA solution on remainder of person and their remaining clothes.
- Wait 10 minutes.
- Remove BA solution with water

NOTE

In accordance with SOG 15 *CBR Incidents* extreme consideration for the privacy of the individual must be taken into account when clothing is being removed. Whilst all practical measures will need to be implemented in respect of patient safety, the dignity of the individual should also be maintained as far as practicable.

8.12 Spillage PPE and fully encapsulated PPE decontamination

8.12.1 Liberally spray PPE with a 5% bleach and water solution.

8.12.2 Leave for 10 minutes

8.12.3 Wash down with a hose line.

8.12.4 Bag and tag.

8.12.5 On return to station, rinse spillage PPE in water, dry (not in direct sunlight) and place it back on appliance.

8.12.6 Return fully encapsulated PPE to the relevant Hazmat Unit for final decontamination.

8.13 Site decontamination

8.13.1 After the people have been decontaminated, the site must be decontaminated, as follows:

- remove suspect substance
- apply bleach solution (5% concentration) and water to surfaces.
- leave for ten minutes
- for inside areas, wipe off surfaces with cloth. For outside areas use water sprays.

9 TERRORISM – RADIOLOGICAL INCIDENTS

9.1 Introduction

9.1.1 The threatened use of radiological devices or weapons by terrorist groups is calculated to cause fear and panic within a community, and their actual use can cause mass destruction and casualties.

9.1.2 The possibility of secondary devices calculated to maim or kill emergency service workers cannot be discounted, and strategies may have to be employed that do not involve provision of immediate assistance to victims.

9.2 Scope

This SOG complements SOG 8.7 which provides a general overview of terrorist incidents, as well as command and control considerations.

9.2.2 It is to be read in conjunction with:

- SOG No 10 *Hazardous Materials,*
- SOG No 10.15 *Chemical Biological and Radiological Incidents,*
- SOG No 1 *Incident Control System, and*
- SOG No 8.1 *Bombs.*

9.2.3 SOG 10.15 should be followed for combat and decontamination procedures.

9.3 Radiological hazards

9.3.1 Radiation is generally spread by four means:

- Gamma radiation,
- X-rays,
- Alpha particles, and
- Beta particles.

9.3.2 Radiological incidents can range from detonation of a thermonuclear explosive device with catastrophic results, or use of a conventional explosive device to disperse radiological sources (dirty bomb), to placement of radioactive sources in areas where they will cause harm.

9.3.3 Radiological agents may cause delayed reactions, and there may be no obvious injuries.

9.3.4 Inhalation is the primary contamination route for Alpha and Beta particles, while Gamma radiation and X-Rays can pass directly through the body.

9.4 Safety of NSWFB personnel

9.4.1 The first priority is the protection of NSWFB personnel.

9.4.2 Full personal protective equipment (PPE) and self-contained breathing apparatus provides adequate protection from particulate matter.

9.4.3 The three main considerations in protecting people from gamma radiation sources are:

- **Time** - limiting the duration of exposure,
- **Distance** - Maintaining the maximum possible distance from the radioactive source, and
- **Shielding** - ensuring that dense materials are placed between the radioactive source and people.

9.5 Tactics for managing radiological incidents

9.5.1 Position appliances upwind of the incident.

9.5.2 Secure the area and prevent entry of unauthorised or unprotected people and vehicles within 50 metres.

9.5.3 Be alert to the possibility of small explosive devices designed to disseminate an agent.

9.5.4 Use time, distance and shielding as protective measures.

9.5.5 Use full PPE including SCBA.

9.5.6 Avoid contact with the source and stay out of any visible smoke or fumes.

9.5.7 Monitor radiation levels using point source detectors carried by Primary Hazmat Units in Sydney, Newcastle, Wollongong and 90 Station Menai. If the incident occurs in an area where detectors are not immediately available, ask for urgent helicopter support from Sydney Hazmat.

9.5.8 Establish background levels of radiation outside the suspected contamination area.

9.5.9 Detain or isolate uninjured people or equipment.

9.5.10 Remove victims from high hazard areas.

9.5.11 Assist the Ambulance Service as necessary to triage, treat and decontaminate trauma victims.

9.5.12 Call for expert guidance from the Radiation Control Branch of the Environment Protection Authority.

9.5.13 Preserve possible evidence for subsequent criminal and forensic investigations. Do not conduct overhaul and clean-up operations, and disturb the incident scene as little as possible.

10 TERRORISM - INCENDIARY INCIDENTS

10.1 Introduction

10.1.1 Incendiary devices can be produced using readily available materials at low cost, and are easily deployed.

10.1.2 Terrorist organisations overseas have often used incendiary devices to draw attention to their cause and to inflict damage and casualties.

10.1.3 The NSWFB could be the first emergency service to arrive at a terrorist incident involving incendiary devices.

10.1.4 It could initially be difficult to ascertain whether a fire has been caused by a terrorist attack.

10.2 Scope

10.2.1 This SOG provides guidance on recognising a possible terrorist incendiary attack and the precautions to be taken.

10.2.2 It is to be read in conjunction with:

- SOG No 10 *Hazardous Materials,*
- SOG No 10.15 *Chemical Biological and Radiological Incidents,*
- SOG No 8.7 *Terrorist incidents*
- SOG No 1 *Incident Control System, and*
- SOG No 8.1 *Bombs.*

10.2.3 SOG 10.15 should be followed for combat and decontamination procedures where hazardous materials may be involved.

10.3 Recognising a terrorist incendiary attack

10.3.1 Indications that a fire has been caused by a terrorist attack using incendiaries include:

- a threat before the event
- advice of a threat by occupants or onlookers upon arrival
- evidence of a blast
- unusually rapid fire spread
- unusually high temperatures
- multiple fires
- uncharacteristic odours or smoke colour
- evidence of chemical accelerants.

10.4 Secondary devices

10.4.1 First responders to a possible terrorist incendiary attack should be mindful of the possibility of a secondary device intended to maim or kill emergency service workers.

10.4.2 Appliances should, as far as possible, be parked in clear areas away from gardens, garbage bins or parked vehicles which could conceal explosive or incendiary devices.

10.4.3 Exposure of personnel should be limited until it is determined that there is no possibility of a secondary device.

10.5 Strategies

10.5.1 Firefighting strategies should generally involve a defensive attack aimed at protecting exposures rather than an offensive attack which could expose firefighters to possible danger.

10.5.2 Where a marginal strategy is necessary, the number of firefighters committed to search and rescue should be minimised.

10.6 Tactics

10.6.1 Position appliances upwind from the incident.

10.6.2 Secure the area and prevent entry of unauthorised or unprotected people and vehicles within 50 metres.

10.6.3 Wear full PPE including SCBA.

10.6.4 Avoid contact with the device and stay out of any smoke or fumes unless appropriately protected.

10.6.5 Immediately remove victims from high hazard areas.

10.6.6 Assist the Ambulance Service as necessary to triage, treat and decontaminate victims.

10.6.7 Preserve possible evidence for subsequent criminal and forensic investigations. Do not conduct overhaul and clean-up operations. Disturb the incident scene as little as possible.

11 TERRORISM – CHEMICAL INCIDENTS

11.1 Introduction

11.1.1 The threatened use of chemical warfare agents or toxic industrial chemicals by terrorist groups is calculated to cause fear and panic within a community, and their actual use can cause mass casualties and contamination of infrastructure.

11.1.2 The possibility of secondary devices intended to maim or kill emergency service workers cannot be discounted, and strategies may have to be employed that do not involve provision of immediate assistance to victims.

11.2 Scope

11.2.1 This SOG complements SOG 8.7, which provides a general overview of terrorist incidents, as well as command and control considerations.

11.2.2 It is to be read in conjunction with:

- SOG No 10 *Hazardous Materials,*
- SOG No 10.15 *Chemical Biological and Radiological Incidents,*
- SOG No 1 *Incident Control System, and*
- SOG No 8.1 *Bombs.*

11.2.3 SOG 10.15 should be followed for combat and decontamination procedures.

11. 3 Chemical agents

11.3.1 Chemical warfare agents and toxic industrial chemicals likely to be used by terrorists fall into the following general categories:

- nerve agents
- blister agents
- blood agents
- choking agents, and
- irritant agents.

11.3.2 SOG 10.15 contains comprehensive information on the types of chemical agents that could be employed and their effects.

11.4 Dispersal of chemical agents

11.4.1 Chemical agents may be dispersed by:

- air handling systems
- misting or aerosol devices
- sprayers
- gas cylinders, or
- dirty bombs (where explosives are used to disperse the agent).

11.5 Safety of NSWFB personnel

11.5.1 The first priority is the protection of NSWFB personnel.

11.5.2 Spillage clothing and self-contained breathing apparatus is the minimum level of protection.

11.5.3 Personnel should be decontaminated thoroughly after possible exposure in accordance with SOG 10.15.

11.6 Risk assessment

11.6.1 Before committing personnel, conduct a hazard analysis and risk assessment, including:

- the nature of the chemical agent
- the possibility of secondary devices, and
- an estimation of the number of casualties and the severity of their symptoms

11.7 Strategies

11.7.1 Where the risk to emergency services workers is high and there are large numbers of casualties, a reverse triage strategy may be required.

11.7.2 Reverse triage involves rapid removal of ambulatory victims to safety, while non-ambulatory or severely injured victims are left in situ until the hazards are controlled.

11.7.3 The objective is to help the maximum number of victims in the shortest possible time while minimising the exposure of rescuers to possible secondary devices or contamination.

11.8 Minimise contamination

11.8.1 Where possible, confine all contaminated and exposed victims in a restricted area outside the hot zone, within the warm zone (see SOG 10.15).

11.8.2 Decontaminate victims and emergency service workers in accordance with SOG 10.15.

11.8.3 Through the Ambulance Service, ensure that hospitals are advised of the incident and the possibility of mass casualties, as well as people who may self-present at hospitals and medical centres.

11.8.4 Request the Communication Centre to respond resources to nearby hospitals to perform decontamination of self-presenting patients.

11.9 Patient care

11.9.1 Casualties exposed to liquid chemical agents require immediate attention including:

- removal to a clean atmosphere
- the removal of outer clothing
- preliminary decontamination, and
- medical care.

11.9.2 Casualties exposed to a chemical vapour hazard should be removed to a clear atmosphere and consideration given to dampening down outer clothing.

11.9.3 If the nature of the chemical agent is known, inform Ambulance personnel so that hospitals can source appropriate antidotes.

11.10 Scene preservation

11.10.1 Preserve possible evidence for subsequent criminal and forensic investigations. Do not conduct overhaul and clean-up operations. Disturb incident scene as little as possible.

12 TERRORISM - EXPLOSIVE INCIDENTS

12.1 Introduction

12.1.1 The threatened use of explosive devices or weapons by terrorist groups is calculated to cause fear and panic within a community, and their actual use can cause mass destruction and casualties.

12.1.2 The possibility of secondary devices calculated to maim or kill emergency responders cannot be discounted, and strategies may have to be employed that do not involve provision of immediate assistance to victims.

12.2 Application

12.2.1 This SOG complements SOG 8.7 which provides a general overview of terrorist incidents, as well as command and control considerations.

12.2.2 It is to be read in conjunction with:

- SOG No 10 *Hazardous Materials,*
- SOG No 10.15 *Chemical Biological and Radiological Incidents,*
- SOG No 1 *Incident Control System, and*
- SOG No 8.1 *Bombs.*

12.2.3 SOG 8.1 should be followed with regard to incident procedures.

12.3 Hazards related to explosive devices

12.3.1 Explosive devices may be employed by terrorists to cause mass casualties and structural damage, or to disseminate chemical, biological, or radiological agents (dirty bombs).

12.3.2 Explosions can cause secondary hazards, such as unstable structures, damaged power and gas lines, hanging debris, void spaces, and other physical hazards.

12.3.3 Devices could contain anti-personnel features such as nails or shrapnel.

12.3.4 There may be secondary devices designed to maim and kill emergency service workers.

12.4 Risk assessment

11.6.1 Before committing personnel, conduct a hazard analysis and risk assessment, including:

- the extent of the damage caused by the explosion
- the possibility of secondary devices, and
- the possibility that the explosive may have been used to disperse chemical, biological or radiological agents

12.5 Strategies

12.5.1 Adopt a defensive strategy in preference to an offensive strategy.

12.5.2 Where the risk to emergency services workers is high and there are large numbers of casualties, a reverse triage strategy may be required.

12.5.3 Reverse triage involves rapid removal of ambulatory victims to safety, while non-ambulatory or severely injured victims are left in situ until the hazards are controlled.

12.5.4 The objective is to help the maximum number of victims in the shortest possible time while minimising the exposure of rescuers to possible secondary devices or contamination.

12.6 Safety of NSWFB personnel

12.6.1 Approach from uphill and upwind

12.6.2 Stage resources at a distance in a safe location

12.6.3 Avoid entering blast areas unless it is absolutely necessary to save lives.

12.4.4 Wear full personal protective equipment and self contained breathing apparatus.

12.4.5 Minimise exposure of personnel until it is clear that there is no secondary device.

12.4.6 Do not park appliances near garbage bins, gardens, or other places that could conceal a secondary device.

12.4.7 In accordance with SOG 8.1, do not use radios within 50 m of an actual or suspected bomb to avoid detonating other devices. Make other arrangements, such as the use of runners.

12.4.8 Avoid contact with the device. Stay out of any smoke or fumes unless appropriately protected.

12.7 Specialist support

12.7.1 Arrange monitoring and analysis of flammability, toxicity, radiation, chemical agents, and pH.

12.7.2 Consider the need to call for Urban Search and Rescue (USAR) resources, including activation of Task Forces.

12.8 Scene preservation

12.8.1 Preserve possible evidence for subsequent criminal and forensic investigations. Do not conduct overhaul and clean-up operations. Disturb the incident scene as little as possible.

8.13 CIVIL DISTURBANCES

1 Introduction

The NSWFB can be called, without warning, to attend incidents in the vicinity of or as a result of a civil disturbance. The causes could be political, religious, ideological or alcohol/drug intoxication.

The increased risk to firefighters will require the normal objectives of extinguishing fires and protecting life and property to be reconsidered, with strategies relayed to all personnel to ensure firefighters' safety.

2 Application

This SOG applies to NSWFB operations at civil disturbances, such as riots, violent protests, demonstrations or illegal assemblies that may affect public safety and property.

NOTE: When civil disturbances occur in correctional facilities, *SOG 8.3 Correctional facility incidents*, will apply

3 NSWFB role

The NSWFB objective is to save life and protect property regardless of the reasons for the incident. Every effort must be made to:

- demonstrate NSWFB neutrality to both Police and rioters
- maintain a separate identity from that of the Police or other services
- not participate in enforcing law and order or assisting Police to apprehend anyone.

4 Response to civil disturbances

1. The Communications Centre (ComCen) will:
   * initiate a minimum 2 pumper response (Structure fire 1st Alarm) to all civil disturbances
   * advise responding pumpers of a staging area if established by Police
2. Firefighters must:
   * respond in full structural fire fighting ensemble, visor down (in case of shattered windows)
   * close all appliance windows
   * respond without flashing lights or sirens on approach to and within the civil disturbance area
   * park all appliances to allow rapid withdrawal.

NOTE: Requests from Police for the NSWFB to attend civil disturbances that do not involve fire, hazmat or rescue operations must be referred to the Director State Operations for approval.

5 Command and Control

The Police are the combat agency during civil disturbances.

The NSWFB Commander will always have the final decision on how NSWFB crews are tasked and if the NSWFB remains in attendance.

The NSWFB Commander will:

- implement the Incident Control System (SOG 1.1) and establish a communications plan (SOG 2.1)
- ensure Police protection for firefighters and equipment is available if required
- liaise with the Police and other agencies to establish specific roles.

A major incident may lead to the establishment of a Site Control, where the Police Commander will be located.

The NSWFB Commander will work from the Site Control and appoint an Operations Officer as soon as possible. This should prevent misunderstandings and allow the operation to run smoothly.

6 Operations

NOTE: All firefighters must wear full structural fire fighting ensemble and carry a hand held transceiver at all times.

1. Position appliances a safe distance from the scene, turned around with the engine running so they are ready for a quick withdrawal.
2. Never leave appliances unattended. Keep all pocket doors and shutters closed.
3. Decide whether it is preferable to:
   * use an attack line of hose from a hydrant. If firefighters are attacked, they can simply drop a hose, move to their appliance and drive away, or
   * use a first aid line from a pumper, for higher pressures or to enable the use of A or B class foam for quicker control of a fire. The hose can be disconnected and abandoned if necessary.
4. Do not leave any gear, eg hydrant bars and keys, lying around.
5. If fires do not represent a hazard to people or property not involved in the incident, consider leaving them to burn out. Review the situation regularly as unattended fires may encourage people to light more.
6. The NSWFB Commander must consider carefully requests by Police for the use of aerial appliances to rescue or remove people from dangerous places. The NSWFB Commander must be aware that the people being removed may be arrested on their return to ground level. This could lead to a confrontation with the people creating the disturbance. Before committing aerials, the NSWFB Commander must be satisfied that lives are at risk and the endangered people cannot be removed by any other means, eg by Police with vertical rescue gear.
7. Remember that Police may be the target of the people creating the disturbance and firefighters can easily be caught in the middle. In the case of fire, it may help for Police to withdraw temporarily while the fire is extinguished.

8. The NSWFB Commander must appoint a Safety Officer and conduct dynamic risk assessments as required.
9. When available, consider requesting Fire Air 1 for aerial observation of the incident.

NOTE: If firefighters are impeded or threatened, withdraw or request Police protection immediately

7 Discipline

Discipline is essential for maintaining morale. Firefighters should remember that their lives and those of fellow firefighters may depend on carrying out instructions promptly, even though they may not agree with the actions. They should also remember that, if they go about their job in a professional way, they may gain the support of the people creating the disturbance and even defuse the situation.

A most important factor in maintaining morale is careful, confident and effective leadership by all officers.

8 Use of NSWFB premises, appliances and equipment by the Police

Police are not permitted to use NSWFB premises or appliances as command posts.

If Police are in attendance at the incident with the NSWFB, they cannot ride on the fire appliance but will escort the NSWFB in Police vehicles.

If members of other emergency services are in immediate danger, firefighters may permit them to withdraw from the scene on the fire appliance.

Requests by Police for standpipes, hose, branches, etc, are to be met, provided that:

- lending the equipment does not affect NSWFB capability
- the NSWFB Commander advises the Police Commander that the NSWFB will not be responsible for any injury or damage caused by Police use of the equipment
- the NSWFB Commander notifies the ComCen that the equipment has been provided due to a Police request.

9 Media liaison

A Media Liaison Officer must be appointed (*SOG 1.14*).

Every effort should be made to ensure that the media does not present a view that identifies the NSWFB with the actions of other services or the people creating the disturbance. The media should recognise the role of the NSWFB in preserving life and property.

All media comment must be in accordance with NSWFB media policy and must be approved by the NSW Police Media Unit.

8.13 CIVIL DISTURBANCES

At civil disturbances (riots, violent protests, demonstrations, illegal assemblies) the NSWFB's objective is to save life and protect property, regardless of the reason for the incident.

Command and control

⇨ NSW Police are the combat agency

⇨ NSWFB Commander has the final decision on how NSWFB crews are tasked and whether NSWFB remain in attendance

NSWFB role

⇨ Demonstrate *neutrality* to both Police and rioters

⇨ Maintain a *separate identity* from that of Police and other agencies

⇨ *Do not* participate in enforcing law and order

NSWFB Commander role

☐ Implement ICS and establish a communications plan.

☐ Appoint a Safety Officer and conduct a Dynamic Risk Assessment.

☐ Appoint a Media Liaison Officer.

☐ Ensure *sufficient* Police protection for firefighters and equipment.

☐ *Liaise* with Police and other agencies to establish specific roles.

☐ Operate from the *Site Control* when and if established by the Police Commander.

Response

☐ Wear *full structural firefighting ensemble* with visor down.

☐ *Close* all appliance windows.

☐ Respond *without lights and sirens* on approach to and within the civil disturbance area.

Operations

☐ Wear full structural firefighting ensemble and carry a *hand held transceiver* at all times.

☐ Park appliance at a *safe distance* from the scene, with engine running – turned around, for rapid departure if required.

☐ If threatened or impeded, *withdraw* or request immediate Police protection.

☐ **Do not** leave vehicles unattended – keep pocket doors and shutters closed.

☐ **Do not** leave equipment lying around.

☐ Preferably use an attack line *directly* from a hydrant, to allow rapid departure if required.

☐ If the fire does not pose a threat to life, or if the fire is in property not involved in the incident, consider *leaving* it to burn out.

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- ☐ Where there is a fire, and where Police presence may be exacerbating the disturbance, it may help if Police temporarily withdraw until the fire is controlled.
- ☐ If available, consider requesting Fire Air 1 for aerial observation.

Media Liaison Officer role

Ensure that all media comments are:

- ☐ In accordance with the NSWFB media policy.
- ☐ Approved by the NSWFB Police Media Unit.

Discipline

Firefighter safety depends upon carrying out instructions promptly:

- ☐ Be professional.
- ☐ Demonstrate careful, confident and effective leadership.

Police use of NSWFB premises, appliances and equipment

- ⇨ Police are *not permitted* to use NSWFB premises or appliances as command posts.
- ⇨ While in attendance, Police *cannot ride* on fire appliances – they must escort the NSWFB in Police vehicles.
- ⇨ If members of other emergency services are in immediate danger, firefighters *may permit* them to withdraw from the scene on a fire appliance.
- ⇨ Requests from Police to use standpipes, hoses, branches etc *may be met* provided that:
  - Lending the equipment does not affect NSWFB capability.
  - NSWFB Commander advises Police Commander that the NSWFB will not be responsible for any injury or damage caused by the Police use of the equipment.
  - NSWFB Commander notifies the ComCen that the equipment has been provided due to Police request.
- ⇨ Requests from Police for the *use of aerial appliances* to rescue or remove people must be carefully considered. Are lives *at risk?* Can people be removed by *other means?*

NSW FIRE BRIGADES

Standard Operational Guidelines

RESPIRATORY PROTECTION

Section Nine

9.1 USE OF RESPIRATORY PROTECTIVE EQUIPMENT

1 Introduction

The following guideline assists firefighters to safely determine when respiratory protective equipment should be worn to ensure the safety of personnel working in hazardous atmospheres.

2 Application

This SOG applies to all types of respiratory protective equipment.

3 Responsibility

The Incident Controller (IC) is responsible for ensuring that firefighters and other personnel who enter a hazardous atmosphere are adequately protected.

All firefighters are responsible for their own safety and must use respiratory protective equipment if there is a risk of a hazardous atmosphere.

4 Types of respiratory protective equipment

4.1 Supplied air respirators

Standards Australia refers to Breathing Apparatus (BA) as *supplied air respirators*. Fire and Rescue NSW uses positive pressure supplied air respirators to provide the highest level of protection. These include:

- Self-contained breathing apparatus (SCBA).
- Extended duration breathing apparatus (EDBA): An SCBA set in twin cylinder configuration which allows firefighters to work for approximately twice the time as single cylinder SCBA.
- Airline respirator: An extension facemask with an airline supplied from a source of compressed air. These sources include:
  - Air trolley breathing apparatus (ATBA): A mobile trolley with compressed air cylinders, a valve assembly and an airline connected to an extension facemask.
  - An independent SCBA set.
  - SCBA worn by a firefighter: An extension facemask and airline worn by a second person which is attached to the auxiliary connection of an SCBA or EDBA set worn by a firefighter.

⚠ **NOTE**

All supplied air respirators used by Fire and Rescue NSW provide a similar level of respiratory protection.

4.2 Air-purifying respirators

Air-purifying respirators are full- or half-facepiece devices which filter contaminants from the air. Air-purifying respirators protect against gases, particles or a combination of both, depending on design. They can be powered or unpowered. The air-purifying respirators used are:

- P2 particle masks.
- Full-facepiece air-purifying respirators with screw-on gas and particle filter cartridges used by specialist sections.

5 When to use respiratory protection

The IC must consider the use of respiratory protection as part of the initial size-up of the incident on arrival, and must monitor conditions during the incident.

When deciding whether to use respiratory protection, consider:

- The type and nature of the incident.
- Possible respiratory hazards.
- The need to continue monitoring possible respiratory hazards.
- Other hazards associated with the incident, such as travelling distances and building construction.
- Pre-incident planning or prior knowledge of the site.

5.1 When to use BA

Breathing Apparatus (BA) must be worn whenever a hazardous atmosphere may exist and your risk assessment identifies BA as a suitable control measure.

Establish BA Control whenever BA is worn. See SOG 9.4, *Breathing Apparatus Control*.

These situations include, but are not limited to:

- When engaged in a firefighting attack on a structure fire or a fire below or above deck on a vessel.
- When working in a smoke plume.
- During salvage and overhaul operations.
- Vehicle fires.
- Elevated temperatures which might injure a person’s airways.
- When working in heavy smoke during grass or bushfires.
- Within the Hot Zone of hazardous materials incidents.
- Fires involving high-rise or large isolated buildings.
- Where it is known or suspected that an inert gas suppression system or fumigation system may have operated.
- When monitoring atmospheric hazards.
- When working in high expansion foam.
- Any other situation where the IC decides the use of BA is necessary.

If there is any doubt wear BA.

WARNING

Wearing BA can exaggerate the effect of illness. Firefighters who are aware they are unwell, particularly if they have illnesses affecting the heart and lungs, should not wear BA and should not work in environments that require BA.

WARNING

Do not use any form of BA under water.

5.2 When to use P2 particle masks

Use P2 masks to protect against:

- Known low concentrations of inert dust, such as those produced when cutting metal or wood.
- Concrete, stone and masonry cutting operations where the work piece can be kept wet.
- The particles, but not the gases such as CO, in bushfire smoke.
- Contamination by body fluids.

Do not use P2 particle masks to protect against:

- Gases.
- Mists.
- Elevated temperatures.
- Vapours.
- Atmospheres with less than 19.5% oxygen. Low oxygen levels can indicate the presence of other contaminants. Always investigate low oxygen levels.

WARNING

When in doubt, wear BA.

P2 particle masks must be fitted correctly to be effective.

6 Specialist equipment

Some of our specialist units are equipped with full-facepiece air-purifying respirators with screw-on gas and particle filter cartridges. Operators must be trained in the use of this equipment.

WARNING

Air-purifying respirators provide a lower level of protection than BA, and must only be used to protect against known contaminants of known concentration where the respiratory protection factor is adequate.

9.1 USE OF RESPIRATORY PROTECTIVE EQUIPMENT

Respiratory protection includes:

⇨ Breathing apparatus (BA).

⇨ P2 particle masks.

When to use respiratory protection

The IC must:

⇨ On arrival, consider the use of respiratory protection as part of the initial size up.

⇨ Monitor conditions during the incident.

When deciding whether to use respiratory protection, consider:

☐ The type and nature of the incident.

☐ Possible respiratory hazards.

☐ The need to continue monitoring possible respiratory hazards.

☐ Other hazards associated with the incident, such as travelling distances and building construction.

☐ Pre-incident planning or prior knowledge of the site.

WARNING

Wearing BA can exaggerate the effect of illness. Firefighters who are aware they are unwell, particularly if they have illnesses affecting the heart and lungs, should not wear BA and should not work in environments that require BA.

When to use BA

Wear BA whenever a hazardous atmosphere may exist and your risk assessment identifies BA as a suitable control measure. Establish BA Control.

Use BA at situations including but not limited to:

⇨ When engaged in a firefighting attack on a structure fire or a fire below or above deck on a vessel.

⇨ When working in a smoke plume.

⇨ During salvage and overhaul operations.

⇨ Vehicle fires.

⇨ Elevated temperatures which might injure a person's airways.

⇨ Working in heavy smoke during grass or bushfires.

⇨ Fires involving high rise or large isolated buildings.

⇨ Within the Hot Zone of hazardous materials incidents.

⇨ Where it is known or suspected that an inert gas suppression system or fumigation system may have operated.

⇨ Monitoring atmospheric hazards.

⇨ Working in high expansion foam.

⇨ Any other situation where the IC decides the use of BA is necessary.

WARNING

Don't use any form of BA under water.

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When to use P2 particle masks

Use P2 particle masks to protect against:

⇨ Known low concentrations of inert dust, such as those produced when cutting metal or wood.

⇨ Concrete, stone and masonry cutting operations where the work piece can be kept wet.

⇨ The particles, but not the gases such as CO, in bushfire smoke.

⇨ Contamination by body fluids.

WARNING

When in doubt, wear BA.

P2 particle masks must be fitted correctly to be effective.

Do not use P2 particle masks to protect against:

⇨ Gases.

⇨ Mists.

⇨ Vapours.

⇨ Elevated temperatures.

⇨ Atmospheres with less than 19.5% oxygen.

9.2 BREATHING APPARATUS SAFE WORKING PRACTICES

1 Introduction

Breathing apparatus (BA) must be worn whenever a hazardous atmosphere may exist and your risk assessment identifies BA as a suitable control measure. This guideline provides a framework for the safe operation of BA.

2 Application

This SOG applies whenever any form of BA is used.

3 Operating environment

The Incident Controller (IC) must:

- Conduct a risk assessment.
- Establish BA Control according to SOG 9.4, *BA Control.*
- Establish BA teams according to SOG 9.3, *BA Operations.*
- Establish a RIT/s according to SOG 18.2, *Rapid Intervention Teams.*

Firefighters must:

- Be aware that when BA and personal protective equipment (PPE) are worn, perception of the external environment can be limited or distorted.
- Monitor air consumption according to SOG 9.3, *BA Operations.*
- When visibility is impaired, consider using thermal imaging cameras, if available. (See SOG 15.1, Thermal Imaging Camera.)
- Follow safe working practices as detailed in Chapter 6 of Certificate II in Firefighting Operations Module *PUA FIR 207B OperateBreathing Apparatus*.

WARNING

Don't use any form of BA under water.

4 Health and hydration considerations

Using breathing apparatus increases both your body's need for water and the risk of heat stress. These effects also increase with:

- The length of time BA is worn, so can be greater when air trolley BA (ATBA) and extended duration BA are used.
- The type of PPE worn.
- Workload.
- Individual factors such as body mass, fitness, level of hydration and rate of respiration.
- Ambient temperature.

It is important to maintain adequate hydration levels and rest periods as per SOG 18.3, *Incident Ground Rehabilitation.*

5 Equipment checks

Check the correct function of all BA in accordance with Table 1. Use the checking procedure specified on the SIMS worksheet for each piece of equipment.

Table 1: Responsibility for BA pre-operational checks

Responsibility	When	Action
Wearer	Immediately before use	Conduct pre-operational check of SCBA set and any extension mask allotted to you
Wearer/operator	Immediately before use	Conduct functional check of air trolley BA sets
Wearer	After disinfection	Conduct functional check of SCBA set and any extension mask allotted to you
	After changing SCBA air cylinder	
Each officer and firefighter at permanently staffed stations	Beginning of each shift	Conduct functional check of SCBA allotted to you
Permanent Station Officers at mixed stations and retained stations	Beginning of each shift	Conduct or delegate the functional check of all SCBA sets on retained appliances
	Weekly	Conduct or delegate functional check of all extension facemask sets at the station
Appliance drivers at permanently staffed stations	Weekly	Conduct functional check of all extension facemask sets at the station
Engine Keepers or designated members at fully retained stations	Weekly	Conduct functional check of all SCBA sets and extension facemask sets at the station
Appliance drivers	Weekly visual Monthly pressure test	Conduct functional check of air trolley BA sets

6 Before entry

Before entering a hazardous atmosphere, firefighters must:

a) Don appropriate PPE identified in the risk assessment.

b) Carry out the pre-operational check and ensure their BA set is operational.

WARNING

Do not enter or re-enter the Hot Zone with a BA cylinder less than 80% full. Replace a 207 bar cylinder when it is below 160 bar. Replace a 300 bar cylinder when it is below 240 bar.

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c) Don the facemask in clean air before entering the combat area.

d) Conduct a buddy check of all equipment, including BA, PPE, radios and TICs.

e) Ensure their completed BA tally tag is registered with BA Control. See SOG 9.4, *BA Control*.

7 Firefighter trapped, lost or in distress

7.1 Firefighter in distress

If for any reason you or another member of your BA team requires emergency help:

a) Activate the RIT by transmitting **'Red, Red, Red, Firefighter Down'**. Include a brief sitrep giving your position, problem and people involved.

b) Manually activate the distress signal unit (DSU). Periodically, silence the DSU for a few seconds to listen for rescuers or when sending radio messages and then manually reactivate it again.

If you encounter a BA team which requires emergency help, follow Step (a) and await instructions from the IC.

WARNING

When a DSU is heard or a firefighter down message is transmitted, BA teams must render immediate assistance as determined by the IC.

7.2 Dislodged facemask/loss of air

If your facemask becomes dislodged:

a) Hold your breath.

b) Readjust the facemask.

c) Purge the facemask.

d) If exposed, exit with your partner to BA Control and update your Sector Commander or IC with a brief sitrep.

If your air supply fails, you cannot maintain a proper seal, your facemask is damaged, or your SCBA malfunctions:

a) Minimise the loss of air by any means possible and exit with your partner to BA Control.

b) If possible and practical, connect your airline to your partner's auxiliary outlet.

WARNING

If you are supplying air to a second facemask, your remaining wearing duration will be at least halved.

c) Update your Sector Commander or IC with a brief sitrep including your current position.

d) If required, activate the **Firefighter in distress** procedure.

While air remains in your cylinder, do not remove your facemask in a hazardous atmosphere.

Do not remove your facemask to supply air to someone else in distress as it will expose you to the hazardous atmosphere.

7.3 Lost

If you or your team are lost:

- Activate the Firefighter in Distress procedure
- Attempt to find a known point of reference.
- Follow reduced visibility navigation procedures such as finding a known point of reference, mind mapping or following hoselines to an exit.
- If you locate an exit, send the IC a sitrep via radio

7.4 Trapped

If you or your team are trapped:

- Move away from the source of danger if possible.
- Activate the **Firefighter in distress** procedure.
- Conserve air by breathing slowly and shallowly and minimising all movement.
- Stay calm and await rescue.

8 Working in high expansion foam

When working in high expansion foam:

- wear the type of BA identified by risk assessment
- maintain physical contact between team members.

WARNING

When working in high expansion foam, both visibility and the audibility of speech, portable radios, warning whistles and other devices are severely diminished.

9.2 BREATHING APPARATUS SAFE WORKING PRACTICES

Operating environment

The IC must:

- ☐ Conduct a risk assessment.
- ☐ Establish BA Control.
- ☐ Establish BA teams.
- ☐ Establish a RIT/s.

Firefighters must:

- ☐ Monitor air consumption.
- ☐ Follow safe working practices.

WARNING

Do not use any form of BA under water.

Firefighter in distress

WARNING

When a DSU is heard or a firefighter down message is transmitted, BA teams must render immediate assistance as determined by the IC.

In an emergency:

- ☐ Activate RIT by transmitting **'Red, Red, Red, Firefighter Down'**. Include a brief sitrep giving your position, problem and people involved.
- ☐ Manually activate the DSU.

If you encounter a BA team that requires emergency help, activate RIT and await instructions from the IC.

Before entry

Before entering a hazardous atmosphere, firefighters must:

- ☐ Don appropriate PPE identified in the risk assessment.
- ☐ Carry out the pre-operational check and ensure their BA set is operational.
- ☐ Don the facemask in clean air before entering the combat area.
- ☐ Conduct a buddy check of all equipment, including BA, PPE, radios and TICs.
- ☐ Ensure their completed BA tally tag is registered with BA Control.

WARNING

Do not enter or re-enter the hazardous atmosphere with a BA cylinder less than 80% full.

Dislodged facemask/ loss of air

If facemask becomes dislodged:

- ☐ Hold your breath.
- ☐ Readjust the facemask.
- ☐ Purge the facemask.
- ☐ If exposed, exit with your team to BA Control and update your Sector Commander or IC with a brief sitrep.

If your air supply fails, you cannot maintain a proper seal, your facemask is damaged, or your SCBA malfunctions:

- ☐ Minimise the loss of air by any means possible and exit with your team to BA Control.
- ☐ If possible and practical, connect your airline to your partner's auxiliary outlet.

WARNING

If you are supplying air to a second facemask, your remaining wearing duration will be at least halved.

- ☐ Update your Sector Commander or IC with a brief sitrep including your current position.
- ☐ If required, activate the **Firefighter in distress** procedure.
- ☐ Do not remove your facemask to supply air to someone else in distress.

Firefighter lost

If you or your team are lost:

- ☐ Activate the Firefighter in Distress procedure.
- ☐ Attempt to find a known point of reference.
- ☐ Follow reduced visibility navigation procedures such as finding a known point of reference, mind mapping or following hoselines to an exit.
- ☐ If you locate an exit, send the IC a sitrep via radio.

Firefighter trapped

If you or your team are trapped:

- ☐ Move away from the source of danger if possible.
- ☐ Activate the **Firefighter in distress** procedure.
- ☐ Conserve air by breathing slowly and shallowly and minimising all movement
- ☐ Stay calm and await rescue.

9.3 BREATHING APPARATUS OPERATIONS

1 Introduction

Breathing apparatus (BA) must be worn whenever a hazardous atmosphere may exist and your risk assessment identifies a type of BA as a suitable control measure. This guideline provides a framework for checking and operating BA equipment at an incident, establishing BA teams, and understanding the working duration of BA.

2 Application

This SOG applies whenever any form of BA is used.

3 Notification

The Incident Controller (IC) must notify:

- The Communication Centre (ComCen) when BA is used.
- The ComCen when extended duration breathing apparatus (EDBA) or air trolley breathing apparatus (ATBA) is to be used so that additional resources can be responded.
- All personnel on the fireground that BA is in use and the configuration of BA.

4 Equipment

4.1 Functional and pre-operational checks

The wearer must perform functional and pre-operational checks in accordance with the SIMS worksheet for each configuration of BA.

- Perform pre-operational check immediately before using BA.
- Perform functional check after changing cylinders and after disinfecting facemasks.

4.2 Preventing damage to BA

When handling BA, take extreme care not to damage valve assemblies, cylinders or other components.

Use the neck strap so that your facemask isn't damaged, scratched or contaminated.

4.3 Maintenance

Replace the BA air cylinder if it is less than 80% full.

Disinfect any facemask that has been used before it is worn by another operator or at the end of the incident.

5 BA teams

WARNING

A Rapid Intervention Team equipped to enter the same location as BA teams must be available throughout operations. (See SOG 18.2, *Rapid Intervention Teams*.)

BA team members must maintain adequate hydration levels and rest periods as per SOG 18.3, *Incident Ground Rehabilitation.*

The IC may appoint a BA Commander when multiple teams are at work. (See SOG 1.7*, Sectors, Groups and Divisions.*)

5.1 SCBA and EDBA teams

Firefighters wearing SCBA or EDBA must always work in a team. Each team must have a minimum of two firefighters. The senior ranking firefighter is the team leader.

Teams of two or three must enter and exit as a team. In a team of four or more, if safe to do so, two firefighters may exit together leaving the remaining firefighters as a team.

NOTE

The working duration of a team must be calculated using the cylinder with the lowest air pressure (refer Section 7).

5.2 ATBA teams

ATBA provides an uninterrupted air supply. An ATBA team consists of one or more wearers and a dedicated ATBA trained operator. The ATBA trained operator must:

- maintain communications with all wearers
- monitor air consumption and maintain a continuous air supply
- operate the BA Control board for the ATBA wearers
- remain in attendance at the air trolley at all times
- not be assigned other tasks.

5.3 Extension airline BA teams

An extension airline BA team consists of a dedicated observer and a wearer with an auxiliary facemask supplied by airline from a BA set. The dedicated observer must:

- monitor the SCBA pressure gauge at all times
- maintain communication with the wearer
- not be assigned other tasks.

5.4 Operators with auxiliary facemask

Auxiliary facemasks are used in confined space or rescue situations, or to allow untrained personnel approved by the IC to operate under the direct supervision of the firefighter wearing the BA set. (See In Orders 1986/19, *Wearing of SCBA by untrained personnel*.) The BA team must include at least two firefighters wearing SCBA or EDBA.

In an emergency where there is no alternative, a firefighter can attach their facemask to another firefighter's auxiliary outlet. Follow the distress procedures outlined in SOG 9.2, *Breathing apparatus safe working practices*.

WARNING

When supplying air to a second facemask, your remaining air supply duration is at least halved.

6 Team communication

All BA wearers should have a portable radio where possible. Where this isn't possible, each BA team must have at least one portable radio and maintain effective communication.

When working in a BA team:

- be alert for signals from one another or from other teams
- maintain verbal, visual or physical contact with your team at all times
- provide regular sitreps to the BACO, Sector Commander, BA Commander or IC.

WARNING

When a DSU is heard or a Red firefighter down message is given, BA teams must render assistance as determined by the IC.

7 Monitoring air consumption

All members of the BA team must monitor cylinder pressures, ensuring sufficient time is allowed to exit safely.

The team should exit to BA Control before the warning whistle sounds on any BA set in the team. If a warning whistle does sound, all members of the team must immediately exit together to the BA Control.

7.1 Nominal air consumption

The standard method of calculating the working duration of air cylinders is based on a nominal air consumption of 40 litres per minute. This doesn't take into account the use of PPE, high temperatures, individual physiology, stress, or heavy workloads.

It is each firefighter's responsibility to monitor and understand their own rate of air consumption.

Use the lowest cylinder pressure of all team members to determine the team's nominal working duration.

WARNING

In difficult environments, firefighters can use twice or three times as much air as the nominal rate of 40 litres per minute.

7.2 Safety margin

All BA sounds a warning whistle when pressure drops to 55 bar (±5 bar). The time taken for an operator to use this 55 bar depends on the operator's use of air and the capacity of air cylinders. This pressure is your safety margin. Based on a nominal air consumption of 40 litres per minute, these safety margins are:

- 207 and 300 bar cylinders: approximately 10 minutes
- 207 and 300 bar cylinder with auxiliary mask in use: approximately 5 minutes
- EDBA with 300 bar cylinders: approximately 20 minutes.

WARNING

These safety margin times are correspondingly reduced as your rate of air consumption increases.

WARNING

Always exit to BA Control before using your safety margin.

9.3 BREATHING APPARATUS OPERATIONS

Notification

The IC must notify ComCen when any form of BA is used.

BA teams

The IC may appoint a BA Commander when multiple teams are at work.

BA team members must maintain adequate hydration levels and rest periods.

SCBA and EDBA teams

- ☐ Each team must have a minimum of two firefighters.
- ☐ The senior ranking firefighter is the team leader.
- ☐ Teams of two or three must enter and exit as a team.
- ☐ In a team of four or more, if safe to do so, two firefighters may exit together leaving the remaining firefighters as a team.

⚠ **NOTE**

The working duration of a team is calculated using the cylinder with the lowest air pressure.

Rapid intervention teams

A Rapid Intervention Team equipped to enter the same location as BA teams must be available throughout operations.

Air trolley BA team

ATBA team consists of one or more wearers and a dedicated ATBA-trained operator.

ATBA-trained operator role:

- ☐ Maintain communications with all wearers.
- ☐ Monitor air consumption and maintain a continuous air supply.
- ☐ Operate the BA Control board for the ATBA wearers.
- ☐ Remain in attendance at the air trolley at all times.
- ☐ Not be assigned other tasks.

Extension airline BA team

Extension airline BA team consists of a dedicated observer and a wearer with an auxiliary facemask supplied by airline from a BA set.

Dedicated observer role:

- ☐ Monitor the SCBA pressure gauge at all times
- ☐ Maintain communication with the wearer
- ☐ Not be assigned other tasks.

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Operators with auxiliary facemasks

Auxiliary facemasks are used:

- ⇨ in confined spaces
- ⇨ in rescue situations
- ⇨ with untrained personnel approved by the IC under the supervision of the firefighter wearing the BA set.

The BA team must include at least two firefighters wearing SCBA or EDBA.

In an emergency, where there is no alternative, a firefighter can attach their facemask to another firefighter's auxiliary outlet.

WARNING

When supplying air to a second facemask, the duration of your remaining air supply is at least halved.

Team communication

- ☐ Have a portable radio, if possible.
- ☐ Be alert for signals from one another or from other teams.
- ☐ Maintain verbal, visual or physical contact with your team at all times.
- ☐ Provide regular sitreps to the BACO, Sector Commander, BA Commander or IC.

WARNING

When a DSU is heard or a 'Red firefighter down' message is given, BA teams must render assistance as determined by the IC.

Monitoring air consumption

- ☐ Firefighters must monitor and understand their own rate of air consumption, ensuring sufficient time to exit safely.
- ☐ The team should exit to BA Control prior to the warning whistle sounding on any BA set in the team. If a warning whistle does sound, the team must **immediately exit** to the BA Control.
- ☐ Use the lowest cylinder pressure of all team members to determine the team's nominal working duration.
- ☐ Always exit to BA Control before using your safety margin.

Safety margin

Based on a nominal air consumption of 40 litres per minute, the safety margins are:

- ⇨ 207 and 300 bar cylinders: *approximately 10 minutes*
- ⇨ 207 and 300 bar cylinder with auxiliary mask in use: *approximately 5 minutes*
- ⇨ EDBA with 300 bar cylinders: *approximately 20 minutes*

WARNING

These safety margin times are correspondingly reduced as your rate of air consumption increases.

9.4 BREATHING APPARATUS CONTROL

1 Introduction

Breathing Apparatus Control (BA Control) is designed to ensure the safety of firefighters during breathing apparatus (BA) operations. It tracks the location, entry time and expected exit time of BA wearers. BA Control:

- Identifies a wearer who is running low on air.
- Enables the activation of search and rescue operations if a wearer fails to report back to the control point by their expected exit time, or if they require assistance.
- Complements the Incident Crew Management System by showing the identity, location and tasking of firefighters wearing BA.

2 Application

This SOG applies whenever BA is worn and must be read in conjunction with SOG 9.1, *Use of Respiratory Protective Equipment*, SOG 9.2, *Breathing Apparatus Safe Working Practices*, SOG 9.3, *Breathing Apparatus Operations* and SOG 1.7, *Sectors, Groups and Divisions*.

3 Implementing BA Control

The Incident Controller (IC) must establish the Incident Control System (ICS) on arrival at the incident and implement BA Control as soon as BA is in use. BA Control must be integrated into ICS.

The appliance driver is the initial BA Control Operator (BACO) but may also have multiple roles at small incidents or until other crews arrive.

The IC must appoint one or more dedicated BACOs as soon as possible.

As additional resources arrive and the span of control is reached, the IC may appoint Sector or Group Commanders. Unless otherwise stated by the IC, the Sector/Group Commanders take over BA Control for the resources under their command and appoint a Sector/Group BACO.

4 Duties of BA Control Operators

BACOs:

- Establish BA Control as close to the entry/exit point as possible.
- Check and enter all details on the BA Control Board.
- Ensure that BA team members are identified by a call sign determined by the incident communications plan.
- Calculate and monitor entry and exit times.
- Monitor all radio communications within the sector.
- When exit time is reached:
  - Immediately contact the individual wearer or BA team leader.
  - If unable to contact, notify their Commander.
  - Activate the RIT immediately when required and notify the IC.

- Indicate to exiting BA crews the locations of the BA staging area and Rehabilitation Area.
- Provide updates to their Commander as required. A second radio transceiver may be required for communicating on the tactical channel.
- Ensure BA Control Boards clearly show when extended duration BA (EDBA) is in use. This is indicated by the red tag from the EDBA twin manifold being attached to the wearer’s yellow tally on the board.
- Ensure BA Control Boards clearly show when aerial appliance operators are wearing BA.
- Ensure BA Control Boards clearly show when extension facemasks are in use:
  - With air trolley BA (ATBA).
  - On aerial appliances.
  - With auxiliary facemask from another BA set.
  - With an extension airline from a standalone BA set.

NOTE

When auxiliary facemasks are used, two operators breathe from the one BA set. BACOs must at least halve estimated operating times recorded on the BA Control Board.

- Notifying the IC or Sector/Group Commander if they require assistance.

5 Duties of BA wearers and teams

All BA wearers must report to the BACO and ensure their BA tally is placed in the BA Control Board with all necessary information.

On exit, BA wearers must report to the BACO and collect their tally from the BA Control Board.

6 Remote entry

Where BA is carried to a remote location before being used, eg, in high-rise or large floor area buildings:

a) The BA wearers report to the relevant Commander (at high-rise incidents this may be several floors below the fire floor).

b) The BA wearer places the BA tally in the BA Control Board in their sector.

c) The BA wearer notifies the BACO when they don their facemask and begin using their air supply.

d) The BACO confirms to the IC or their Commander that entry has been made.

e) The BA wearer notifies the BACO when they have exited.

f) The BA wearer reports to the BACO to retrieve their BA tally.

g) The IC must consider relocating BA Control as close to the entry/exit point as possible as soon as practicable.

7 BA Control for Rapid Intervention Teams

When a full crew is dedicated to the role of Rapid Intervention Team (RIT), the BACO will manage BA Control for the RIT on the RIT crew's BA Control Board. If the BACO requires assistance to maintain span of control, they must notify the IC.

When no full crew is dedicated to the RIT, space must be reserved on BA Control Boards for the initial RIT.

8 Duties of a BA Commander

The IC determines the need for a BA Commander, and whether the BA Commander reports to the IC. The BA Commander is responsible for:

- Supervising BACO duties.
- Ensuring BACOs are adequately resourced.
- Maintaining adequate BA resources.
- Confirming communication channels.
- Monitoring work/rest cycles for BACOs.

9.4 BREATHING APPARATUS CONTROL

BA Control

⇨ Tracks the location, entry time and expected exit time of BA wearers.

⇨ Identifies a wearer running low on air.

⇨ Enables the activation of search and rescue operations if a wearer fails to report back to the control point, or if they require assistance.

⇨ Complements ICMS by showing the identity, location and tasking of firefighters wearing BA.

Implementing BA Control

☐ The IC must establish BA Control as soon as BA is in use.

☐ The appliance driver is the initial BACO, but may have other roles at small incidents or until other crews arrive. The IC must appoint dedicated BACOs as soon as possible.

☐ Sector and Group Commanders are responsible for BA Control for the resources under their command and will appoint a Sector/Group BACO.

Duties of BACOs

☐ Establish BA Control as close to the entry/exit point as possible.

☐ Check and enter all details on the BA Control Board.

☐ Ensure BA team members are identified by the correct call sign.

☐ Calculate and monitor entry and exit times.

☐ Monitor all radio communications within the sector.

☐ When exit time is reached – immediately contact the individual wearer or BA team leader. If unable to contact, notify their Commander. Activate the RIT immediately when required and notify the IC.

☐ Indicate to exiting BA crews the locations of the BA staging area and Rehabilitation Area.

☐ Provide updates to their Commander as required. A second radio transceiver may be required for the tactical channel.

☐ Ensure BA Control Boards clearly show when EDBA is in use, by the red EDBA tag being attached to the wearer's yellow tally.

☐ Ensure BA Control Boards clearly show when aerial appliance operators are wearing BA.

☐ Ensure BA Control Boards clearly show when extension facemasks are in use – with ATBA, on aerial appliances, with auxiliary facemask from another BA set, with an extension airline from a standalone BA set.

⚠ **NOTE**

When auxiliary facemasks are used, two operators breathe from the one BA set. BACOs must at least halve estimated operating times recorded on the BA Control Board.

☐ Notify the IC or SC if they require assistance.

Duties of BA wearers

- ☐ All BA wearers must report to the BACO and ensure their BA tally is placed in the BA Control Board with all necessary information.
- ☐ On exit, BA wearers must report to the BACO and collect their tally from the BA Control Board.

Duties of a BA Commander

The IC determines the need for a BA Commander, and whether the BA Commander reports to the IC.

The BA Commander:

- ☐ Supervises BACO duties.
- ☐ Ensures BACOs are adequately resourced.
- ☐ Maintains adequate BA resources.
- ☐ Confirms communication channels.
- ☐ Monitors work/rest cycles for BACOs.

BA Control for RIT

- ☐ When a full crew is dedicated to the role of RIT – BACO manages BA Control for the RIT on the RIT crew's BA Control Board separately.
- ☐ When no full crew is dedicated to the RIT – reserve space on BA Control Boards for initial RIT.

Remote entry

Where BA is carried to a remote location, eg in high-rise or large floor area buildings:

- ☐ BA wearers report to the relevant Commander – this may be several floors below.
- ☐ BA wearer places the BA tally in the BA Control Board in their sector.
- ☐ BA wearer notifies the BACO when they don their facemask and begin using their air supply.
- ☐ BACO confirms to the IC or their Commander that entry has been made.
- ☐ BA wearer notifies the BACO when they have exited.
- ☐ BA wearer reports to the BACO to retrieve their BA tally.

The IC must consider relocating BA Control as close to the entry/exit point as soon as practicable.

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NSW FIRE BRIGADES

Standard Operational Guidelines

Section Ten

10.1 GUIDELINES FOR ALL HAZARDOUS MATERIAL INCIDENTS

1 Introduction

This SOG assists firefighters in conducting a dynamic risk assessment (DRA) and safely managing incidents using the acronym SISIACMR:

S Safe approach
I Incident control
S Scene security
I Identify hazardous materials
A Assess potential harm and minimise environmental contamination
C Call in resources
M Monitor information
R Render safe and decontaminate

2 Scope

This SOG applies to all land and inland waterways based hazardous material incidents.

3 Responsibilities

Fire and Rescue NSW is the combat agency for rendering the incident safe with respect to life, property and the environment.

Under *Hazardous Materials/Chemical, Biological, Radiological* sub plan, the Department of Environment, Climate Change and Water (DECCW) is responsible for and provides advice on site clean-up, rehabilitation and waste disposal for hazardous materials emergencies.

Where a spill originating on the land enters State waters, Fire and Rescue NSW is the combat agency and will be assisted by the relevant Port Corporation. State waters are the responsibility of NSW Maritime or the relevant Port Corporation. Fire and Rescue NSW may be called on to assist.

4 SISIACMR

4.1 Safe approach

Approach the scene from upwind and uphill where possible.

Position the appliance a safe distance according to the nature of the hazard to avoid contaminating personnel and equipment.

Site vehicles so that they can be moved if the need arises, eg if the wind changes.

Treat all spillages or escapes of materials as dangerous until proven otherwise.

4.2 Incident control

On arrival, implement the Incident Control System (SOG 1) and establish an Incident Control Point with a full view of the operation, upwind of the Hot Zone in the Cold

Zone. Establish BA control and the Incident Crew Management System (ICMS), and appoint a Safety Officer as soon as practicable.

Conduct size up and DRA and develop Incident Action Plan (IAP).

All personnel must be made aware of the risks as soon as the hazard is identified.

Where there is an immediate risk to life that requires emergency rescue the Incident Controller (IC) must ensure that appropriate Personal Protective Equipment (PPE) is worn. Spillage clothing and BA are the minimum in non-fire situations. Establish emergency decontamination according to SOG 10.4, *Decontamination*.

Establish a RIT according to SOG 18.2*, Rapid Intervention Teams* and ensure a BA relief team is available.

4.3 Scene security

Establish scene security:

- Implement the Three Zone System.
- Establish a 30 metre minimum initial Hot Zone in all directions.
- Immediately remove all non-involved people from the Combat Area.
- Assemble contaminated people for decontamination, if required.
- Determine if existing or suspected ignition sources should be rendered safe in the Hot Zone.

WARNING

If suitable PPE is unavailable then an Exclusion Zone must be established.

Three Zone System

- **Hot Zone** – where no personnel enter until a DRA determines appropriate actions and level of PPE.
- **Warm Zone** – where Fire and Rescue NSW conducts its operations.
- **Cold Zone** – where the Incident Control Point and support agencies are located and where the Police implement overall site control.

Combat Area

The Hot and Warm Zones.

Exclusion Zone

An unsafe area where no level of PPE gives adequate protection and where nobody must enter, eg where there is a risk of wall collapse or an explosion.

4.4 Identify hazardous materials

Identify the chemical and/or the hazard presented by the chemical. Look for:

- chemical name
- UN number
- Dangerous Goods Class
- trade name.

Use whatever information is available. Information sources include:

- Emergency Information Panel (EIP)/Hazchem code
- *Initial Emergency Response Guidebook* carried on Fire and Rescue NSW appliances
- reference library carried on hazmat appliances
- material safety data sheets (MSDS)
- electronic pre-incident plans (PIP)

- Hazmat Action Guide (HAG Form)
- transport manifest documents/driver
- on-site specialists and scientific advisors
- measuring instruments

Wherever possible use binoculars from a position external to the Hot Zone.

If identification and information on the position and volume of the escape requires closer inspection:

- Conduct DRA to determine adequate level of PPE for a particular incident.
- Use a gas detectors to monitor lower explosive limits (LELs) where applicable.

4.5 Assess potential harm

After identifying the hazardous materials, seek further information from as many sources as possible.

Assess the potential harm to people, property and the environment of the material by considering the following properties:

- quantity (volume/mass and concentration)
- physical properties
- flammability
- reactivity
- corrosiveness
- radioactivity
- toxic or infectious.

4.6 Call in resources

Request assistance from the Hazardous Materials Response Unit and other specialist personnel such as chemists and engineers.

Request the assistance of other agencies when required.

Consider the need for additional Police or the resources available through the District Emergency Management Officer (DEMO).

Call for extra resources as early as possible. Be aware of the need to replace crews in protracted incidents or extreme conditions.

Consider resources needed to implement SOG 18.3*, Incident Ground Rehabilitation* and SOG 18.4, *Incident Ground Health Monitoring*.

4.7 Monitor information

Record all relevant information.

Request weather updates.

Liaise with property owners and/or transport companies and local councils.

Seek advice from the material manufacturers.

Establish and maintain effective communications.

Continue atmospheric monitoring.

Continue DRA and review IAP as required.

4.8 Render safe and decontaminate

4.8.1 Render safe operations

Render safe operations include:

- Managing the incident so that the immediate threat to life, property or the environment has ceased.
- Containing or confining the spill or release of contaminant by:
  - Neutralising the hazardous material.
  - Separating substances, if this can be done without undue risk.
  - Righting damaged drums or containers so that the leak is uppermost.
  - Closing appropriate valves or shut down processes after consultation with on-site specialists, if this can be carried out safely.
- Monitoring atmospheric contaminants until they are below the Time Weighted Average (TWA) exposure levels.

During render safe operations:

- Wear a level of PPE applicable to the risk when working in the Hot Zone.
- Increase or decrease the size of the Combat Area as required.
- Minimise exposure by avoiding unnecessary contact with the hazardous material.

4.8.2 Decontamination

Establish a Decontamination Area in accordance with SOG 10.4, *Decontamination*.

Establish an entry and exit point and closely monitor these areas.

Decontaminate personnel according to SOG 10.4, *Decontamination*.

Render safe through decontamination or containment all equipment and other items leaving the Hot Zone.

Rehabilitate and monitor personnel according to SOG 18.3, *Incident Ground Rehabilitation* and SOG 18.4, *Incident Ground Health Monitoring*.

5 Handover

The IC will hand over control of the incident once the site has been rendered safe. This involves:

- Consulting with other agencies where required.
- Developing a set of conditions by which the person or organisation accepting responsibility can safely manage the site.
- Completing the handover form and informing the Communication Centre.

10.1 GUIDELINES FOR ALL HAZARDOUS MATERIAL INCIDENTS

Responsibilities

- ⇨ Fire and Rescue NSW is the combat agency for rendering the incident safe.
- ⇨ In a hazmat emergency, DECCW is responsible for site clean-up, rehabilitation, waste disposal.
- ⇨ If spill enters State waters, Fire and Rescue NSW is the combat agency, assisted by the relevant Port Corporation.
- ⇨ If incident occurs in State waters, NSW Maritime or the relevant Port Corporation is responsible – Fire and Rescue NSW may be called to assist.

Three Zone System

- ⇨ **Hot Zone** – where no personnel enter until DRA determines appropriate actions and level of PPE.
- ⇨ **Warm Zone** –where Fire and Rescue NSW conducts its operations.
- ⇨ **Cold Zone** – where the Incident Control Point and support agencies are located and where the Police implement overall site control.

Combat Area

The Hot and Warm Zones.

Exclusion Zone

An unsafe area where no level of PPE gives adequate protection, and where nobody must enter.

SISIACMR

Safe approach

- ☐ Approach from upwind and uphill.
- ☐ Position appliance at a safe distance – to avoid contamination.
- ☐ Site vehicles where they can be quickly moved if needed.
- ☐ Treat all spillages or escapes as dangerous until proven otherwise.

Incident control

- ☐ Implement ICS.
- ☐ Establish an Incident Control Point (ICP) with full view of operation – upwind of Hot Zone, in the Cold Zone.
- ☐ Conduct a size up and Dynamic Risk Assessment (DRA), and develop an Incident Action Plan (IAP).
- ☐ Ensure risks are communicated to all personnel. Ensure appropriate PPE is worn.

Scene security

- ☐ Implement the Three Zone System.
- ☐ Establish a 30 m minimum initial Hot Zone.
- ☐ Remove all non-involved people from the Combat Area.
- ☐ Assemble contaminated people for decontamination.

☐ Determine if existing or suspected ignition sources should be rendered safe in the Hot Zone.

WARNING

If suitable PPE is unavailable then establish an Exclusion Zone.

Identify hazmats

☐ If possible, use binoculars from outside the Hot Zone to identify the chemical and/or hazard presented by the chemical.

☐ If closer inspection is needed:

- Conduct DRA to determine adequate level of PPE.
- Consider the use of gas detectors.

☐ Look for chemical name, UN number, Dangerous Goods Class, trade name – use other information sources (eg MSDS, Hazchem code) or specialist advice if needed.

Assess potential harm

☐ Seek information on identified materials.

☐ Consider quantity, physical properties, flammability, reactivity, corrosiveness, radioactivity, health hazards, and environmental hazards when assessing risks.

Call in resources

Call for extra resources as early as possible:

⇨ Hazmat Response Unit
⇨ Specialists
⇨ Other agencies, Police, DEMO
⇨ Replacement crews
⇨ Rehabilitation and health monitoring

Monitor information

☐ Record all relevant information.

☐ Request weather updates.

☐ Liaise with property owners, transport companies, local councils.

☐ Seek advice from material manufacturers.

☐ Establish and maintain effective communications.

☐ Continue atmospheric monitoring.

☐ Continue DRA and review IAP.

Render safe and decontaminate

☐ Contain or confine the spill.

☐ Wear level of PPE appropriate to the risk.

☐ Establish Decontamination Area. Decontaminate personnel.

☐ Decontaminate equipment as it leaves the Hot Zone.

Handover

Hand over control of site once rendered safe:

☐ Consult with other agencies.

☐ Develop a set of conditions by which the person or organisation can safely accept responsibility for the site.

☐ Complete handover form and inform the ComCen.

4 DECONTAMINATION

4.1 Introduction

4.1.1 Incidents involving chemicals, radioactive materials and biological hazards may necessitate the decontamination of personnel and equipment.

4.1.2 The success of decontamination depends on strict adherence to a disciplined process within defined zones. Decontamination procedures must take into account that not every appliance or station is equipped with specialised decontamination equipment. Occasions will therefore arise when preliminary or emergency decontamination will have to be undertaken.

4.2 Types of Contamination

4.2.1 Determine the appropriate type of decontamination to be used:

- preliminary;
- wet dilution;
- wet contamination;
- dry;
- fire fighting uniform; and
- emergency.

4.2.2 **Preliminary** - Used where available personnel and equipment is insufficient to allow for the establishment of a formal decontamination process, primarily, prior to the arrival of the HazMat Response Unit.

4.2.3 **Wet Dilution** - Used when the level of toxicity of the contaminate can be sufficiently reduced by dilution with water as to pose no environmental hazard.

4.2.4 **Wet Containment** - Used when the contaminating substance must be contained to prevent its spread to the environment.

4.2.5 **Dry Decontamination** - Primarily used where the contaminate is of a dry nature e.g. powders, fungicides, pesticides.

4.2.6 **Decontamination of Fire Fighting Uniform** - Required when firefighters, wearing only their fire fighting uniform, have become contaminated.

4.2.7 **Emergency Decontamination** - Used to decontaminate casualties removed from the Hot Zone.

4.3 Siting of the Decontamination Zone

4.3.1 Position the decontamination zone on solid ground, upwind of the incident, and on ground that slopes down towards the Hot Zone.

4.3.2 **Wash Area** - Position on the edge of the Hot Zone, over or in close proximity to a drain.

4.3.3 **Disrobing/Rest Area** - Position in a shade covered area, sufficiently distant from the Wash Area to prevent cross contamination. Where the incident is of a size requiring a formal Site Management procedure, position the Disrobing/Rest Area on the edge of the Restricted Access Zone, close to the Support Zone.

4.4 Decontamination Team

4.4.1 Assign the required members for the decontamination team. A decontamination team consists of:

- Decontamination Officer (DO);
- Wash Operator (WO);
- Wash Assistant (WA);
- Disrobe Assistant (DA); and
- Pump Operator (PO).

4.4.2 **Decontamination Officer (DO)**

The responsibilities of the DO are to:

- liaise with the Incident (HazMat) Controller;
- ensure all exposed personnel are decontaminated in accordance with expert advice;
- brief the decontamination team regarding their duties, type and method of decontamination to be carried out;
- debrief the decontaminated operators. Endeavour to obtain the information needed to complete an exposure report, seek to establish the physical well being of the operator (in conjunction with medical personnel if available), and find out if the operator has information which may assist the Incident (HazMat) Controller;
- ensure any equipment which has lost its integrity is removed from service immediately and clearly tagged;
- determine if the wearer is able to continue operating;

- establish a record of all personnel exposed to the contaminate and notify the NSWFB consultant occupational health physician through the communication centre;

- arrange for the labelling, safe collection and removal of contaminated clothing and equipment;

- arrange for the make-up of equipment in the Decontamination Zone at the conclusion of the incident; and

- ensure each member carries out personal hygiene measures i.e. washing hands prior to eating and/or leaving the incident site.

4.4.3 **Wash Operator (WO)**

The responsibilities of the WO are to:

- follow all directions issued by the DO;

- assist in correctly establishing the decontamination zone;

- wear a minimum protection of a splash suit;

- attach airlines to BA auxiliary air line fittings where necessary;

- remain in the Wash Area;

- ensure the appropriate decontamination measures are thoroughly carried out for exiting crews; and

- carry out a final inspection of the decontaminated personnel to ensure effective cleaning has been achieved.

4.4.4 **Wash Assistant (WA)**

The responsibilities of the WA are to:

- follow all directions issued by the DO;

- assist in establishing the decontamination zone;

- wear a minimum protection of a splash suit to allow for relief of the WO;

- as required, operate a BA in the area to provide air to personnel undergoing decontamination;

- prevent entry of unauthorised personnel into the Wash Area; and

- assist decontaminated personnel to move to the Disrobing/Rest Area.

4.4.5 **Disrobe Assistant (DA)**

The responsibilities of the DA are to:

- follow all directions issued by the DO;
- assist in correctly establishing the Decontamination Zone;
- wear a minimum protection of splash boots and splash gloves;
- assist in the partial removal of clothing and equipment from decontaminated personnel, where further wearing is required;
- where decontaminated crews are not returning to the Hot Zone, assist in the complete removal of protective clothing. Place the clothing in plastic bags before labelling and sealing the bags;
- ensure cylinders are changed on BA where necessary; and
- ensure liquid refreshment is provided to personnel.

4.4.6 **Pump Operator (PO)**

The responsibilities of the PO are to:

- follow all directions issued by the DO;
- remain in the Support Zone;
- ensure sufficient water and pressure is supplied for the decontamination of personnel; and
- ensure the pump is used only for decontamination purposes.

4.5 Decontamination Procedure

4.5.1 To provide the maximum effectiveness in decontamination, the WO is to adopt the following procedure for decontaminating personnel wearing specialised protective equipment over and above their fire fighting uniform:

(a) Decontaminate the person with the lowest air supply first.

(b) Rinse the operators undergoing decontamination. Where a portable decontamination shower is used, ensure the wearers remain in the shower for a minimum of 2 mins.

(c) Instruct the wearers undergoing decontamination to stand with arms outstretched and legs apart.

(d) Using a brush or cloth, starting at the wearers head, completely clean the wearer giving attention to the BA (on non-encapsulating suits), gloves, folds in suits and zip fastenings.

(e) Instruct the wearer to lift each foot in turn and clean the sole of each boot.

(f) Carry out a further rinsing of operators to remove remaining material(s).

(g) Prior to dispatching to the Disrobing/Rest Area for removal of the suit and BA, inspect the wearer, to ensure effective decontamination has been achieved. Where satisfactory decontamination is not achieved, carry out further decontamination.

(h) Contain all materials used for dry decontamination in a heavy duty plastic bag, or recovery bin where available.

4.6 Preliminary Decontamination

4.6.1 **Decontamination Zone** - The Wash Area is to consist of a hose reel and BA extension airline to provide a supplementary air supply to crew members (as necessary). The Disrobing/Rest Area is to be equipped with a salvage sheet, heavy duty plastic bags, ties and labels, seating, *Oxy-Viva* resuscitator, liquid refreshment, and disposable overalls (where available).

4.6.2 **Decontamination Team** - The team is to be established with a minimum of a WO and a DA.

4.7 Wet Dilution

4.7.1 **Personnel** - Wet dilution is used where a formal decontamination process can be implemented. This set up requires a full team of personnel and may involve the use of specialised decontamination equipment (see Fig 4.1).

Decontamination Zone

4.7.2 **Wash Area** - The Wash Area is to be considered contaminated and is to be identified by the use of barrier tape. Use a portable decontamination shower in the Wash Area (where available).

4.7.3 **Disrobing/Rest Area** - This area is to be isolated from non-involved personnel and identified with barrier tape. It is to be equipped with a salvage sheet, heavy duty plastic bags, ties and labels, seating, *Oxy-Viva* resuscitator, liquid refreshment, and disposable overalls (where available).

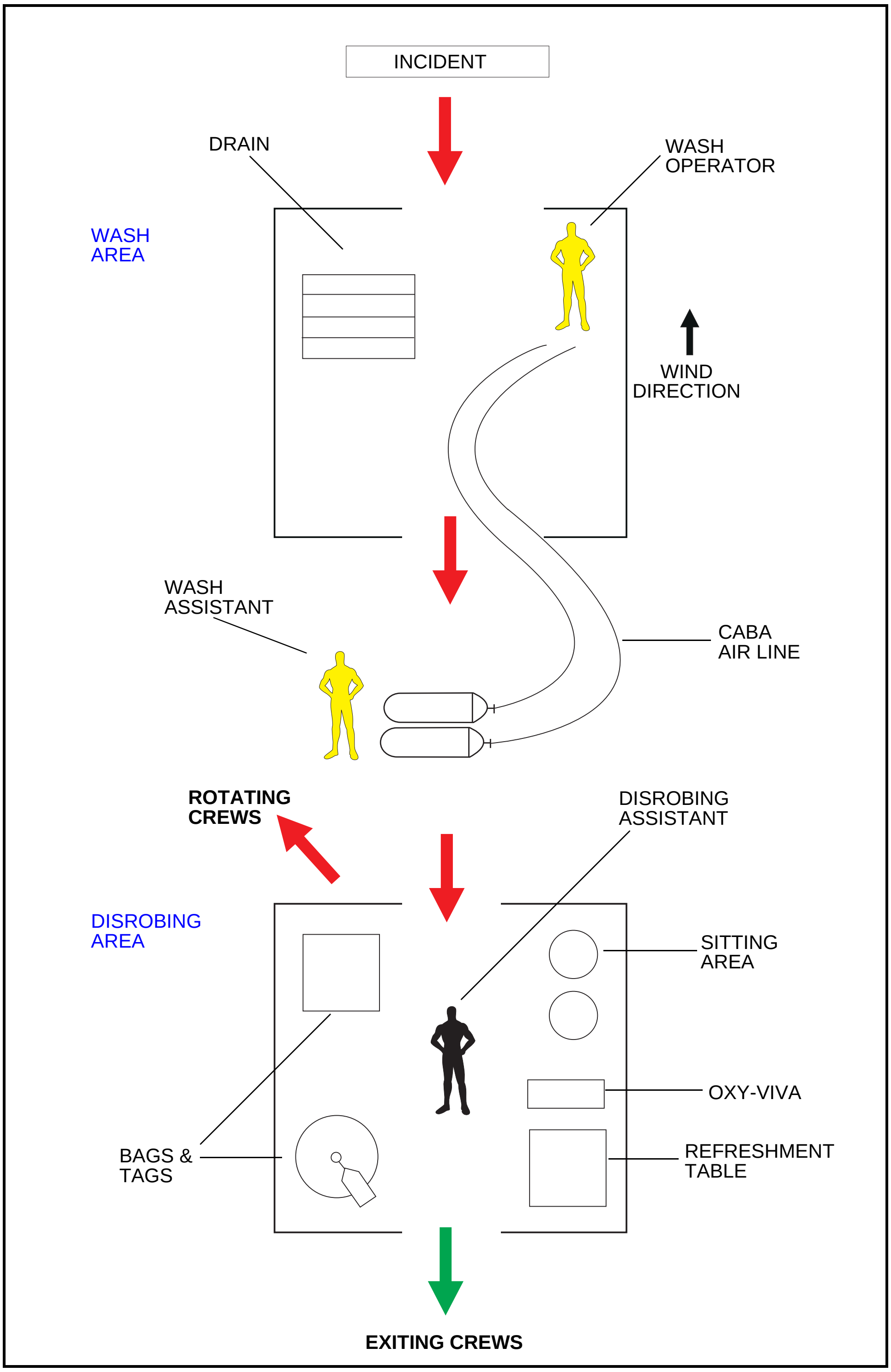


Fig 4.1 Dilution Decontamination

4.8 Wet Containment

4.8.1 **Personnel** - Used where a formal decontamination process can be implemented. This setup requires a full team of personnel and may involve the use of specialised decontamination equipment (see Fig 4.2).

Decontamination Zone

4.8.2 **Wash Area** - The Wash Area is to be considered contaminated and identified by the use of barrier tape. It is to be equipped with a containment dam and hose reel. Additionally, use a portable decontamination shower (where available).

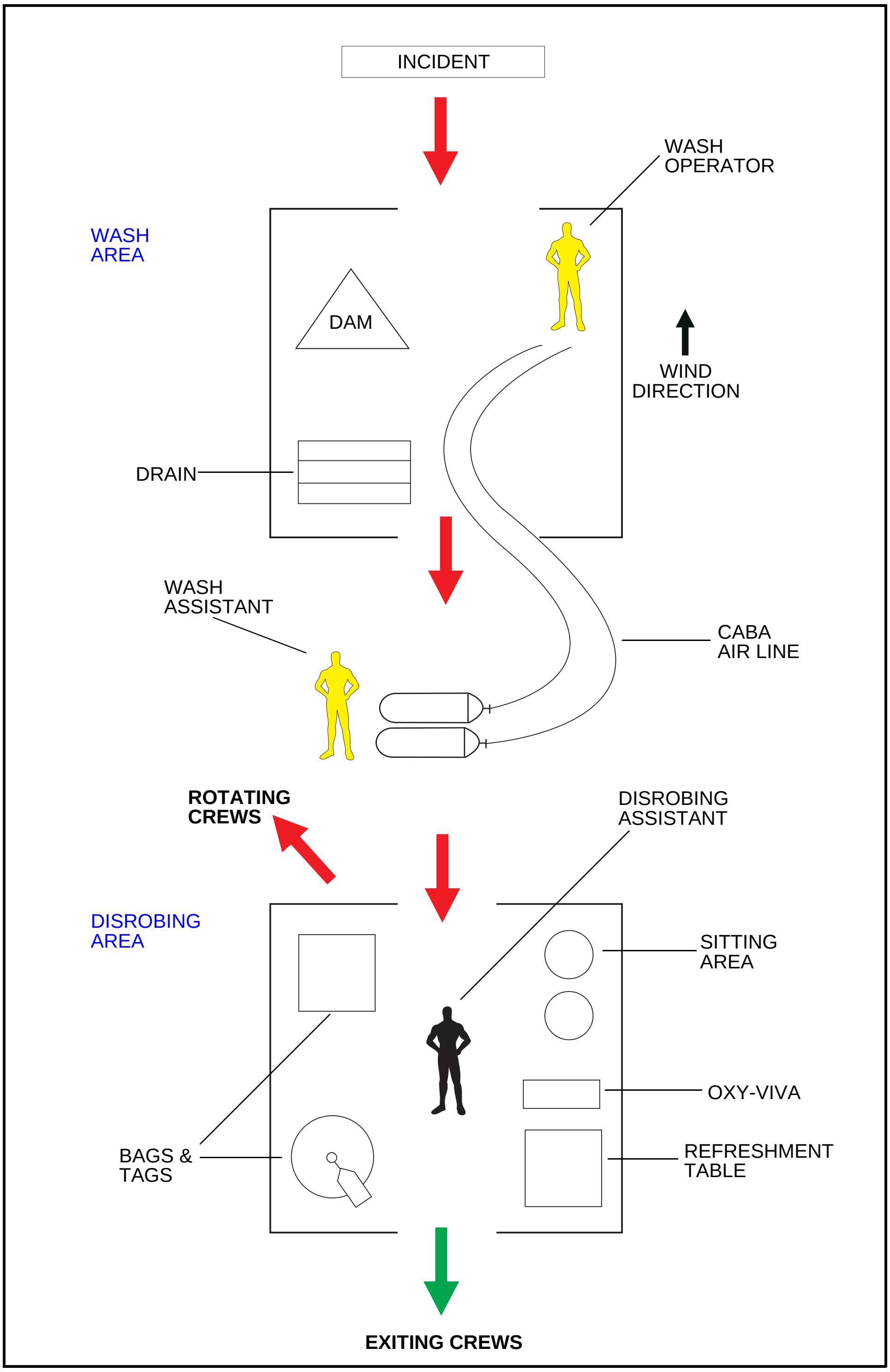


Fig 4.2 Containment Decontamination

4.8.3 **Disrobing/Rest Area** - This area is to be isolated from non-involved personnel and identified with barrier tape (where necessary). It is to be equipped with a salvage sheet, heavy duty plastic bags, ties and labels, seating, *Oxy-Viva* resuscitator, liquid refreshment, and disposable overalls (where available).

4.8.4 **Additional Decontamination Procedure** - Conserve the use of water consistent with thorough cleaning of operators and ensure that crew members are given a final wash down on exiting the containment dam prior to proceeding to the Disrobing/Rest Area.

⚠ **NOTE**

Retain containment water pending final disposal instructions.

4.9 Dry Decontamination

4.9.1 **Personnel** - Dry decontamination may be carried out in either a preliminary form or in a formal manner. For a preliminary dry decontamination, a minimum of a WO and a DA are to be used. For a formal dry decontamination, use a full decontamination team.

Decontamination Zone

4.9.2 **Wash Area** - The Wash Area is to be considered contaminated and identified with barrier tape. It is to be equipped with cleaning materials e.g. cloths, rags, etc, an approved vacuum cleaner as carried by the HazMat Response Unit (where available), heavy duty plastic bags, labels and ties (for cleaning materials), and an extension BA air line for attachment to the auxiliary air line fitting.

4.9.3 **Disrobing/Rest Area** - This area it to be isolated from non-involved personnel and identified with barrier tape. It is to be equipped with a salvage sheet, heavy duty plastic bags, ties and labels, seating, *Oxy-Viva* resuscitator, liquid refreshment, and disposable overalls (where available).

4.9.4 **Decontamination Procedure** - Initially decontaminate wearers with cloths, vacuum cleaner or other dry methods. Follow dry decontamination with a final wet dilution decontamination.

4.10 On Site Decontamination of Fire Fighting Uniform

4.10.1 Where firefighters have become contaminated at an incident, whilst only wearing their fire fighting uniform and BA, the WO is to apply the following decontamination procedure:

(a) When the contaminate is of a dry nature, lightly wet down the wearer with the hose reel.

⚠ **NOTE**

This is only to be done when a non reactive material is involved.

(b) Connect firefighters to a supplementary air supply.

(c) Instruct firefighters to remove their BA set **without** displacing the face mask (assistance may be required).

(d) Remove the wearers external clothing i.e. helmet, turnout coat, boots and overtrousers and place the helmet and boots in a separate bag to the tunic and overtrousers.

(e) Thoroughly wash the wearers head.

(f) Instruct the wearer to remove the BA face mask and wash their hands and face with soap and water.

(g) Carry out a final inspection of the wearer and when satisfied, instruct the wearer to proceed to the Disrobing/Rest Area.

(h) Provide alternative clothing in the form of disposable overalls (paper type or similar).

4.10.2 The wearer is to:

(a) Consider the tunic and overtrousers unserviceable until they have been decontaminated in an appropriate manner.

(b) Thoroughly wash and scrub the helmet, boots and BA on return to the station, unless advised to return them to the HazMat Response Unit for final decontamination.

(c) On return to the station, immediately shower with cold water.

4.11 Emergency Decontamination of Casualties

4.11.1 Where the rescue or removal of affected persons has occurred, and decontamination procedures are necessary before handing the casualties over to medical personnel, adopt the following procedures:

(a) Lay out a charged hose reel and blankets at a suitable place on the edge of the Hot Zone.

(b) Move the contaminated casualties to that point.

(c) Decontaminate the casualties by an appropriate means, and if necessary, remove their clothing to achieve effective removal of contaminates.

(d) Provide privacy for casualties who are to have their clothing removed.

(e) Move the casualties to an isolated area for medical attention. Where no medical crews are in attendance, monitor the casualties until medical services arrive.

(f) In addition to casualties, the rescue crew is to report for decontamination.

DECONTAMINATION PROCEDURES CHECK SHEET

At all hazardous material incidents the NSWFB attend it is highly likely that personnel will be working in the vicinity of the substances involved. For this reason this Check Sheet has been designed to enable effective decontamination to be carried out at the incident site.

GENERAL PROCEDURES

- Determine the type of decontamination to be used:
  - ☐ preliminary
  - ☐ wet containment
  - ☐ wet dilution
  - ☐ dry
  - ☐ decontamination of fire fighting uniform
  - ☐ emergency decontamination
- Appoint a decontamination team
  - ☐ decontamination officer
  - ☐ wash operator
  - ☐ wash assistant
  - ☐ disrobing assistant
  - ☐ pump operator
- Determine the position of the decontamination zone

Wash Area

☐ upwind of Hot zone
☐ solid ground sloping toward incident
☐ close to and upgrade of a drain
☐ on the perimeter of the Hot Zone

Disrobing/Rest Area

☐ upwind of the Hot Zone
☐ in shade
☐ distant from the Wash Area to prevent cross contamination
☐ on the perimeter of the Warm Zone

- Establish a Decontamination Zone

Wash Area

☐ hose reel
☐ containment dam
☐ vacuum cleaner
☐ portable shower
☐ extension air line
☐ cleaning materials
☐ other ____________________

Disrobing/Rest Area

☐ salvage/plastic sheet
☐ *oxy-viva*
☐ water
☐ seating
☐ disposable overalls
☐ plastic bags, labels, ties
☐ soap and water for hand washing

- Define the Wash Area and Disrobing/Rest Area with barrier tape

TYPES OF DECONTAMINATION

Preliminary
- Used when resources are limited
- Consists of wash operator and disrobing assistant

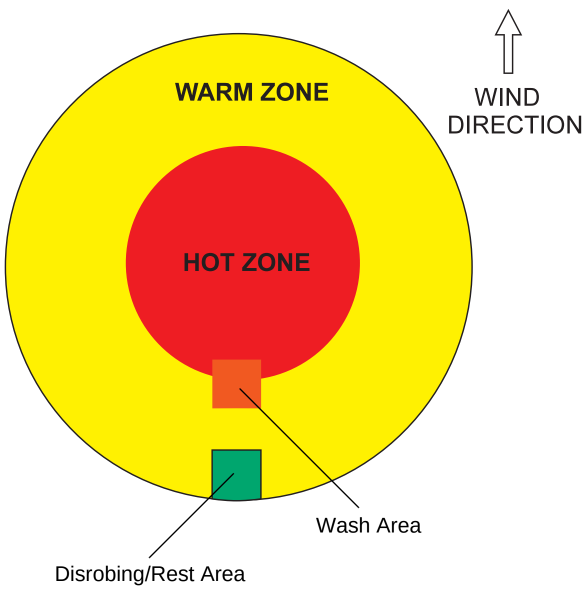
Wet Dilution
- Used when flushing waste water to drain
- Full team operation

Wet Containment
- Used when waste water requires containment
- Full team operation
- Secondary wash diluted to drains

Dry
- Full team operation
- Used to remove dry contaminates, usually wiped or vacuumed off

Fire Fighting Uniform
- Used to decontaminate firefighters exposed in fire fighting uniform e.g. at fires

Emergency
- Used to decontaminate casualties removed from the Hot Zone



CONSIDERATIONS

- Need to evacuate
  - ☐ co-ordinate with Police
- Need for helicopter support
  - ☐ identify/notify the location of a helipad
- Activation of HAZMATPLAN
- Liaison with other agencies/organisations
- Assist with the final Clean-up
- Use of other resources
  - ☐ Health
  - ☐ Rescue units
  - ☐ Water resources
  - ☐ Operational Support
  - ☐ Transport
  - ☐ *RTA*
  - ☐ Environmental
  - ☐ Welfare
  - ☐ Utilities - water, electricity, gas, council

8 BIOLOGICAL HAZARDS

8.1 Introduction

8.1.1 Biological hazards include clinical and related materials, waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practices, and wastes generated in hospitals during the treatment of patients or in research projects. The bulk of these hazards originate in hospitals.

8.1.2 Much of the waste can be hazardous to firefighters who come in contact with it. Considerable amounts of clinical and related waste are transported daily around NSW, in some cases vehicles may not be clearly identified as carrying such materials.

8.1.3 This section addresses the procedures required when dealing with problems associated with:

- contaminated waste;
- cytotoxic waste (see Fig 8.1); and
- pharmaceutical waste.

Fig 8.1 Cytotoxic Waste Label

8.2 Precautionary Measures

8.2.1 Consider the safety of personnel as the highest priority.

8.2.2 Treat biological hazards as highly toxic, invisible, non-odorous materials until expert advice is obtained.

8.2.3 Seek expert advice at the earliest possible stage in proceedings.

8.2.4 Identify the Hot Zone and seal off the area to prevent unauthorised entry.

8.2.5 Wear a minimum protection level of a splash suit and BA whenever entering the Hot Zone.

8.2.6 Exercise particular care to ensure that protective clothing is not penetrated by sharp implements e.g. syringes.

8.2.7 Avoid unnecessary disturbance of the materials until substances have been identified.

8.2.8 Contain the spread of biological hazards to the smallest area practicable and use suitable absorbents to remove the contained materials.

8.2.9 Do not release any animals unless advised that this action is safe.

8.2.10 Ensure the *Department of Health* is notified of the incident.

8.3 Fires Involving Biological Hazards

8.3.1 Consider the procedures listed in this section, in addition to those contained in *Section 7 - Hazardous Material Fires*.

8.3.2 Take steps to cover all areas of exposed skin. This includes the wearing of BA and fire fighting gloves, and by ensuring that the collar on the tunic is turned up.

8.3.3 Commit a minimum number of personnel to the Hot Zone, consistent with safe working practices, and delay salvage work or close proximity fire fighting until detailed information is available on the correct action to be taken.

8.3.4 Where water is used for fire fighting, use sprays in preference to jets, in the vicinity of biological hazards, to avoid the production of aerosols.

8.3.5 Minimise the use of fire fighting water and contain any contaminated run-off.

8.3.6 Assume smoke plumes are carrying biological hazards and evacuate downwind accordingly.

BIOLOGICAL HAZARDS CHECK SHEET

In addition to the Land Based or Marine Based Events Check Sheet this Check Sheet may be used at incidents which involve hazardous materials of a biological nature.

PRECAUTIONARY MEASURES

- Implement Incident Control System
- Seal off the Hot Zone to prevent unauthorised entry
- Treat the materials as highly toxic, invisible, non-odorous substances until expert assistance arrive
- Seek expert advice as soon as possible
- Minimum protection of splash suit and BA
- Exercise care to ensure clothing is not penetrated by sharps
- Avoid unnecessary disturbance
  - ☐ movement of materials
  - ☐ production of water spray aerosols
- Contain materials to smallest area
- Do not release animals
- Decontaminate all exposed personnel

FIRE SITUATIONS

- Consider all procedures in the Hazardous Material Fires Check Sheet *(Section 7)*
- Cover all exposed skin
  - ☐ BA
  - ☐ gloves
  - ☐ collar of tunic turned up
- Minimum personnel committed consistent with safe working
- Delay salvage until detailed information is available
- Minimise the use of water
- Contain contaminated run-off from fire

CONSIDERATIONS

- Notify *Public Health Unit*
- Need for down wind evacuation
  - ☐ co-ordinate with Police
- Need to allow the fire to burn

9 RADIOACTIVE SUBSTANCES

9.1 Introduction

9.1.1 Radioactive materials are primarily used in the medical field and industry for quality control. Small quantities of these materials are frequently transported around NSW.

9.1.2 Radioactive sources likely to be encountered by the NSWFB will most likely be of a low level hazard and, therefore, the emergency handling of radioactive incidents, or of personnel exposed to radiation, need not be feared if simple control and hygiene procedures are strictly adhered to.

9.2 General Precautions

9.2.1 Approach the incident from upwind and isolate the area for a minimum distance of 30 m in all directions, unless expert advice indicates that a smaller distance is adequate. Ensure that no unauthorised personnel enter the Hot Zone.

9.2.2 Establish a strict control line to ensure that the radioactive substance is confined to the Hot Zone, and fully assess the health hazards presented by the radioactive source prior to committing crews.

9.2.3 Wear a splash suit and BA, and minimise the time spent in the Hot Zone. Rotate crews frequently to reduce the exposure time of each person. Use the protection provided by natural shields e.g. vehicles.

9.2.4 When working in the Hot Zone, wear dosimeters (where these are available).

9.2.5 Monitor the absorbed radiation dose of personnel in the Hot Zone, and ensure that the maximum permitted levels are not exceeded.

9.2.6 Ensure the *EPA Radiation Control Section* is notified of the incident through the Fire Command Centre.

9.3 Spill or Leak

9.3.1 Avoid contact with damaged or leaking packages. Where packages must be moved, mechanical aids e.g. shovels are to be used.

9.3.2 Shut-off the leak at the source, or control the spill and dyke the area using absorbent material.

9.3.3 Move undamaged and uncontaminated packages away from the involved area.

9.3.4 Delay clean-up operations until the arrival of expert assistance.

9.4 Fires Involving Radioactive Materials

9.4.1 Consider the following procedures in addition to those contained in *Section 7 - Hazardous Materials Fires*.

9.4.2 BA is to be worn by all personnel involved in operations.

9.4.3 Use standard fire fighting agents to extinguish the blaze.

9.4.4 Avoid contact with the exposed substance or leaking/damaged packages.

9.4.5 Where it is safe to do so, move undamaged packages away from the fire zone.

9.4.6 Delay clean-up operations until the arrival of expert assistance.

9.5 Decontamination

9.5.1 Consider the following procedures in addition to those contained in *Section 4 - Decontamination*.

9.5.2 Ensure that all contaminated equipment remains in the Hot Zone.

9.5.3 Prior to exiting the Wash Area, decontaminated personnel are to be monitored for contamination. Where contamination remains, personnel are to undergo further decontamination until contamination readings are reduced to an acceptable level.

9.5.4 The WO and WA are to wear BA to protect against airborne contaminates.

9.5.5 Return all decontaminated equipment to the Hazmat Response Unit for final decontamination.

RADIOACTIVE SUBSTANCES CHECK SHEET

In addition to the Land Based or Marine Based Events Check Sheet this Check Sheet should be used at incidents involving Radioactive Substances. It is important to remember that the hazards associated with radioactive materials can be significantly reduced by strict control and hygiene procedures.

IMMEDIATE ACTION

- Implement Incident Control System
- Establish a Hot Zone
  - ☐ 30 m in all directions
  - ☐ smaller distance as indicated by expert advice
  - ☐ define with barrier tape
- Establish strict control
  - ☐ no unauthorised entry
  - ☐ ensure the substance is confined to the Hot Zone
- Notify *EPA* Radiation control Section

GENERAL PRECAUTIONS

- Wear adequate protection
  - ☐ splash suit and BA
  - ☐ dosimeters
  - ☐ utilise natural shielding
- Rotate crews frequently
  - ☐ minimise time in Hot Zone
- Monitor absorbed radiation dose of personnel and do not exceed safety limits
- Maximise personal distance to the radioactive source when working in the Hot Zone

SPILL/LEAK PROCEDURES

- Delay clean-up until arrival of expert advice
- Isolate non involved packages
  - ☐ move uncontaminated packages
  - ☐ stop leak at source
  - ☐ use mechanical aids e.g. shovels
- Control escape and dyke the area
- Avoid contact with radioactive material

FIRE SITUATIONS

- Consider the provisions of the *Hazardous Material Fires Check Sheet (Section 7)*
- Wear BA
- Use standard fire fighting agents
- Delay salvage operations until expert advice is obtained
- Protect exposures
  - ☐ move non involved packages
- Avoid contact with radioactive materials

DECONTAMINATION

- Consider the directions of the *Decontamination Check Sheets (Section 4)*
- Contain all contaminated equipment in Hot Zone
  - ☐ recovery bins
  - ☐ plastic bags
  - ☐ other ____________________
- Monitor decontaminated personnel
  - ☐ normal radiation readings
  - ☐ further decontamination required
- Wash Operator and Wash Assistant wear BA
- Return all decontaminated equipment to the HazMat Response Unit

10 LIQUIFIED PETROLEUM GAS

10.1 Introduction

10.1.1 Each year in NSW alone, somewhere in the region of three quarters of a million tonnes of liquefied petroleum gas is manufactured, transported and used, with a steadily increasing demand. Owing to extremely high standards of safety which are practised within the LPG industry, only a relatively small number of minor incidents occur. However, any substantial LPG leak may have serious consequences.

10.2 Leak - No Fire

10.2.1 Approach all LPG tanks and cylinders from upwind only.

10.2.2 Immediately remove all persons in the vicinity of a gas vapour cloud.

10.2.3 Establish a Hot Zone (see Table 10A).

MINOR LEAKS	MAJOR LEAKS
100 m in all directions around tanks and cylinders	300 m from sides and 900 m from ends of tanks
10 m around motor vehicles	900 m in all directions around rail cars

Table 10A Hot Zone distances

10.2.4 Wear fire fighting uniform and BA whilst making an approach to, or working in areas suspected of containing gas.

10.2.5 Avoid entering the gas vapour cloud, and **only** do so under the protection of water sprays.

10.2.6 **Do not** approach a tank or cylinder in a direct line to the pressure relief valve.

10.2.7 Where a major leak is present, position two charged lines of 70 mm hose in a protected area, ready for fire protection.

10.2.8 Position a back up crew, with a charged spray branch, to provide fire protection for the forward crew.

10.2.9 A crew utilising two spray branches, to disperse any leaking gas, is to approach the tank and assess the leak. Where safe to do so, the crew is to shut off the leak by an appropriate means.

10.2.10 Ice formed by leaking liquid LPG and creating a temporary seal is not to be hosed.

10.2.11 If unable to stop the leak, direct water sprays across the path of the vapour cloud and disperse gas toward a safe location, paying attention to low lying areas where gas may accumulate.

10.2.12 Prevent gas or liquid LPG from entering drains, basements, etc, by whatever means are available.

10.2.13 Liquid contact with skin will result in freeze burns or frostbite. Use thermal gloves if it is necessary to operate valves or touch metal components.

10.3 Fire Situation

10.3.1 Assume that a potential BLEVE situation exists.

10.3.2 The priorities are to:

- evacuate unnecessary persons;
- cool flame impinged on heated tanks and cylinders;
- control leaks by closing appropriate valves; and
- extinguish fires external to the tank causing flame impingement or heating.

10.3.3 Carry out an initial evacuation for 300 m from the sides and 900 m from the ends of involved tank(s). Assess the need to increase the evacuation distance to 1 km, in all directions, depending on the severity of the fire.

10.3.4 When approaching a vessel:

- approach from the sides of the tank or cylinder only and wear BA whilst doing so;
- approach behind the protection of water sprays; and
- **do not** approach in a direct line to the pressure relief valve.

10.3.5 Set up cooling sprays and/or monitors as soon as practicable after arrival and position cooling lines to facilitate the evacuation of NSWFB personnel if necessary.

10.3.6 Apply water at a minimum rate of 2000 L/min (33 L/sec) on each large tank which requires cooling. The application of water on containers is to be made at the point of flame contact.

⚠ **NOTE**

The container's vapour space (area above the liquid) is most crucial and is to be considered a high priority area for cooling. Cool all containers by using sprays in preference to jets of water.

10.3.7 Seek on-site specialist aid to discuss the feasibility of shutting off fuel supply valves. Stopping the flow of gas should be the first consideration after water cooling is established.

10.3.8 Only extinguish fires involving leaking fuel **by shutting off or stopping the flow of fuel**. Extinguishing the fire without stopping the leak may lead to an escalation of the incident.

10.3.9 Under no circumstances should burning gas, escaping from a pressure relief valve, be extinguished.

10.3.10 Be aware that in rail car incidents, adjacent cars may contain highly reactive or toxic materials. Seriously consider evacuating emergency personnel completely, and permitting the fire to burn.

10.4 LPG Motor Vehicles

10.4.1 Fully assess the situation before taking any action.

10.4.2 Wear BA in addition to fire fighting uniform.

10.4.3 Determine, and avoid the relief valve discharge point. Use caution where the relief valve discharge point is not evident.

10.5 Non-Fire Situations

In non-fire situations the following actions are required:

(a) Disperse vapour clouds with water fog lines.

(b) For leaks originating in the engine compartment, attempt to turn off the vehicle ignition to control the leak of LPG.

(c) Close the cylinder service valve (see Fig 10.1). Where this cannot be done, continue to disperse the leaking gas with water fog.

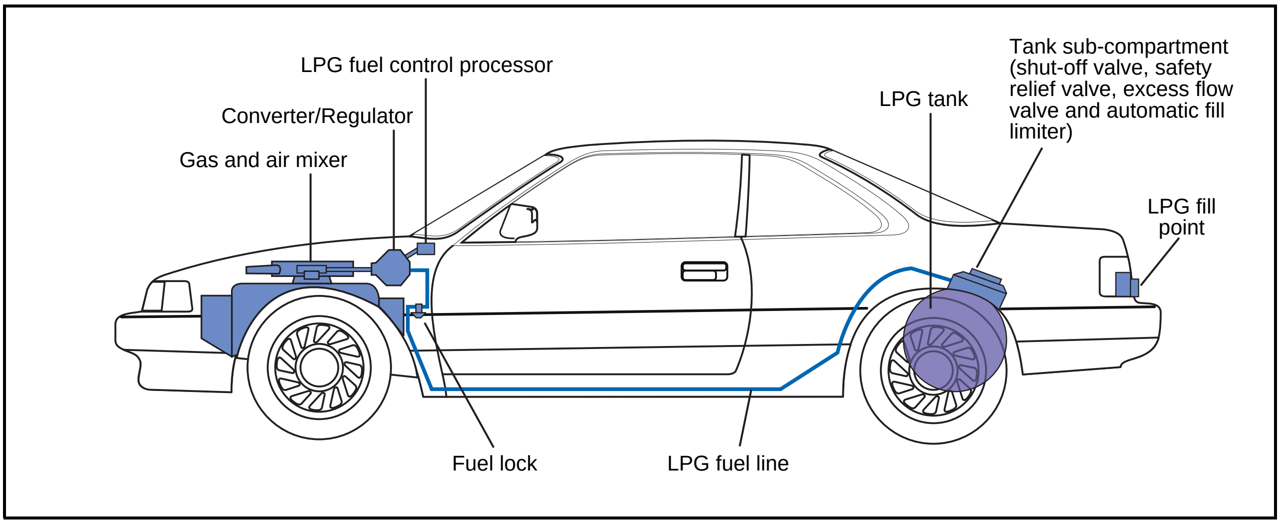


Fig 10.1 Schematic Layout of Passenger LPG System

10.6 Fire Situations

In fire situations involving LPG vehicles the following actions are required:

(a) Establish a Combat Area for 75 m around the vehicle.

(b) Cool the vehicle fire and then, under the protection of water sprays, gain access to the LPG cylinder and close the service valve.

⚠ **NOTE**

Approach the vehicle from the sides only, unless it is determined that the cylinder is mounted in a north/south manner, in which case approach from the rear.

(c) Take particular care with fires that have been burning for prolonged periods prior to the NSWFB arrival, or when the relief valve is in operation.

(d) When cooling the fire, in addition to the LPG cylinder, apply water to the passenger compartment as soon as possible to reduce flame impingement.

(e) If the source of the gas cannot be shut off, **do not extinguish gas fires**, apply cooling water to the LPG cylinder while extinguishing the fire in the vehicle.

LIQUIFIED PETROLEUM GAS CHECK SHEET

In addition to the Land Based Events Check Sheet this Check Sheet should be used at incidents involving Liquified Petroleum Gas

LEAK - NO FIRE

- Implement Incident Control System
- Establish a Hot Zone
  - ☐ minor leak - 100 m in all directions around tanks
  - ☐ 10 m in all directions around motor vehicles
  - ☐ major leak - 300 m from sides and 900 m from ends of tanks
  - ☐ major leak - 900 m around rail cars
- Immediately remove all persons from the Hot Zone
- For major leak
  - ☐ position two charged 70 mm lines of hose
  - ☐ position in a protected area
- Position a back up crew
  - ☐ charged spray branch
  - ☐ BA
- Approach the tank to make an assessment
  - ☐ BA
  - ☐ avoid gas and/or vapour clouds
  - ☐ identify and avoid relief valve discharge area
  - ☐ shut off the leak by an appropriate means
- Do not hose ice forming a temporary seal
- If unable to stop the leak, disperse the gas
  - ☐ direct water spray across vapour path
  - ☐ disperse to safe location
  - ☐ avoid low lying areas
- Prevent the gas or liquid from entering
  - ☐ drains
  - ☐ basements
  - ☐ pits
- Use thermal gloves when touching metal components

FIRE SITUATIONS

- Assume a BLEVE situation exists
- Priorities
  - ☐ evacuate unnecessary personnel
  - ☐ cool flame impinged tanks
  - ☐ control leaks by closing valves
  - ☐ extinguish fires external to the tank
- Initial evacuation for 300 m radius around tanks
  - ☐ prepare to extend to 1000 m radius
- Set up cooling sprays and/or monitors
  - ☐ facilitate evacuation of personnel
  - ☐ minimum rate of 200 L/min (33 L/s)
  - ☐ vapour area in tank cooled
  - ☐ sprays in preference to jets of water
- Close appropriate valves
  - ☐ seek advice
  - ☐ approach from sides of tank
  - ☐ provide water spray protection
  - ☐ do not approach relief valve discharge area
- Extinguish fire external to the tank or cylinder
- Do not extinguish fires emanating from the relief valve

LPG POWERED VEHICLES

- Assess the situation prior to taking action
- Wear BA at all times
- Determine and avoid the relief valve discharge area
  - ☐ use caution if unable to do so

Non-fire Situations

- Disperse vapour clouds with fog
- Close valves
  - ☐ cylinder service valve
  - ☐ turn off ignition

Fire Situations

- Establish Hot Zone for 75 m in all directions
- Cool vehicle fire from behind protective barriers
  - ☐ apply cooling line to LPG cylinder if accessible
  - ☐ cool passenger compartment
- Close the cylinder service valve
  - ☐ provide water spray protection
  - ☐ gain access to LPG cylinder
  - ☐ take particular care around fires that have burned for prolonged periods
- If gas valves cannot be closed, do not extinguish gas fires

CONSIDERATIONS

- Adjacent rail cars may contain hazardous materials
  - ☐ need to evacuate and allow to burn
- Need to increase initial evacuation distances
  - ☐ co-ordinate with Police Service

10.11 ASBESTOS

1 Introduction

This Standard Operational Guideline assists firefighters to deal safely with incidents where asbestos is, or is suspected to be, present, to minimise exposure.

2 Application

This SOG applies to any incident attended by the NSWFB where asbestos may be encountered.

3 Identifying asbestos

WARNING

At every incident where this SOG applies, assume that the asbestos present is friable – until the type is known.

Presence

When determining if asbestos is present on site, consider the following:

- *Age of construction* – asbestos was used extensively before the mid-1980's, although its commercial use continued until 2003 in specialist applications such as plant rooms.
- *Asbestos register* – workplaces with asbestos are required to have this register. There is no requirement for domestic dwellings to identify asbestos.
- Any pre-incident plans, brigade exercises, local knowledge, or owner/occupier knowledge.

Types

Industry identifies materials containing asbestos as either *friable* or *bonded*.

Friable asbestos

Friable asbestos is any material that contains asbestos in *powder form*, or that can be crumbled, pulverized, or reduced to powder by hand pressure when dry. Examples are sprayed asbestos insulation, pipe and boiler lagging, and any fire damaged bonded material.

Bonded asbestos

Bonded asbestos is any material that contains asbestos in a *bonded matrix.* It cannot be crushed by hand when dry and is intact in structure. Examples are flat (fibro) and corrugated (roofing) asbestos cement sheeting and asbestos cement pipes used for electrical, water, drains and flues.

NOTE

Bonded asbestos products that have been subject to weathering or water blasting, or severely damaged by fire, heat, hail or mechanical action, are considered to be friable asbestos.

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4 Friable asbestos incident

A friable asbestos incident is one where friable asbestos has been confirmed and firefighters *are likely to come in contact* with asbestos fibres, or one where the asbestos type has not been determined.

4.1 Control measures

Notification and response

- Notify the Communication Centre (ComCen) that it is a friable asbestos incident.
- Consider requesting:
  - An additional pump to assist with decontamination
  - A Hazardous Materials Response Unit
- Notify all NSWFB personnel and all personnel from other agencies that it is a friable asbestos incident – indicate the known location of the asbestos.
- Notify Duty Commander (Metropolitan) or On Call Senior Officer (Regional).
- Notify via the ComCen the following agencies (where applicable):
  - Local Council for residential or non-workplace site
  - Department of Environment, Climate Change and Water (DECCW) for large heavy industry or public authorities
  - WorkCover NSW for workplaces
  - NSW Health if there is potential of public exposure to asbestos.

Risk assessment

- Conduct a Dynamic Risk Assessment (DRA), considering all hazards.
- Continually review the DRA to assist with strategies.

Operations

- Establish a 50 metre Warm Zone initially, with controlled access to the Hot Zone. The Hot and Warm Zone dimensions may be altered following a risk assessment conducted by the Incident Controller.
- Set up Wet Decontamination:
- Minimise personnel in the Hot Zone, to reduce number of crews exposed.
- Record everyone entering the Hot Zone.
- Ensure personnel entering the Hot Zone wear structural firefighting ensemble and SCBA at structure fires. At incidents where asbestos is not the primary hazard and is subsequently encountered, eg storm recovery operations, conduct a DRA and consult with the Hazardous Materials Response Unit to determine the appropriate level of PPE.
- Use fog spray near asbestos.
- Dampen asbestos before it is disturbed – eg covered (tarped), drilled, cut or moved. If using NSWFB-issued plastic sheeting to cover asbestos, it must be double-wrapped to provide the adequate thickness required.
- Consider evacuation or stay indoors strategies for exposures within the smoke plume.

4.2 Decontamination

All personnel, equipment and appliances must be decontaminated after leaving the Hot Zone.

Decontamination Zone

In the Decontamination Zone, Wash Operators and Wash Assistant must:

- Wear SCBA face mask attached to a SCBA set with an extension hose, gloves and splash suit.
- Where possible, direct water run-off back to the Hot Zone.
- Wet decontaminate all PPE, including SCBA, by lightly spraying it with water to reduce the movement of airborne particles.
- Ensure all helmets, SCBA cylinders are washed before personnel leave the Decontamination Zone.
- Thoroughly wash firefighting boots in particular the laces, zippers and soles.
- Use water sprays to decontaminate soot, ash and foreign products from small gear and appliances.
- Place contaminated hose in yellow asbestos containment bags, tag and leave in the Hot Zone for disposal by the owner/occupier.

After decontamination

After being decontaminated:

1. Carefully remove firefighting gloves and don disposable gloves.
2. Remove helmet and SCBA face mask.
3. Don P2 dust mask.
4. Remove SCBA and structural firefighting ensemble.
5. Place wet structural firefighting ensemble – including flash hood, neck protector and firefighting gloves – into a yellow asbestos containment bag , securely seal and tag for laundering..
6. Wash SCBA with an open stream of water before normal SCBA disinfection and pre-operational checks, then return SCBA to the appliance.
7. Remove P2 dust mask and disposable gloves. Bag and tag, and leave on scene.
8. On return to station:
   - All personnel in the hot zone – Shower, giving hair particular attention. Dress in clean clothing. Send dirty duty wear clothing for normal dry cleaning.
   - *Station Commander* – Contact the laundry provider and have items picked up for decontamination according to local arrangements.

⚠ **NOTE**

Do not transport bags containing contaminated clothing in the cabin of appliances – transport bags in the web hose baskets, if available, or another safe stowage area.

5 Bonded asbestos incident

A bonded asbestos incident is one where bonded asbestos is present but poses no threat to personnel if undisturbed.

5.1 Control measures

- Advise the ComCen that it is a bonded asbestos incident.
- Conduct a DRA, considering all hazards.
- Notify all NSWFB personnel and all personnel from other agencies that it is a bonded asbestos incident. Indicate location of the asbestos.
- Monitor operations to ensure that they are not affecting the asbestos material.

⚠ **NOTE**

If the asbestos needs to be disturbed, drilled, cut or moved, upgrade the incident to a friable asbestos incident and notify the ComCen.

6 Salvage, overhaul and fire investigations

Prior to conducting salvage, overhaul or fire investigations the Incident Controller must conduct a DRA to determine whether or not the asbestos will be disturbed.

If it is necessary to disturb the asbestos, manage it as a friable asbestos incident, with minimum PPE of suitably rated disposable overalls and disposable gloves, and SCBA. Consider using rubber gumboots to remove the possibility of firefighting boot laces becoming contaminated.

If salvage, overhaul or fire investigations can take place *without* disturbing the asbestos, minimum PPE is disposable overalls and gloves and P2 particulate mask.

7 Handover

Before leaving the incident:

- Ensure the asbestos-contaminated zone is clearly marked.
- Where practical, give the owner/occupier a *NSWFB handover of site of NSWFB Response form*, available on the appliance. Depending on premise type, advise the owner/occupier to contact WorkCover NSW, DECCW or the local council, for advice on removing the asbestos-contaminated waste.
- Ensure Stop Message to the ComCen contains details of asbestos, whether a handover has occurred, and who has taken responsibility for the site.

8 Reporting

The AIRS report must contain the following:

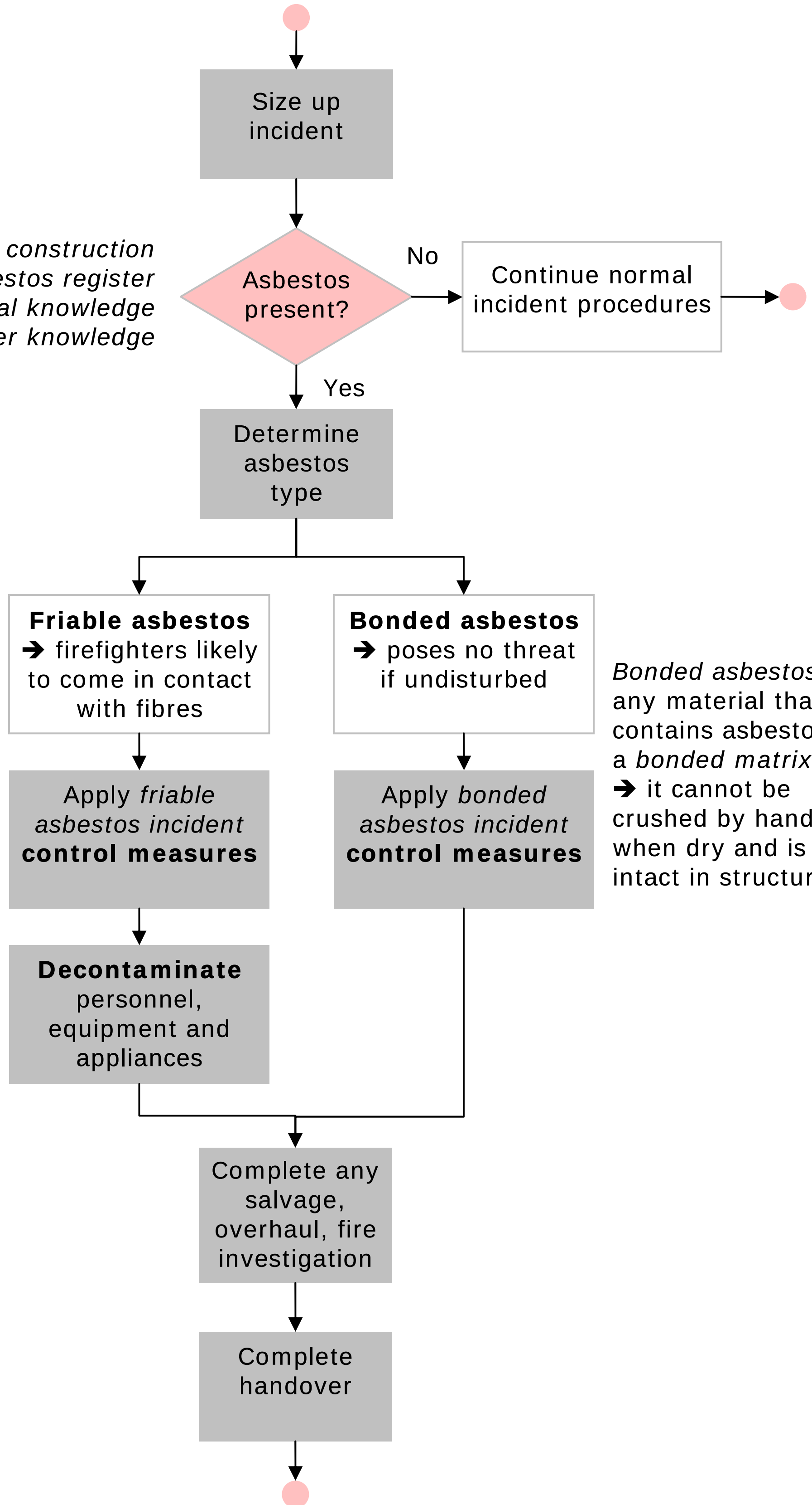
- Names of all NSWFB personnel who operated in the Hot Zone.
- Names and contact details of all other personnel who operated in the Hot Zone while the incident was under the control of the NSWFB.
- The measures adopted at the incident ground to control exposure to asbestos.

If firefighters have been exposed to asbestos (which will only occur if PPE or decontamination is inadequate) ensure *Notification of Injury, Illness, Exposure & Near Miss* (NIIENM) is completed.

10.11 ASBESTOS

Where asbestos is, or suspected to be present at an incident, firefighters must follow guidelines to *minimise their exposure* to the asbestos.

Age of construction
Asbestos register
PiPs, local knowledge
Owner/occupier knowledge



Friable asbestos is any material that contains asbestos in *powder form*, or that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.
➔ includes *weathered* and *damaged* bonded asbestos, and *undetermined* asbestos.

Bonded asbestos is any material that contains asbestos in a *bonded matrix.*
➔ it cannot be crushed by hand when dry and is intact in structure.

Friable asbestos incident

Control measures

- ☐ Assume that the asbestos is *friable* – until the type is known.
- ☐ Conduct a *Dynamic Risk Assessment*.
- ☐ Establish 50 metre Warm Zone, with controlled access to the Hot Zone – alter zone dimensions after risk assessment if required.
- ☐ Ensure crews in the Hot Zone wear *structural firefighting ensemble* and *SCBA*.
- ☐ Set up wet decontamination.
- ☐ Use fog spray near asbestos.
- ☐ Dampen asbestos before it is disturbed (covered, drilled, cut, moved). If using NSWFB-issued plastic sheeting to cover, *double-wrap* to provide adequate thickness.
- ☐ Consider evacuation or stay indoors strategy within smoke plume.

Decontamination – hoses, equipment, appliances

- ☐ Wear SCBA face mask attached to SCBA set with an extension hose, gloves and splash suit.
- ☐ *Hoses* – place contaminated hose in yellow asbestos containment bags, tag and leave in the Hot Zone.
- ☐ *Equipment and appliances* – use water to remove soot, ash and foreign products.

After decontamination

- ☐ *Carefully* remove firefighting gloves – don disposable gloves.
- ☐ Remove helmet and SCBA face mask – don P2 dusk mask.
- ☐ Remove SCBA and structural firefighting ensemble. Place wet structural firefighting ensemble in *yellow asbestos containment bags* and tag for laundering.
- ☐ Wash SCBA with an open stream of water before normal SCBA disinfection and pre-operational checks. Return SCBA to appliance.
- ☐ Remove P2 dust mask and disposable gloves. Bag and tag and leave on scene.
- ☐ Transport bags containing contaminated clothing in web hose baskets or another safe stowage area on the appliance – not in the cabin.
- ☐ On return to station, shower and wash hair.

Salvage, overhaul and fire investigations

Conduct a Dynamic Risk Assessment – determine if asbestos will be disturbed.

If you **need to disturb** the asbestos:

- ☐ *Minimum PPE* – paper overalls, disposable gloves and SCBA. Consider using rubber gumboots instead of firefighting boots.

If you **don't need to disturb** the asbestos:

- ☐ *Minimum PPE* – paper overalls, disposable gloves and P2 particulate mask.

GUIDELINE SUPPORT DOCUMENT FOR SOG 10.11 ASBESTOS

This Guideline Support Document supports SOG 10.11, *Asbestos.* It complements and adds to the information in the SOG, to better inform firefighters about asbestos.

Asbestos is a hazardous substance made from fibrous silicate minerals found in some rock formations. It was used extensively before the mid-1980s by manufacturing and industry, especially the building industry.

The dangers of asbestos were not widely recognised until the mid 1970s, which lead to the gradual phasing out of asbestos mining. However, use of asbestos as an ingredient in some products did not completely cease until 2003.

Because of the durability of many of the products containing asbestos, there is still a lot of asbestos in the built environment today – meaning that firefighters may still be exposed to asbestos.

This document provides more detailed information about the following:

- **Identifying asbestos** – to help identify asbestos at an incident:
  - *Asbestos use*
  - *Examples of asbestos use*
  - *Regulation of asbestos use*
- **Asbestos exposure and health effects** – which describes some potential health problems that can arise from exposure to asbestos:
  - *Health effects of asbestos exposure*
  - *Firefighters' exposure to asbestos*
- **Procedures** – the procedures at incidents:
  - *Procedures at incidents with asbestos*
  - *Handing over the site*
  - *Reporting*
- **Asbestos products** – lists of products that contain asbestos:
  - *Asbestos-containing materials*
  - *Common asbestos-containing products*
  - *Building materials that may contain asbestos*

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1 Asbestos use

Asbestos was popular in manufacturing and industry because it is a good insulator against heat and electricity. It resists corrosion and is durable, strong and flexible. Before the mid-1980s it was used extensively in building materials such as insulation, asbestos cement sheeting, and pipes. Its commercial use continued until 2003 in specialist applications such as plant rooms. (See Section 9 *Asbestos products* for extensive lists of asbestos-containing products.)

There are *many different types* of asbestos, but in Australia the *three most common* types of raw asbestos fibre that were processed into finished products were **Chrysotile** (white), **Crocidolite** (blue), and **Amosite** (brown).

Material that contains asbestos is referred to as either **bonded** or **friable.**

Bonded (tightly bound) asbestos material

Bonded asbestos material is any material that contains asbestos in a *bonded matrix*. It is most common in *residential* buildings.

Bonded asbestos material may include Portland cement or various resin/binders, and cannot be crushed by hand when dry.

Asbestos Cement products (in good condition) are an example of bonded asbestos material. A large number of products made from asbestos cement are still found in Australian buildings, including:

- Flat (fibro) – corrugated or compressed – asbestos cement sheeting
- Asbestos cement pipes used for electrical, water, drainage and flues.

Friable (loosely bound) asbestos material

Friable asbestos material is any material that contains asbestos and is in the form of a powder, or that can be crumbled, pulverized or reduced to powder by hand pressure when dry. It is not commonly found in residential buildings.

Friable asbestos was primarily used in commercial and industrial settings for fire proofing, sound proofing and insulation, but can be found in some old domestic heaters, stoves, hot water systems and associated pipe lagging, and in the backing of vinyl and linoleum floor coverings.

Any asbestos waste, including asbestos cement waste, which has not been appropriately disposed of is considered by WorkCover NSW to be friable asbestos.

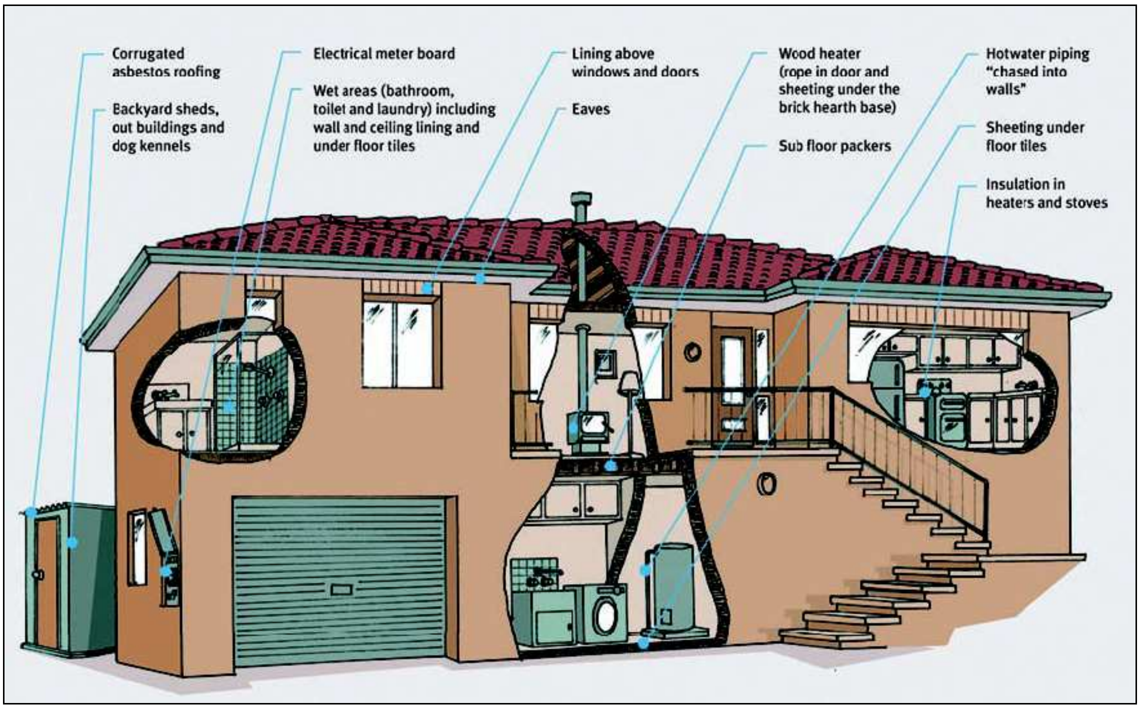
NOTE

Be aware that any asbestos cement product that has been subjected to weathering or water blasting, or severely damaged by fire, heat, hail or other mechanical action, is considered to be a friable asbestos product.

2 Examples of asbestos use

The following examples show places where asbestos may be found.

Also see Section 9 *Asbestos products* for extensive lists of asbestos-containing products.



Asbestos products in a domestic building

Image from *Management of asbestos in the non-occupational environment*, enHealth Council, Department of Health and Ageing – available from the State Government of Victoria, Australia, Department of Human Services, http://www.dhs.vic.gov.au.


Asbestos vinyl tiles


Asbestos lagging inside steel; Asbestos vinyl tiles lining to pipework


Corrugated asbestos cement roof


Malthoid waterproof roof membrane


Asbestos cement roof vent pipe


Zelemite meter board in asbestos-fibre-cement-lined meter box


Asbestos fibre cement wall panel to riser


Internal millboard (asbestos) lining to inline duct heaters


Asbestos vinyl tiling under carpet


Asbestos cement wall lining


Sprayed limped asbestos to steel column


Asbestos insulation (friable) as lagging to boiler and pipes

Places where asbestos may be used.

Photos from *Your five step guide to managing asbestos*, Chief Minister's Department, ACT Government – available from the Asbestos Awareness website, http://www.asbestos.act.gov.au.

3 Regulation of asbestos use

The WorkCover guide *Your guide to working with asbestos* (2008) provides useful information about working with asbestos and the relevant regulations.

Building work

Demolition, renovation and other building operations involving asbestos are regulated by WorkCover NSW. Workers must be licensed and follow safe working practices.

From 1 January 2008, a **bonded asbestos licence** is required for the removal of more than 10 square metres of bonded asbestos.

Also, water blasting or reusing asbestos products is illegal under regulation 259 of the *Occupational Health and Safety Regulation 2001*.

Asbestos register

Regulation 44 of the *Occupational Health and Safety Regulation 2001* requires that the controller of a workplace keep an **asbestos register.**

This register lists the *type, condition* and *location* of all asbestos and asbestos-containing material on the premise.

The asbestos register follows risk management principles by:

- Identifying asbestos-containing materials within the workplace
- Assessing the risk to health for each asbestos instance identified
- Recommending measures to control the risk to health, if required

As the register identifies where asbestos will be found, it is a **valuable resource** for crews performing Pre-Incident Plans (PIPs), or while in attendance at an incident.

It should be noted however that the assessment of the risk and control measures in the asbestos register *are not applicable* in an emergency situation, as the NSWFB will be following the relevant Standard Operational Guideline.

Also note that an asbestos register *may not be available* at all premises – for example, at Class 1 residential buildings.

4 Health effects of asbestos exposure

Asbestos fibres are made up of many, very fine, fibrils (very fine fibres) that can easily become airborne. The most dangerous fibres are the *smallest ones*, which are invisible to the naked eye but which penetrate the deepest part of the lungs.

The risk of developing asbestos-related diseases depends on the:

- Fibre shape
- Concentration of dust
- Length of exposure

Asbestos-related diseases have a *delay*, or lag period, usually in the order of *20-40 years* between first exposure and onset of symptoms and detection of the disease. Asbestos disease can appear or progress even after a person is no longer exposed.

The three most common diseases associated with asbestos are:

• **Asbestosis** – the scarring of lung tissue that can result from the inhalation over a period of years of substantial amounts of asbestos. This results in breathlessness, which may lead to disability, and in some cases, early death.
• **Lung cancer** – cancer of the lung. The risk is related to the amount of fibre inhaled and is greatly in increased in persons who also smoke cigarettes. No safe level of asbestos exposure for lung cancer has been identified.
• **Mesothelioma** – a cancer of the pleura (outer lung lining), or of the peritoneum (the lining of the abdominal cavity). Both pleural and peritoneal Mesothelioma can result from exposure to Amosite and Crocidolite. The risk of Mesothelioma is less with Chrysotile than with other types of asbestos – exposure to Chrysotile alone has caused few Mesotheliomas, and has never produced peritoneal Mesothelioma without exposure to either Amosite or Crocidolite as well. Mesothelioma rarely occurs in less than 15 years from first exposure, and most cases occur over 30 years after first exposure.

Chronic exposure to asbestos (such as at the asbestos mines at Wittenoon in West Australia) is a significant hazard – however, the hazard associated with a single acute exposure (as might happen at a fire involving asbestos roofing insulation) is less clear.

Incidence of disease appears to be related to total lifetime exposure, including to that from the ambient background.

5 Firefighters’ exposure to asbestos

The major exposure of firefighters to asbestos via airborne fibres can occur when:

- Asbestos that has been used for insulation purposes or building materials *is involved in a fire*, or *is damaged by fire.*
- *At natural hazards and rescue operations,* where bonded asbestos cement products are *damaged by impact* (eg hail, fallen trees, wind). WorkCover NSW considers asbestos products in these states to be friable asbestos.

The risk of exposure to airborne fibres is increased when:

- Asbestos products have been affected by heat or fire
- Asbestos cement products have been severely weathered or exposed to hail
- Asbestos products are water blasted
- Asbestos fibres are disturbed during operations

The risk of exposure to airborne fibres is managed by:

- Appropriate selection of PPE.
- Leaving asbestos products undisturbed.
- Wetting the material and surrounding areas with a gentle spray, so that fibres do not become airborne.
- Careful handling of bonded asbestos products (eg **do not** break sheets, slide sheets over each other, or drop sheets, and only cut with hand tools.)

6 Procedures at incidents with asbestos

SOG 10.11, *Asbestos*, describes the procedures for dealing with incidents involving asbestos. The procedures vary according to the type of asbestos present.

Friable asbestos incident

A friable asbestos incident is one where *asbestos has been confirmed on site* and firefighters are **likely to come in contact with asbestos fibres**, or one where the asbestos type has not been determined.

A friable asbestos incident requires more careful management as there is a likelihood that firefighters will be exposed to asbestos fibres. Examples of friable asbestos incidents would be structure fires where the asbestos-containing material is impinged by a fire.

For friable asbestos incidents, the SOG contains guidance on:

- The notification that must occur to ensure that enough resources are on-scene
- The control measures to be put in place to minimise exposure
- The decontamination procedures for personnel, equipment and appliances, to prevent spreading the contamination and therefore reduce the exposure.

Bonded asbestos incident

A bonded asbestos incident is one where *bonded asbestos* is present but **poses no threat** to firefighters, if **left undisturbed**.

Essentially, bonded asbestos incidents pose minimal risk to firefighters. The SOG specifies some control measures that will reduce the change of firefighter exposure or contamination.

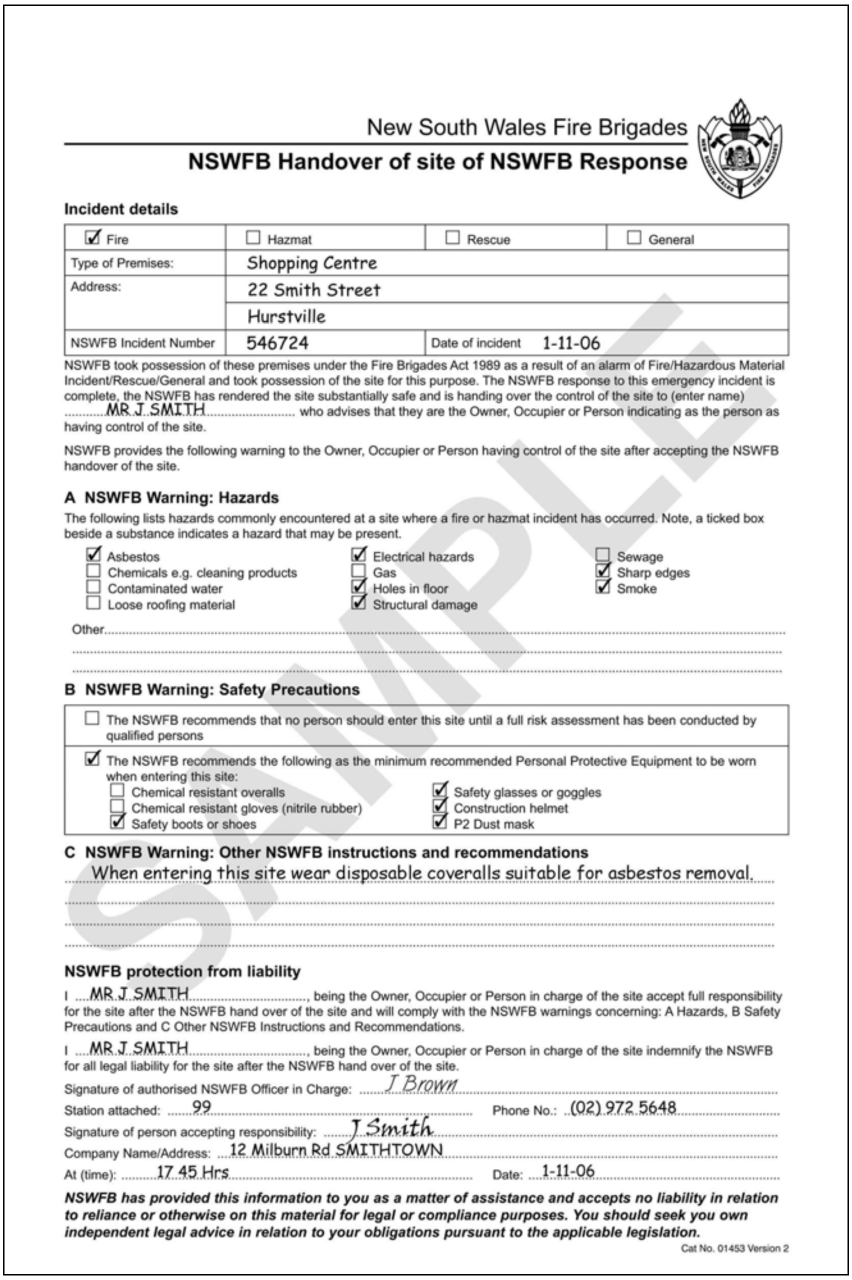
Where firefighters are involved in salvage, overhaul and fire investigations, care still needs to be taken to ensure that firefighters do not come in contact with asbestos fibres. The SOG outlines further procedures for this.

7 Handing over the site

Due to the risk of further contamination to other emergency services personnel, or the owners, occupiers or workers on the site, the NSWFB **must provide advice** to these people *before leaving the scene.* This process also provides protection to the NSWFB.

SOG 10.11, *Asbestos*, outlines the process of handover. This involves marking areas of suspected contamination, then referring owners, occupiers or workers to WorkCover NSW, the Department of Environment, Climate Change and Water (DECCW), or the local council. These agencies will provide practical advice in relation to the removal and disposal of any contaminated materials.

To facilitate handover, complete a *NSWFB handover of site of NSWFB Response form*, which is available on all appliances.



New South Wales Fire Brigades

NSWFB Handover of site of NSWFB Response

Incident details

☑ Fire	☐ Hazmat	☐ Rescue	☐ General
Type of Premises:	Shopping Centre		
Address:	22 Smith Street		
	Hurstville		
NSWFB Incident Number	546724	Date of incident 1-11-06	

NSWFB took possession of these premises under the Fire Brigades Act 1989 as a result of an alarm of Fire/Hazardous Material Incident/Rescue/General and took possession of the site for this purpose. The NSWFB response to this emergency incident is complete, the NSWFB has rendered the site substantially safe and is handing over the control of the site to (enter name) ....MR J SMITH.... who advises that they are the Owner, Occupier or Person indicating as the person as having control of the site.

NSWFB provides the following warning to the Owner, Occupier or Person having control of the site after accepting the NSWFB handover of the site.

A NSWFB Warning: Hazards

The following lists hazards commonly encountered at a site where a fire or hazmat incident has occurred. Note, a ticked box beside a substance indicates a hazard that may be present.

- ☑ Asbestos
- ☐ Chemicals e.g. cleaning products
- ☐ Contaminated water
- ☐ Loose roofing material
- ☑ Electrical hazards
- ☐ Gas
- ☑ Holes in floor
- ☑ Structural damage
- ☐ Sewage
- ☑ Sharp edges
- ☑ Smoke

Other..

B NSWFB Warning: Safety Precautions

☐ The NSWFB recommends that no person should enter this site until a full risk assessment has been conducted by qualified persons

☑ The NSWFB recommends the following as the minimum recommended Personal Protective Equipment to be worn when entering this site:

- ☐ Chemical resistant overalls
- ☐ Chemical resistant gloves (nitrile rubber)
- ☑ Safety boots or shoes
- ☑ Safety glasses or goggles
- ☑ Construction helmet
- ☑ P2 Dust mask

C NSWFB Warning: Other NSWFB instructions and recommendations

When entering this site wear disposable coveralls suitable for asbestos removal.

NSWFB protection from liability

I ....MR J SMITH...., being the Owner, Occupier or Person in charge of the site accept full responsibility for the site after the NSWFB hand over of the site and will comply with the NSWFB warnings concerning: A Hazards, B Safety Precautions and C Other NSWFB Instructions and Recommendations.

I ....MR J SMITH...., being the Owner, Occupier or Person in charge of the site indemnify the NSWFB for all legal liability for the site after the NSWFB hand over of the site.

Signature of authorised NSWFB Officer in Charge: ....J Brown....

Station attached: ....99.... Phone No.: ....(02) 972 5648....

Signature of person accepting responsibility: ....J Smith....

Company Name/Address: ....12 Milburn Rd SMITHTOWN....

At (time): ....17 45 Hrs.... Date: ....1-11-06....

NSWFB has provided this information to you as a matter of assistance and accepts no liability in relation to reliance or otherwise on this material for legal or compliance purposes. You should seek you own independent legal advice in relation to your obligations pursuant to the applicable legislation.

Cat No. 01453 Version 2

Example of the *NSWFB Handover of site of NSWFB Response* form

When sending the Stop Message to the Communication Centre, the Incident Controller must indicate the type of asbestos present, whether or not a handover has occurred, and who has taken responsibility for the site.

8 Reporting

Upon return to station, complete the AIRS report, ensuring that it contains details of the asbestos. SOG 10.11, *Asbestos*, outlines the AIRS reporting requirements.

If firefighters have been exposed to asbestos, ensure *Notification of Injury, Illness, Exposure & Near Miss* (NIIENMS) forms are completed.

9 Asbestos products

Following are lists of products and materials than can contain asbestos.

9.1 Asbestos-containing materials

The *Code of Practice for the management and control of asbestos in workplaces [NOHSC: 2018 (2005)]* (Australian Government, National Occupational Health and Safety Commission) contains the following list showing examples of asbestos-containing materials. It emphasises that the list is not exhaustive.

A
Air-conditioning ducts: exterior or interior acoustic and thermal insulation
Arc shields in lift motor rooms or large electrical cabinets
Asbestos-based plastics products - as electrical insulates and acid-resistant compositions or aircraft seat
Asbestos ceiling tiles
Asbestos cement conduit
Asbestos cement electrical fuse boards
Asbestos cement external roofs and walls
Asbestos cement in the use of form work when pouring concrete
Asbestos cement internal flues and downpipes
Asbestos cement moulded products such as gutters, ridge cappings, gas meter covers, cable troughs and covers
Asbestos cement pieces for packing spaces between floor joists and piers
Asbestos cement (underground) pits, as used for traffic control wiring, telecommunications cabling, etc
Asbestos cement render, plaster, mortar and coursework
Asbestos cement sheet
Asbestos cement sheet behind ceramic tiles
Asbestos cement sheet internal over exhaust canopies such as ovens, fume cupboards, etc.
Asbestos cement sheet internal walls and ceilings
Asbestos cement sheet underlays for vinyl
Asbestos cement storm drain pipes
Asbestos cement water pipes (usually underground)
Asbestos-containing laminates (eg formica) used where heat resistance is required, eg ships
Asbestos-containing pegboard
Asbestos felts
Asbestos marine board (eg marinate)
Asbestos mattresses used for covering hot equipment in power stations
Asbestos paper used variously for insulation, filtering and production of fire resistant laminates
Asbestos roof tiles
Asbestos textiles
Asbestos textile gussets in air-conditioning ducting systems
Asbestos yarn
Autoclave/steriliser insulation

B
Bitumen-based water proofing such as malthoid, typically on roofs and floors but also in brickwork
Bituminous adhesives and sealants
Boiler gaskets
Boiler insulation, slabs and wet mix
Brake disc pads
Brake linings

C
Cable penetration insulation bags (typically Telecom)
Calorifier insulation
Car body filters (not common)
Caulking compounds, sealant and adhesives
Cement render
Chrysotile wicks in kerosene heaters
Clutch faces
Compressed asbestos cement panels for flooring, typically verandas, bathrooms and steps for demountable buildings
Compressed asbestos fibres (CAF) used in brakes and gaskets for plant and automobiles

D
Door seals on ovens

E
Electric heat banks - block insulation
Electric hot water services - normally not asbestos but some millboard could be present
Electric light fittings, high wattage, insulation around fitting (and bituminised)
Electrical switchboards – see Pitch-based
Exhausts on vehicles

F
Filler in acetylene gas cylinders
Filters - beverage; wine filtration
Fire blankets
Fire curtains
Fire door insulation
Fire-rated wall rendering containing asbestos with mortar
Fire-resistant plaster board, typically on ships
Fire-retardant material on steel work supporting reactors on columns in refineries in the chemical industry
Flexible hoses
Floor vinyl sheets
Floor vinyl tiles
Fuse blankets and ceramic fuses in switchboards

G
Galbestos roofing materials (decorative coating on metal roof for sound proofing)

Gaskets - chemicals, refineries
Gaskets - general
Gauze mats in laboratories / chemical refineries
Gloves - asbestos

H
Hairdryers - insulation around heating elements
Header (manifold) insulation

I
Insulation blocks
Insulation in electric reheat units for air-conditioner systems

L
Laboratory bench tops
Laboratory fume cupboard panels
Laboratory ovens - wall insulation
Lagged exhaust pipes on emergency power generators
Lagging in penetrations in fireproof walls
Lifts shafts - asbestos cement panels lining the shaft at the opening of each floor, and asbestos packing around penetrations
Limpet asbestos spray insulation
Locomotives - steam; lagging on boilers, steam lines, steam dome and gaskets

M
Mastics
Millboard between heating unit and wall
Millboard lining of switchboxes
Mortar

P
Packing materials for gauges, valves, etc, can be square packing, rope or loose fibre
Packing material on window anchorage points in high-rise buildings
Paint, typically industrial epoxy paints
Penetrations through concrete slabs in high-rise buildings
Pipe insulation including moulded sections, water-mix type, rope braid and sheet
Pitch-based (eg zelemite, ausbestos, lebah) electrical switchboard
Plaster and plaster cornice adhesives

R
Refractory linings
Refractory tiles
Rubber articles - extent of usage unknown

S
Sealant between floor slab and wall, usually in boiler rooms, risers or lift shafts
Sealant or mastik on windows
Sealants and mastics in airconditioning ducting joints
Spackle or plasterboard wall jointing compounds
Sprayed insulation - acoustic wall and ceiling
Sprayed insulation - beams and ceiling slabs
Sprayed insulation - fire retardant sprayed on nut internally, for bolts holding external building wall panels
Stoves - old domestic type; wall insulation

T
Tape and rope - lagging and jointing
Tapered ends of pipe lagging, where lagging is not necessarily asbestos
Tilux sheeting in place of ceramic tiles in bathrooms
Trailing cable under lift cabins
Trains - country - guards vans - millboard between heater and wall
Trains - Harris cars - sprayed asbestos between steel shell and laminex

V
Valve, pump, etc. insulation

W
Welding rods
Woven asbestos cable sheath

9.2 Common asbestos-containing products

The Mesothelioma Centre provides the following list of common asbestos-containing products. It emphasises that the list is not exhaustive. See http://www.mesotheliomacenter.org for further information.

Acoustical panels
Acoustical plaster
Acoustical tile
Adhesive
Aircell insulation
Aprons
Asbestos board
Asbestos canvas
Asbestos cloth
Asbestos cord
Asbestos corrugated sheets
Asbestos curtains
Asbestos felt
Asbestos fiber
Asbestos fiber felt
Asbestos finishing cement
Asbestos flatboard
Asbestos forms
Asbestos furnace tape
Asbestos gaskets
Asbestos gloves
Asbestos insulating blankets
Asbestos insulating cement
Asbestos insulation
Asbestos lap
Asbestos micarta
Asbestos millboard
Asbestos mineral wool
Asbestos mittens
Asbestos packing
Asbestos pads
Asbestos panels
Asbestos paper
Asbestos rollboard
Asbestos rope
Asbestos seals
Asbestos sheets
Asbestos sponge block
Asbestos sponge cover
Asbestos spray
Asbestos tank jacket
Asbestos tape
Asbestos textile
Asbestos tiles
Asbestos wick
Asbestos yarn
Asbestos-faced mineral wool
Asphalt
Attic insulation
Automobile hood liners
Blaze shield
Block
Board
Boiler wall coat
Boilers
Bonding cement
Cables
Calcium silicate insulation
Carded asbestos cloth
Castables
Ceiling tiles
Cement
Ceramic tile
Cigarette filters
Clapboards
Clay
Cloth
Clutches
Cork board
Cork covering
Cork-filled mastic
Cork mastic
Corrugated asbestos sheets
Corrugated paper
Dry mix joint compound
Duct adhesive
Eighty-five percent magnesia insulation
Emulsion adhesive
Emulsions
Expansion
Expansion joint
Fake snow
Fibrous adhesive
Finishing cement
Fire resistant insulation shield
Firebrick
Fireclad asbestos paper
Firefoil board
Firefoil panel
Fireguard asbestos paper
Fireproofing cement
Flex board
Flexible duct connectors
Furnace cement
Fyrbestos sheets
Gasket material
Gaskets
Generators
Goldbestos
Gunning mix
Hair dryers
Heat shield
Heatguard
High pressure packing
Industrial A-C board
Insulation coating
Insulation duct
Insulation jacketing
Insulating mix
Insulation seal
Insulmastic
Ironing board covers
Joint compounds
Kent cigarettes
Lagging
Lagging adhesive
Lagging cloth
Lagging tape
Leggings
Limpet
Marine panels
Mastic
Masonry fill
Mastic
Mastic adhesives
Metal mesh blanket
Millboard
Mineral wool block
Mineral wool insulating cement
Mineral wool mineral wool blankets
Mittens
Mitts
Navy sealer
Nuclear reactors
One-shot cement
Packing
Packing material
Paint
Paper
Paper tape
Panels
Patching fiber
Patching plaster
Permaboard
Pipe covering
Plaster
Powershield
Pumps
Putty
Quick-setting joint compound
Railroad electrical arc chutes
Raw asbestos fiber
Refractory cements
Roofing felt
Roofing paper
Rollboard
Rope
Rope packing
Sealer
Sheet packing
Sheet rope
Sheetrock
Sheets
Shingles
Sound shield
Sleeves
Spackle
Spackle plaster
Sponge felt
Spray
Spray fireproofing
Stone corrugated sheets
Stone sheathing
Talc powder
Tape
Tar paper
Transite
Troweled coating
Turbines
Valve rings
Valve stem packing
Valves
Vermiculite compounds
Vinyl asbestos floor tile
Vinyl wallpaper
Waterproofing
Welding rods
Wick
Wires
Wood fiber plaster
Yarn

9.3 Building materials that may contain asbestos

The Mesothelioma Centre provides the following list of building materials and products that may contain asbestos. See http://www.mesotheliomacenter.org for further information.

Products that may contain asbestos

Product	Location	% Asbestos	Dates of Use
Roofing and Siding			
Roofing felts	Flat, built up roofs	10-15	1910-present
Roof felt shingles	Roofs	1	1971-1974
Roofing shingles	Roofs	20-32	?-present
Roofing Tiles	Roofs	20-30	1930-present
Siding shingles	Siding	12-14	?-present
Clapboards	Siding	12-15	1944-1945
Walls and ceilings			
Sprayed coating	Ceilings, walls, and steelwork	1-95	1935-1978
Troweled coating	Ceilings, walls	1-95	1936-1978
Asbestos-cement sheet	Near heat sources such as fireplaces, boilers	20-50	1930-present
Spackle	Walls, ceilings	3-5	1930-1978
Joint compounds	Walls, ceilings	3-5	1945-1977
Textured paints	Walls, ceilings	4-15	?-1978
Millboard, rollboard	Walls, commercial buildings	80-85	1925-?
Vinyl wallpaper	Walls	6-8	?
Insulation board	Walls	30	?
Floors			
Vinyl-asbestos tile	Floors	21	1950-1980?
Asphalt-asbestos tile	Floors	26-33	1920-1980?
Resilient sheet flooring	Floors	30	1950-1980?
Mastic adhesives	Sheet flooring and tile backing	5-25	1945-1980?
Pipes and boilers			
Cement pipe and fittings	Water and sewer mains	20-?	1935-present
Block insulation	Boilers	6-15	1890-1978
Preformed pipe wrap	Pipes	50	1926-1975
Corrugated asbestos paper	Pipes, high temp., moderate temp.	90 35-70	1935-1980? 1910-1980?
Paper tape	Furnaces, steam valves, flanges, electrical wiring	80	1901-1980?
Putty (mudding)	Plumbing joints	20-100	1900-1973

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Product	Location	% Asbestos	Dates of Use
Other products			
Gaskets/Packing	Pipe flanges, boiler doors, valves, pumps	10-80	1900-1980s
Cloth/Blankets	Welding accessory, pipe insulation, curtains, clothing	40-100	1900-1985
Clothing (gloves, mittens, sleeves, aprons, coats, jackets, pants, hoods, spats)	Heat and fire resistant protective clothing	40-100	1900-1985
Cement/mortar	Used as a castable insulation on furnaces, pipes, boilers, brick	5-100	1900-1975
Metal-clad firebrick	Found in Open Health Furnaces and Basic Oxygen Furnaces	10	1950-1980s
Gunnite/fire-proofing spray	Sprayed onto furnaces as well as structural steel for fireproofing protection	20-75	1900-1980s
Hot-tops (ingot mould covers and inserts)	Used with ingot moulds in the steel pouring process	10-80	1960-1980

10.12 CLANDESTINE DRUG LABORATORIES

1 Introduction

This SOG assists firefighters to deal safely with incidents involving clandestine drug laboratories (clan drug labs). At times, Fire and Rescue NSW crews may come across clan drug labs during routine calls to fires, automatic fire alarms or other incidents. At other times, Fire and Rescue NSW is called upon by the New South Wales Police Force (NSWPF) to assist in controlled special operations that involve clan drug labs.

Once a clan drug lab is identified and the NSWPF arrives, the incident is deemed a crime scene and Fire and Rescue NSW acts as a support agency.

2 Application

This SOG applies to any incident attended by Fire and Rescue NSW where a clan drug lab exists or is suspected.

3 Identifying a clandestine drug laboratory during regular operations

3.1 Indicators

If you discover any of these telltale signs, individually or in combination, suspect a clan drug lab:

- Are any chemical processes being used?
- Are any chemical substances such as ammonia, acetones, or hydrochloric acid visible?
- Are any containers or equipment items visible?
- Are windows totally covered or blackened?
- Are there unusual odours?
- Are there illegal electricity connections?
- Is there excessive security for the premises?
- Are large quantities of prescription drugs evident?
- Is there a threat of explosion or fire?
- Is atmospheric monitoring showing Lower Explosive Limit (LEL) levels or approaching alarm mode?

3.2 Hazards

WARNING

Beware of booby traps.

To avoid booby traps and/or destabilising chemical reactions:

- Do not switch any power points or lights on or off.
- Avoid touching or moving any objects.

- Do not close or open cupboard doors or fridges.
- Do not attempt to shut down any reaction processes in an operating laboratory.
- Do not disconnect mains power (non fire situations only).
- Consider that even after mains power is disconnected there may still be other illegal connections to the electricity supply.

WARNING

Be aware of toxic, reactive, corrosive, flammable and explosive substances.

Check LEL levels to determine if the atmosphere is flammable. If LELs exist, wear full structural firefighting ensemble and BA when entering the Hot Zone (not fully encapsulated suits or spillage clothing).

3.3 Discovering clandestine drug laboratories

If you discover a clan drug lab:

- Treat the incident as a hazardous materials incident and follow SOG 10.1, *Guidelines for all hazardous material incidents*.
- Carry out a dynamic risk assessment (DRA).
- Be aware that people present may be offenders. Do not become involved in law enforcement or other policing matters.
- Immediately notify the Communication Centre (ComCen) and request a Hazmat Response Unit and Police Chemical Operations Group – if possible use a mobile phone to transmit information from the incident to prevent possible monitoring of GRN radio messages.
- Withdraw to the exterior of the premises and evacuate other areas as necessary.
- If at a structure fire, consider a defensive strategy and attempt extinguishment using external attack lines.
- Establish BA Control and decontamination procedures.
- Preserve the scene wherever possible. Do not touch, tilt, tamper with or taste any object or substance.
- On arrival of the NSWPF the incident becomes a controlled police special operation and Fire and Rescue NSW becomes a support agency. The Fire and Rescue NSW Commander will hand over the incident to the NSWPF and then fills the role of Site Safety Officer (Safety Officer) in the NSWPF incident control system.

4 Controlled NSWPF special operations

4.1 Command and control

The NSWPF Officer is the Incident Site Controller.

Fire and Rescue NSW's role at police special operations is to assist the NSWPF and other agencies present to manage safety issues arising from the chemical hazards and laboratory processes. The Fire and Rescue NSW Commander is the Safety Officer in the NSWPF Integrated Command and Control System.

Fire and Rescue NSW personnel and equipment must be staged in accordance with SOG 1.8, *Pre-deployment and staging*, at a safe location.

WARNING

Fire and Rescue NSW personnel must not become involved in the apprehension of or management of suspected criminal offenders.

4.2 Risk assessment

The Site Control Officer, Safety Officer and Forensic Chemist conduct a DRA of the site. The outcomes of the DRA determine the level of protective clothing to be used by all personnel.

4.3 Safety Officer functions

Specific functions performed by the Safety Officer are:

- Liaise with the Police Site Controller to develop the Incident Action Plan (IAP).
- Recommend, implement and monitor specific safe working practices
- Brief all personnel of hazards and risks as per the DRA.
- Assign a Rapid Intervention Team (RIT) in accordance with SOG 18.2, *Rapid intervention teams*.
- Ensure the atmosphere is monitored, and that results are recorded.
- Ensure the laboratory is ventilated when safe to do so after consultation with the NSWPF.
- Maintain BA Control.
- Monitor personnel for signs and symptoms of chemical contamination and heat or cold related injuries and determine their ability to continue working in that environment.
- Ensure regular rotation, rest and hydration of personnel working at the site in accordance with SOG 18.3, *Incident ground rehabilitation*, and SOG 18.4, *Incident ground health monitoring*.
- Ensure all personnel, including offenders, are decontaminated.
- Ensure all equipment and evidence is either isolated or decontaminated.
- Regularly liaise with the Site Control Officer and the Forensic Chemist on chemical and other hazards and ensure that the IAP is updated.
- Ensure the Manager Hazmat and the Response Coordinator (RESCO) is updated regularly on the incident. Where possible use a mobile phone from a safe location.
- Ensure adequate records are kept.

Once the Fire and Rescue NSW role is complete, the Fire and Rescue NSW Commander must hand site safety back to the NSWPF and notify the ComCen.

10.12 CLANDESTINE DRUG LABORATORIES

Indicators

- ☐ Chemical processes being used.
- ☐ Chemical substances – ammonia, acetones, hydrochloric acid.
- ☐ Containers or equipment visible.
- ☐ Windows covered or blackened.
- ☐ Unusual odours.
- ☐ Illegal electricity connections.
- ☐ Excessive security.
- ☐ Large quantities of prescription drugs.
- ☐ Threat of explosion or fire.
- ☐ LEL levels.

Discovering clan labs

- ☐ Treat as hazardous material incident.
- ☐ Carry out a DRA.
- ☐ Be aware that people present may be offenders – do not become involved in law enforcement.
- ☐ Use a mobile phone, if possible, to contact the ComCen. Request Hazmat and Police.
- ☐ Withdraw to the exterior of the premises – evacuate other areas as necessary.
- ☐ If structure fire – consider a defensive strategy.
- ☐ Establish BA Control and decontamination procedures.
- ☐ Preserve the scene – do not touch, tilt, tamper or taste anything.

Hazards

Booby traps

WARNING

Beware of booby traps:

- ☐ Do not switch any power points or lights on or off.
- ☐ Avoid touching or moving objects.
- ☐ Do not close or open cupboard doors or fridges.
- ☐ Do not attempt to shut down any reaction processes in an operating laboratory.

Power supply

Even after mains power is disconnected, there may be other illegal connections to the electricity supply.

- ☐ Do not disconnect mains power (non-fire situations only).

LELs

- ☐ Check LEL levels to determine if the atmosphere is flammable.
- ☐ When LEL levels are encountered, wear full structural firefighting ensemble and BA in the Hot Zone (not fully encapsulated suits or spillage clothing).

WARNING

Beware of toxic, reactive, corrosive, flammable and explosive substances.

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Command and control

Once the NSW Police Force (NSWPF) arrive the incident becomes a controlled police special operation.

Fire and Rescue NSW's role is to assist NSWPF to manage safety issues arising from chemical hazards and lab processes.

⇨ NSWPF Commander is the Incident Site Controller.

⇨ Fire and Rescue NSW Commander is the Safety Officer.

WARNING

Fire and Rescue NSW personnel must not become involved in the apprehension of or management of suspected criminal offenders.

Once the Fire and Rescue NSW role is complete, the Fire and Rescue NSW Commander must hand site safety back to the NSWPF and notify ComCen.

Safety Officer role

- ☐ Conduct a DRA with NSWPF Site Controller and forensic chemist – to determine PPE. Brief all personnel.
- ☐ Liaise with NSWPF Site Controller to develop and update Incident Action Plan.
- ☐ Implement and monitor safe working practices.
- ☐ Assign a Rapid Intervention Team.
- ☐ Ensure the atmosphere is monitored and results recorded.
- ☐ Ensure lab is ventilated when safe to do so.
- ☐ Maintain BA Control.
- ☐ Monitor personnel for signs of chemical contamination and heat or cold related injuries.
- ☐ Implement incident ground rehabilitation and health monitoring.
- ☐ Ensure personnel (including offenders), equipment and evidence are decontaminated.
- ☐ Use a mobile phone, if possible, to regularly update Manager Hazmat and Response Coordinator (RESCO).
- ☐ Ensure records are kept.

10.13 FUMIGATION

1 Scope and application

This Standard Operational Guideline helps firefighters to operate safely at incidents where fumigation to control pests has been, or is suspected of being, carried out.

2 Hazards

Firefighters may be exposed to toxic and volatile chemicals if they enter areas being fumigated and are not wearing appropriate PPE. This may occur:

- If firefighters are unaware of fumigation activity in progress – ie they do not see warning signs or other indicators before entering, or the pest controller does not follow requirements for notifying the owner and using warning signs.
- If fixed dispensing equipment starts operating automatically and without warning.
- If vapours from fumigation drift to other areas of the building through ventilation ducts, lift shafts or other openings.

3 Process

Fumigation is a process of applying a pesticide chemical to a sealed area for a period, generally to treat insects or other vermin. The pesticide is applied in gas form (or a state that produces a gas) to the area. For a bulk solids storage facility (silo) or bowling or golf green (during soil fumigation), the area may be sealed with a cover such as a tarpaulin.

Fogging is a form of fumigation and involves generating and applying an insecticide fog (which looks like smoke) to the sealed area. The fog is generated by a portable generator or by fixed dispensing equipment that can operate automatically. Fixed dispensing equipment may be fitted with a warning flashing light adjacent to each entry point.

The chemicals used are toxic and volatile, generally colourless, but may have an odour. They include Phosphine (UN 2199), Ethylene Dichloride (UN 1184), Carbon Disulphide (UN 1131) and Hydrogen Cyanide (UN 1051). For fogging, the chemicals Dichlorphos (UN 1967) or Pyrethroid (UN 1968) are mixed with carbon dioxide.

Symptoms of exposure to the chemicals vary but can include dizziness, nausea, headaches or vomiting. Chemicals can be absorbed through exposed skin, mouth, nose and eyes.

Pest controllers are not required to notify local fire stations of their intention to carry out fumigation. However, they are required to:

- Give owners/occupiers written notice before commencing work.
- Provide Safety Data Sheets (SDS) if requested by the owner/occupier.
- During the fumigation period, place warning signs at all entrances to the premises.

4 Indicators

Indicators that fumigation may be in progress include:

- What appears to be smoke (the insecticide fog), but no fire – often reported via an Automatic Fire Alarm (AFA) or Triple Zero call.
- Fumigation warning signs at entrances to premises, sometimes accompanied by installed flashing lights adjacent to entry points.
- Unusual odours.
- Presence of a pest control vehicle.
- Pest control notice at the Fire Indicator Panel (FIP) – the notice may indicate isolated zones where fumigation is in progress.

5 Prior notification

If prior notification of fumigation is received, Station Commander must:

1. Complete a Fumigation Notice form.
2. Make an entry in the Occurrence Book and the Station Commander's diary.
3. Place a copy of the form on all appliances at the station.
4. Notify adjoining stations.

6 Safety

- Where smoke is observed but no fire is immediately obvious, consider whether fumigation may be in progress. Check for indicators.
- If fumigation is confirmed or suspected, do not enter the premises or areas affected, unless there is life risk.
- If there is fire, consider a defensive strategy.
- If an AFA activates in another area of the building, consider whether vapours from the fumigation may have drifted to that area.

Where entry is required

1. If necessary to enter due to life risk, determine the chemical involved from the pest controller or owner/occupier.
2. Don appropriate PPE to avoid exposure to the chemical as indicated in the SDS or Hazmat Action Guide.
3. If in a high-rise building, when using the lifts, get off one floor below the suspect floor and proceed via the fire stairs.
4. Maintain the seal of the area as far as possible.
5. Upon exit, decontaminate as outlined in SOG 10.4, *Decontamination*.

7 Firefighter exposed to chemical

If a firefighter is not wearing appropriate PPE and is exposed to the chemical (eg if automatic dispensing equipment starts operating without warning):

1. Immediately withdraw from the area to a place with clean air.
2. Decontaminate as outlined in SOG 10.4, *Decontamination*.
3. Carry out first aid as indicated in the Hazmat Action Guide, SDS or chemical database, or on medical advice.
4. Call for resources – eg ambulance, specialists, hazmat. Request Duty Commander and Health & Safety Branch are notified.
5. Record details of the chemical.

⚠ **NOTE**

Do not transport bags containing contaminated clothing in the cabin of the appliance.

On return to station

1. Have the firefighter shower and dress in clean clothing.
2. Send contaminated clothing for decontamination according to local arrangements.
3. Record the exposure in the Occurrence Book.
4. Ensure that Notification of Injury, Illness, Exposure or Near-Miss (NIIENM) form is completed.

10.13 FUMIGATION

Hazards

You may be exposed to fumigation chemical if you enter areas being fumigated and are not wearing appropriate PPE. This may occur:

- ⇨ If you are unaware of fumigation activity in progress – you don't see the indicators.
- ⇨ If fixed dispensing equipment starts operating automatically and without warning.
- ⇨ If vapours from fumigation drift to other areas of the building.

Indicators

- ⇨ What appears to be smoke (the insecticide fog), but no fire – often reported via an AFA or Triple Zero call.
- ⇨ Fumigation warning signs at entrances to premises, sometimes with installed lights flashing.
- ⇨ Unusual odours.
- ⇨ Presence of a pest control vehicle.
- ⇨ Pest control notice at the Fire Indicator Panel.

Safety

- ☐ Where you observe what appears to be smoke but no fire, consider if fumigation may be in progress. Check for indicators.
- ☐ If fumigation is confirmed or suspected, do not enter the premises or areas affected, unless there is life risk.
- ☐ If there is fire, consider defensive strategy.
- ☐ If an AFA activates in another area of the building, consider whether vapours from the fumigation may have drifted to that area.

Where entry is required:

- ☐ If necessary to enter due to life risk, determine the chemical involved – from pest controller or owner/occupier.
- ☐ Don appropriate PPE to avoid exposure to the chemical as indicated in the SDS or Hazmat Action Guide.
- ☐ If in a high-rise building, when using the lifts, get off one floor below the suspect floor and proceed via the fire stairs.
- ☐ Maintain the seal of the area as far as possible.
- ☐ Upon exit, decontaminate as outlined in SOG 10.4, *Decontamination*.

Firefighter exposed to chemical

If a firefighter is not wearing appropriate PPE and is exposed to the chemical:

- ☐ Immediately withdraw from the area to a place with clean air.
- ☐ Decontaminate as outlined in SOG 10.4, *Decontamination.*
- ☐ Carry out first aid as indicated in the Hazmat Action Guide, SDS or chemical database, or on medical advice.
- ☐ Call for resources – eg ambulance, specialists, hazmat. Request Duty Commander and Health & Safety Branch are notified.
- ☐ Record details of the chemical.

⚠ **NOTE**

Do not transport bags containing contaminated clothing in the cabin of the appliance.

On return to station:

- ☐ Have the firefighter shower and dress in clean clothing.
- ☐ Send contaminated clothing for decontamination according to local arrangements.
- ☐ Record the exposure in the Occurrence Book.
- ☐ Ensure that *Notification of Injury, Illness, Exposure or Near-Miss* (NIIENM) form is completed.

Prior notification

Pest controllers are not required to notify local fire stations of their intention to carry out fumigation. They are required to:

- ⇨ Give owners/occupiers written notice before commencing work.
- ⇨ Provide SDS if requested by the owner/occupier.
- ⇨ During the fumigation period, place warning signs at all entrances to the premises.

If prior notification of fumigation is received, Station Commander must:

- ☐ Complete a Fumigation Notice form.
- ☐ Make an entry in the Occurrence Book and Station Commander's diary.
- ☐ Place a copy of the form on all appliances at the station.
- ☐ Notify adjoining stations.

Fumigation is a process of applying a pesticide chemical to a sealed area for a period.

Fogging is a form of fumigation – involves applying an insecticide fog (which looks like smoke) to the sealed area.

Symptoms of exposure include dizziness, nausea, headaches or vomiting. Chemical can be absorbed through exposed skin, mouth, nose and eyes.

15 CHEMICAL, BIOLOGICAL AND RADIOLOGICAL (CBR) INCIDENTS

15.1 Introduction

15.1.1 This SOG provides guidance for incidents that require response to a hazardous chemical, biological, radiological (CBR) incident, where there has been an attempt by a group or individual to contaminate the general public, emergency service personnel and/or property.

15.1.2 An incident of this type requires considerable care to avoid contamination of the first responders and may include emergency/mass decontamination of the general public, both at the incident site and at nearby hospitals and medical centres.

15.1.3 CBR incidents differ from hazardous materials (HazMat) incidents in that there is a greater multi-agency approach to casualty management and patient care. Police will also need to gather evidence given that CBR incidents will be considered crime scenes until declared otherwise.

⚠ **NOTE**

The operational objective with a CBR incident is to do the greatest good for the greater number.

15.2 Application

15.2.1 The NSWFB is the Combat Agency for Hot and Warm Zone management of HazMat and CBR incidents. This SOG applies to all NSWFB members involved in CBR activities.

15.3 Hazard Types

15.3.1 The hazards encountered may be of three forms:

- toxic chemical;
- biological agent; or
- radiological.

Toxic Chemical

15.3.2 These may be either industrial chemicals or military-style warfare agents. Military warfare agents consist of five main types:

- nerve;
- blood;
- choking;

- blister; and
- riot control.

15.3.3 Blister agents and riot control agents are not designed to kill but to incapacitate the victims.

Biological Agents

15.3.4 Biological agents are made from a variety of microorganisms and biological toxins.

15.3.5 Biological toxins are chemical compounds that are poisonous to humans. They are produced from plants, animals or microbes.

15.3.6 Microorganisms are generally living viruses or bacteria that have the ability to establish deadly infections in their victims.

15.3.7 Although many of these organisms are recognised as military-type weapons, others can be cultivated and introduced into the environment with the intention of inflicting harm on a targeted civilian population.

⚠ **NOTE**

The NSW Health Department is responsible for the management of biological contamination within the community. The NSWFB will provide specific assistance as requested, if and when the location of the release is identified.

Radiological

15.3.8 Radioactive sources likely to be encountered will most likely be of a low-level hazard and therefore, the emergency handling of radioactive incidents, or personal exposure to radiation need not be feared if simple control and hygiene procedures are strictly adhered to.

15.4 Precautionary Measures

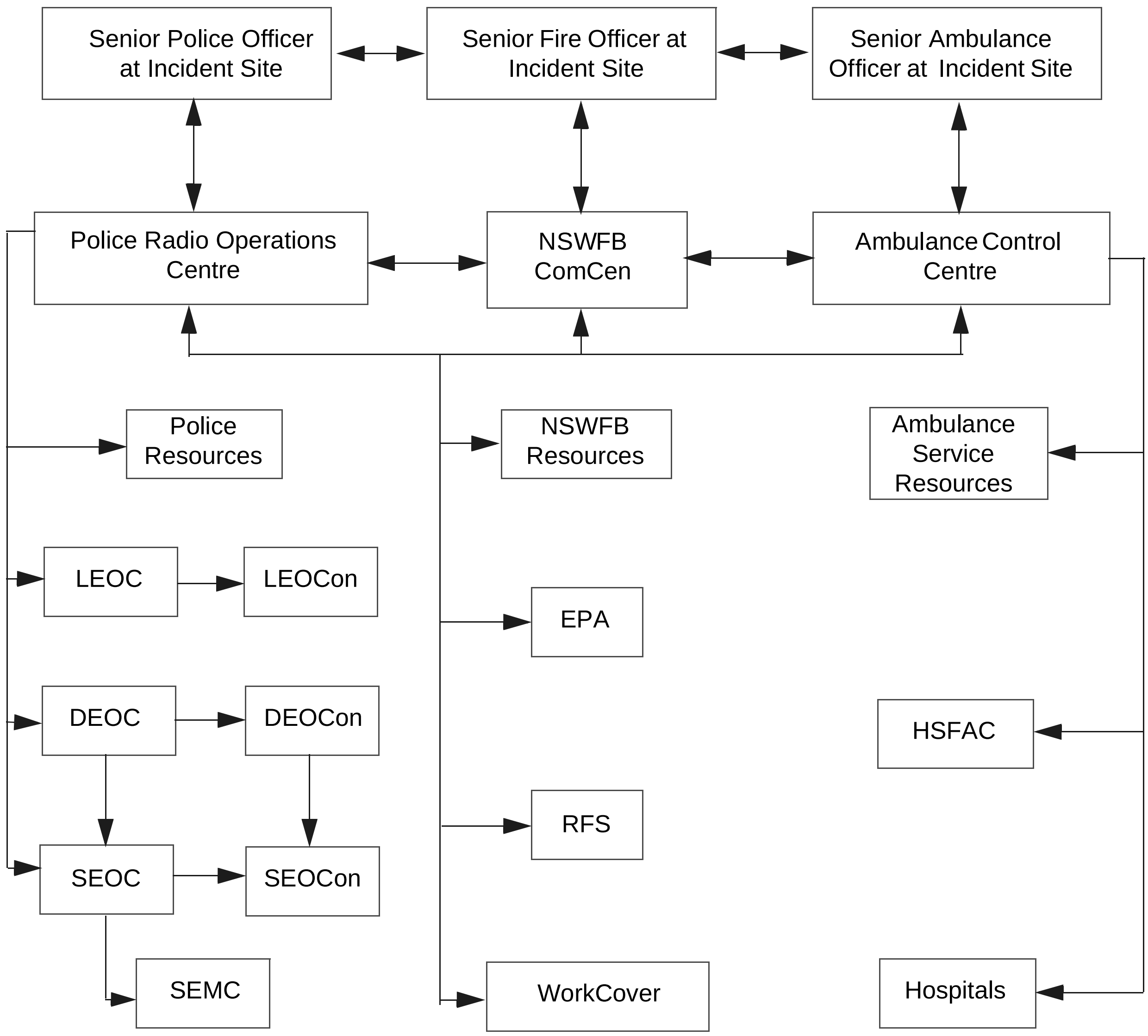
15.4.1 When carrying out CBR operations the following precautionary measures should be considered whatever the hazard encountered:

- safe approach;
- incident control;
- scene security;
- identify hazardous materials;
- assess potential harm and minimise environmental contamination;
- call in resources;
- monitor information; and

- render safe and decontaminate.

15.5 Notification

15.5.1 Fig 15.1 illustrates how information is communicated at a CBR incident.



KEY

COMCEN	-	Communications Centre
DEOC	-	District Emergency Operations Centre
DEOCon	-	District Emergency Operations Controller
EPA	-	Environmental Protection Agency
HSFAC	-	Health Service Functional Area Co-ordinator
LEOC	-	Local Emergency Operations Centre
LEOCon	-	Local Emergency Operations Controller
RFS	-	Rural Fire Service
SEMC	-	State Emergency Management Committee
SEOC	-	State Emergency Operations Centre
SEOCon	-	State Emergency Operations Controller

Fig 15.1 HazMat Action Plan

15.6 Safe Approach

15.6.1 Due to the possibility of toxic vapour clouds and gases travelling with the wind from the incident, note the direction of the wind prior to arrival at the incident scene.

15.6.2 Approach the incident scene from upwind and upgrade. Position the appliance remote from the hazardous material to avoid contaminating personnel and equipment. If necessary, direct other arriving vehicles to a safe location.

15.6.3 The Incident Controller (IC) is to fully assess the incident situation before taking any direct action. The situation **may not** be what it immediately appears so as a precaution, initially, all crews entering the Hot Zone should wear fully encapsulated gas suits.

15.6.4 Always treat the hazard as a highly toxic, invisible and non-odorous material(s) until expert advice is obtained.

15.6.5 In enclosed spaces consider contamination spread by ventilation. These systems should be shut down immediately and remain closed if the hazard has been detected in close proximity to ventilated areas, such as pressurised stairways.

CAUTION

These incidents have the ability to cause harm to emergency services personnel, so be aware of secondary or delayed devices.

15.6.6 An *immediate response* action should be taken if you suffer any of the following symptoms:

- blurred or dimmed vision;
- irritation of the eyes;
- sudden headache, dizziness;
- wheeziness, tightness of chest or choking;
- difficulty in, or decrease in rate of breathing; or
- nausea, vomiting or weakness.

NOTE

First arriving crews may need to protect themselves from contaminated persons as they may be in a state of panic and will approach any emergency service personnel for assistance. In order to avoid cross contamination between crews and contaminated persons, it may be necessary to utilise fog or spray from hose lines, or first aid reel to assist in the initial management of contaminated persons. If this process is to be utilised, it is to be done in a manner that does not harm civilians. Additionally, this process will also assist in the decontamination of any affected persons (see para 15.13).

Immediate Response

15.6.7 The *immediate response* actions consist of:

- donning breathing apparatus (BA);
- immediately evacuating the area;
- decontaminating in accordance with decontamination procedures;
- seeking urgent medical attention; and
- defending crews against cross contamination.

15.7 Incident Control and Forward Control Point

15.7.1 On arrival at the incident the Officer-in-charge (OIC) will establish a Forward Control Point (FCP) conforming to the provisions of site management, as detailed in the HazMat Plan. The role of the FCP is to co-ordinate the operations of the Hot Zone and Warm Zone of a CBR incident.

15.7.2 The FCP will be located in the Cold Zone, in close proximity to CBR operations and will form the main point from which multi-agency operations will be directed. For the purposes of the Incident Control System (ICS), the Operations Officer should be located at the FCP.

15.7.3 The Incident Control Point (ICP) will be established remote from the FCP and will facilitate the functions of Incident Command, Logistics Planning, Media and Support Operations.

15.7.4 The OIC is to implement the ICS in accordance with *SOG 1.1*.

15.7.5 Subsequent arriving appliances are to be assembled at a nominated Staging Area. In most cases the Staging Area will be in the vicinity of the FCP.

15.7.6 The Combat Agency for a HazMat incident is the NSWFB with the IC having overall control of the incident.

⚠ **NOTE**

The IC is the person who has overall control of the Combat/Area (Hot and Warm Zones) during the HazMat phase, and is the senior NSWFB Officer at the incident/ emergency site.

15.8 Zone Identification

Hot Zone

15.8.1 This is an area that exists inside the *Hot Zone Barrier Tape* and designates the area into which only authorised, suitably protected personnel may enter. Protection levels are to be determined by the IC or Operations Officer.

Warm Zone

15.8.2 This is an area that provides a buffer between the contaminate and personnel, marked by *NSWFB Barrier Tape*. This area contains the decontamination zone and staging area where equipment is laid out and where back-up crews await entry.

Cold Zone

15.8.3 This is an area of limited access to personnel involved in the support of the working crews. It is the area in which the FCP and the ICP should be located, and where the dedicated pump(s) for decontamination purposes is/are situated. This zone is accessible to the media and non-involved personnel. The NSW Police Service is responsible for the Cold Zone.

15.9 Scene Security

15.9.1 One of the first steps towards gaining control of the incident is to secure the scene. This ensures the safety of the general public and personnel not involved in a combat role, and it defines the area in which specific protection is required.

15.9.2 The immediate priority is the safety of the general public and emergency service personnel.

Personal Protective Equipment

15.9.3 The first stage is to ensure that all NSWFB crew are wearing the appropriate personal protective equipment (PPE) as detailed in Table 15A.

15.9.4 NSW Police, Ambulance Service, Health Medical Team and Australian Defence Force personnel may have carbon impregnated (charcoal) fabric suits offering CBR protection. The NSWFB also have charcoal or disposable protective suits and approved respirators with filter canisters for use at protracted incidents. This equipment will be supplied and monitored by the Hazardous Materials Response Unit and generally will be for utilisation of emergency service personnel.

15.9.5 NSW Police, Ambulance and Health personnel will have an identification card that indicates the level of protective clothing they can wear. The IC or Operations Officer is to ensure that only trained personnel operate within the Hot/Warm Zone.

⚠ **NOTE**

Other emergency responders may utilise other types of PPE when operating at a CBR incident.

RELATIVE LEVEL OF PROTECTION	DESIGNATION	OPTION 1	OPTION 2	NOTES
Highest	A	Fully encapsulated suit with SCBA		Unknown levels or known level mandates
	B	SCBA + chemical protective suit or charcoal suit	Air line + chemical protective suit or charcoal suit	Known level or risk assessment carried out if level not measurable (positive pressure systems)
	C1	Powered air purifying respirator and chemical protective suit	Powered air purifying respirator and charcoal suit	Known level or risk assessment carried out if level not measurable (positive pressure systems)
	C2	Air purifying respirator and chemical protective suit	Air purifying respirator and charcoal suit	Known and measurable level (negative pressure system) or assessment indicates it is safe
Normal	D	Work clothes (uniform or overalls)		No hazard present or detected - may require access to PPE at short notice if near warm zone

Table 15A Levels of Protection and PPE

Possible Initial Levels of Protection at an Incident

15.9.6 The following initial levels can be expected at a CBR incident:

- Level A in the Hot Zone until the nature and level of the agent is determined.
- Level B in the Warm Zone until a determination is made on levels.
- Level C in the Warm Zone and where levels permit its use or a thorough risk assessment has been carried out.

⚠ **NOTE**

Protective levels are not fixed to operational areas and Level C may be permissible in the Hot Zone after rigorous assessment.

Designation of Zones

15.9.7 Designate a minimum distance of 50 m using *NSWFB Barrier Tape* around the suspicious material. This area is to be known as the Warm Zone.

15.9.8 Using firefighters dressed in the designated protective clothing, mark out the Hot Zone using *Hot Zone Barrier Tape* at a minimum distance of 30 m.

Zone Clearance

15.9.9 The OIC of the first arriving appliance shall delegate the necessary roles and responsibilities for the safe and effective removal of non-ambulatory members of the public, including persons rendering aid to the injured.

15.9.10 All contaminated persons are to be assembled upwind, at the outer edge of the Hot Zone and asked to remove their outer clothing down to underwear.

⚠ **NOTE**

Privacy issues are explained in para 15.13.6.

15.9.11 Contaminated persons should then be directed to initial decontamination facilities for wet decontamination and medical attention, if required.

15.9.12 Firefighters should wear the minimum protection level of a splash suit and BA to do initial clearance of Hot and Warm Zones and any snatch and grab rescue, avoiding any liquid contamination or leaking packages.

CAUTION

Always treat all suspicious liquids or gases as dangerous until proven otherwise.

15.9.13 The OIC of the first arriving appliance is deemed to be the HazMat Controller (HC) until such time as he/she is relieved of his/her responsibilities by a more senior NSWFB officer.

15.9.14 The HC is to ensure that no unauthorised persons enter the Hot Zone and that all personnel within the Hot Zone are wearing designated PPE and BA.

15.10 Identification and Assessment of Hazardous Materials

15.10.1 Identification of the hazard is an immediate priority to enable the correct health and emergency response to the hazard. Rudimentary classification is essential in defining the hazard as a solid, liquid or gas. If it is a gas, is it heavier or lighter than air?

15.10.2 Detection systems will take time to positively determine the hazard, therefore, it is important that the first arriving firefighters observe the signs and symptoms of the affected people, and liaise with the NSW Ambulance Service or other medical personnel that may be available to accurately diagnose the symptoms.

15.10.3 Observations of victims and suspicious hazards by the first arriving emergency personnel at the scene **must be immediately** forwarded to the IC.

15.10.4 The HazMat Response Unit has a detection capability and will work in the Hot Zone, in full protective clothing to identify the hazard.

15.10.5 Assess how the hazard is spread by identifying whether it is a transfer hazard, vapour hazard, desorption hazard or radiation hazard. This information must be collated and passed to the IC.

15.11 Call in Resources

15.11.1 The NSWFB role is to render safe and decontaminate, and to ensure that any final clean up operations are carried out in conjunction with the *Environment Protection Authority (EPA)*. The NSWFB will assist as per the *Memorandum of Understanding*.

15.11.2 Do **not** delay the call for full assistance with resources. Ongoing SITREPS are essential and should be sent at 10 - 20 minute intervals, or more frequently if circumstances dictate.

15.11.3 CBR incidents and terrorist attacks may cause a Mass Casualty Incident (MCI) resulting in multiple deaths and many injuries. Rapid establishment of triage areas for quick assessment of patients is essential at the incident site.

15.11.4 On advice of Ambulance Officers, suitably trained Medical Practioners may replace SCAT personnel in the Warm Zone.

⚠ **NOTE**

Consideration should be given to calling in additional resources to assist in the casualty handling.

15.11.5 It can be expected that an undefined number of people will self report to hospitals as they may have or believe that they may have been affected by a contaminate. Therefore, NSWFB personnel will be deployed to designated hospitals to provide decontamination services. These measures are designed to minimise any cross contamination to health care workers from residual material on the clothing of victims.

15.11.6 Agencies that must be notified are:

- NSW Police Service;
- NSW Ambulance Service;
- NSW Health Authorities; and
- EPA.

15.11.7 The Australian Defence Force can be called in to provide assistance as required. Any request for assistance is to be co-ordinated and actioned by the NSW Police Service via State Communications or the on-site Police Commander.

15.11.8 The HC will advise the NSW Police Service of any restrictions in the Warm and Hot Zones. Consideration should be given to the following:

- the type of protective clothing and BA to be worn in each Zone;
- minimising the amount of personnel required in each Zone to avoid congestion;
- maintaining the integrity of evidence and reducing scene disturbance; and
- ensuring access to these areas for designated personnel only.

15.12 Monitoring Information

15.12.1 Once an appropriate response to the incident/emergency has been undertaken, it is important that an ongoing review of new and existing information is carried out.

Any review should incorporate:

- safety aspects;
- operational strategies and tactics;
- status of incident;
- sample and atmospheric monitoring; and
- evidence protection/collection in conjunction with the Police.

15.13 Render Safe and Decontamination

15.13.1 At a CBR incident, emergency decontamination is likely to be required for:

- the general public;
- emergency services (Police, Fire and Ambulance Services);
- site/area; and
- equipment and machinery.

15.13.2 Personnel in appropriate PPE (as detailed in Table 15A) are to handle immobilised casualties.

15.13.3 Fresh water flushing is the principal means of decontamination to be used by the NSWFB to decontaminate the general public for an unknown hazard. The method to be adopted is to request contaminated persons to remove their outer garments down to underwear and then to dampen down using soap and water, wash and flush their hair, eyes, face and exposed skin.

15.13.4 Medical personnel may require additional decontamination processes to be carried out using specified decontamination agents. This is to be carried out under medical supervision.

15.13.5 It is accepted medical procedure that the removal of the outer garments of a contaminated person, or a person suspected of being contaminated, will reduce greatly the levels of contamination. This should, as far as practicable, be facilitated prior to wet decontamination being undertaken.

⚠ **NOTE**

Extreme consideration for the privacy of the individual must be taken into account when clothing is required to be removed. Whilst all practicable measures will need to be implemented in respect of patient safety, the dignity of the individual should also be maintained as far as practicable.

15.13.6 The EPA has advised that water utilised for the decontamination of casualties with vapour exposure does not need to be contained. However, water used to decontaminate grossly contaminated persons or for area decontamination must be contained.

⚠ **NOTE**

Prior to walking contaminated persons through the decontamination area, ensure that all jewellery, watches, glasses, valuables such as money, ID and passports are sealed in a small plastic bag and are retained by the owner.

15.13.7 The goals of decontamination are:

- to save lives and minimise casualties;
- to remove and minimise the hazard; and
- to reduce the transfer of the hazard.

15.13.8 At the incident scene there will be three types of decontamination areas:

- initial decontamination area;
- emergency or mass civilian decontamination area; and
- firefighter, service or technical decontamination area.

15.13.9 The first available pumper is to carry out decontamination using fog lines to dampen any affected person’s clothing as a pre-cursor to undergoing mass decontamination. This action is an interim measure to stop any further spread of contaminants.

15.14 Emergency/Mass Civilian Decontamination Area

15.14.1 Mass decontamination is used for large numbers of persons affected by the release of a hazardous agent. If deemed to be necessary this decontamination area is to be set up by the first arriving fire units. Initially, two pumpers will be required for this task.

15.14.2 The first arriving units will clear the Warm and Hot Zones of contaminated people. All contaminated persons will be directed to the Emergency Decontamination Area.

Stage 1

15.14.3 The two pumpers are to be positioned so as to provide a corridor and some degree of privacy for the washing down of contaminated people. Wash operators are to be dressed in splash suits and BA and are to use first aid reels to form water fog for washing the general public (see Fig 15.2). Directions to the general public are to be communicated using a fire appliance PA.

15.14.4 The Emergency/Mass Civilian Decontamination Area must be set up very quickly. Set up hand lines operating on a fog pattern and low pressure, and then walk the general public removed from the Hot Zone through the water curtain. Depending on the number of people and the type of decontamination, the HC will make a decision whether or not to undress contaminated persons down to their underwear.

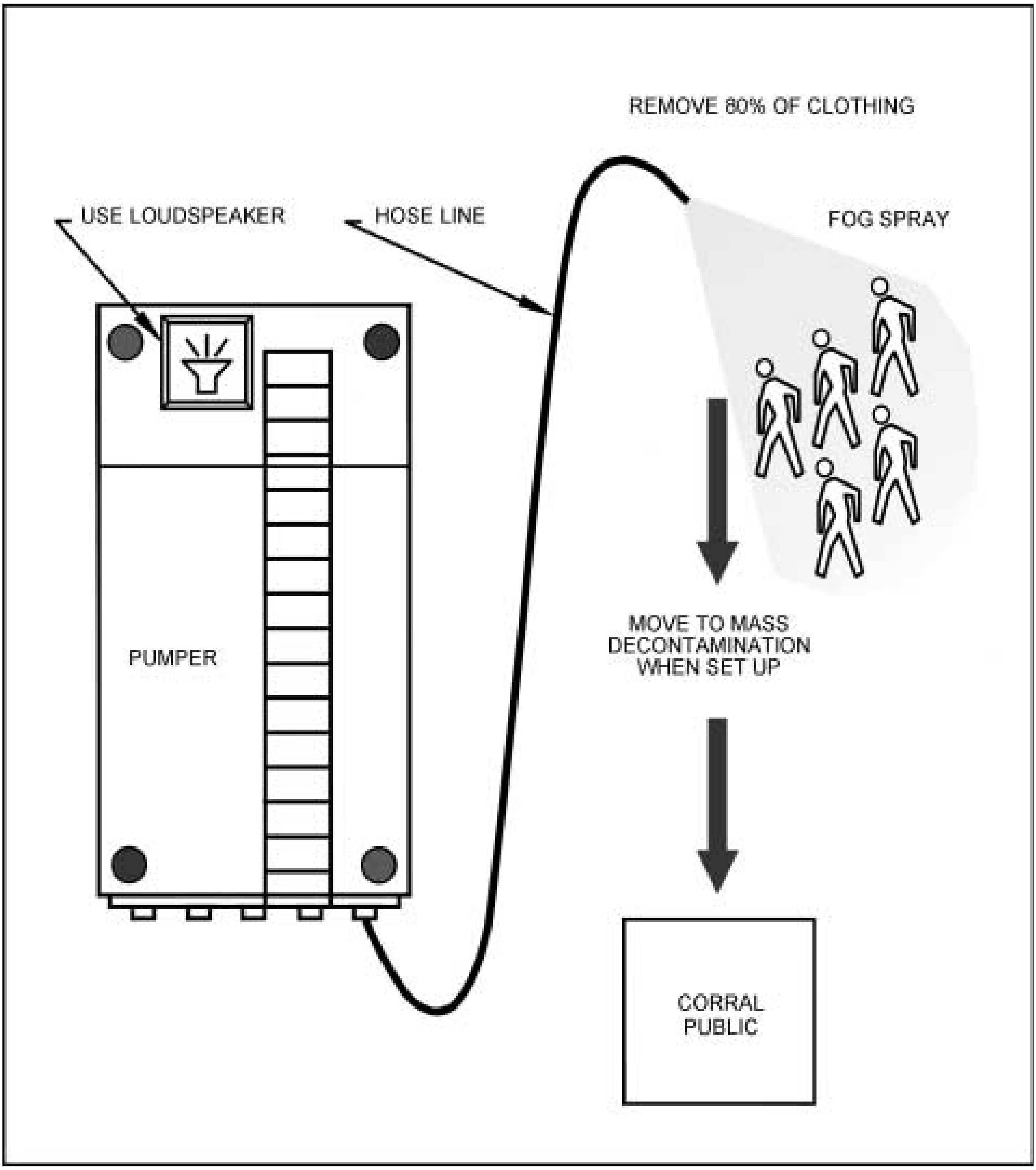


Fig 15.2 Mass Decontamination (Stage 1)

Stage 2

15.14.5 An alternative method is to position two pumpers to provide a corridor between vehicles (see Fig 15.3). Ladders are set up between the vehicles with 70 mm hose blanked off at one end and lashed down on to the ladders to provide a decontamination shower. The shower is made by piercing the hose at intervals along its length.

15.14.6 If additional appliances are available another vehicle can be used in the process to provide separate corridors and showers for males, females, family units and disabled persons. These corridors can be made into private facilities by the addition of black plastic or salvage sheets as curtains.

⚠ **NOTE**

This process will create a great deal of anxiety amongst contaminated persons and firefighters must be considerate and empathise to their situation.

15.14.7 On leaving the decontamination shower, persons will require clothing and shelter until each is checked by using a detection device. They will be temporarily isolated until given the all clear and released for further medical assessment.

15.14.8 All clothing removed from the general public must be bagged and tagged for identification purposes.

⚠ **NOTE**

It should be remembered that the incident scene may be classified as a crime scene and as such there is a need for the preservation of all evidence.

15.15 Decontamination Shelter - Stage 3

15.15.1 At large scale CBR incidents a self-contained inflatable shelter can be erected to provide a decontamination facility for affected persons.

15.15.2 The shelter (see Fig 15.4) is inflated by compressed air from Self Contained Breathing Apparatus (SCBA) air cylinders and can be erected rapidly.

15.15.3 The shelter contains decontamination showers and associated equipment, such as hot water generators, fans, bunded areas and chutes for the disposal of contaminated clothing.

15.15.4 The shelter and its associated equipment will be transported to the incident site in a module that also contains blankets, disposable clothing, protective clothing and other associated equipment. When not in use the module will be located at the Hazardous Materials Response Unit at Greenacre.

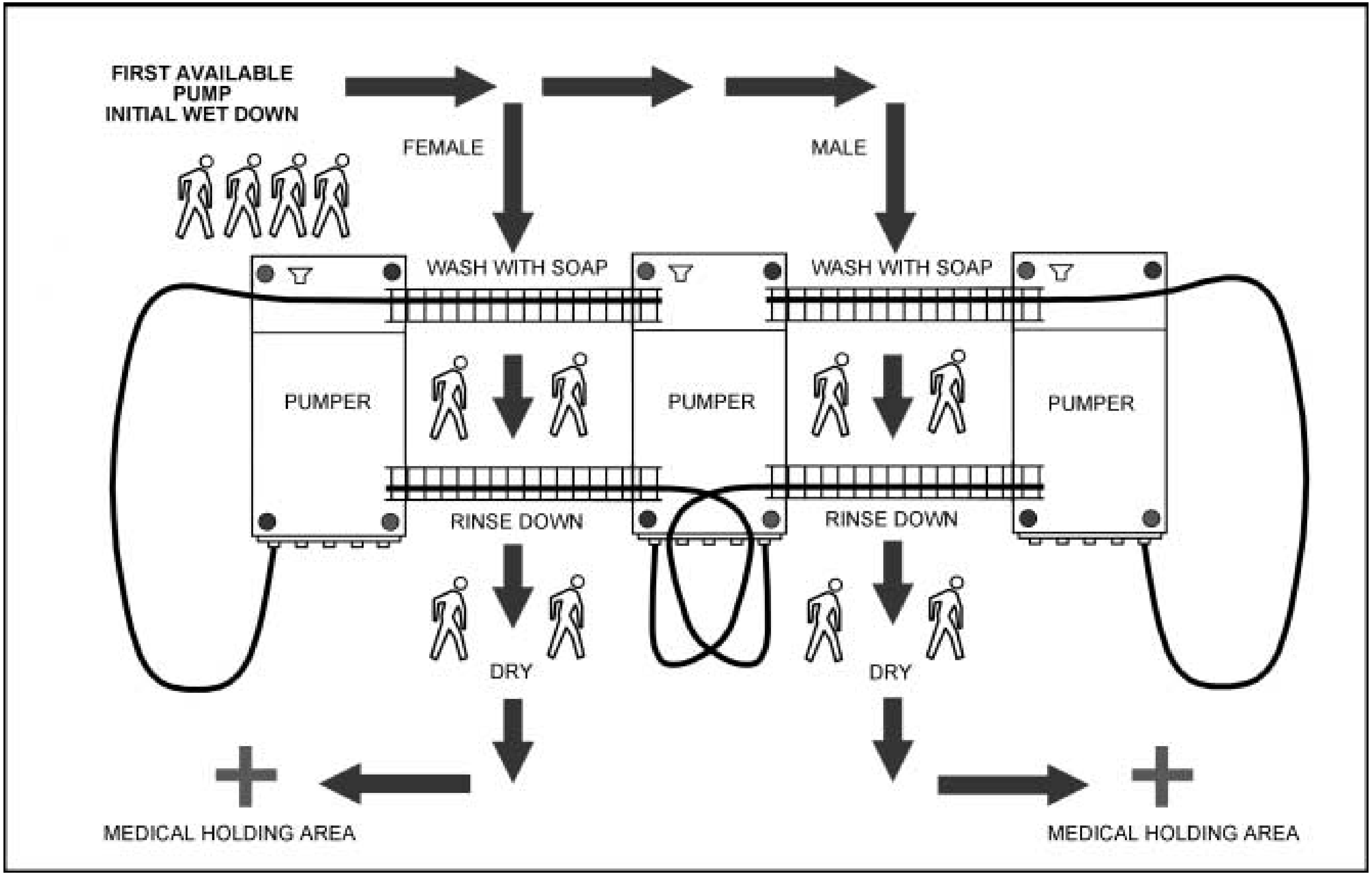


Fig 15.3 Mass Decontamination (Stage 2)

15.16 Hospital Decontamination

15.16.1 Emergency mass decontamination at hospital entrances may be required for self-evacuees from the incident. NSWFB pumper(s) will be despatched to each of the hospitals immediately surrounding the incident location. The crews of these units are to liaise with hospital staff and if necessary set up an Emergency Decontamination Area as per predetermined emergency plans at the hospital.

15.16.2 Care is needed in siting the decontamination area so that run-off does not flow into the hospital or affect hospital operations, including the access of ambulances and the public.

15.17 Service/Technical Decontamination Area

15.17.1 A Service or Technical Decontamination Area is to be set up under the direction of the HazMat Response Units.

15.17.2 The first task of the HazMat Response Units is to enter the Hot Zone and identify and take samples of the hazardous materials. Standard HazMat guidelines are to be used (see *SOG 10.4*).

15.17.3 To provide the maximum effectiveness in decontamination, the following actions are to be carried out when decontaminating operators that are wearing specialised protective equipment over their standard fire fighting uniform:

(a) Decontaminate the operator with the lowest air supply first.

(b) Rinse the operators undergoing decontamination. Where a portable decontamination shelter is used (see Fig 15.4), ensure that the operators remain in the shower for a minimum period of two minutes.

(c) Instruct the operators undergoing decontamination to stand with arms outstretched and legs apart.

(d) Using a brush or cloth and starting at the operator’s head, completely clean the operator, giving special attention to the BA (on non-encapsulating suits), gloves, folds in suits and zip fastenings.

(e) Instruct the operator to lift each foot in turn and clean the sole of each boot.

(f) Carry out a further rinsing of operators to remove any remaining material(s).

(g) Prior to dispatching to the Disrobing/Rest Area for removal of the suit and BA, inspect the operator to ensure that effective decontamination has been achieved. Where satisfactory decontamination has not been achieved, carry out further decontamination.

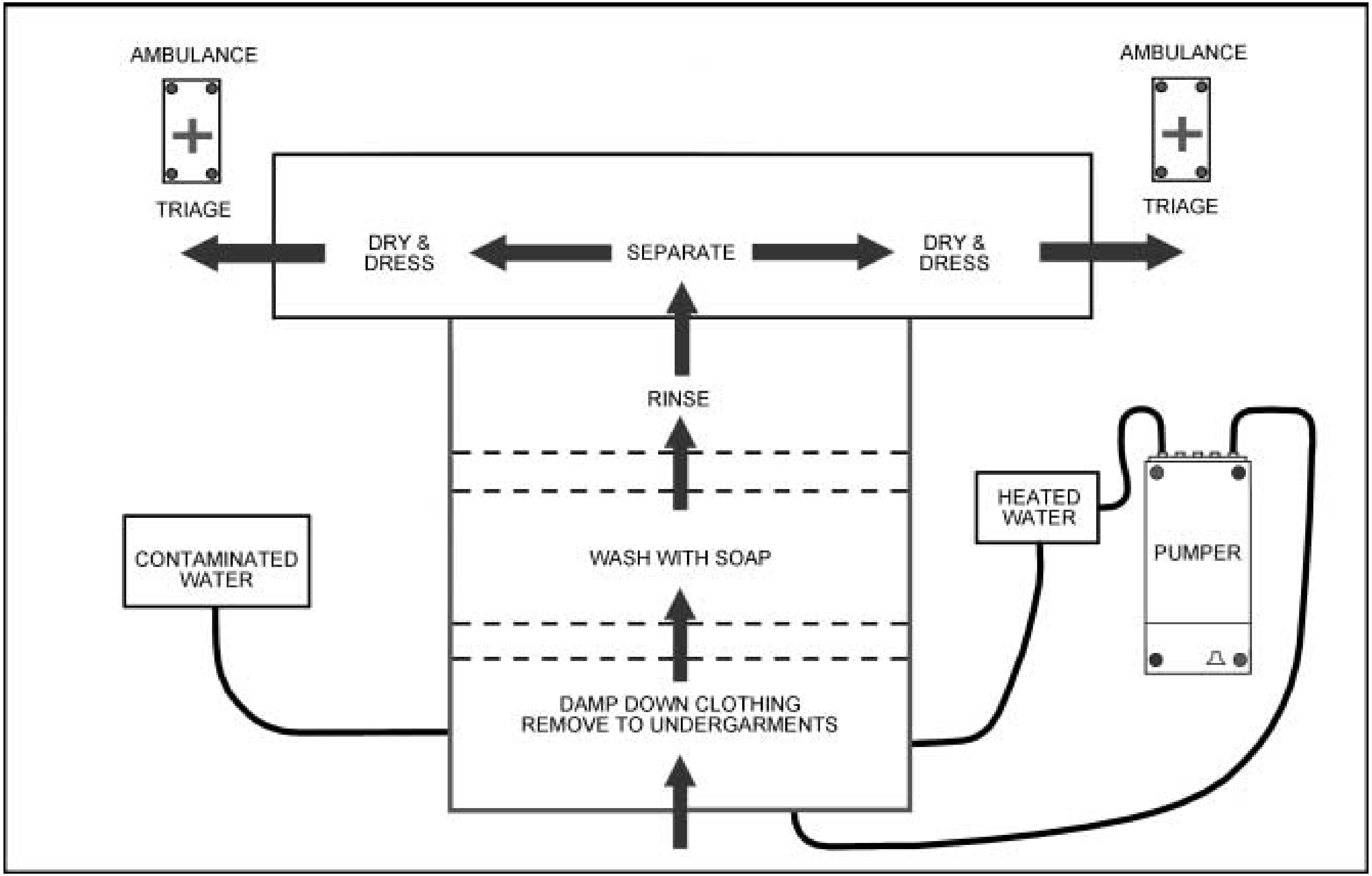


Fig 15.4 Portable Decontamination Shelter (Stage 3)

15.18 Deceased Persons

15.18.1 If deceased persons are located whilst attending CBR operations the following actions should be considered:

- leave diseased in situ;
- report discovery to the senior NSWFB Officer and NSW Police; and
- document the location, time and other relevant details.

15.18.2 Following NSW Police Forensic Services examining the victim in situ, decontamination may be required (see Fig 15.5). This will be facilitated jointly by the NSWFB and the NSW Police Forensic Services.

15.18.3 The decontamination will be conducted in an appropriate location where privacy can be assured. Following decontamination, the victim will be transported to a designated morgue or temporary morgue. This will be co-ordinated by the NSW Coroner.

⚠ **NOTE**

NSW Police Forensic Services personnel have received training in the wearing and operation of BA and protective clothing by the NSWFB BA Training Centre.

15.19 Personal Hygiene

15.19.1 All NSWFB crew members are to carry out personal hygiene measures i.e. washing hands prior to eating and/or leaving the incident site.

15.20 Environmental Considerations

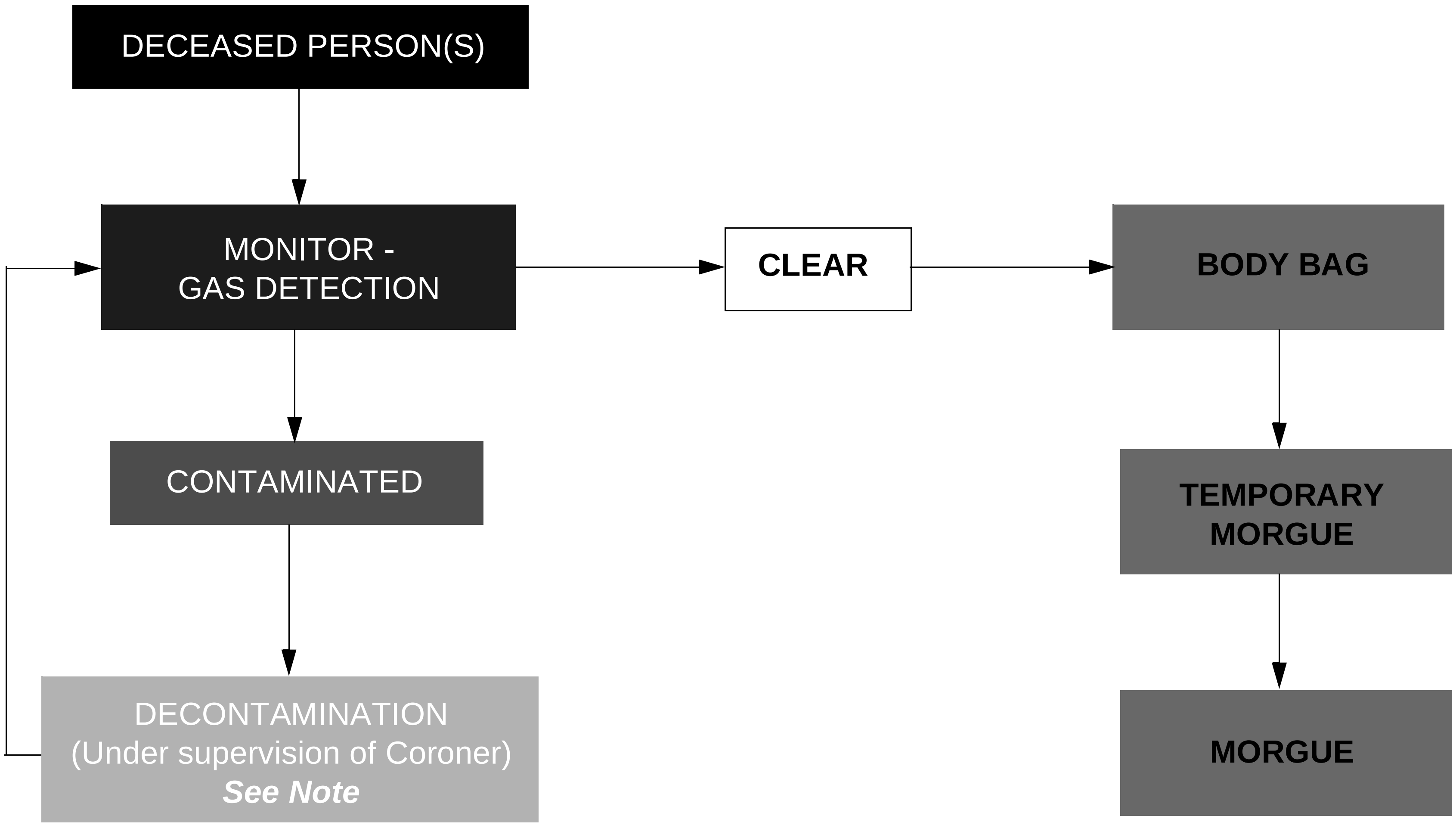
15.20.1 The EPA is the Combat Agency for site clean-up after the incident has been rendered safe by the NSWFB (see *SOG 10.1*).

15.20.2 The IC will provide a written report of the incident to the EPA through normal NSWFB channels, outlining any problems encountered and/or suggestions to improve the overall response of all parties to such an incident or emergency (see *SOG 10.2*).

15.21 Referenced Documents

15.21.1 The following documents have been referenced within this document and should be read in conjunction with this SOG:

- *HazMat Plan;*
- *Memorandum of Understanding between the NSWFB and the EPA;*
- *SOG 1.1, Incident Control System;*
- *SOG 10.1, Control Structure;*
- *SOG 10.2, Site Management; and*
- *SOG 10.4, Decontamination.*



NOTE

Decontamination of a deceased body is to continue until it is determined to be clear of contamination.

Fig 15.5 Method for Dealing with Deceased Persons

CHEMICAL, BIOLOGICAL AND RADIOLOGICAL (CBR) INCIDENTS CHECK SHEET

⚠ **NOTE**

This Check Sheet is to be utilised in conjunction with other Section 10 Hazardous Materials Check Sheets.

FIRST ARRIVING APPLIANCES

☐ Establish Forward Control Point (FCP) in the Cold Zone by the first arriving appliance.
- ☐ FCP co-ordinates operations within Hot and Warm Zones, including other emergency services.
- ☐ Operations Officer should be located at the FCP and should consider the appointment of an assistant Operations Officer.

☐ Observe incident from distance following HazMat SOG's to determine incident magnitude, including:
- ☐ approximate number of apparent casualties;
- ☐ weather conditions, wind direction, atmospheric conditions and time of day;
- ☐ plume direction (vapour/cloud movement);
- ☐ types of injuries and symptoms presented;
- ☐ exact location of incident;
- ☐ safe access route and a staging area location; and
- ☐ **be aware of secondary or delayed devices.**

☐ Transmit frequent, informative and accurate situation reports (SITREPS).
☐ Evacuate persons from potential at-risk areas to minimise potential contamination. Consider utilising appliance PA system.
☐ Establish mass decontamination (as required).
☐ To prevent unauthorised personnel enterring Warm Zone, use barrier tape to establish outer edge of Warm Zone.
☐ Establish Hot Zone with Hot Zone barrier tape.
☐ Commence removal of casualties from Hot Zone to decontamination area in Warm Zone.
☐ **Ensure appropriate level of personnel protective clothing is determined and maintained.**

FURTHER ARRIVING APPLIANCES

☐ Establish Incident Control Point (ICP) remote from the FCP.
- ☐ ICP facilitates the functions of Incident Command, Logistics, Planning, Media and support to operations.
- ☐ Senior representatives of other emergency services will attend the ICP.

☐ Continue removal of casualties from Hot Zone to decontamination area in Warm Zone.
☐ Establish staging area for responding appliances.
☐ Establish forward BA/HazMat staging area in Warm Zone.
☐ Formalise decontamination process, including HazMat decontamination shelter.
☐ Establish a clean area within the Warm Zone for decontaminated civilians to await medical clearance.
☐ **Ensure appropriate level of personnel protective clothing is determined and maintained.**

APPLIANCES RESPONDING TO HOSPITALS

☐ Set up for emergency decontamination of the public.
☐ Report to hospital administration for further orders.
☐ Task to decontaminate contaminated self-reporting victims before they can enter the hospital.
☐ **Ensure appropriate level of personnel protective clothing is determined and maintained.**

NSW FIRE BRIGADES

Standard Operational Guidelines

RESCUE

Section Eleven

11.3 CONFINED SPACE OPERATIONS

1 Introduction

This SOG explains how to conduct emergency operations safely and quickly, while complying with relevant legislation.

A confined space is defined as:

An enclosed or partially enclosed space that is at atmospheric pressure during occupancy and is not intended or designed primarily as a place of work, and:

a) is liable at any time to:

   i) have an atmosphere which contains potentially harmful levels of contaminant

   ii) have an oxygen deficiency or excess, or

   iii) cause engulfment, and

b) could have restricted means for entry and exit.

Confined spaces may include but are not limited to:

a) storage tanks, tank cars, process vessels, boilers, pressure vessels, silos and other tank- like compartments

b) open-topped spaces such as pits or degreasers

c) pipes, sewers, shafts, ducts and similar structures, and

d) any shipboard spaces entered through a small hatchway or access point, cargo tanks, cellular double bottom tanks, duct keels, ballast and oil tanks, and void spaces, but not including dry cargo holds.

2 Application

This SOG applies to all NSWFB personnel who respond to an emergency in a confined space.

3 Authority to enter confined space

Before entering confined spaces for non-emergency activities such as training or inspections, legislation requires that the NSWFB complete a Written Authority/Risk Assessment—Confined Space and carry out atmospheric monitoring.

However, during an emergency response, the NSWFB may enter a confined space before complying with these requirements.

4 IC responsibilities

On arrival, the IC must:

- conduct a size up and risk assessment and send a sitrep requesting additional resources if required
- brief crews on hazards and control measures before entry

- complete the NSWFB Written Authority/Risk Assessment—Confined Space form promptly
- establish a Rapid Intervention Team (SOG 18.2) and ensure appropriate rescue gear is available
- establish BA Control and ICMS (SOG 18.1)
- conduct Atmospheric Monitoring at multiple points
- establish Tactical and Task communications with crews (SOG 2.1)
- ensure all personnel comply with PPE requirements
- establish and implement a ventilation plan
- preserve any serious incident site (SOG 1.6).

5 Size up and risk assessment

NOTE: A Written Authority and Risk Assessment may be available at the site. This will provide essential information including location and description of work, hazards, utility services isolation checklist, atmospheric monitoring results, ventilation plan and staff check list.

When conducting size up and risk assessment identify:

- any existing Written Authority and Risk Assessment
- entry points
- atmospheric hazards, eg toxic, explosive or oxygen deficient/enriched areas
- physical hazards eg structural collapse, moving machinery, slippery surfaces, trip and open pits, hot surfaces
- utility services still connected eg electricity, gas, steam or water pipes
- location of any victims, their condition and degree of entrapment
- additional NSWFB resources eg BA/Hazmat, Aerial appliances or specialised rescue equipment required
- other emergency agencies and utility companies required
- additional personnel to assist in search, hauling lines and extrication.

6 Emergency entry to confined space

If in an emergency, a confined space is entered before the required documents and atmospheric monitoring are completed, the IC must ensure that, as a minimum, the following steps is done to deal with likely hazards:

1. brief crews before entry, including hazards and control measures
2. wear Structural Firefighting Ensemble, or fully encapsulated suit if hazardous chemicals are suspected, and take 38mm hose line
3. wear SCBA
4. establish an initial Rapid Intervention Team (SOG 18.2)
5. deploy equipment to extricate crews if necessary, eg ladder, cordage pack.

The IC may amend the PPE when:

- atmospheric monitoring has shown that the atmosphere is safe,
- the NSWFB Written Authority/Risk Assessment -Confined Spaces form is completed
- all control measures have been implemented.

However the minimum PPE will be work shirt, duty trousers, multi-purpose helmet and gloves.

7 Atmospheric monitoring

The atmosphere in a confined space must be monitored at the entry, mid point and at the low or end point to determine all of the following:

- oxygen deficiency
- oxygen enrichment
- toxic gas (carbon monoxide, hydrogen sulphide)
- lower explosive levels

NOTE: All NSWFB gas monitors can measure these atmospheric hazards, however if other gases are suspected, request BA/Hazmat attendance. On site atmospheric monitoring may be available and should also be used.

NOTE: Carbon monoxide levels must be monitored down wind of any internal combustion engine, eg PPV or generator

11.3 CONFINED SPACE OPERATIONS

Authority to enter

Legislation requires that, before you enter a confined space at work, you must:

⇨ Complete a Written Authority and Risk Assessment

⇨ Carry out atmospheric monitoring

In an emergency, the NSWFB may enter a confined space before complying with these requirements.

The Incident Controller must:

- ☐ Conduct size up and risk assessment. Request additional resources if required.
- ☐ Brief crews on hazards and control measures before entry.
- ☐ Complete the *NSWFB Written Authority/Risk Assessment – Confined Space* form.
- ☐ Establish a Rapid Intervention Team (RIT) and ensure appropriate rescue gear is available.
- ☐ Establish BA Control and ICMS.
- ☐ Conduct atmospheric monitoring at multiple points.
- ☐ Establish tactical and task communications with crews.
- ☐ Establish a ventilation plan.
- ☐ Ensure personnel have appropriate PPE – *minimum PPE* is work shirt, duty trousers, multi-purpose helmet and gloves.
- ☐ Preserve any serious incident site.

Emergency entry

In an emergency, ensure the following *minimum* steps are completed:

- ☐ *Brief crews* before entry including likely hazards and control measures.
- ☐ *Wear structural firefighting ensemble*, or fully encapsulated suit if hazardous chemicals are suspected.
- ☐ Take *38 mm hose line*.
- ☐ *Wear SCBA*.
- ☐ Establish an *initial RIT*.
- ☐ Deploy equipment to extricate crews if necessary – eg ladder, cordage pack.
- ☐ Only downgrade PPE once atmospheric monitoring shows that it is safe, the *NSW Written Authority/Risk Assessment – Confined Space* form is complete, and control measures are in place.

Size up/risk assessment

When conducting size up and risk assessment identify:

- ☐ Any existing Written Authority and Risk Assessment at the site.
- ☐ Entry points.
- ☐ Atmospheric hazards – toxic, explosive, oxygen deficient or enriched.

- ☐ Physical hazards – structural collapse, moving machinery, open pits, hot surfaces.
- ☐ Utility services – electricity, gas, pipes – still connected.
- ☐ Location of victims, their condition and degree of entrapment.
- ☐ Additional NSWFB resources required (hazmat, aerial appliances, specialised rescue)
- ☐ Additional other emergency services or personnel required.

Atmospheric monitoring

- ☐ Determine if any *onsite* atmospheric monitoring is available.
- ☐ Monitor the atmosphere *at the entry, mid point* and *low or end point* to determine:
  - Oxygen deficiency or enrichment
  - Toxic gases (carbon monoxide, hydrogen sulphide)
  - Lower explosive levels.
- ☐ NSWFB gas monitors measure these atmospheric hazards – if other gases are suspected, *request BA/Hazmat*.
- ☐ Monitor carbon monoxide levels *down wind* of any internal combustion engine.

NSW FIRE BRIGADES

Standard Operational Guidelines

DRIVING

Section Thirteen

13.2 SAFE WORK ON ROADS

1 Introduction

The purpose of this guideline is to ensure the safety of crews working on roads.

2 Application

This guideline applies to all NSWFB personnel.

3 Responsibility

The Officer-in-Charge (OIC) must ensure that operational risks are acceptable and where hazards exist, appoint a Safety Officer.

All firefighters and officers at the scene must:

- take care of their own safety and that of other people at the site
- monitor traffic conditions and alert the OIC to any hazards.

4 Personal protective equipment

To ensure visibility, firefighters must always wear appropriate personal protective equipment (PPE) when working on roadways. In non-operational situations, high visibility vests may replace firefighting apparel when appropriate.

NOTE Overtrousers must be worn at night. The Officer-in-Charge must decide whether overtrousers are required during the daytime.

5 Flashing lights

The driver must operate the vehicle's emergency beacons and hazard warning lights at all times.

6 Traffic calming devices

All NSWFB appliances must carry the following equipment:

- **Advance Warning Sign**: used to give advanced warning to other road users
- **Traffic cones** (witches' hats): used to divert traffic around the area where vehicles and crews are on or near roads.

7 Traffic control

Do not stop or redirect traffic during non-emergency work on roads unless it is necessary to prevent possible harm to firefighters or equipment.

Fire-fighters must be conscious of the public inconveniences they cause when working on roads and ensure that road closures are minimised, although not at the expense of incident effectiveness or safety.

8 Positioning the vehicle and defining the work space

- place and orient the advanced warning sign on the footpath where it is clearly visible to road users at a distance twice the prescribed speed limit in metres from the start of the work area to a maximum of 140 m, or at the next intersection
- position the vehicle safely and turn on the emergency beacons and hazard warning lights to warn approaching traffic
- ensure that a line of traffic cones is placed from the warning sign to the vehicle, spaced evenly to provide a safe work area
- if necessary, appoint spotters to monitor traffic.

NOTE If traffic conditions become dangerous, move to safety immediately.

9 Hydrant inspections and pressure testing

Firefighters must not conduct maintenance work, such as cleaning out hydrant compartments, on roadway hydrants. If a hydrant requires maintenance, the Officer-in-Charge must record the details and inform the responsible water authority.

Conduct hydrant inspections and pressure tests on roads only when it is safe to do so.

Hydrant inspections *must not* be conducted:

- on roads where the regulatory speed limit exceeds 70 kph
- on motorways, highways, main roads, alternative routes for main arterial roads
- where the Officer-in-Charge assesses that the risks to firefighters and/or the community are unacceptable.

10 Vehicle breakdowns

When a vehicle breaks down:

- define the workspace around the vehicle in accordance with Section 8. If the vehicle is stationary in other than the kerbside lane, place the warning sign in the road lane 20 m behind the vehicle.
- notify Communication Centre of the problem so they can arrange help
- wait for help to arrive.

11 Aerial drills

When conducting aerial evolutions on roads, or in other areas with vehicular traffic, eg parking areas:

- define the workspace around the vehicle in accordance with Section 8
- ensure that a traffic lane 3.5 metres wide is available when stabilisers are deployed
- ensure pedestrians can pass safely
- stabilise the vehicle

- ensure no other vehicles can park in front of the aerial appliance and prevent the boom from being housed.
- monitor traffic conditions continuously. If traffic conditions change, consider suspending the drill exercise to prevent disruption to traffic.

13.2 SAFE WORK ON ROADS

When working on roads – during incidents or when performing non-operational work – NSWFB personnel must *ensure safety* and work within a defined *work area*.

Risk Management

The officer-in-charge must:

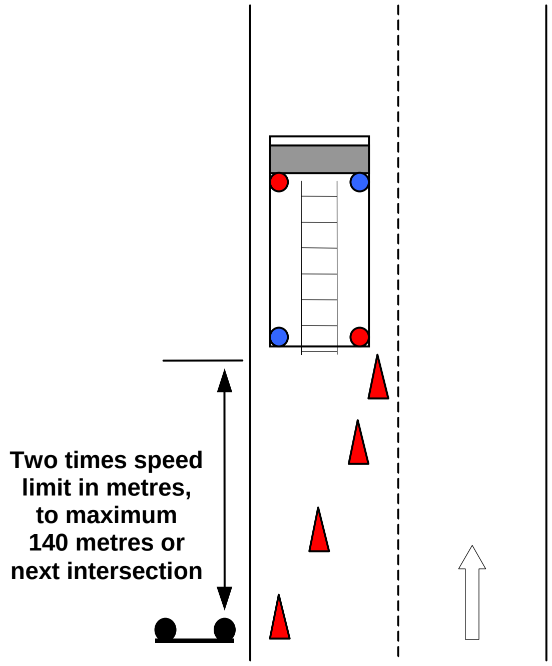
- ☐ Assess the *traffic risks* and ensure that all firefighters and the public are safe.
- ☐ Where hazards exist, appoint a *Safety Officer*.
- ☐ If conditions change, *move* to safety.
- ☐ Keep *road closures* to a minimum – but not at the expense of incident strategies or safety.

Clothing

- ☐ Wear *personal protective equipment* (PPE). In non-operational work, *high visibility vests* may replace PPE if appropriate.
- ☐ At night, wear *overtrousers*. During the day, the officer-in-charge can decide if overtrousers are required.

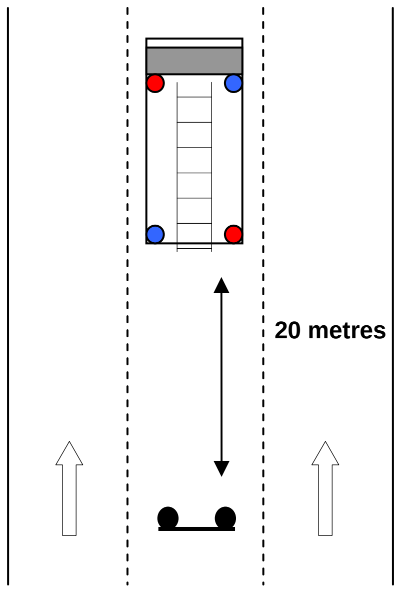
Defining the work area

- ☐ Position the vehicle.
- ☐ Turn on the vehicle's emergency *beacons* and *hazard warning lights*.
- ☐ Place *advance warning sign* on the footpath at a distance two times the speed limit in metres from the vehicle – to a maximum of 140 metres or at the next intersection.
- ☐ Place *traffic cones* at regular intervals between the vehicle and advance warning sign.
- ☐ If necessary, appoint *traffic spotters* at safe vantage points to warn approaching vehicles.



Vehicle breakdown

- ☐ If in the kerbside lane, define a *work area* with the advance warning sign and traffic cones.
- ☐ If *not* in the kerbside lane, place the advance warning sign 20 metres from the vehicle.
- ☐ Notify the Communication Centre and wait for assistance.



Non-operational work

Do not redirect or stop traffic unless it is necessary to prevent harm to personnel or equipment.

Hydrant inspections

- ☐ Conduct inspections and pressure tests on roadway hydrants *only* when it is safe to do so.
- ☐ *Do not* conduct *maintenance* on roadway hydrants – record the details and inform the water authority.
- ☐ *Do not* conduct hydrant inspections:
  - where the regulatory speed exceeds 70 kph
  - on a motorway, highway, main route, or alternative route for main arterial road
  - where the officer-in-charge assesses that there is unacceptable risk

Aerial drills

- ☐ Define the *work area* with the advance warning sign and traffic cones.
- ☐ Ensure *pedestrians* can pass safely.
- ☐ Allow 3.5 metre wide traffic lane when stabilisers are operating.
- ☐ Allow *clear space* in front of the appliance for housing of booms.
- ☐ Monitor the traffic and *suspend* drill if there are safety issues.

FIRE AND RESCUE NSW

Standard Operational Guidelines

UTILITIES

Section Fourteen

1 TELECOMMUNICATIONS NETWORK CABLES

1.1 Introduction

1.1.1 Telecommunications Network Cables provide telecommunications, cable television and other services to a large portion of Sydney and surrounding areas.

1.1.2 The network comprises various types of cables. These are either supported on existing electricity supply (utility) poles, or located in underground ducts. These poles typically carry Energy Supply Authority (ESA) conductors with voltages ranging between 240 V and 11 000 V AC, or greater.

1.1.3 Whilst the telecommunication network cables form part of a very safe network, there may be occasions when firefighters (in the course of their duty) will encounter the cables in situations that render them dangerous to life and/or property.

1.2 Application

1.2.1 This guideline essentially refers to the cables owned by *Optus*, but other operators may introduce similar systems.

1.2.2 Due to the proximity of these cables to low and high voltage energy supply cables, operational officers should be aware of the necessity to contact the relevant ESA through the NSWFB Communication Centre, when involved in an incident involving telecommunication network cables.

1.3 *Optus* Telecommunications Network

1.3.1 The *Optus* telecommunications network consists of two separate networks:

- the Synchronous Digital Hierarchy (SDH) Trunk Network; and
- the Hybrid Fibre Coax (HFC) Local Distribution Network.

1.3.2 The SDH Trunk Network uses fibre optic cable and is generally located in underground cable ducts. Alternately, the cables are buried in trenches and are identified by marker posts.

1.3.3 The HFC Local Distribution Network also uses fibre optic cable as well as coaxial hardline cable, but is generally located above ground attached to utility poles. It comprises many components that may become damaged and require the attendance of qualified *Optus* personnel.

NOTE

Parts of the HFC network located underground must be treated in the same way as the overhead network.

1.4 *Optus* HFC Local Distribution Network Components

1.4.1 In terms of what firefighters are likely to encounter the following components comprise the *Optus* HFC Local Distribution Network:

- Power supply boxes;
- Optical Nodes;
- Amplifiers;
- Taps;
- Lead-in cables;
- Strand;
- Coaxial Hardline Cable; and
- Fibre Optic Cable.

1.4.2 Fig 1.1 illustrates the general layout of the *Optus* HFC Local Distribution Network.

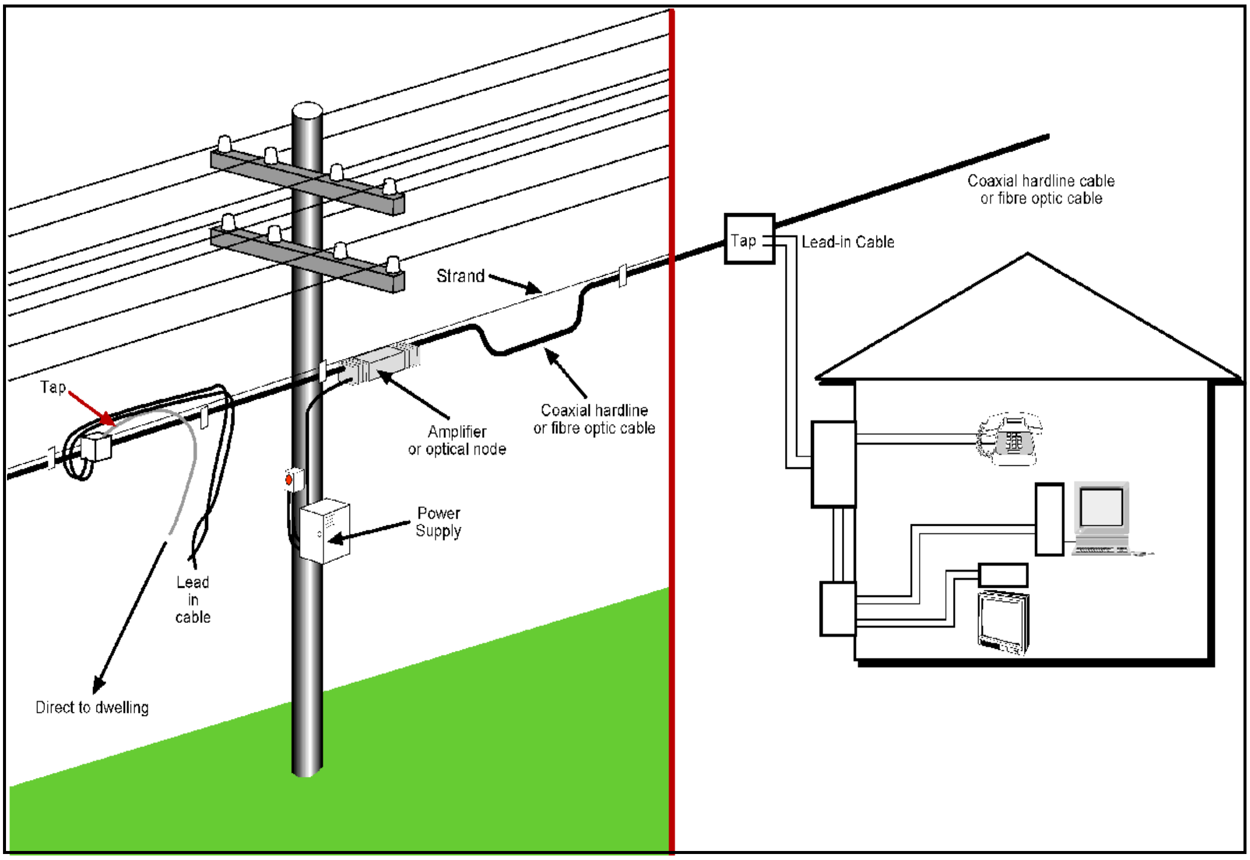


Fig 1.1 Optus HFC Local Distribution Network Configuration

1.5 Power Supply Box

1.5.1 At various locations on the HFC network, power supply boxes are provided to supply the 90 V AC required to operate the system.

1.5.2 The boxes are attached to electrical poles and take the form of a grey metal box, similar in size to a meter supply box at a domestic dwelling.

1.5.3 The power supply boxes contain a power supply and gel cell batteries which provide standby power to the network should there be a mains power failure.

1.5.4 The boxes are identified by a serial number on the outside case. This number should be quoted should a problem arise involving the power supply box or its associated cables and system components.

1.5.5 Turning off the electricity mains switch (labelled *Optus*), located on the utility pole adjacent to the power supply box, will not turn off the power within the *Optus* network.

⚠ NOTE

During an electricity main power failure the *Optus* network is usually still energised.

1.5.6 Power supply boxes contain 240 V and 90 V AC and therefore should be regarded as electrically hazardous.

1.6 Optical Nodes

1.6.1 Optical nodes are located on the strand. These components are rectangular and have a natural metal finish. The nodes convert the laser light in an optical fibre cable to an electrical signal on the coaxial cable.

1.6.2 The optical nodes are powered by the 90 V AC provided by the power supply.

1.7 Amplifiers

1.7.1 Amplifiers are attached at intervals along the length of the coaxial hardline cable. These components are rectangular aluminium boxes that are required to amplify telecommunications, video and other signals present on the coaxial hardline cables.

1.7.2 The amplifiers are powered by the 90 V AC provided by the power supply boxes.

1.8 Taps

1.8.1 Taps are small rectangular aluminium boxes from which telecommunications, video and other signals as well as 90 V AC for telephony equipment are supplied to a customer's premise. They are typically located at utility poles. Wires may be attached to premises leading from these taps (see Fig 1.1).

1.9 Lead-in cable

1.9.1 The lead-in cable is constructed of coaxial cable, a cable with twisted pairs and a small steel bearer wire all individually sheathed in a PVC jacket and joined by a web.

1.9.2 The lead-in cable is typically coloured black and its function is to deliver telecommunications, video and other signals as well as 90 V AC, via the twisted pair, to power telecommunications equipment at the customer's premise.

1.10 Strand

1.10.1 The strand is the common term for a 6.5 mm galvanised steel cable that is used to support the HFC network cables and apparatus.

1.10.2 The strand is connected to the ESA Multiple Earthed Neutral (MEN), and as such forms part of the ESA Low Voltage (LV) MEN grid.

⚠ NOTE

The MEN is the return current path of the ESA electrical supply network and as such should be treated as a live conductor.

1.11 Coaxial Hardline Cable

1.11.1 The coaxial hardline cable is a round black or grey PE jacketed aluminium cable used to transport telecommunications, video and other signals over short distances.

1.11.2 Coaxial hardline cable is usually lashed to the strand by a small wire wrapped around the cable and the strand.

1.11.3 The coaxial hardline cable carries 90 V AC to power amplifiers and other active elements in the HFC network.

1.12 Fibre Optic Cable

1.12.1 Fibre optic cable is round black or grey HDPE jacketed cable with multiple strands of thin glass fibres.

1.12.2 The fibre optic cable is used to transport telecommunications, video and other signals over long distances.

1.12.3 The fibre optic cable is usually lashed to the strand by a small wire wrapped around the cable and the strand

1.13 Precautionary Measures

1.13.1 Assume that **all** cables are **live** and will continue to be dangerous and/or life threatening. Take all precautions associated with electricity and electrical hazards.

1.13.2 Be aware of the chance of secondary fires or incidents remote from the site due to excess voltage or other electrical faults. These fire/incidents could be located in unoccupied dwellings or in bush/grassland. A cable that has been dislodged may also cause other cables to become involved.

1.13.3 Due to the similarity of *Optus* cables to Aerial Bundled Cables (ABCs) used by ESA in some areas, **all** cables should be treated as an ESA conductor until otherwise determined by the appropriate ESA.

1.14 Fire Fighting Operations

1.14.1 Each incident should be quickly evaluated to determine priorities, life protection, exposures and involvement.

1.14.2 The following actions should be carried out when dealing with fire fighting operations that involve telecommunications cables:

- identify the hazard and send a SITREP to the communication centre;
- notify the Police to establish traffic control (if required);
- notify the Ambulance Service to deal with injuries (if required);
- notify the ESA to deal with any ESA conductors; and
- notify *Optus* (or other operator) through communications centre to deal with telecommunications cables.

1.15 Fire Incidents

1.15.1 Be aware of all electrical cables, as in a fire situation their fixings may become damaged leading cables to become detached from buildings or poles.

1.15.2 Cables may be situated above the incident site and may be positioned at lower heights than usual, or on, or across the approach road.

1.15.3 High road height appliances such as turnable ladders and hydraulic platforms should approach the incident site with caution.

1.15.4 Position appliances and equipment safely. **Do not** drive over cables, either consider a different approach or call for a back up crew to approach from another angle.

1.15.5 Treat any fire in cables as an electrical fire unless determined otherwise, and use an appropriate extinguishing medium.

1.16 Rescue and MVA Incidents

1.16.1 Establish a safe zone. If power lines or any other cables are down or damaged, arrange for appliances to assist in carrying out operations.

1.16.2 Establish a safe area by using appliances, verbal directions, barrier tape, signs and witches hats to isolate persons and/or vehicles from further danger or damage.

1.16.3 Dependant upon the situation on arrival, apply the relevant SOGs e.g. Hazardous Materials.

1.17 Safety Precautions

1.17.1 The following safety precautions should be applied at all incidents that involve telecommunication network cables:

- Do not pick up any cable found damaged or dislodged - a minimum clearance of 8 m is recommended;

- If using rope, wood or other items to move cable(s) ensure that the item is electrically non-conductive, electrical gloves are worn and that you are on a dry surface. If in doubt do not touch the cable(s);

- Do not handle damaged cables without the use of leather gloves, and then only when it has been positively established by the ESA, *Optus* or appropriate carrier, to be carrying no voltage;

CAUTION

The fibre optic cable contains fine glass strands. If the cable is damaged, minuscule fragments of broken glass could come loose and cause severe injury through skin penetration or inadvertent transfer from hands to eyes.

- **Do not** look into the ends of any fibre optic cable as it may be carrying pulses of laser light which is invisible to the eye, and can cause permanent eye damage, including blindness; and

- Unless the situation is life threatening, **do not** attempt to cover or remove a damaged cable without an *Optus* (or appropriate operator) technician present.

TELECOMMUNICATIONS NETWORK CABLES

CHECK SHEET

The purpose of this Check Sheet is to provide a list of actions that should be carried out when involved in incidents connected with telecommunications network cables.

FIRE FIGHTING OPERATIONS

- Each incident should be quickly evaluated to determine priorities, life protection, exposures and involvement.
- The following actions should be carried out when dealing with fire fighting operations that involve telecommunications cables:
  - ☐ identify the hazard and send a SITREP to the communication centre;
  - ☐ notify the Police to establish traffic control (if required);
  - ☐ notify the Ambulance Service to deal with injuries (if required);
  - ☐ notify the ESA to deal with any ESA conductors; and
  - ☐ notify *Optus* (or other operator) through communications centre to deal with telecommunications cables.

FIRE INCIDENTS

- Be aware of all electrical cables, as in a fire situation their fixings may become damaged leading cables to become detached from buildings or poles.
- Cables may be situated above the incident site and may be positioned at lower heights than usual, or on, or across the approach road.
- High road height appliances such as turnable ladders and hydraulic platforms should approach the incident site with caution.
- Position appliances and equipment safely. **Do not** drive over cables, either consider a different approach or call for a back up crew to approach from another angle.
- Treat any fire in cables as an electrical fire unless determined otherwise, and use an appropriate extinguishing medium.

RESCUE AND MVA INCIDENTS

- Establish a safe zone. If power lines or any other cables are down or damaged, arrange for appliances to assist in carrying out operations.
- Establish a safe area by using appliances, verbal directions, barrier tape, signs and witches hats to isolate persons and/or vehicles from further danger or damage.
- Dependant upon the situation on arrival, apply the relevant SOGs e.g. Hazardous Materials.

SAFETY PRECAUTIONS

- The following safety precautions should be applied at all incidents that involve telecommunication network cables:
  - ☐ Do not pick up any cable found damaged or dislodged - a minimum clearance of 8 m is recommended;
  - ☐ If using rope, wood or other items to move cable(s) ensure that the item is electrically non-conductive, electrical gloves are worn and that you are on a dry surface. If in doubt do not touch the cable(s);
  - ☐ Do not handle damaged cables without the use of leather gloves, and then only when it has been positively established by the ESA, *Optus* or appropriate carrier, to be carrying no voltage;

CAUTION

The fibre optic cable contains fine glass strands. If the cable is damaged, minuscule fragments of broken glass could come loose and cause severe injury through skin penetration or inadvertent transfer from hands to eyes.

  - ☐ **Do not** look into the ends of any fibre optic cable as it may be carrying pulses of laser light which is invisible to the eye, and can cause permanent eye damage, including blindness; and
  - ☐ Unless the situation is life threatening, **do not** attempt to cover or remove a damaged cable without an *Optus* (or appropriate operator) technician present.

14.2 ISOLATING POWER AT INCIDENTS

1 Scope and application

This Standard Operational Guideline instructs firefighters about isolating power to control the risks associated with electricity.

It applies at any incident involving a structure where power is provided by the electricity network. Alternative power sources – eg solar panels – are covered in SOG 14.7, *Alternative power sources.*

This SOG does not cover isolating power on rail networks.

2 Hazards

WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.
If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

Power is isolated from the electricity network to control the risks associated with the following electrical hazards:

- Damage to a structure may expose wires and cause conductive material in contact with them – eg gutters, downpipes, cladding, fences, meter boxes, metal ladders – to become live.
- Water in contact with exposed wires acts as a conductor and will become live.
- Damage to a structure may cause wires to fall and touch the ground, creating a voltage gradient and increasing the risk of electric shock through step and touch potential.
- When visibility is reduced – eg smoke or darkness – fallen or low-hanging live wires may be difficult to see.
- Even when power is turned off at the switchboard, the wires that deliver the power to the switchboard from the network – the consumers mains – remain live until the electricity company isolates the power to the site.
- A structure may have illegal wiring – eg for electricity theft, or at clandestine drug laboratories or squats. Illegal wiring or connections may be uninsulated; wires and attachments may be hidden or unpredictable.
- There may be more than one switchboard for the site – eg industrial complexes, individual home units or houses after major renovations – so areas of the structure may be live.

Once power has been isolated *there may still be an electrical hazard* if the structure has an alternative power source – ie solar panels, wind turbine, methane system, uninterruptible power system (UPS), or backup generator.

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3 Tactical considerations

In some cases – mostly at larger structures and complexes – it may not be appropriate to turn off power to the entire structure, eg:

- Industrial complexes – some processes may be difficult to shut down quickly
- High-rise buildings – lights or lifts may be needed during evacuation of residents
- Health care facilities – life-sustaining equipment may be in use.

4 Isolating power

Isolating power means disconnecting power *to the site* – this can only be done by the electricity company. As an interim measure, firefighters can turn off power *within the structure* at the switchboard.

WARNING

Do not cut electrical wires, even if they appear to be dead. Cutting wires could expose you to electricity which could kill or injure you.

To turn off and isolate power:

1. Contact the Communication Centre (ComCen) to request the electricity company attend to isolate power from the electricity network to the site.
2. If it is not appropriate to turn off power to the entire structure, liaise with on-site experts to determine how best to turn off power. Check any pre-incident plans for safe shutdown procedures.
3. At the switchboard:
   - Assume the switchboard is live. Don electrical gloves, then over-gloves. Put your helmet visor down.
   - Ensure the area around the switchboard is safe to approach – check for hazards such as structural collapse, radiant heat, pooled water or fallen wires. Identify the main switch and other circuit breakers in the switchboard.
   - Turn your eyes away in case the power arcs and there are flashes. Flick the mains switch or switches to OFF.
   - Turn off all other circuits – switch circuit breakers to OFF, or remove fuses.
4. Advise all personnel at the incident and the ComCen that *'power has been turned off at the switchboard'*.
5. Restrict work as far as reasonably practical to that required to protect life or prevent dangerous expansion of the incident. Carefully consider whether the possible benefits of undertaking the work outweigh the risks.
6. Once the electricity company representative isolates the power to the site, advise all personnel at the incident and the ComCen that *'power has been isolated to the site by electricity company representative'*.

   If there is any doubt about the isolation of power to the site, test for the presence of electricity with a voltage detector.
7. Assess whether there are alternative power sources. If so, follow instructions in SOG 14.7, *Alternative power sources.*

5 Precautions before power is isolated

If you need to work inside the structure before power is isolated to the site by the electricity company:

- Assume all conductive material (including wet ground) is live. Avoid contact with anything that could conduct electricity.
- Use the voltage detector to identify electrical sources, being aware of its limitations – eg detection may be hindered by cable shielding.
- If you find an electrical hazard – eg exposed wires – immediately inform your crew and notify the Incident Controller.
- Establish an Exclusion Zone around any identified hazard.
- If there are wires fallen within the structure, try to locate both ends to determine the hazardous area. Establish an 8 metre radius Exclusion Zone where the wires touch the ground.
- Do not apply water to an electrical hazard.
- If you find a person in contact with electricity, keep clear and remain 8 metres away from the person. Do not attempt to touch or rescue the person until the power has been isolated.

  Anyone receiving an electric shock must receive first aid treatment and be immediately transported to hospital for assessment and treatment.

6 Handover

Indicate any electrical hazards on the site handover form and recommend that electricity circuits be checked by an electrician before restoring power.

14.2 ISOLATING POWER AT INCIDENTS

Isolating power

- ☐ Contact the ComCen to request electricity company isolate power from electricity network to site.
- ☐ For larger structures and complexes (eg health care facility), determine whether appropriate to turn off power – liaise with on-site experts.
- ☐ At the switchboard, assume switchboard is live. Don electrical gloves, then over-gloves. Put your helmet visor down.
- ☐ Ensure area around switchboard is safe to approach. Identify mains switch and other circuit breakers.
- ☐ Turn your eyes away. Flick mains switch or switches to OFF.
- ☐ Turn off all other circuits.
- ☐ Advise personnel at the incident and ComCen that *'power has been turned off at the switchboard'*.
- ☐ Restrict work to that required to protect life or prevent dangerous expansion of the incident.
- ☐ Once electricity company isolates power, advise personnel at the incident and ComCen that *'power has been isolated to the site by electricity company representative'*.
- ☐ If any doubt, test for the presence of electricity with a voltage detector.
- ☐ Assess whether there are alternative power sources – follow SOG 14.7, *Alternative power sources.*

WARNING

Do not cut electrical wires, even if they appear to be dead. Cutting wires could kill or injure you.

Precautions before power isolated

- ☐ Assume all conductive material – including wet ground – is live. Avoid contact with anything that could conduct electricity.
- ☐ Use the voltage detector to identify electrical sources – be aware of voltage detector limitations.
- ☐ If you find an electrical hazard, inform crew and notify IC.
- ☐ Establish an Exclusion Zone around any identified hazard.
- ☐ If wires have fallen, locate both ends. Establish 8 metre radius Exclusion Zone where wires touch the ground.
- ☐ Do not apply water to an electrical hazard.
- ☐ If you find a person in contact with electricity, remain 8 metres away. Do not attempt to touch or rescue the person until power has been isolated.
- ☐ Anyone receiving an electric shock must receive first aid treatment and be transported to hospital.

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WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.
If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

Tactical considerations

It may not be appropriate to turn off power to an entire structure, eg:

- ⇨ Industrial complex – some processes may be difficult to shut down.
- ⇨ High-rise building – lights or lifts may be needed for evacuation.
- ⇨ Health care facility – life-sustaining equipment may be in use.

Handover

On site handover form – indicate any electrical hazards and recommend circuits be checked by an electrician before restoring power.

Hazards

Hazards before isolating power:

- ⇨ Damage to a structure may expose wires and cause conductive material in contact with them – gutters, downpipes, cladding, fences, meter boxes, metal ladders – to become live.
- ⇨ Water in contact with exposed wires acts as a conductor and will be live.
- ⇨ Wires may fall and touch the ground, creating a voltage gradient and increasing the risk of electric shock.
- ⇨ When visibility is reduced fallen or low-hanging live wires may be difficult to see.
- ⇨ Even when power is turned off, the wires that deliver power to the switchboard from the network – the *consumers mains* – remain live until isolated by the electricity company.
- ⇨ A structure may have illegal wiring.
- ⇨ There may be more than one switchboard.

Once power has been isolated *there may still be an electrical hazard* if the structure has an alternative power source – eg solar panels or generator.

14.3 WIRES DOWN

1 Scope and application

This Standard Operational Guideline helps firefighters to work safely at incidents where power lines (high or low voltage) are down – a wires down incident.

2 Hazards

WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.
If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

During size-up, consider the following hazards:

- Fallen power lines in contact with the ground may transfer electricity to the ground, creating a voltage gradient and increasing the risk of electric shock through step and touch potential.
- Power lines under tension may move or break, extending the hazardous area. Snapped power lines can recoil.
- Wind or equipment failure may cause fallen power lines to move, extending the hazardous area.
- While not obvious, adjacent power lines or equipment may be damaged.
- Automatic switching equipment can unexpectedly re-energise power lines.
- Both ends of broken power lines could be live.
- Anything conductive – eg vehicle, metal ladder, metal fence – in contact with power lines will be live.
- A person in contact with power lines acts as a conductor and will be live – the person’s body will be at the same voltage as the power line.
- Water in contact with power lines acts as a conductor and will be live.
- Where a vehicle is in contact with power lines there is an increased risk of fire due to sparks and heating. Tyres may get hot and eventually burst, possibly some time after the voltage is removed.

3 Safe work around downed power lines

Always assume that downed power lines are live.

- Establish an 8 metre radius Exclusion Zone from the downed power lines and anything they are touching.
- Contact the Communication Centre (ComCen) to request attendance by the electricity company.
- Do not approach fallen power lines – they may move unexpectedly if the wire arcs or recoils.

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- Do not touch, move or cut fallen power lines.
- Locate both ends of broken power lines but do not approach them.
- Do not stand or park vehicles near downed power lines.
- Do not drive over downed power lines.
- If a vehicle has been in contact with high voltage power lines, isolate it for 24 hours, to ensure that there is no risk of tyres exploding.
- Maintain the Exclusion Zone until cleared by the electricity company representative on site before proceeding with any emergency work – do not rely on radio or telephone messages.

4 People trapped in a vehicle by downed power lines

If there are people trapped in a vehicle by downed power lines:

- Contact the ComCen to request attendance by the electricity company and an ambulance.
- Keep clear and maintain the 8 metre radius Exclusion Zone.
- Advise the occupants to remain in the vehicle.
- If it is safe for them to do so, instruct the driver to drive the vehicle clear of the power lines.
- *Only* if the risk for the occupants of remaining in the vehicle is greater than the risk of leaving – eg the vehicle is on fire – advise the occupants to jump clear of the vehicle and not to touch the vehicle when their feet come in contact with the ground. Advise them to move away from the vehicle by shuffling their feet along the ground.

5 People in contact with live power lines

If a person is in contact with live power lines:

- Contact the ComCen to request attendance by the electricity company and an ambulance.
- Keep clear and maintain an 8 metre radius Exclusion Zone.
- Do not attempt to touch or rescue the person until the power has been isolated by the electricity company.

Anyone receiving an electric shock must receive first aid treatment and be immediately transported to hospital.

6 Handover

Do not leave the incident until it has been rendered safe or control has been handed over to a responsible person using the site handover form.

14.3 WIRES DOWN

Safe work around downed power lines

- ☐ Always assume downed power lines are live.
- ☐ Establish an 8 metre radius Exclusion Zone from the downed power lines and anything they are touching.
- ☐ Contact the ComCen to request the electricity company.
- ☐ Do not approach fallen power lines – they may move unexpectedly if the wire arcs or recoils.
- ☐ Do not touch, move or cut fallen power lines.
- ☐ Locate both ends of broken power lines but do not approach them.
- ☐ Do not stand or park vehicles near downed power lines.
- ☐ Do not drive over downed power lines.
- ☐ If a vehicle has been in contact with high voltage power lines, isolate it for 24 hours, in case the tyres explode.
- ☐ Maintain Exclusion Zone until cleared by the electricity company representative on site – do not rely on radio or telephone messages.

WARNING

Contact with, or close approach to, live wires or electrical equipment, could kill or injure you.

If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

Hazards

During size-up, consider:

- ⇨ Fallen power lines in contact with the ground may transfer electricity to the ground, creating a voltage gradient and increasing risk of electric shock.
- ⇨ Power lines under tension may move or break – snapped power lines can recoil.
- ⇨ Wind or equipment failure may cause fallen power lines to move.
- ⇨ Adjacent power lines or equipment may be damaged.
- ⇨ Automatic switching equipment can unexpectedly re-energise power lines.
- ⇨ Both ends of broken power lines could be live.
- ⇨ Anything conductive – eg vehicle, metal ladder, metal fence, person, water – in contact with power lines will be live.
- ⇨ Where a vehicle is in contact with power lines there is an increased risk of fire due to sparks and heating. Tyres may get hot and burst.

People trapped in vehicle by downed power lines

□ Contact the ComCen to request electricity company and ambulance.

□ Keep clear and maintain an 8 metre radius Exclusion Zone.

□ Advise occupants to remain in the vehicle.

□ If it is safe for them to do so, instruct the driver to drive the vehicle clear of the power lines.

□ *Only* if the risk for the occupants of remaining in the vehicle is greater than the risk of leaving – eg vehicle is on fire – advise the occupants to:

- Jump clear of the vehicle, not touching the vehicle when they land
- Move away by shuffling their feet along the ground.

Handover

Do not leave the incident until it has been rendered safe or control has been handed over to a responsible person using the site handover form.

People in contact with live power lines

□ Contact the ComCen to request electricity company and ambulance.

□ Keep clear and maintain an 8 metre radius Exclusion Zone.

□ Do not attempt to touch or rescue the person until power has been isolated.

□ Anyone receiving an electric shock must receive first aid treatment and be transported to hospital.

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14.4 WORKING NEAR POWER LINES

1 Scope and application

This Standard Operational Guideline helps firefighters to work safely near power lines and associated structures. It applies when working near overhead high or low voltage power lines.

It includes covered cables such as high voltage Covered Conductor Thick (CCT) cables and high or low voltage Aerial Bundled Cables (ABCs).

It does not cover wires down incidents – see SOG 14.3, *Wires down.* It does not cover pole fires – see SOG 14.6, *Poles, kiosks, pillar boxes and street fixtures.*

2 Hazards

WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.

If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

During size-up, consider the following hazards:

- Support structures damaged by fire, storm or flood may become unstable and collapse, causing power lines to fall or sag.
- Power lines affected by fire or heat may sag.
- Power lines under tension can fail when damaged by fire or when the support structure is damaged. Snapped power lines can recoil.
- Arcing can occur due to the conductivity of smoke and flame – between high voltage power lines, or from the power lines to the ground or support structure.
- Debris (eg trees and branches) on power lines can be live and can transfer electricity to the ground – flashes from arcing may not be evident. Debris on power lines can cause the lines to snap or support structures to collapse and transfer electricity to the ground. Debris may ignite some time after initial contact. Debris may eject with significant force. Movement or removal of debris may cause lines to move, break or recoil.
- At night or in reduced visibility it can be difficult to see overhead power lines.
- During floods, clearance between the water level and power lines is reduced.

For covered cable systems also consider:

- Covered cables are not sufficiently insulated to be considered safe to touch.
- It is difficult to positively identify whether a covered cable is high or low voltage.
- Covered cables used for electricity distribution can be mistaken for telecommunications-related cables.

- It can be difficult to see façade-mounted ABCs – they may not be visible from the street if mounted above the awning, or they may be painted the same colour as the building. Damaged ABCs may electrify awnings or other metal building materials.

3 Safe work distances near power lines

When working near power lines:

- Maintain a safe work distance, depending upon the voltage of the power line:

AC voltage	Approach distance
Up to and including 132 000 Volts	3 metres
Above 132 000, up to and including 330 000 Volts	6 metres
Above 333 000 Volts	8 metres
DC voltage	**Approach distance**
Up and including +/- 1500 Volts	3 metres

  Aerial operators are trained to comply with these distances.
- If you cannot identify the voltage, maintain a safe work distance of 8 metres from the power line.
- If you need to work closer to power lines than these distances, you must obtain an exemption from the electricity company (or have them isolate the power).
- Increase the safe working distance to at least 8 metres and establish an Exclusion Zone if:
  – There is debris on or in contact with the power line
  – The support structure or power line is damaged or sagging.
- Increase the safe working distance to 25 metres if there is fire under or near a high voltage power line, due to the risk of arcing.

4 Fire near power lines

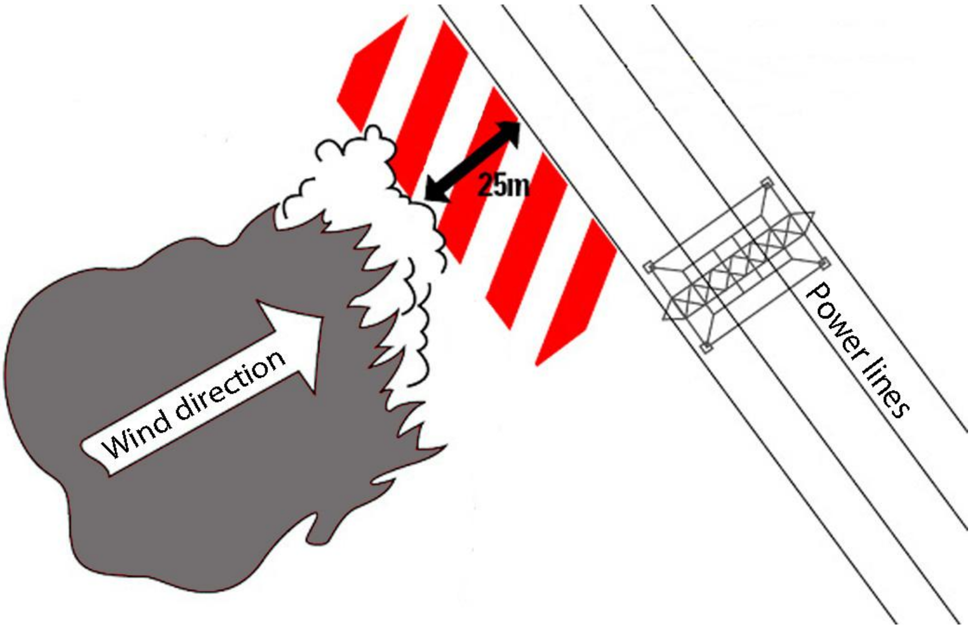
Where there is fire near power lines:

- Request the Communication Centre (ComCen) notify the electricity company of the fire and request isolation of power lines.
- Treat the power lines as live and maintain the safe work distance until cleared by the electricity company representative on site – do not rely on radio or telephone messages.
- Do not spray water directly on or near power lines or insulators from the ground or air.

5 Fire near high voltage power lines

High voltage power lines may not be able to be isolated. They are critical infrastructure and support essential community services. De-energizing them may have significant impact on public safety.

- Do not engage in firefighting under high voltage power lines.
- Keep people and vehicles a minimum of 25 metres clear of a fire burning under or near power lines.



- If crossing a power line easement, ensure that there is adequate clearance between the highest point of the vehicle (including aerials) and the power lines. The clearance varies between 3 and 8 metres depending on the voltage of the power lines. Avoid areas with tall vegetation under power lines.

Mopping up

During mopping-up operations near high voltage power lines:

- Wait for the fire to burn clear of the cleared areas beneath the power lines before commencing mop-up.
- Only approach within 25 metres of the power lines to mop up grass fires.
- Only knock down low (less than 2 metres high) isolated flames, spots or smouldering logs that are not producing a convection column or heavy smoke plume. In such cases:
  - Never direct the hose stream into the power line.
  - Never direct the hose stream into a smoke plume that is near (ie less than 25 metres) or reaching power lines. Keep stream no higher than a person's head.
  - Never direct the hose stream at a burning bush or tree (more than head height) in a power line easement.

6 Clearance during floods

If you need to cross under power lines in a boat during floods:

- Maintain between 3 and 8 metres (depending upon the voltage of the power lines) between the highest point of the boat and the power lines.
- If this is not possible, find an alternate route – cross at least 8 metres downstream (preferred) or 25 metres upstream from the power lines.

7 Debris on power lines, or damaged support structures and power lines

Where there is debris on power lines, or where support structures or power lines are damaged:

- Keep clear of the debris or damaged support structure or power line.
- Assume that any debris is live.
- Establish an Exclusion Zone of at least 8 metres radius from the debris or the damaged support structure or power line.
- If power lines fall, follow SOG 14.3, *Wires down.*
- Contact the ComCen to notify the electricity company to isolate the power.
- Do not leave the incident until it has been rendered safe or until control has been handed over to a responsible person using the site handover form.

8 Covered and overhead cable systems

At incidents where covered or overhead cable systems are present:

- Do not handle CCT cables and ABCs – treat them as live.
- For façade-mounted ABCs, assume awnings, gutters, downpipes or other conductive materials are live.
- Contact the ConCen to notify the electricity company to isolate the power.
- Maintain the safe work distance until cleared by the electricity company representative on site – do not rely on radio or telephone messages.

14.4 WORKING NEAR POWER LINES

Safe work distances

☐ Maintain a safe work distance, depending on power line voltage:

AC voltage	Distance
Up to and including 132 000 Volts	3 metres
Above 132 000, up to and including 330 000 Volts	6 metres
Above 333 000 Volts	8 metres
DC voltage	**Distance**
Up and including +/- 1500 Volts	3 metres

Aerial operators are trained to comply with these distances.

☐ If you cannot identify the voltage, maintain 8 metres from power line.

☐ If you need to work closer, obtain an exemption from the electricity company – or have lines isolated.

☐ Increase safe working distance to at least 8 metres and establish an Exclusion Zone if:

- There is debris on or in contact with the power line
- The support structure or power line is damaged or sagging

☐ Increase safe working distance to 25 metres if there is fire under or near a high voltage power line.

Fire near *high voltage* power lines

☐ Do not engage in firefighting under high voltage power lines.

☐ Keep people and vehicles a minimum of 25 metres clear of a fire burning under or near power lines.

☐ If crossing a power line easement:

- Ensure there is adequate clearance (3 – 8 metres) between the highest point of vehicle and power lines.
- Avoid areas with tall vegetation.

Mopping up

☐ Wait for the fire to burn clear.

☐ Only approach within 25 metres to mop up grass fires.

☐ Only knock down low (less than 2 metres) isolated flames not producing a convection column or heavy smoke.

- Never direct hose stream into a power line, into a smoke plume reaching power lines, or into burning vegetation in easement.
- Keep stream no higher than a person's head.

Fire near power lines

☐ Request the ComCen to notify the electricity company.

☐ Treat power lines as live and maintain safe work distance until cleared by electricity company on site.

☐ Do not spray water directly on or near power lines.

Clearance during floods

☐ Maintain adequate clearance (3 – 8 metres depending on voltage) between highest point of boat and live power line.

☐ If not possible, find an alternate route – cross at least 8 metres downstream (preferred) or 25 metres upstream from the power lines.

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WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.

If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

Damaged power lines or structures; debris on power lines

- ☐ Keep clear of debris or damaged power lines or structure.
- ☐ Assume any debris is live.
- ☐ Establish Exclusion Zone of at least 8 metres radius from debris or damaged power line or structure.
- ☐ Contact the ComCen to notify the electricity company.
- ☐ Do not leave the incident until it has been rendered safe or until control has been handed over to a responsible person using the site handover form.

Covered and overhead cable systems

- ☐ Do not handle covered cables – treat them as live.
- ☐ For façade-mounted ABCs, assume awning and other metal building materials are live.
- ☐ Contact the ConCen to have the electricity company isolate power.
- ☐ Maintain safe work distance until cleared by the electricity company representative on site – do not rely on radio or telephone messages.

Hazards

During size-up, consider:

- ⇨ Damaged support structures may be unstable or collapse – power lines may fall or sag.
- ⇨ Heat damaged power lines may sag.
- ⇨ Power lines under tension can fail – snapped power lines can recoil.
- ⇨ Arcing can occur – between power lines or from power lines to ground.
- ⇨ Debris on power lines:
  - Can be live.
  - Can cause power lines to snap or structures to collapse.
  - May ignite some time after initial contact.
  - May eject with significant force.
  - May move and cause lines to move, break or recoil.
- ⇨ When visibility is reduced it can be difficult to see power lines.
- ⇨ During floods, clearance is reduced between water level and power lines.

For covered cable systems:

- ⇨ Covered cables – eg Covered Conductor Thick (CCT) and Aerial Bundled Cables (ABCs) – are not safe to touch.
- ⇨ It is difficult to identify if a covered cable is high or low voltage.
- ⇨ Covered cables used for electricity distribution can be mistaken for telecommunications-related cables.
- ⇨ It can be difficult to see façade-mounted ABCs – they may not be visible above an awning or may be painted same colour as building.
- ⇨ Damaged ABCs may electrify awnings or other metal building materials.

14.5 SUBSTATIONS

1 Scope and application

This Standard Operational Guideline helps firefighters to deal safely and effectively with incidents involving substations.

It applies at any substation – ie open, above ground, basement or underground (vaults). It includes associated switchyards. Substations contain transformers, switchgear or ancillary equipment for the electrical distribution network.

This SOG does not apply to kiosks, which are covered in SOG 14.6, *Poles, kiosks, pillar boxes and street fixtures.*

2 Hazards

WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.
If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

During size-up, consider the following hazards:

- High and low voltages are present.
- Under fault conditions, shrapnel may be projected from exploding electrical equipment. There may be secondary explosions.
- There are large volumes of oil in equipment such as transformers and switchgear – the oil may contain polychlorinated biphenyls (PCBs).
- A bund or holding tank may overflow during firefighting and run off into the surrounding areas.
- Hazardous materials such as asbestos and compressed gases may be present.
- Burning materials – eg cable insulation – may give off toxic fumes.
- The perimeter fence could be live.

For underground vaults, also consider:

- Electrical failure of a cable may result in an explosion or fire, which could damage insulation and make all metal parts within the vault live.
- There may be an accumulation of explosive and toxic gases in the confined space.
- Fires in underground tunnels can heat above ground surfaces and produce smoke and toxic gases.
- Entry or ventilation covers – which can be large and heavy – may be dislodged by explosions and project some distance.
- Excavation, drilling or boring equipment that has contacted underground cables can be live.

- Water and debris in a flooded vault may increase the extent and severity of the electrically hazardous area.
- Adjacent service tunnels – eg for rail, water, sewerage – may be affected.

3 Open, above ground and basement substations

At an open, above ground or basement substation incident:

- Contact the Communication Centre (ComCen) to notify the electricity company.
- Commence work outside the substation *only if* there is direct or indirect danger to life, or it is necessary to prevent the spread of fire or damage to surrounding property.
- While waiting for the electricity company representative:
  - Do not enter the substation.
  - Prepare the necessary equipment.
  - Consult any pre-incident plans or site emergency plans. Identify any fire suppression systems present.
  - Identify any transformer bund wastewater system.
- Upon arrival of the electricity company representative:
  - Confirm isolation and earthing of electrical equipment.
  - Determine which parts of the substation are still energised – if safe to do so, cordon off these areas. Appoint an additional Safety Officer to monitor operations near these areas.
  - Liaise with the electricity company representative on safety and technical issues. Assess what firefighting activities can be undertaken safely.
- Conduct a safety briefing with each crew before they enter the Hot Zone.
- Follow all safe work instructions given by the electricity company representative.

4 Underground vaults

At an underground vault incident:

- Contact the ComCen to notify the electricity company and to respond the CO_2 Tender. Consider notifying other affected services.
- Do not enter the vault – wait for the electricity company representative to arrive.
- Do not approach or park vehicles over entry covers (open or closed) due to the risk of explosion.
- Establish a Hot Zone of at least 8 metres radius surrounding the vault.
- Prepare the necessary equipment. Consider requesting hazmat or other specialists. Consult any pre-incident plans.
- Protect all exposures.

WARNING

Treat all underground vaults, tunnels, pits and vaults as confined spaces. Follow SOG 11.3, *Confined spaces.*

- Liaise with the electricity company representative on safety and technical issues. Follow all safe work instructions given by the electricity company representative.
- Do not operate any switches without consultation with the electricity company representative.
- Use gas detectors and thermal imaging cameras as appropriate.

CO_2 gas for vault fires

If using CO_2 gas to suppress fire in a vault:

- Determine the number of cylinders required – indicated on the cover.
- Delay release of the gas until you are sure that no one is inside.
- Ensure all hatches are closed and any openings are sealed or covered – eg cover ventilators in the roadway with a heat resistant blanket weighted down.
- Upon discharge of the gas, keep the vault closed and openings sealed for at least 20 minutes.
- After 20 minutes, remove gas and smoke from the vault.
- Test the atmosphere before allowing anyone to enter.

5 Unauthorised person in a substation

If an unauthorised person is found within a substation:

- Contact the ComCen to notify the electricity company.
- Order the person to sit down and remain calm.
- Do not attempt to rescue or remove the person. Do not enter the substation.
- Wait for the electricity company representative to arrive on site.

6 Handover

Do not leave the incident until it has been rendered safe or control has been handed over to a responsible person using the site handover form.

14.5 SUBSTATIONS

Open, above ground and basement substations

Upon arrival:

☐ Contact the ComCen to notify the electricity company.

☐ Commence work *outside* substation *only if* there is life risk or to protect exposures.

While waiting for electricity company:

☐ Do not enter the substation.

☐ Prepare the necessary equipment.

☐ Consult any pre-incident plans or site emergency plans. Identify any fire suppression systems present.

☐ Identify any transformer bund wastewater system.

Upon arrival of electricity company:

☐ Confirm isolation of equipment.

☐ Determine which parts of the substation are still energised – if safe to do so, cordon off these areas. Appoint an additional Safety Officer to monitor these areas.

☐ Liaise with the electricity company on safety and technical issues. Assess what firefighting activities can be undertaken safely.

☐ Conduct a safety briefing with each crew before they enter the Hot Zone.

☐ Follow all safe work instructions given by the electricity company.

WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.

If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

Underground vaults

☐ Contact ComCen to:

- Notify electricity company
- Respond CO_2 Tender
- Notify any other affected services.

☐ Do not enter the vault – wait for electricity company to arrive.

☐ Do not approach or park vehicles over entry covers (open or closed).

☐ Establish a Hot Zone of at least 8 metres radius surrounding the vault.

☐ Prepare the necessary equipment. Consider requesting hazmat or other specialists. Consult any pre-incident plans.

☐ Protect all exposures.

☐ Treat vault as a confined space – follow SOG 11.3, *Confined spaces.*

☐ Liaise with electricity company on safety and technical issues – follow all safe work instructions given.

☐ Do not operate any switches without consultation with the electricity company.

☐ Use gas detectors and thermal imaging cameras as appropriate.

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CO2 gas for vault fires

- ☐ Determine the number of cylinders required – indicated on the cover.
- ☐ Delay release of the gas until you are sure that no one is inside.
- ☐ Ensure all hatches are closed and any openings are sealed or covered.
- ☐ Upon discharge of the gas, keep the vault closed for at least 20 minutes.
- ☐ After 20 minutes, remove gas and smoke from the vault.
- ☐ Test the atmosphere before allowing anyone to enter.

Unauthorised person in a substation

- ☐ Contact the ComCen to notify the electricity company.
- ☐ Order the person to sit down and remain calm.
- ☐ Do not attempt to rescue or remove the person. Do not enter the substation.
- ☐ Wait for the electricity company representative to arrive on site.

Handover

Do not leave the incident until it has been rendered safe or control has been handed over to a responsible person using the site handover form.

Hazards

- ⇨ High and low voltages are present.
- ⇨ Shrapnel may be projected from exploding electrical equipment – there may be secondary explosions.
- ⇨ Large volumes of oil are present in equipment – oil may contain PCBs.
- ⇨ A bund or holding tank may overflow and run off into the surrounding areas.
- ⇨ Hazardous materials – asbestos, compressed gas – may be present.
- ⇨ Burning materials may give off toxic fumes.
- ⇨ The perimeter fence could be live.

For underground vaults:

- ⇨ Electrical failure of a cable may result in an explosion or fire, which could damage insulation and make all metal parts within the vault live.
- ⇨ There may be an accumulation of explosive and toxic gases in the confined space.
- ⇨ Fires in underground tunnels can heat above ground surfaces and produce smoke and toxic gases.
- ⇨ Entry or ventilation covers – which can be large and heavy – may be dislodged by explosions and project some distance.
- ⇨ Excavation, drilling or boring equipment that has contacted underground cables can be live.
- ⇨ Water and debris in a flooded vault may increase the extent and severity of the electrically hazardous area.
- ⇨ Adjacent service tunnels – eg rail, water, sewerage – may be affected.

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14.6 POLES, KIOSKS, PILLAR BOXES AND STREET FIXTURES

1 Scope and application

This Standard Operational Guideline helps firefighters to deal safely and effectively with incidents involving:

- Poles, kiosks and pillar boxes, components of the electrical distribution network
- Street fixtures such as traffic lights, street lights, speed cameras and electrified signs.

It applies where the component or fixture is on fire or damaged in some other way (eg motor vehicle accident or storm damage), or where a vehicle is in contact with the component or fixture.

It does not cover wires down incidents – see SOG 14.3, *Wires down.*

2 Hazards

WARNING

Contact with, or close approach to, live wires or electrical equipment, could kill or injure you.
If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

During size up, consider the following hazards:

- A component or fixture on fire or damaged may be live.
- Solid water streams sprayed on a live component or fixture will create an electrical circuit.
- A vehicle in contact with a component or fixture may be live and transfer electricity to the ground, creating a voltage gradient and increasing the risk of electric shock through step and touch potential.
- A kiosk on fire may explode. Burning insulating equipment may give off toxic gases. Oil-filled equipment may contain polychlorinated biphenyls (PCBs).
- A pole on fire or damaged, or a pole-top fire, may cause:
  - Power lines to fall and transfer electricity to the ground, creating a voltage gradient and increasing the risk of electric shock through step and touch potential.
  - Timber cross-arms, heavy pole-top equipment, or poles to fall.
  - Pole-top equipment to ignite, shatter or rupture, projecting shrapnel.
  - Fire to spread from the base.
  - Toxic gases to be given off if the pole is copper chrome arsenic (CCA) treated.

3 Procedure

Where a pole, kiosk, pillar box or street fixture is on fire or damaged, or where there is a vehicle in contact:

- Conduct a risk assessment from 8 metres away. Use the voltage detector to help identify whether the component or fixture – or anything in contact – is likely to be live.
- If you suspect that the component or fixture is live, establish an 8 metre radius Exclusion Zone.
- Contact the Communication Centre (ComCen) to notify the operator of the component or fixture – eg electricity company, Roads and Maritime Services, local council. Provide the location and any identification marked on the component or fixture. Request an ambulance if people are involved.
- Maintain the Exclusion Zone until the component or fixture is isolated by the operator's representative on site – do not rely on radio or telephone messages.

Pole or pole-top fire

If the incident is a pole or pole-top fire, *also*:

- Park vehicles clear of the fire, away from the power lines.
- Only extinguish the fire with a pulse spray, using a spray nozzle.

Extinguishing a pole fire with a pulse spray from 8 metres

People in vehicle

If an occupied vehicle is involved, *also*:

- Advise any occupants to remain in the vehicle.
- If safe for them to do so, instruct the driver to drive the vehicle clear.
- *Only* if the risk for the occupants of remaining in the vehicle is greater than the risk of leaving – eg the vehicle is on fire – advise the occupants to jump clear of the vehicle and not to touch the vehicle when their feet come in contact with the ground. Advise the occupants to move away from the vehicle by shuffling their feet along the ground.

People in contact

If a person is in contact with a live component or fixture:

- Keep clear and maintain an 8 metre radius Exclusion Zone.
- Do not attempt to touch or rescue the person until the power has been isolated by the electricity company.

Anyone receiving an electric shock must receive first aid treatment and be immediately transported to hospital.

4 Handover

Do not leave the incident until it has been rendered safe or until control has been handed over to a responsible person using the site handover form.

14.6 POLES, KIOSKS, PILLAR BOXES AND STREET FIXTURES

All incidents

☐ Conduct a risk assessment from 8 metres away.

☐ Use to voltage detector to help identify if the component or fixture – or anything in contact – is live.

☐ If you suspect it is live, establish an 8 metre radius Exclusion Zone.

☐ Contact the ComCen to notify the operator – eg electricity company, Roads and Maritime Services, local council. Request an ambulance if people are involved.

☐ Provide location and any identification marked on the component or fixture.

☐ Maintain the Exclusion Zone until isolated by the operator's representative on site – do not rely on radio or telephone messages.

People in vehicle

☐ Advise any occupants to remain in the vehicle.

☐ If safe for them to do so, instruct the driver to drive the vehicle clear.

☐ *Only* if the risk for the occupants of remaining in the vehicle is greater than the risk of leaving – eg vehicle is on fire – advise the occupants to:

- Jump clear of the vehicle, not touching the vehicle when they land.
- Move away by shuffling their feet along the ground.

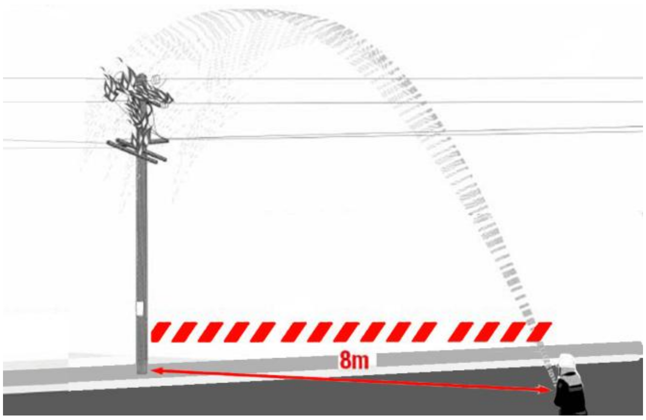
WARNING

Contact with, or close approach to, live wires or electrical equipment, could kill or injure you.
If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

Pole or pole-top fire

☐ Park vehicles clear of the fire, away from the power lines.

☐ Only extinguish the fire with a pulse spray, using a spray nozzle.



Pulse spray from 8 metres

People in contact

☐ Keep clear and maintain an 8 metre radius Exclusion Zone.

☐ Do not attempt to touch or rescue the person until the power has been isolated by the electricity company.

☐ Anyone receiving an electric shock must receive first aid treatment and be immediately transported to hospital.

Handover

Do not leave the incident until it has been rendered safe or until control has been handed over to a responsible person using the site handover form.

Hazards

- ⇨ A component or fixture on fire or damaged may be live.
- ⇨ Solid water streams sprayed on a live component or fixture will create an electrical circuit.
- ⇨ A vehicle in contact with a component or fixture may be live and transfer electricity to the ground, creating a voltage gradient and increasing the risk of electric shock.
- ⇨ A kiosk on fire may explode. Burning insulating equipment may give off toxic gases. Oil-filled equipment may contain polychlorinated biphenyls (PCBs).
- ⇨ A pole on fire or damaged, or a pole-top fire, may cause:
    - Power lines to fall and transfer electricity to the ground, creating a voltage gradient and increasing the risk of electric shock.
    - Timber cross-arms, pole-top equipment, or poles to fall.
    - Pole-top equipment to ignite, shatter or rupture, projecting shrapnel.
    - Fire to spread from the base.
    - Toxic gases to be given off if a pole is copper chrome arsenic (CCA) treated.

14.7 ALTERNATIVE POWER SOURCES

1 Scope and application

This Standard Operational Guideline helps firefighters to work safely and at incidents where there is an alternative power source. Alternative power sources include solar power systems, wind turbines, methane systems, generators, and uninterruptible power sources (UPSs).

This SOG includes instructions for turning off power from an alternative power source, plus instructions for solar power systems damaged by storms or affected by floods. This SOG should be read in conjunction with SOG 14.2, *Isolating power at incidents.*

2 Hazards

WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.

If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

During size-up, consider the following hazards:

- The presence of an alternative power source may not be obvious. It should (but may not) be indicated on or near the switchboard.
- The alternative power source may continue to produce electricity after power has been turned off at the switchboard or isolated to the site – wires between the alternative power source and its shutdown switch may be live.
- A UPS or generator may automatically start when the power from the network is isolated, re-energising wires within the structure.

For solar panels:

- Solar panels exposed to sunlight produce electricity even after power has been turned off at the switchboard – wires between the solar panels and the inverter at the switchboard will be live. This electricity is direct current (DC) voltage that cannot be detected by FRNSW voltage detectors. The more solar panels present, the higher the possible voltage.
- Damage to the structure during fire or other emergency may expose these wires or internal cells of the solar panel and cause conductive material in contact with them – eg gutters, downpipes, metal roof sheeting, cladding – to become live.
- During floods, floodwater in contact with solar panels and system components may be live.
- During storms, if solar panels are damaged there may be broken glass and other broken components.
- Solar panels on roofs are an additional load – a roof weakened by storm or fire may collapse.

3 Tactical considerations

UPSs and generators are installed to provide continuous power supply for critical processes – eg to power life-sustaining equipment at a health care facility. It may not be appropriate to shut down a UPS or generator.

Designs and installations of alternative power source systems vary, particularly wind turbines and methane systems. An on-site expert may be able to provide a safe shutdown procedure.

4 Turning off an alternative power source

Only an electrician can completely isolate an alternative power source as it involves disconnecting wiring from the alternative power source.

Firefighters can *turn off* an alternative power source to stop electricity feeding into the structure's circuits, or back to the electricity network if configured to do so.

To turn off an alternative power source:

1. Consult with any on-site experts to determine how best to turn it off and whether it is appropriate.
2. Assume the switchboard is live. Don electrical gloves, then over-gloves. Put your helmet visor down.
3. Follow any shutdown procedure displayed. This may be on or near the switchboard or adjacent to the alternative power source.
4. If the shutdown procedure cannot be found:
   - **Solar panels** – turn off the inverter main switch (usually in the meter box), then turn off the solar panel main switch (usually next to the inverter).
   - **UPS** – turn off *both* the input to and the output from the UPS system. For a large UPS the switches may be located in the UPS room.
   - **Generator** – turn off the generator at the switchboard.

WARNING

Wiring remains live between the inverter and the solar panels. FRNSW voltage detectors do not detect DC electricity.

5. Restrict work as far as reasonably practical to that required to protect life or prevent dangerous expansion of the incident. Carefully consider whether the possible benefits of undertaking the work outweigh the risks.
6. If power must be isolated from the alternative power supply, have the owner/occupier contact their electrician.

5 Solar panels damaged by storms

When working near solar panels damaged by storms:

- Assume the solar power system and surrounding area is live.
- Establish an Exclusion Zone of at least 3 metres around any damaged solar panel components. Increase the Exclusion Zone to 8 metres if the components are in contact with conductive materials.

- If there is broken glass, wear P2 dust mask and goggles.
- Turn off the solar power system – see *Turning off an alternative power source*.

6 Solar panels and floods

Before a flood

If a solar power system is in an area likely to be affected by floodwater:

- Turn off the solar power system – see *Turning off an alternative power source*.
- If the floodwater level will reach the solar panels – and there is time – advise the owner/occupier to have their electrician isolate the solar power system.

During a flood

If a solar power system is affected by floodwater:

- Assume that the solar panels, inverter, associated wiring and surrounding area are live. Assume the floodwater and any conductive material in contact with the solar power system is live.
- Do not attempt to turn off the solar power system.
- Establish an Exclusion Zone of 8 metres around the solar panels and conductive material.
- Notify the Local Emergency Operations Controller (LEOCon) of the uncontrolled electrical hazard at that site.

After a flood

If a solar power system has been affected by floodwater:

- Assume that the solar panels, inverter, associated wiring and surrounding area are live. Assume any conductive material in contact with the solar panels is live.
- Establish an Exclusion Zone of 8 metres around the solar panels.

7 Handover

Indicate any electrical hazards on the site handover form and recommend that electricity circuits be checked by an electrician before restoring power.

14.7 ALTERNATIVE POWER SOURCES

Read this in conjunction with SOG 14.2, *Isolating power at incidents.*

Turning off an alternative power source

- ☐ Consult with any on-site expert to determine how best to turn it off and whether it is appropriate.
- ☐ Assume switchboard is live. Don electrical gloves, then over-gloves. Put visor down.
- ☐ Follow shutdown procedure displayed – may be on or near switchboard or adjacent to alternative power source.
- ☐ If the shutdown procedure cannot be found:
  - **Solar panels** – turn off inverter main switch (usually in meter box), then turn off solar panel main switch (usually next to inverter).
  - **UPS** – turn off both the input to and output from the UPS system.
  - **Generator** – turn off at switchboard.

WARNING

Wiring remains live between the inverter and the solar panels. FRNSW voltage detectors do not detect DC electricity.

- ☐ Restrict work to that required to protect life or prevent dangerous expansion of the incident.
- ☐ If power must be isolated, have the owner/occupier contact their electrician.

WARNING

Contact with, or close approach to, live wires or electrical equipment could kill or injure you.

If you receive an electric shock, or suspect that you have received one, the Incident Controller must be informed. You must be transported to hospital for assessment and treatment.

Solar panels damaged by storms

- ☐ Assume solar power system and surrounding area is live.
- ☐ Establish an Exclusion Zone of at least 3 metres around damaged components.
- ☐ Increase Exclusion Zone to 8 metres if solar power system components are in contact with conductive materials.
- ☐ If there is broken glass, wear P2 dust mask and goggles.
- ☐ Turn off solar power system – see *Turning off an alternative power source.*

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Solar panels and floods

Before a flood

- ☐ Turn off solar power system – see *Turning off an alternative power source.*
- ☐ If time, have owner/occupier have their electrician isolate solar power system.

During a flood

- ☐ Assume solar power system and surrounding area is live.
- ☐ Assume the floodwater and any conductive material in contact with solar power system is live.
- ☐ Do not attempt to turn off the solar power system.
- ☐ Establish an 8 metre Exclusion Zone around the solar panels.
- ☐ Notify the LEOCon of uncontrolled electrical hazard at that site.

After a flood

- ☐ Assume solar power system and surrounding area is live.
- ☐ Assume any conductive material in contact with the solar power system is live.
- ☐ Establish an 8 metre Exclusion Zone around the solar power system.

Handover

On site handover form indicate any electrical hazards and recommend circuits be checked by an electrician before restoring power.

Hazards

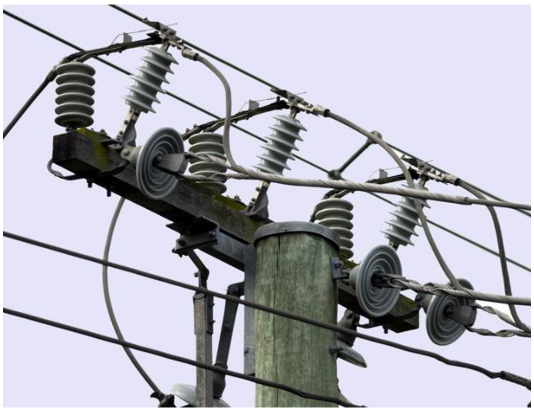
- ⇨ Presence of an alternative power source may not be obvious.
- ⇨ Alternative power source may continue to produce electricity after power has been turned off – wires between the alternative power source and its shutdown switch may be live.
- ⇨ UPS or generator may automatically start when the power from network is isolated, re-energising wires within the structure.

For solar panels:

- ⇨ Solar panels exposed to sunlight produce electricity even after power has been turned off at the switchboard – wires between the solar panels and the inverter will be live. This is DC voltage that cannot be detected with FRNSW voltage detectors.
- ⇨ Damage to the structure during fire or other emergency may expose these wires and cause conductive material in contact with them – gutters, downpipes, metal roof sheeting, cladding – to become live.
- ⇨ During floods, floodwater in contact with solar panels and components may be live.
- ⇨ During storms, if solar panels are damaged there may be broken glass and other broken components.
- ⇨ Solar panels on roofs are an additional load – a roof weakened by storm or fire may collapse.

Fire and Rescue NSW

Guideline Support Document for Electricity SOGs 14.2 - 14.7




Top left, top right, bottom right photos courtesy of Endeavour Energy

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1 Introduction

This is the *Guideline support document for electricity SOGs 14.2-14.7*.

This guideline support document (GSD) provides background information on electrical hazards firefighters have to deal with at incidents. It is divided into five broad areas:

- Electricity basics – including the danger of an electrical circuit, common terms, effects on the body, and other dangers such as voltage gradient, automatic reclosers, arcing, and conductors
- Safety around electrical hazards – including typical electrically hazardous incidents, the FRNSW electrical safety kit and personal protective equipment, and reducing the risk by isolating power
- The electricity distribution network – including a description of the components from the power station to the switchboard
- Alternative power sources – such as solar power
- Electricity in other places – eg rail, hybrid vehicles

This GSD supplements the Standard Operational Guidelines (SOGs) that outline safe work practices for firefighters at incidents where there are electrical hazards:

- SOG 14.2, *Isolating power at incidents*
- SOG 14.3, *Wires down*
- SOG 14.4, *Working near power lines*
- SOG 14.5, *Substations*
- SOG 14.6, *Poles, kiosks, pillar boxes and street fixtures*
- SOG 14.7, *Alternative power sources*

The SOGs and this GSD replace the *Electrical Hazards Awareness Manual*.

Regulatory requirements

FRNSW has a duty of care to ensure, so far as reasonably practicable, the health and safety of workers engaged in activities in carrying out work. This duty is required under the *Work Health and Safety Act 2011* (the Act) and *Work Health and Safety Regulation 2011* (the Regulation).

Clause 147 of the Regulation states:

> *A person conducting a business or undertaking at a workplace must manage risks to health and safety associated with electrical risks at the workplace …*

Clause 166 of the Regulation states:

> *(1) A person conducting a business or undertaking at a workplace must ensure, so far as is reasonable practicable, that no person, plant or thing at the workplace comes within an unsafe distance of an overhead or underground electric line …*

(2) If it is not reasonably practicable to ensure the safe distance of a person, plant of thing from an overhead or *underground electric line, the person conducting the business or undertaking at the workplace must ensure that:*

(a) a risk assessment is conducted in relation to the proposed work, and

(b) control measures implemented are consistent with:

(i) the risk assessment, and

(ii if an electricity supply authority is responsible for the electric line, any requirements of the authority …'

Under these regulatory requirements, FRNSW is the '*person conducting a business or undertaking'*.

2 Electricity basics

Danger of an electrical circuit

You may be killed or injured if you become part of an electrical circuit and electricity flows through your body.

Direct contact – an electrical circuit is created when:

- You touch two live wires at the same time.
- You touch a live wire and the ground – the earth – at the same time.

Indirect contact – an electrical circuit is created when:

- You touch something (metal object, person, structure, equipment) that is in contact with a live wire.
- You are close to an electrical arc.
- You stand in a 'pool' of electricity – a voltage gradient – created when electricity is released into the ground surface.

Common electrical terms

An electric *current* is a movement or flow of electrons through a material.

The path along which a current flows is a *circuit*. The rate of flow or intensity of the current through a circuit is measured in *amperes* (amps or A).

Energy must be present to cause a current to flow. This energy is the *voltage* (V).

Current will flow through any material, although in varying degrees. A *conductor* is a material that allows an electric current to pass easily through it – eg metal. An *insulator* does not allow electric current to pass easily – eg glass. Current still flows through insulators but in such small quantities that it normally cannot be detected.

A conductor offers *resistance* (measured in ohms or R) to the flow of the current. The resistance of a conductor depends on the length of the conductor, its diameter, the material it is made of, and the temperature.

An analogy	
Voltage	… is like water pressure in a hose – it is the force that causes the flow of electricity. The greater the voltage (pressure), the further the electricity can travel.
Current	… is like the flow rate of water in the pipe – similar to litres per minute flowing in a hose.
Resistance	… is similar to the effect of friction on the flow of water in the pipe – the more resistance (friction), the less flow of electricity

Electricity transmitted or distributed to the network is defined as high or low voltage:

- *High voltage* – voltages *above 1000 volts AC or 1500 volts DC*. High voltage installations are always either high off the ground or behind security fencing. Most people recognise the hazards associated with these installations. Typical high voltages are 11 000 volts or greater.
- *Low voltage* – voltages *below 1000 volts AC or 1500 volts DC*. Nearly all industrial equipment and domestic appliances operate at a low voltage, typically 415 volts AC for industrial equipment and 240 volts AC for domestic appliances.

Effect of electricity on the body

The human body is an efficient conductor of electricity. When a person receives an electric shock, electricity is conducted through the body.

The effect on the body depends on the amount of current and the length of time the body is exposed to the current. It may make a person's heart beat erratically, or even stop – this can occur sometime after the electric shock was received. Respiratory arrest may occur. Permanent internal organ damage can result. The person may be thrown clear of the electrical source, or for lower voltages they may suffer muscle spasm and be locked onto the electrical source until the circuit is turned off. You may hear a sudden loud pop or bang, or see a flash.

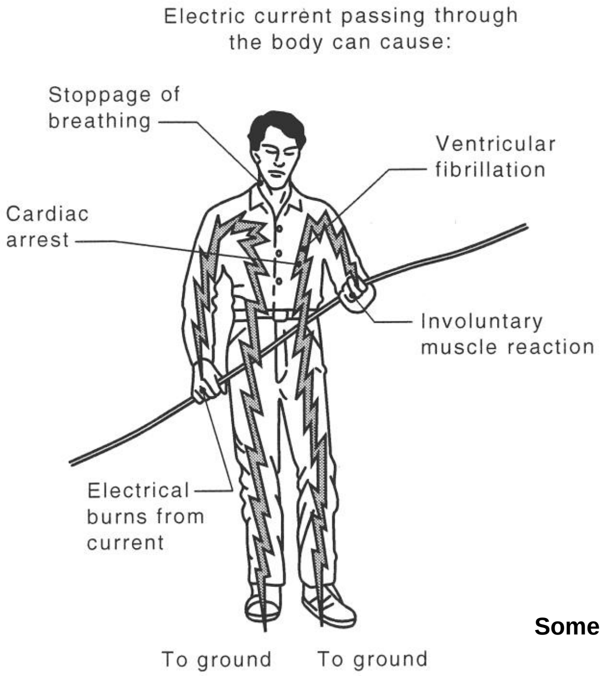
They may receive significant burns. Some body parts, such as the skin, resist the electrical current. Resistance produces heat, which can cause burn injuries. The severity of an electrical burn depends on the type and amount of contact, the current's path through the body, and how long the contact lasted. Electrical burns are often deep, and the person will have both an entrance and an exit wound. Although these wounds may look superficial, the tissue below may be severely damaged.

Photo courtesy of Ausgrid

Electrical burn

For high voltage electric shocks, the person may be blasted away from the electric source amid a large powerful arc or explosion. The person may have less internal organ damage but will suffer severe surface burns.

A person in close proximity to an electrical arc from high voltage can suffer severe burns from the intense heat, internal injuries caused by gas and heat, serious eye damage caused by ultraviolet rays, physical injuries resulting from being thrown by the blasting action (eg fractures and fall-related injuries), or loss of limbs.



Some effects of electricity on the body

Diagram courtesy of Energy Networks Association

Current kills you

It is the current that injures or kills and the voltage that pushes the current through the body – a small amount of current for a few seconds can be fatal.

In certain circumstances, currents as low as 10 mA can cause death. Average residential distribution systems can carry up to 400 000 times this current.

Current (milliamperes—mA)	Likely effect on the human body
1	Slight tingling sensation.
2 to 9	Small shock
10 to 24	Muscles can contract and cause paralysis. Burns occur at contact point.
25 to 74	Respiratory muscles can become paralysed. Painful shock with entry/exit burns.
75 to 300	Ventricular fibrillation. Shock usually fatal. Distinct entry/exit burns.
>300	Death is almost certain. Severe burns to skin, limbs and internal organs. (Survivors' burnt limbs often need amputation.)

First aid

Electric shocks often cause more injury than is readily apparent.

Once the source of electricity has been removed (eg the power turned off), a person who has had an electric shock must have first aid treatment, following DRABCD (danger, response, airway, breathing, compressions, defibrillation).

The person must be transported to hospital for assessment and treatment.

Don't become a victim

A person in contact with an electrical source is a conductor of electricity until the power is switched off. If you touch the person, you will also become a conductor of electricity.

Most electric shocks occur when people are exposed to low voltage electricity – eg:

- A faulty switch or appliance cord, due to wear-and-tear or unauthorised home repairs
- Playing with or coming into contact with a cord or plug – usually children
- An electrical appliance in contact with water.

People can also receive an electric shock from:

- Fallen power lines following a storm or accident
- Lightning strike on an open playing field, golf course or boat.

In all cases but lightning strike, there is a risk to the rescuer of electric shock. Before attempting any rescue or treatment, the electrical source must be removed – eg by turning off the power.

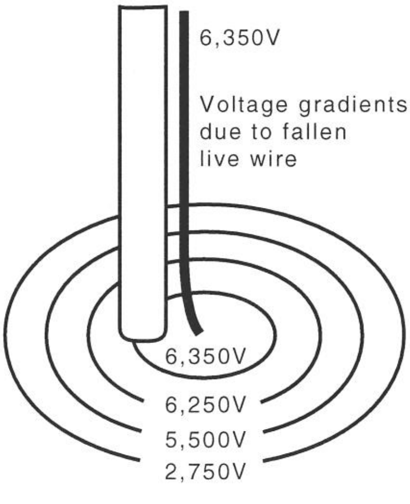
With high voltage electric shocks, there is extreme danger to rescuers due to electricity earthing by arcing across an air gap to an object or person. This risk increases with humidity. You can do nothing for a person who has received a high voltage electric shock – protect yourself.

Voltage gradient on the ground

Electricity always seeks the shortest and easiest conductive path to earth. However, if electricity is released onto the ground surface, such as when a live wire falls to the ground, the electricity will fan out from the point of contact. This is known as voltage gradient.

There is a rippling effect that is like dropping a pebble into calm water. In the pool of water the wave created at the point of contact gets smaller as it rings out.

Similarly, in the pool of electricity the energy is at full system voltage at the point of ground contact, but drops progressively as you move away from the contact point.

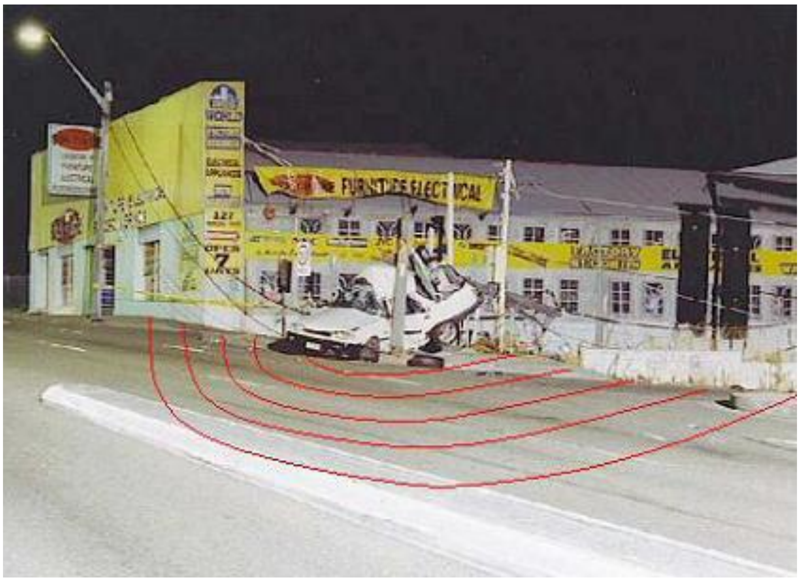


Voltage gradient

Diagram courtesy of Energy Networks Association

The voltage gradient varies depending on:

- Composition of the ground – eg concrete, road surface, soil
- Moisture content
- Voltage of the electrical source



Voltage gradient area after a vehicle brings down power lines.

The red lines loosely represent the invisible voltage gradient line.

The voltage gradient also extends through the unseen region on the other side of the fence, and inside the building immediately behind the accident.

Photo courtesy of Ausgrid

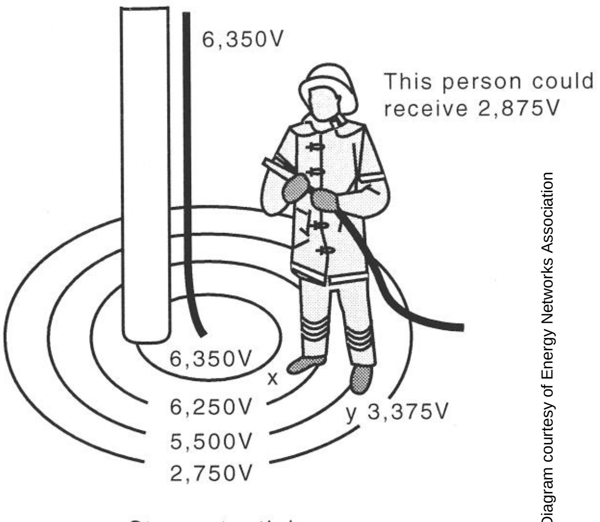
- ♦ Case study 2007-01, *Electrical hazards at structure fires*, highlights issues firefighters face when a downed wire creates a voltage gradient on the ground. Floodwater extended the hazardous area. A firefighter received an electric shock when stepping within the pool of electricity.

Step potential

Step potential (or *step voltage*) is the voltage between your feet if you stand in a pool of electricity (ie when you stand within a voltage gradient on the ground).

The voltage you receive varies depending upon where you are standing in relation to the source of the electricity.

If one foot was near the point of ground contact (at x voltage) and the other foot a step away (at y voltage), the difference in voltage would cause electricity to flow through your body driven by a voltage equal to (x minus y) volts. The difference in voltage is the step potential.



Step potential

Diagram courtesy of Energy Networks Association

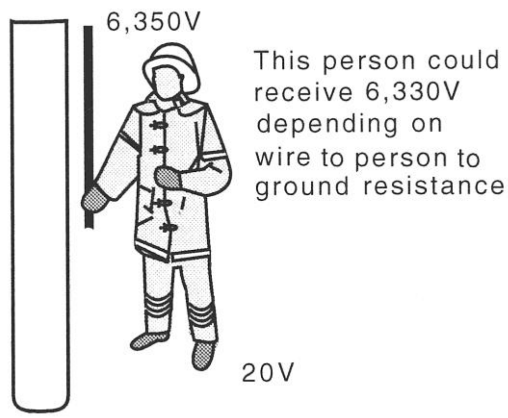
No matter what the voltage, if you step in the pool of electricity you will receive an electric shock – you do not have to be actually touching the wire or energised source. The closer you are to the energised source, the greater the risk that you will receive an electric shock and the greater the voltage of the shock.

As it is difficult to calculate the step potential (ie to know the voltage and understand the other variables), the way to avoid receiving an electric shock where there is a voltage gradient is to stay at least 8 metres from where the source of the electricity touches the ground. This distance is far enough for the electricity to have dissipated.

Touch potential

Touch potential (or *touch voltage*) is the voltage that you receive when you touch an energised object (eg wire, cable, fence, car, pole, downpipe) and the ground at the same time. You may touch it with your body (eg your hand) or an object you are holding (eg a tool or piece of equipment).

The electric current travels in a path from the energised source, through your hands, arms, legs and feet, to the ground. The difference in voltage between the object you touch and ground is the touch potential.

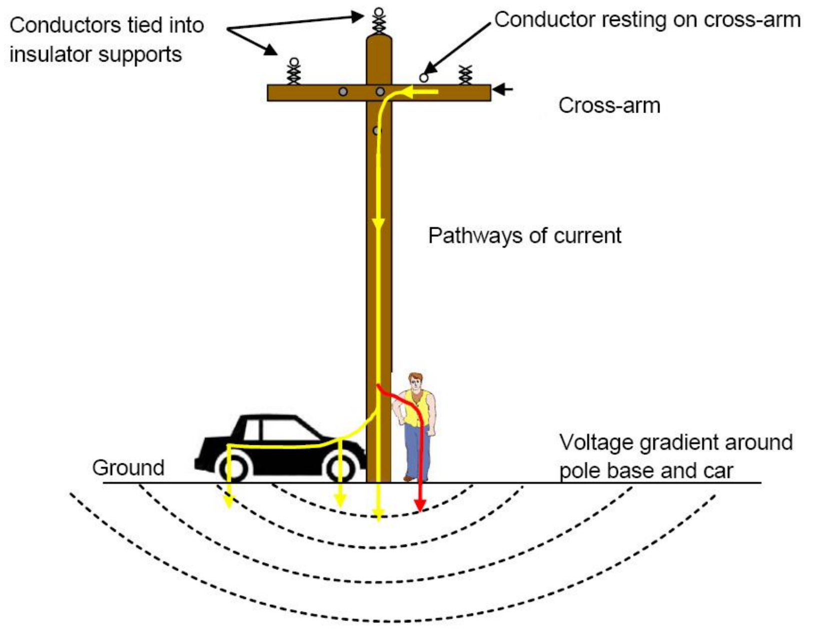


Touch potential

The voltage you receive varies depending upon where you are standing in relation to the energised source when you touch it.

No matter what the voltage, if you touch an energised object you will receive an electric shock.

As it is difficult to calculate the touch potential (ie to know the voltage and understand other variables), the way to avoid receiving an electric shock is to stay at least 8 metres from objects that may be energised.



Example:

An electrical conductor dislodges from its support insulator and rests on the pole cross-arm or pole itself. The conductor is most likely live, resulting in a pathway of electric current through the cross-arm and down the pole to earth.

Step potential: You will receive an electric shock if you stand within the voltage gradient.

Touch potential: You will receive an electric shock if you touch the pole (as illustrated).

Diagram courtesy of Ausgrid

Reclose function (automatic switching)

Electricity companies install protection systems to protect the power lines and equipment connected to the power lines damaged by faults. These are referred to as reclose function or automatic switching.

Once the protection system switches off the power, the power will automatically switch back on. This is done to minimize interruptions of power to customers. It allows time for a short term fault to clear, such as a tree branch to blow off the power line or for clashing power lines to swing back to normal.

The delay before automatically switching back on can be momentary, or up to 30 seconds.

This means that power lines that were de-energised – eg at a wires down incident – could automatically re-energise without warning. It is impossible to tell if a power line is live just by looking at it, and you cannot tell if a power line has been re-energised. Only the electricity company can guarantee that a power line is de-energised and safe to work around.

Arcing

An electrical arc is a sudden flash of electricity between two points. If you are between the two points, you can become part of the electrical circuit and receive an electric shock and potentially other injuries.

The size of the arc depends upon the energy in the electric circuit.

Direct current (DC) arcs much more readily than alternating current (AC). This is because with AC there is a momentary break in the supply as the polarity changes from positive to negative – this break in supply stops the arc. With DC the voltage stays constant and the momentum of the electrons forces them off the wire to create the arc. Solar panels produce DC electricity which is converted to AC at an inverter.

You may also encounter high voltage arcing at bushfires or burning vehicles near power lines carrying voltages greater than 11 kV. Smoke and flames can cause an arc if the smoke density or flame carbon content is sufficient – the electricity can jump the gap between the power lines and travel down the smoke or flame path to the ground. The flash it causes is extremely bright and hot. Where there is fire under high voltage power lines, the minimum safe work distance is increased to 25 metres due to the possibility of arcing.

Conductors

Conductors allow electricity to easily pass through them. Examples are:

- Metals (eg copper, aluminium, steel) – including ladders, fences, guttering, roofing
- Human body
- Timber and trees
- Flame and dense smoke
- Vehicle tyres
- Some fire extinguishing mediums
- Wet or dirty rope
- Water – including hose lines

If a conductor is touching an electric circuit, it will also be live. You cannot tell just by looking whether something is live.

Water is a good conductor. Puddles, damp ground, wet clothing, wet flooring and any other wet or damp surface can become energised.

Normally insulators – eg rubber, glass, porcelain – on equipment prevent electricity flowing to ground (ie to earth). However, when damaged – eg by fire – insulation can break down. Insulation can also break down or fail if too much voltage is applied to it.

3 Safety around electrical hazards

Electrically hazardous incidents

Firefighters may be exposed to electrical hazards at incidents such as:

- When attending a structure fire or a storm-damaged structure – from wiring within the structure, powered from the electricity network or an alternative power source (eg solar panels).
- When working near power lines – eg bushfires, structure fires, hazmat incidents, floods or rescues.
- When wires are down due to storm or accident, including where a vehicle is in contact with a downed wire.
- When an electrical network component – substation, pole, power line, kiosk, pillar box – or street fixture is damaged or on fire, including where a vehicle is in contact with the component or fixture.
- When there is fire or storm damage at a substation, including underground electrical vaults.
- When conducting industrial rescues.
- When attending a motor vehicle accident involving a hybrid vehicle.
- When attending incidents on rail, monorail, or light rail networks.

The electricity SOGs 14.2 – 14.7 provide safe working instructions for dealing with these hazards. The electricity SOGs are:

- SOG 14.2, *Isolating power at incidents*
- SOG 14.3, *Wires down*
- SOG 14.4, *Working near power lines*
- SOG 14.5, *Substations*
- SOG 14.6, *Poles, kiosks, pillar boxes and street fixtures*
- SOG 14.7, *Alternative power sources*

Electricity encountered on the rail network is covered in Operations Bulletin 2009/02, *Removing power from RailCorp overhead lines*. Light rail and the monorail are covered in this manual. Electrical hazards of telecommunications cables are covered in SOG 14.1, *Telecommunications Network Cables*.

The SOGs emphasise safety and hazard awareness, to control the risks associated with electricity. Essentially, they state:

- Stay away from the hazard. Always regard it as live until you know otherwise.
- Conduct a risk assessment from at least 8 metres away from the hazard.
- If suspected to be electrically hazardous, establish an Exclusion Zone.
- Have the electricity company isolate power.

Personal protective equipment

FRNSW personal protective equipment (PPE) is not sufficient to protect you from electric shock. Wear the appropriate minimum PPE for the type of incident and follow the SOGs to minimise electrical risks.

As outlined in the *Wearing of uniform and personal protective equipment (PPE) recommended practice*, firefighters are discouraged from wearing jewellery as it increases the risk of electric shock injury. This is particularly true for metal jewellery – eg bracelets, rings, neck chains and watches.

Electricity safety kit

The electrical safety kit consists of a green canvas bag containing:

- Orange electrical gloves – 1 set
- Leather over-gloves – 1 set
- GLM Mini Rescue voltage detector – 1 or 2, depending upon appliance inventory

Electrical safety kit

Electrical gloves and over-gloves

The orange electrical gloves are rated to maximum 650 V. The leather over-gloves are worn over the electrical gloves at all times to protect the rubber.

The canvas bag has three separate compartments. These are stowed as follows:

- Front two compartments – one electrical glove in each compartment. They are not stored together or folded on each other as the moisture on the rubber can cause deterioration and makes the gloves unusable.
- Rear compartment – over-gloves and GLM Mini Rescue voltage detector. The voltage detector is stored with the over-gloves so that it does not damage the electrical gloves.

For information on inspection and replacement of the electricity safety kit, see [SIMS equipment worksheet: Electrical Safety Kit – Insulated Electrical Gloves].

GLM Mini Rescue voltage detector

The GLM Mini Rescue is a proximity non-contact voltage detector. When set correctly it detects AC electricity, in the range 50 V AC to 500 kV AC. It will not detect DC electricity.

When the detector goes into alarm, it must be assumed that an electrical hazard is present and that all conductive material (including wet ground) is live. Controls must be put in place to address this hazard.

Photo courtesy of GL McGavin Pty Ltd

GLM Mini Rescue voltage detector

When the detector does not alarm, it *must not* be assumed that the area is free of electrical hazards. This is because the detection capability of the GLM Mini Rescue can be inhibited by several factors – eg the electrical source may be shielded, or the current may be DC.

For further information on how to use the voltage detector, see Recommended practice: GLM Mini Rescue. For information on inspection and replacement, see SIMS equipment worksheet: GLM Mini Rescue - AC Voltage Detector.

- Heads Up 19 includes a story highlighting the importance of testing for AC electricity with a voltage detector. At this incident firefighters luckily discovered that a damaged carport was electrified before anyone touched it.

Substations and Safety Officers

At incidents at substations an additional Safety Officer is appointed.

Once the electricity company attends they isolate and earth *only parts* of the substation and advise which parts are still energised. The additional Safety Officer is appointed to monitor operations near the energised areas, to ensure the safety of firefighters.

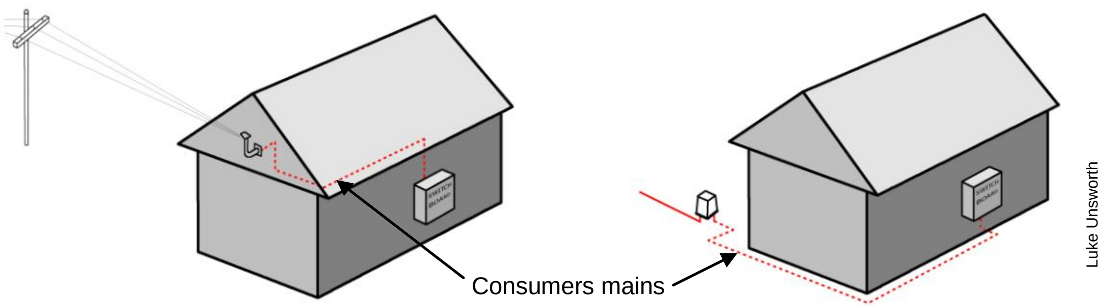
Turning off and isolating power

The procedures for turning off and isolating power are in SOG 14.2, *Isolating power at incidents.*

Isolating power means disconnecting power to the site. This can only be done by the electricity company. Isolating power is the best way to control the risks associated with electrical hazards.

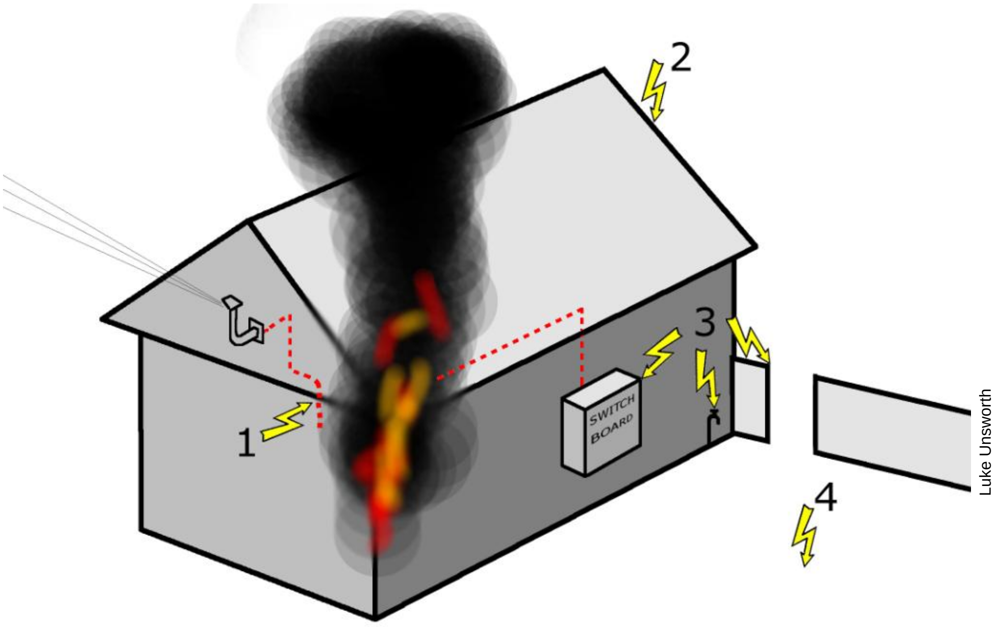
As an interim measure, firefighters can turn off power at the switchboard. *Turning off power* means turning off the main switch, removing fuses, and switching off circuit breakers at the switchboard. This removes power from the circuits within the structure supplied through the switchboard.

However, when power is turned off at the switchboard the wiring from the electricity network to the switchboard – the *consumers mains* – remains live until the power is isolated by the electricity company.



Overhead power supply **Underground supply**

If a conducting material comes in contact with the consumers mains it may become electrified. Fire, water or structural collapse can increase the likelihood of an electrical fault occurring.



In this scenario:

1. The consumers mains is damaged by fire.
2. The damaged consumers mains electrifies the metal roof.
3. Other conductive materials in contact with the consumers mains or electrified roof – the fence, tap and meter box enclosing the switchboard – are also electrified.
4. A voltage gradient may exist on the ground.

Under normal conditions it is safe to touch conducting metal such as the metal meter box enclosing the switchboard. However, during incidents there may be additional risks:

- The switchboard may be unexpectedly live. Wearing two sets of gloves – electrical gloves covered by over-gloves – reduces the risk of electric shock if the switchboard is live.
- There may be flashes from arcing. Turning your head away when opening the switchboard reduces the risk of damaging your eyes if there is a flash.

Until the power is isolated by the electricity company, work should be only that required to protect life or prevent dangerous expansion of the incident.

The following case studies illustrate that firefighters should continue to be cautious until power has been isolated to the site by the electricity company:

- ♦ Case study 2007-01, *Electrical hazards at structure fires*, highlights issues firefighters face when insulation on wiring breaks down and creates unseen hazards. At one incident the gas line was energised, which in turn energised the water pipes – causing several firefighters to receive minor electric shocks.

- ♦ Case study 2009-03, *Switched on or switched off? Two fires illustrate electrical hazards,* highlights the importance of having power isolated by the electricity company. It also highlights that firefighters should never assume that a hazard has been removed – at one incident two firefighters wrongly believed power had been isolated to a structure and received electric shocks when they came in contact with an energised metal structure.

- ♦ Insight No 2, *Firefighters turn off sprinklers during department store fire*, highlights issues relating to fighting fires in complex buildings and the importance of isolating power.

When turning off power at more complex sites it is important to assess how best to turn off power – eg there are additional issues at health-care institutions as life-sustaining equipment may be in use.

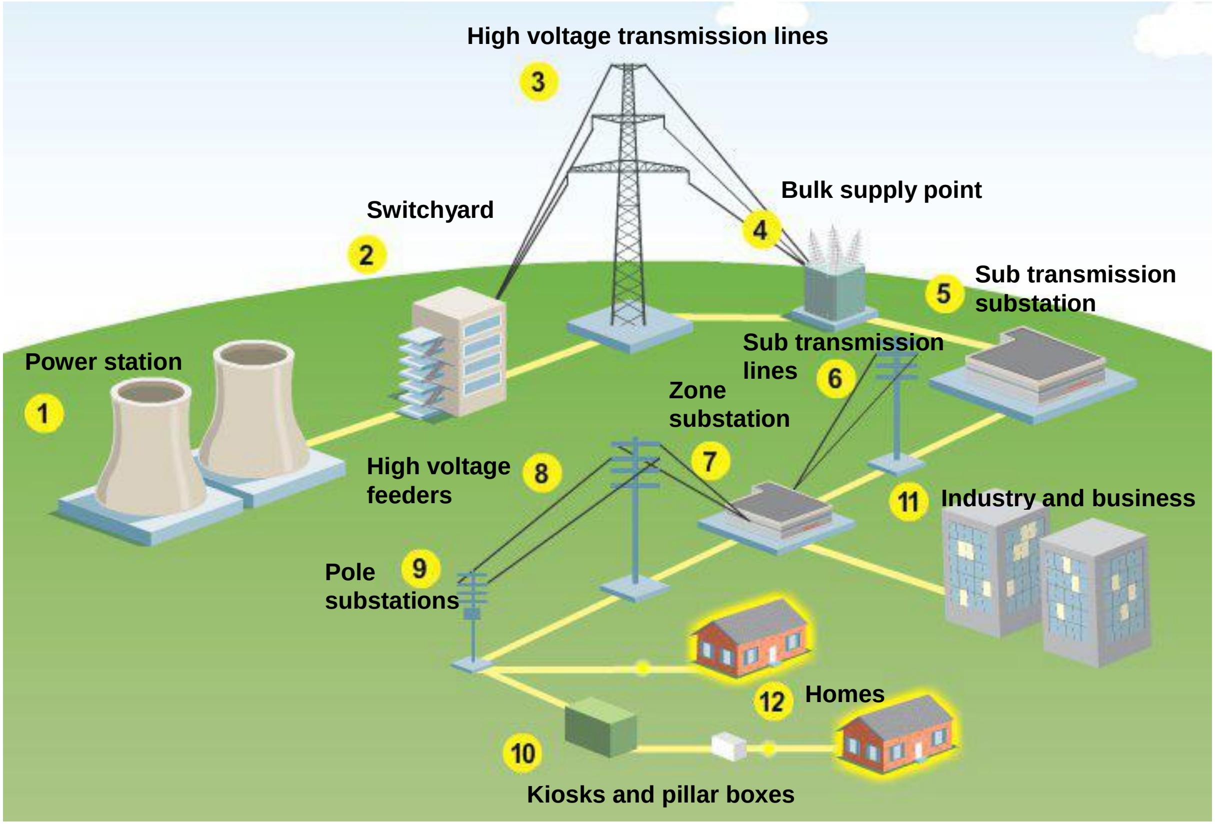
- ♦ Case study 2009-05, *Residential high rise evacuation*, highlights an issue firefighters faced when turning off power to a high-rise building. Electricity was turned off initially but then needed to be turned back on to assist with evacuation of residents down the fire stairs.

To assist with later investigations:

- Before turning off the circuit breakers, note which circuit breakers have already tripped before you turn the others off.
- Place any fuse directly below its fuse holder, so you know which circuit it came from.

4 Electricity from the network

Overview of the network



Electricity distribution from power station to consumer

Generation and transmission

(1. Power station – 4. Bulk supply point)

In NSW, electricity is generated by Macquarie Generation, Delta Electricity and Eraring Energy. Generated electricity is sold to TransGrid, who own, operate, and manage the transmission of high voltage electricity across NSW and the ACT.

Sub transmission

(5. Sub transmission – 6. Sub transmission lines)

Electricity is sold at sub transmission stations to the various electricity distributors. The distributors are Ausgrid, Essential Energy and Endeavour Energy, who each supply electricity to separate parts of NSW. The electricity is purchased at 132 kV, 66 kV and 33 kV. The electricity distributors transmit the purchased electricity to zone substations by underground or overhead sub transmission feeders.

Distribution

(7. Zone substation – 11. Business and industry, and 12. Homes)

At zone substations, electricity is transformed to lesser voltages, then transmitted to distribution substations. At the distribution substations, the electricity is again transformed, from 11 kV to the 415/240 volt AC for domestic and commercial use or DC for rail networks.

Power stations

Power stations are the generating source of the electricity. A catastrophe here has the potential to black out large areas.

Photo courtesy of Ausgrid

Eraring coal-fired power station

Transmission towers

Transmission towers carry electricity from power stations to bulk supply points in voltages of:

- 500 000 V (500 kV)
- 330 000 V (330 kV)
- 132 000 V (132 kV)

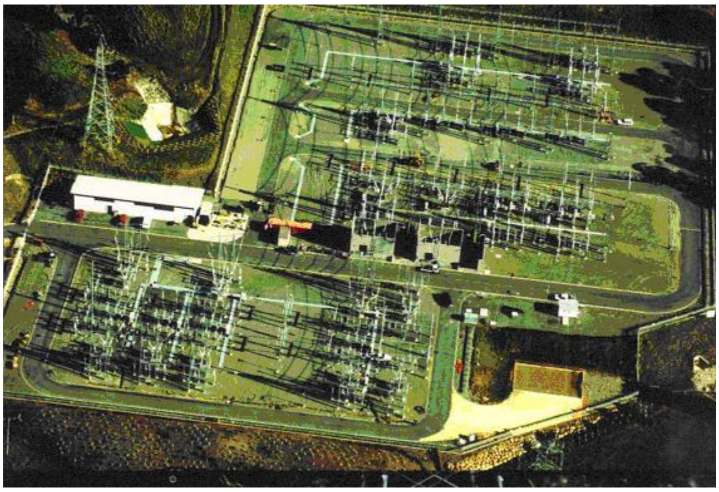
Photos courtesy of Ausgrid

Typical high voltage transmission tower

Most towers support 132 kV and 330 kV transmission voltages. However, a 500 kV transmission system runs between the Central Coast and Wollongong via Sydney.

Bulk supply points

There are currently 82 bulk supply points in NSW – owned and operated by TransGrid.



Bulk supply points

Photos courtesy of Endeavour Energy

Bulk supply points contain transformers, switchgear and ancillary equipment required to feed the distribution system. They are fenced and have controlled entries and exits.

They have both high and low voltage power sources, from incoming and outgoing supplies. There are large volumes of oil in various apparatus such as the transformers and circuit breakers. They may contain polychlorinated biphenyls (PCBs). A large transformer could contain thousands of litres of oil.

Some substations also have sources of compressed gas such as air, Nitrogen (N), Carbon Dioxide (CO_2) and Sulphur Hexafluoride (SF_6). In addition battery rooms are sources of Hydrogen (H_2) and diluted Sulphuric Acid (H_2SO_4) in large quantities. Some substations have two battery rooms.

There are also numerous cable trenches and ducts with polyvinyl chloride (PVC) insulated cables (which give off Chlorine CI gas when burning). Buildings may contain asbestos.

Sub transmission towers

Sub transmission towers and pole lines carry electricity from bulk supply points to major substations in voltages of:

- 132 000 V (132 kV)
- 66 000 V (66 kV)
- 33 000 V (33 kV)

Photo courtesy of Ausgrid

Sub transmission pole line

Zone substations

Zone substations are owned by the electricity distributors.

Zone substations can be totally enclosed (like City Central at Darling Harbour), or largely exposed with a security fence and buildings housing the operational functions of the substation.

All zone substations have high voltages running in and out of them, either above or below ground. Each substation has power transformers, switchgear and ancillary equipment required to feed the distribution system.

Enclosed zone substation – City Central at Darling Harbour

Photos courtesy of Ausgrid

Open zone substation – Homebush Bay

These substations are normally designed to allow safe movement at ground level. They are not designed to ensure safe distances to live equipment when aloft, within cubicles, or enclosures, or when people are carrying conductive objects.

Most high voltage conductors within substations are uninsulated. It is not possible for an untrained person to determine visually which part of a substation is likely to be electrically hazardous.

Totally enclosed zone substations have high security entrances with solid doors that are always locked. The open outdoor-type zone substations have a high-security, steel fence with gates that are always locked.

Like bulk supply points, they contain a vast amount of oil (typically 25 000 litres). The oil could possibly contain PCBs. There will also be compressed gas cylinders and PVC cabling. Asbestos may be present.

Some zone substations also have sources of compressed gas such as air, Nitrogen (N), Carbon Dioxide (CO_2) and Sulphur Hexafluoride (SF_6). In addition battery rooms are sources of Hydrogen (H_2) and diluted Sulphuric Acid (H_2SO_4) in large quantities. Some substations have two battery rooms.

Some larger substations have automatic water sprinkler and/or CO_2 fire suppression systems. In transformer bays, the system could be an atomised water sprinkler system which, in addition to saturating the fire area, is also dense enough to reduce the air quality within the sprinkler area to help reduce combustibility.

CO_2 systems are installed in some control buildings, to extinguish low voltage control wiring fires. In the case of CO_2 systems, there is normally a system isolation switch just inside the entrance door – which should be operated by the electricity company.

Fire suppression systems can vary depending on the type of substation. For example, for the City Central zone substation, the equipment consists of:

- Automatic high velocity water spray fire suppression systems serving each individual zone transformer
- Automatic fire sprinkler system serving the whole of the cable basement
- Aspirating type smoke detection system, such as VESDA™, serving all areas
- Portable fire extinguishers installed throughout
- Fire hydrants
- Fire hose reels.

Older city zone substations such as City North, Dalley Street, City South and City East have automatic high velocity water spray fire suppression systems to serve each zone transformer. Smoke detection is not currently provided.

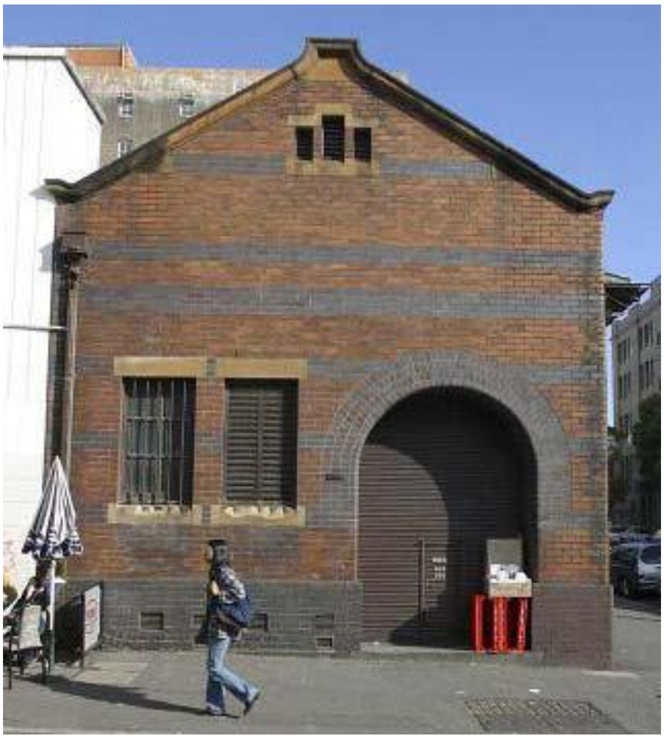
♦ Case study 2009-08, *Transformer fire at Tuggerah*, highlights the issues firefighters can face when attending a fire in a bulk supply points or substations. As with most substation fires, this was a protracted incident, needing close liaison with the electricity company.

Distribution substations

Electricity is transformed at distribution substations, which come in a variety of shapes and sizes.

Substations – open and above ground

Open and above ground substations are generally built from solid brick. Some have security fences with external transformers. Some use small buildings that were originally built for another purpose and later converted to a substation.



Photos courtesy of Ausgrid

Distribution substations – built from solid brick

Distribution substation – using a building originally built for another purpose

Photos courtesy of Ausgrid

Distribution substation – showing external transformers

All these substations contain high and low voltage distribution systems. Each substation has high voltage transformers, switchgear and ancillary equipment.

They usually have solid locked doors and/or security gates enclosing the electrical equipment.

High voltage equipment is well protected and unlikely to be exposed by damage to the building although, as a standard precaution, all exposed electrical equipment should be considered live and dangerous.

Like other substations, they contain large volumes of oil. There is likely to be PVC cabling. Asbestos may be present.

These substations are identified by electrical hazard warning labels on the walls or doors.

Substations – basement

Basement substations are substations within large complexes and high-rise buildings. They are usually not able to be sealed.

The fire suppression system for a city basement-type substation typically contains an array of nozzles installed in a system of fixed CO_2 pipework connected to a wall mounted or footpath CO_2 connection box. In a fire, the fire dampers installed in the inlet and exhaust ventilation openings close and CO_2 is injected from a FRNSW CO_2 tender or other bulk CO_2 carrier.

Portable fire extinguishers are also installed.

Substations – chamber/vault

In high-density areas of cities and in many residential subdivisions, electrical distribution wires run through cable tunnels or conduits located under footpaths or roadways.

Transformers or switchgear for these circuits are situated underground in concrete vaults, with access provided to the vault by an entry cover at ground level, or through access doors and a stairwell.

These substations contain an array of nozzles installed in a system of fixed CO_2 pipework connected to a wall-mounted or footpath CO_2 connection box. Ventilation is provided through openings in the roadway. In a fire, the ventilation openings need to be covered and CO_2 injected. The number of CO_2 cylinders required to be injected is indicated on the connection box.

Photos courtesy of Ausgrid

Wall-mounted access box for CO_2 injection – showing EnergyAustralia (EA) marking

Wall box opened – 12 indicates the number of CO_2 cylinders to be injected

Access cover opened – the 6 on the cap indicates the number of CO_2 cylinders to be injected

Ground level access box for CO_2 injection – showing Sydney County Council (SCC) and EnergyAustralia (EA) markings

Kiosk substations

Kiosk (also called padmount) substations are secure steel, fibreglass or hardened plastic boxes, installed at ground level over concrete pits containing electrical installations. They are generally green, olive, or a shade in between. In every respect they are miniature versions of a chamber or ground substation.

As kiosk construction has taken several different forms over the years, the best methods for recognising these types of substations is by the electrical hazard warning labels on the walls or doors.

Like other substations, they contain large volumes of oil and are likely to contain PVC cabling.

Kiosks are securely locked, but generally not alarmed. In the event of a fire, car impact or lightning strike, the electrical company will only know of the incident if it is reported or there is an indication of equipment failure in the electricity company control room.

As a standard precaution, all exposed electrical equipment should be considered live and dangerous. Low voltage equipment is uninsulated and may be exposed if the housing is damaged.

Kiosk (or padmount) substation

Photos courtesy of Ausgrid

Internal view of a kiosk showing the high voltage end

Kiosk substation

Kiosk substation in new housing area

Photos courtesy of Endeavour Energy

Kiosk in suburban location

Pole substations

Pole substations are essentially a transformer with fuses mounted on an electricity power pole to convert the high voltage to low voltage for supply to residential and commercial premises. Ausgrid owns and operates 5000 of these pole substations in the Sydney metropolitan area.

Pole substations contain high and low voltage distribution systems. Like other substations, they contain large volumes of oil. There is likely to be PVC cabling.

They are exposed and are a hazard to anybody who climbs the pole or if the pole is brought down by vehicle impact, storm or fire.

Photos courtesy of Ausgrid

Pole-mounted substations

Double pole-mounted substation

Photo courtesy of Endeavour Energy

Pillar boxes

Pillar boxes are low voltage connection and control points for underground power. They provide a connection point between the main electrical feeder cable and commercial or residential premises. In residential areas they can contain a maximum of six connections to properties.

Pillar boxes are usually located on the footpath or adjacent to the commercial premises or residence.

Their design and construction varies, but they are commonly made from steel, moulded concrete, fibreglass, or high-impact plastic. They stand 600-900 mm high. The voltage contained is 415 V.

Telecommunications companies (eg Telstra and Optus) use pillar boxes of similar designs – it may be difficult to determine ownership of the pillar box.

The covers of pillar boxes are typically bolted or screwed to a concrete or plastic moulding – with special tools required to remove the cover. The covers are not locked but are difficult to remove without the special tool.

Photo courtesy of Ausgrid


Steven Baker

Steven Baker


Photo courtesy of Ausgrid

Pillar boxes – with typical locations


Photo courtesy of Endeavour Energy

Pit boxes

Pit boxes contains similar apparatus to pillar boxes. They may be installed in footpaths or grass verges, and at times can be buried beneath lawns and gardens. They are accessed via a plate or cover.

If no power lines or pillar boxes are visible in an area, it is likely that pit boxes are used to supply underground electricity to premises.

Photos courtesy of Essential Energy

Pit boxes

Street light columns

Street light columns are similar to pillar boxes in that they provide a secure connection between the main supply and houses. They are of metal construction, in varying designs, all with a street light at the uppermost point.

Photos courtesy of Ausgrid

Street light columns

Poles, power lines and insulators

An overhead distribution network is typically constructed with high voltage (HV) power lines, low voltage (LV) power lines, street lighting, telecommunications conductors, insulators, switchgear and transformers, all mounted on poles.

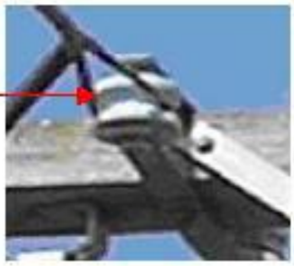
Power lines are referred to as *high voltage* or *low voltage*. This describes the nature of the circuit, not the size or shape of the power line – there is no physical difference in high and low voltage power lines.

Most aerial power lines in rural areas are bare copper, aluminium or steel.

Typically on the LV system, four power lines are used – one neutral and three active phases. The layout of the power lines varies, depending on the area, age of the network, and construction constraints. This means that accurate identification of high and low power lines is difficult for those not electrically trained.

A typical distribution pole configuration showing high voltage cables at the top of the pole and the low voltage cables at the next level down the pole.

High Voltage Insulator

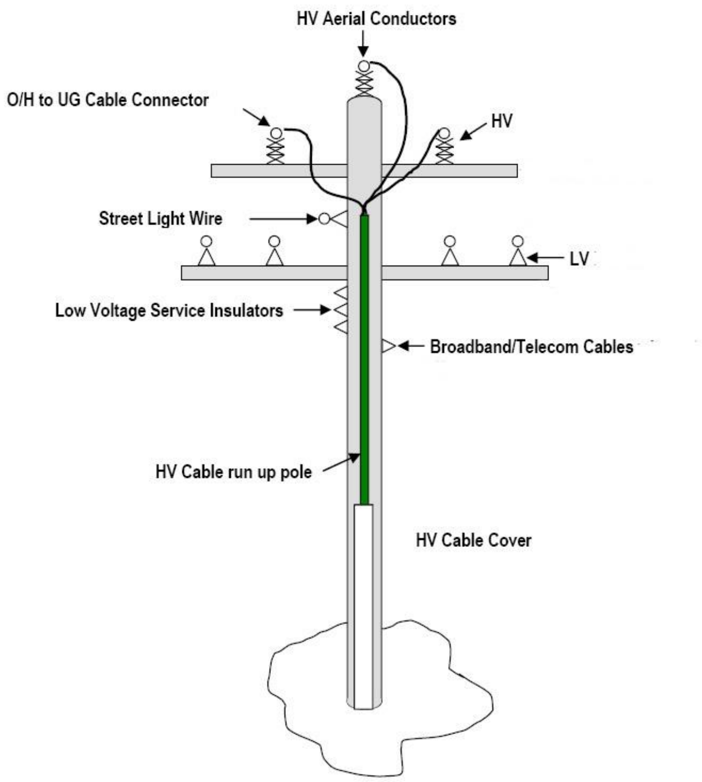


Low voltage Insulator

Diagram courtesy of Ausgrid

- ♦ Case study 2007-01, *Electrical hazards at structure fires*, highlights the dangers at a wires down incident. A pool of electricity was created around the downed wire, but floodwater extended the hazardous area. A firefighter received an electric shock when stepping within the pool of electricity.

Regardless of the difference between poles types, the basic wiring configuration remains the same.



Terms:
O/H = overhead
UG = underground
HV = high voltage
LV = low voltage
conductor = power line

Diagram courtesy of Ausgrid

Basic pole configuration

Insulators

Insulators are designed and used to prevent electricity flowing into the ground or earth from the conductive power lines.

- High voltage insulators are typically located at the top of pole cross-arms, and are large (to handle the higher voltage).
- Low voltage insulators are typically located at the lower level of a pole, and are smaller than high voltage insulators (about the size of a clenched fist).

Usually, the larger the insulator with more skirts, the higher the voltage.

Insulators are manufactured from various materials. Typically, ceramic is used as it has excellent insulating properties and is relatively easy to mass-produce.

Low voltage insulator

Photos courtesy of Ausgrid

High voltage insulators

Polymeric (plastic) type insulators are slowly replacing the ceramic style insulators as they are lightweight, compact, impact and vandal resistant, with high pollution resistance. They are much smaller than ceramic insulators and may cause confusion when trying to identify voltage.

33 kV polymeric post insulator

33 kV polymeric tension insulator

Photos courtesy of Endeavour Energy

Examples of insulators

Piping over power lines – tiger tails

Tiger tails are pipings fitted over overhead power lines, generally close to building and construction sites. They are generally yellow-and-black striped, but can be red-and-black-striped.

They are fitted to provide a *visual* indication to people working near overhead power lines that the lines are live. They are not effective insulation against contact and do not protect people from electrocution or electric shock.

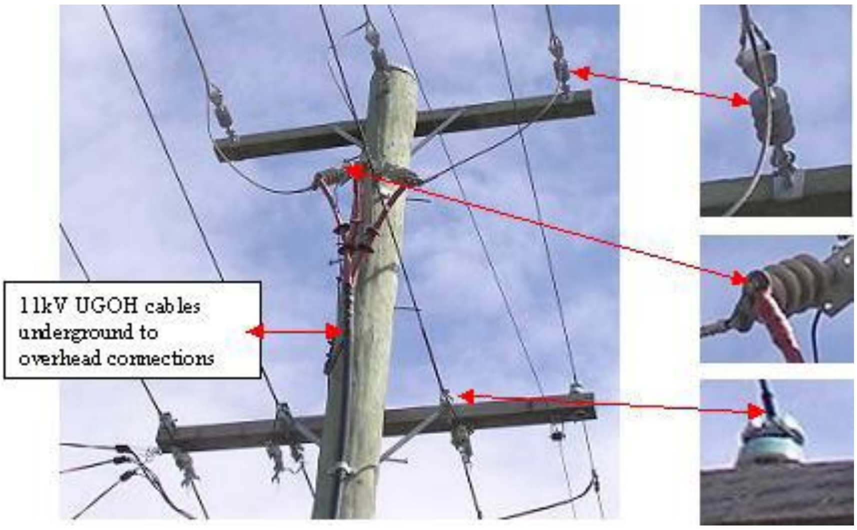
Tiger tails do not remove the electrical hazard associated with power lines, so normal safe work distances to power lines apply (outlined in SOG 14.4, *Working near power lines*).

Tiger tails fitted over power lines near a construction site

Underground to overhead connection

Where an underground (or buried) cable is connected to the overhead system, the transition point is known as an Underground to Overhead point (or UGOH).

There are several methods used to make this connection – the most common methods being inside a metal box, or directly via a polymeric insulator.



UGOH connection via a polymeric insulator

Diagram courtesy of Ausgrid

Covered conductors

Covered conductors are often used in leafy suburbs and commercial areas – eg they are used for the low voltage service cable between the street and residence or factory.

Wires are covered with cross-linked polyethylene (XLPE) insulation.

There are high voltage covered cables known as covered conductor thick (CCT), which are grey coloured.

High and low voltage wires can be wound together and covered in XLPE and are known as aerial bundled cables (ABCs). This makes them appear to be one thick cable, rather than three or four thin cables. They are black coloured.

XLPE covering is *not touch safe insulation* – it can break down due to exposure to the elements. Normal safe work distances to power lines apply (outlined in SOG 14.4, *Working near power lines*).

Covered cables in a leafy suburb

Photo courtesy of Ausgrid

 High voltage covered conductor thick (CCT)	 High voltage aerial bundled cable (ABC)
 Low voltage service cable	 Low voltage aerial bundled cable

Types of covered cables

Covered cables can appear the same as broadband telecommunications cables, making identification difficult.

Façade-mounted aerial bundled cables

ABCs can be attached to the façades of buildings, rather than strung from power poles. They are usually installed along shop fronts in strip shopping centres, but may also be installed in other locations. In some streets they may run for over a kilometre.

Façade-mounted ABCs may be painted to match the colour of the building, making them difficult to see. They may not be visible from street level if mounted above the awning. Awnings may become electrified if the cable is damaged in an incident.


David Felton

ABC strung between two buildings


Bruce Covey

ABC running at different level on the facade

Bruce Covey

ABC attached above awning on shop front in inner Sydney

David Felton

ABC attached above awning on shop front in a country town

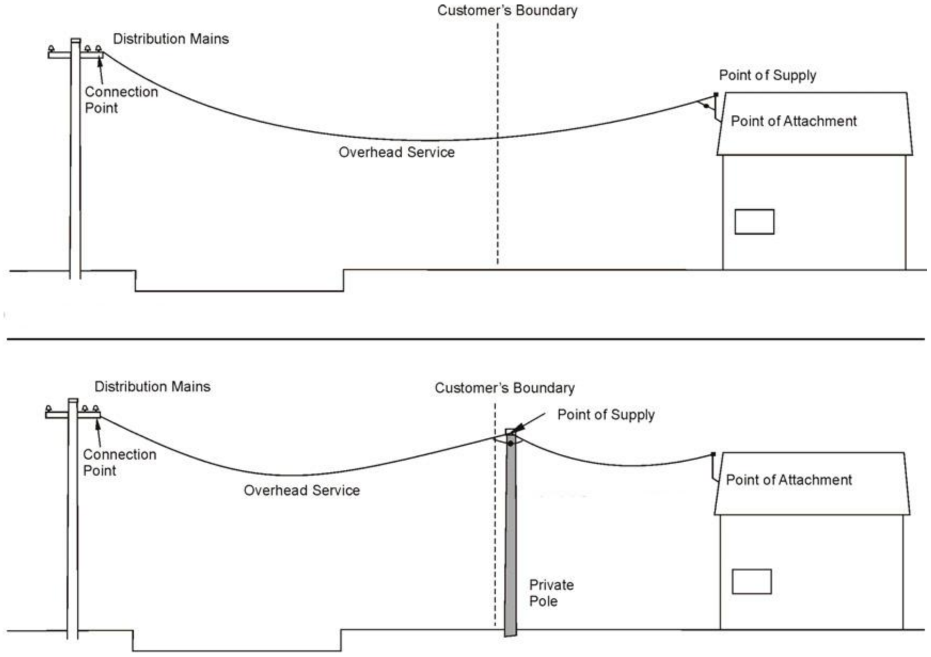

Bruce Covey

ABC painted to match the building

Connections to houses and buildings

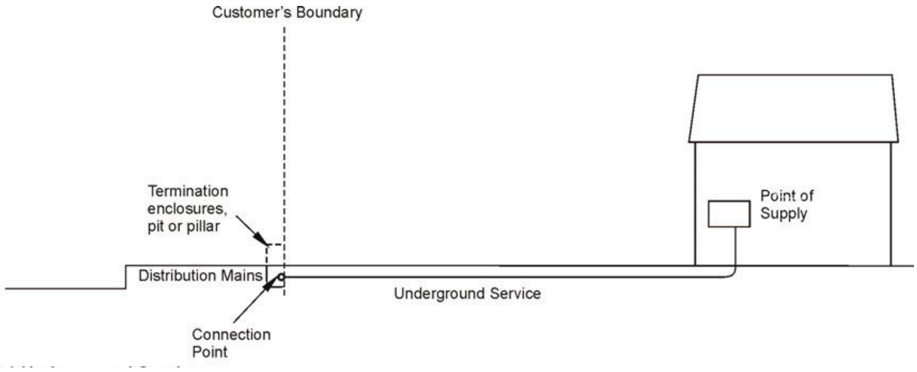
Power is supplied from the network to houses and buildings overhead (from a power pole), or underground (via a pillar box or pit box). Connections vary depending upon the network in the area.

Overhead supply



Diagrams from *Service and Installation Rules of New South Wales*, NSW Government Department of Water & Energy

Underground supply



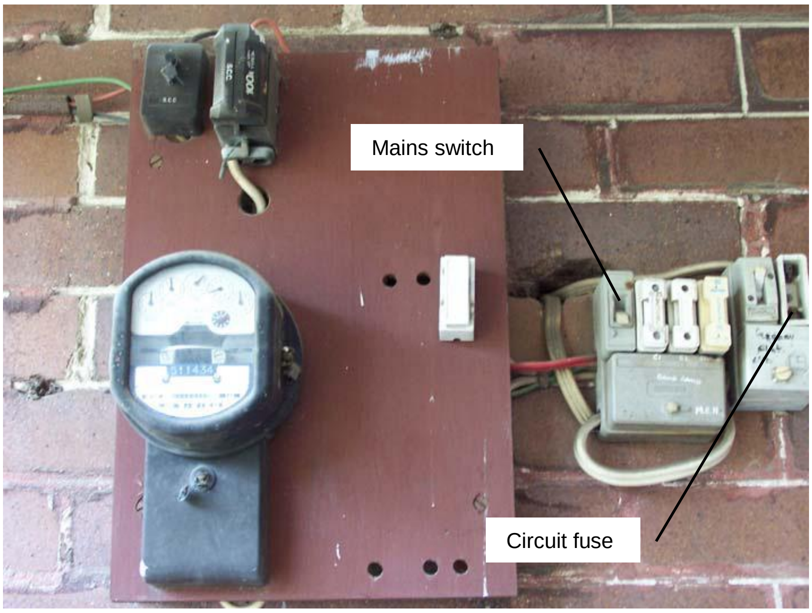
Switchboards

Switchboards are the junction of the supply of electricity from the network to the consumer. They can range from small residential switchboards to switchboards in large factory units. Voltages range from 240 to 415 Volts.

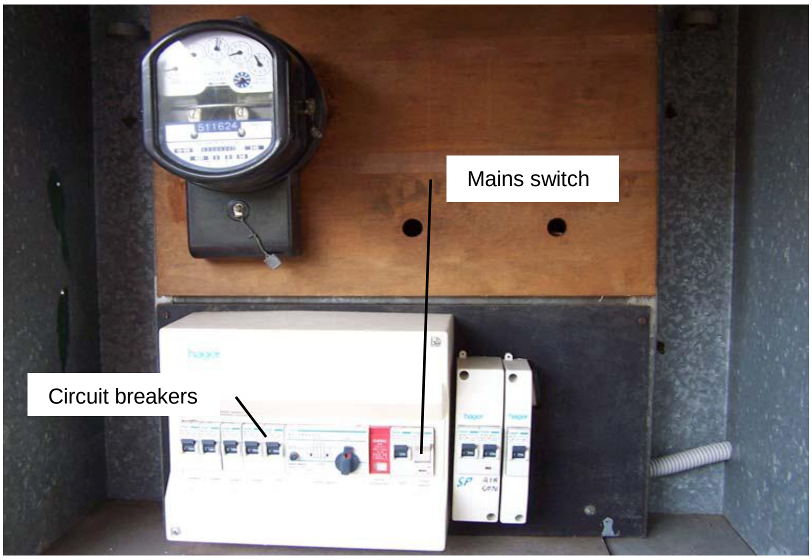
Switchboards contain a mains switch to temporarily turn off the junction point and discontinue electricity supply from the network to the structure. In addition, switchboards contain:

- Fuses – which are links placed in the electrical circuit designed to fail when the flow of current is excessive and the circuit heat ups.
- Circuit breakers – which perform a similar function to fuses, with the added advantage that, once triggered, they can be reset once the problem has been fixed.
- ‘Safety switches’ (*earth leakage circuit breakers* or *residual current devices*) – which detect electrical faults and shut off the circuit to minimise harm.

Following are examples of switchboards in houses, apartments and units.

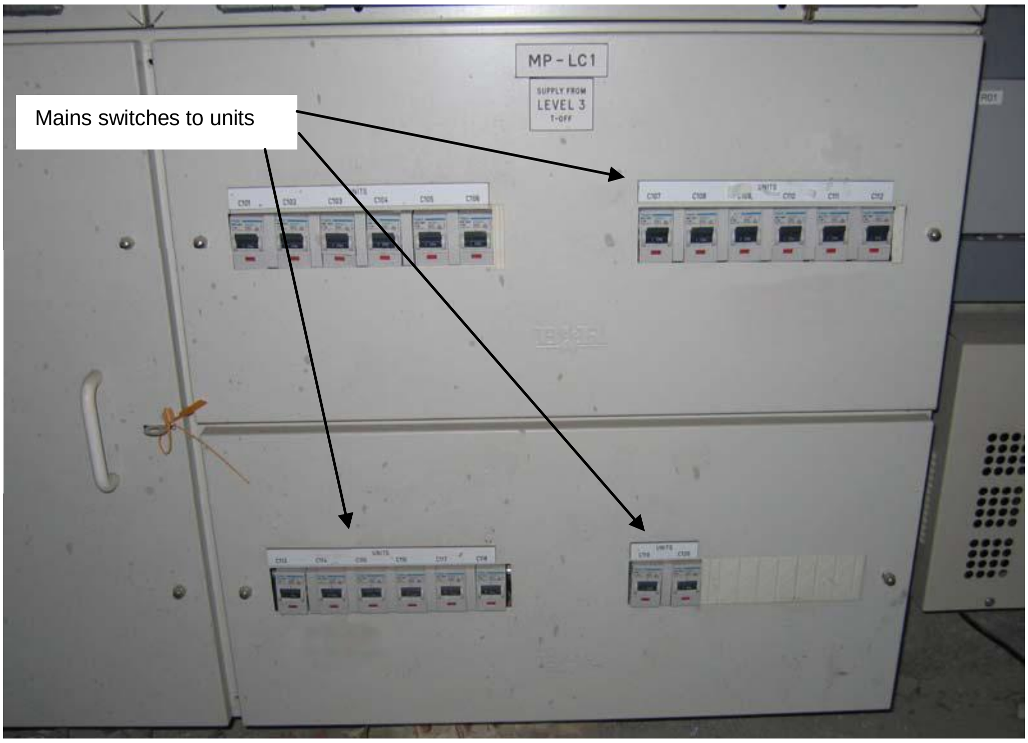


Standard domestic switchboard – without metal meter box



Photos courtesy of Ausgrid

Standard domestic switchboard (inside metal meter box)



Apartment block distribution board to units
(open in a locked room)

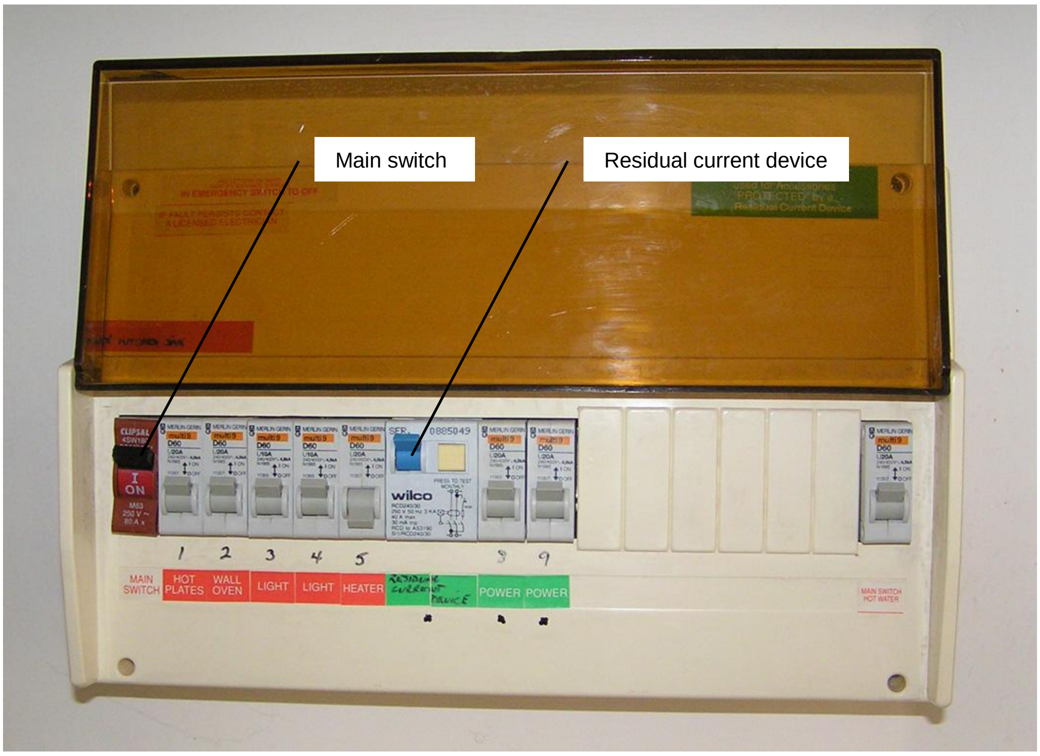


Photo courtesy of Don Pickles

Unit switchboard (usually within the unit)

Unit switchboard (usually within the unit)

This switchboard does not have a mains switch. When turning off power, each circuit breaker needs to be turned off, as well as the mains switch for this unit on the distribution board.

5 Alternative power sources

Alternative power generation systems include solar panels, methane systems, wind turbines and generators. They can be installed in various ways, including:

- **Grid-connect** – DC electricity generated by the alternative power source (eg solar panel) is converted from DC to AC electricity by an inverter, which then feeds it to the switchboard. If more electricity is generated than needed, the additional power is exported to the electricity network (the grid).
- **Stand-alone** – more common in rural areas where the electricity network is inaccessible. These systems include storage batteries and an inverter and may include a combination of alternative power sources. They could include a generator.
- **Grid-connect with battery storage** – there is a battery storage (or uninterruptible power supply, UPS) in addition to the alternative power source, to provide back-up power if the electricity network power fails. If the main switch is turned off at the switchboard, the batteries continue to supply power to the structure.

This GSD does not cover solar hot water – thermal – systems.

Solar power

Solar power systems can be installed anywhere on a property. Typically they are installed on the northern-facing side of a roof, but can also be in a paddock or open space.

Solar panels – also called photovoltaic (PV) cells or arrays – generate electricity when exposed to sunlight. The direct current (DC) voltage and current present depend on the available sunlight and the number of solar panels. They can produce up to 600 V per array.

Diagram courtesy of BP Solar

There are three components in a typical grid-connect solar power system:

- **Solar PV array** – an assembly of flat aluminium-framed glass panels, usually located on the roof.
- **Inverter** – a device to convert direct current (DC) to alternating current (AC).
- **Two-way electricity meter** – a meter which measures surplus power from the solar panel array and allows it to be directed to the electricity network.

Turning off solar power systems

Firefighters cannot completely isolate solar power systems – however, they can turn them off, to stop the electricity feeding into the structure supply or back to the electricity network.

The procedure for turning off the solar power system should be indicated on or near the switchboard. It involves switching off both the inverter main switch and the solar panel main switch (located near the inverter).

Australian Standard AS/NZS 5033 states that there must be a sign at the meter box or main switchboard indicating that there is a solar power system and its location. It also indicates the open circuit voltage and short circuit current of the system. However, not all installations comply with the standard.

If solar panels are exposed to sunlight – ie during daylight hours – they will produce DC electricity even after the inverter switch has been turned off. This means that the wiring from the solar panels to the inverter will still be live. (Solar panels also produce some electricity from other forms of lights – eg moonshine. The amount generated depends upon the intensity of the light.)

If solar panels must be completely isolated this must be done by an electrician. Larger commercial premises may have onsite experts with safe isolation procedures. Isolating power involves disconnecting the power at the solar panels.

Covering solar panels with a material that blocks light will reduce their ability to generate electricity – however, it is difficult to determine how effective this will be and current research is not decisive. Also, it may not be safe to access the roof to cover the panels.

Storm damage

During storms, where solar power systems may be damaged by fallen trees and other storm debris, owners may need to have an electrician isolate power to the solar panels before it is safe for firefighters to commence work.

Storm debris or conductive building materials – eg metal roofs, guttering, downpipes, ladders – in contact with electrical components may be live.

Each solar panel weighs approximately 16 kg. This is extra roof loading particularly for weakened roofs and needs to be part of the considerations before commencing work. Also, if solar panels are damaged there may be broken glass and other broken materials.

An exclusion zone of 3 metres – marked with barrier tape – is sufficient, but is increased to 8 metres if components are in contact with conductive materials.

During floods

Before a flood, firefighters are able to safely turn off solar power systems.

Once affected by flood, it is not safe for firefighters to work in and around a building with solar power systems. Even if the solar power system is turned off, there is a risk of electric shock. Flood water in contact with solar power system may be live – there should be an exclusion zone of 8 metres.

After the flood, owners should have their installer or an electrician check the electric circuits.

Wind turbines and methane systems

The installation of small-scale wind turbines and methane systems varies considerably.

After the main switch has been turned off, they may continue to produce power – eg a turbine may continue to turn and produce electricity after the turbine has been turned off.

Wind turbine and methane systems should contain a switch for turning them off, with shutdown procedures – although this cannot be guaranteed. The switch is likely to be close to the power generation source.

Backup generators

Backup generators are installed to provide continuous power after the electricity network power is not available – eg during a blackout. They are usually programmed to switch on within seconds of interruption to the regular power supply. They are often diesel-powered and can be manually switched off. Care needs to be taken when turning them off as they may be providing critical functions – eg life-sustaining equipment in a hospital.

Uninterruptible power supplies

An uninterruptible power supply (UPS), sometimes called a battery backup, maintains a continuous supply of electric power to connected equipment by supplying power from a separate source when electricity network power is unavailable.

They may be small, portable units that supply power to a single item, or large fixed systems that supply power to multiple items or structures.

A UPS is inserted between the electricity network and the load it is protecting. When a power failure or abnormality occurs, the UPS switches from network power to its own power source almost instantaneously.

Power supplied to a large UPS system from the electricity network can normally be isolated at the switchboard.

However, the UPS is itself a power source, so this does not isolate the power from the UPS to other equipment. Circuits from a UPS system remain live, even after power is isolated at a main switchboard.

Signage similar to that identifying the location of the switchboard should identify the location of any UPS system, particularly a large system. There may be means of isolating a UPS at that location.

It may not be appropriate to isolate a UPS – eg at a health-care institution it may be connected to life-sustaining equipment; or at an industrial complex, some processes may be difficult or dangerous to shut down quickly.

6 Electricity in other places

Rail network

RailCorp operates the rail network in and around Sydney.

The overhead lines on the network operate at 1500 V DC. Incidents are managed in consultation with RailCorp staff – FRNSW personnel, appliances and equipment are not allowed on railway lines until the safety of the lines has been verified by the RailCorp Commander.

The procedures for notifying RailCorp and obtaining a temporary Rescue Power Outage (RPO) to remove power from overhead lines are outlined in Operations Bulletin 2009/02, *Removing power from RailCorp overhead power lines*.

Metro Light Rail

The Metro Light Rail in Sydney is operated by Metro Transport Sydney. Metro Light Rail operates 24 hours a day, 365 days a year, with services every 8-10 minutes most of the day.

The trams receive power from an overhead wire, which carries 750 V DC and varies in height between 4.5 m and 5.5 m.

The overhead power is supplied by two substations, each capable of powering the entire system if required. The substations can be remotely controlled and maintained from the Operations Control Centre.

Incidents on the Sydney Metro Light Rail network are managed in consultation with their staff. They isolate the power and render the area safe.

Metro Monorail

The Metro Monorail in Sydney is operated by Metro Transport Sydney.

The trains are semi-automatic, with safety decisions made by a micro-processor based control system in the front car of each train. The trains also have control panels for manual guidance of the trains during service or when placing in service. The network is monitored from a central control room.

Three conductor rails attached to the main Metro Monorail track supply 525 V AC electricity to the trains.

An incident on the Metro Monorail is managed in consultation with Metro Transport Sydney.

Electric and hybrid vehicles

An electric vehicle uses electrical energy stored in a battery or other energy source. A hybrid vehicle is a vehicle with more than one source of on-board energy –eg electric and petrol hybrid.

For detailed background information about hybrid vehicles, see the Rescue section's document *Hybrid vehicle technology presentation*, on the Rescue section website.

Street fixtures

Street fixtures are equipment and other fixtures installed in and around streets and roads and which are connected to electricity. Examples are traffic lights, street lights, speed cameras and electrified signs.

Most traffic lights and cameras are installed, operated and maintained by the Roads and Maritime Services (formerly known as the RTA). Electrified signs may come under the control of a local council or a commercial operator. Street lights are maintained by electricity companies or local councils.

Voltages

Street fixtures are mostly low voltage (ie less than 1000 Volts) but may be higher. As at 8 April 2011, Roads and Maritime Services supplied the following information regarding voltages of their equipment:

Fixture	Voltage
Traffic signals	240 AC, some have low voltage
Stand alone camera poles, i.e. Speed, School Zones	240 AC
Safety Camera Poles	240 AC, some have low voltage
TIRTLS	12 or 24 DC buried camera housing unit located in gutters
Mobile Speed Camera Vehicles	Two dry cell sealed battery in rear of vehicle
Point-to-Point Cantilever Arms, Gantry and Poles	240 AC, could be up to 48 DC
Safe-T-Cam Gantry	240 AC, above ground
Safe-T-Cam pits to source access points	Up to 415 AC, 3 phase
Safe-T-Cam Gantry @ Checking Station	240 AC above ground, power run from main unit at building
Safe-T-Cam pits to source access points @ Checking Station	Up to 415 AC, 3 phase, power run from main unit at building

Roads and Maritime Services advised that safety cameras (ie redlight/speed cameras at intersections) are usually powered through the traffic signals.

It also advised that all camera enforcement sites have UPS back-up power units in the cabinet, except for the Safe-T-Cam where the UPS is located in the bunker. Bus lane and Transitway cameras can have a UPS in the camera housing, but will not have a roadside cabinet.

Isolating power

All fixtures have an identification number, but this may not be visible at the site. For this reason, when requesting isolation it is important to advise the suburb, main road and nearest cross streets.

In some circumstances the Roads and Maritime Services traffic signal technicians may be able to switch off power to a speed camera where it is powered through the traffic signals.

Fixed speed cameras usually require the camera technician on call to attend the site to give their electrician access to the main power source (often accessed through a nearby power pole).

Luminous signs

Luminous signs, commonly known as neon signs, comprise a glass tube with a high voltage current. The tube contains a gas that becomes luminous when charged by electricity. The colour varies with the gas:

- Neon glows red
- Hydrogen glows green
- Carbon dioxide glows white.

These tubes have transformers nearby to increase the voltage. There may be a power switch near the luminous sign.

7 Appendix

Acknowledgements

The following organisations are acknowledged for assisting during the development of the electricity Standard Operational Guidelines and this guideline support document:

- Energy Networks Association – for use of images and text from their publication *National guidelines on electrical safety for emergency personnel*
- Ausgrid – for advice content, review of documents, and use of images and text from their publication *Electrical hazard awareness for emergency services training guide*.
- Endeavour Energy – for advice on content, review of documents, and use of images
- Essential Energy – for advice on content, review of documents, and use of images
- Roads and Traffic Authority (now known as Roads and Maritime Services), Compliance and Enforcement Branch – for advice on content relating to street fixtures

References

The following documents were referenced during the development of the electricity Standard Operational Guidelines and this guideline support document:

- Energy Networks Association 2006, ENA DOC 008-2006, *National guidelines on electrical safety for emergency personnel*, Standards Australia, Sydney
- EnergyAustralia (now Ausgrid), *Electrical hazard awareness for emergency services training guide*, Version 1.4, November 2004
- WorkCover NSW Code of Practice 2006, *Work near overhead power lines*
- WorkCover NSW Code of Practice 2007, *Low voltage electrical work*
- McKie, Peter, 2008, *Active first aid*, 7.4 edition, Active Publications Pty Ltd, Fyshwick, ACT
- Work Health and Safety Act 2011 (NSW)
- Work Health and Safety Regulation 2011 (NSW)
- NSW Government Department of Water & Energy, *Service and Installation Rules of New South Wales – The electricity industry standard of best practice for customer connection services and installations*, Amendment 2, October 2006

Other useful publications

You may find the following documents provide useful information:

- Australian Standard 2005 AS 4777.1-2005, *Grid connection of energy systems via inverters, Part 1: Installation requirements*, Standards Australia, Sydney
- Australian Standard 2006 AS/NZS 5033, *Installation and safety requirements for photovoltaic (PV) arrays,* Standards Australia, Sydney – plus the draft for public comment 2011
- Australian Standard AS/NZS 60479.1:2002, *Effects of current on human beings and livestock, Part 1: General aspects*, Standards Australia, Sydney
- Standards Australia 2002, AS/NZS 60479.2:2002, *Effects of current on human beings and livestock, Part 2: Special aspects,* Standards Australia, Sydney

NSW FIRE BRIGADES

Standard Operational Guidelines

SPECIAL APPLIANCES AND EQUIPMENT

Section Fifteen

1 THERMAL IMAGING CAMERA

1.1 Introduction

1.1.1 A Thermal Imaging Camera (TIC) is a sophisticated piece of electronic equipment that has been adapted for use by fire brigades throughout the world to enable fire fighting crews to effectively see through dense smoke.

1.1.2 Heat energy radiated from objects in the form of infra-red waves are detected by the TIC. The TIC then identifies the energy differences from the object(s) being scanned and converts the readings to visual images. The principle of TIC operation is therefore the portrayal of images based upon temperature differences.

1.2 Application

1.2.1 The purpose of this guideline is to give an overview of the role of the TIC within the NSWFB, and to detail how the TIC integrates with fire fighting techniques currently employed in NSW.

1.2.2 The TIC can be utilised in many applications as listed below:

- search and rescue of casualties in smoke logged areas;
- locating hot spots and the seat of the fire;
- locating points of overheating in electrical appliances;
- assisting crews to and from the scene of the operation in low visibility;
- directing water streams to the centre of the fire thereby minimising water damage;
- determining the extent of fire spread in structures e.g. wall cavities, ceiling voids and ducting;
- determining ventilation points in conjunction with positive pressure ventilation tactics;
- indicating direction and travel distances of smoke plumes and vapour clouds;
- assisting the OIC with dynamic risk assessment of fires;
- assisting with investigation procedures (fire trails and heat signatures);
- locating casualties at large motor vehicle accidents or structural collapse;
- determining fluid levels in tanks and vessels; and
- enabling remote viewing and/or recording of incidents (in conjunction with a co-axial cable).

1.2.3 As can be seen from the preceeding list, the TIC can be used in a variety of circumstances. However, the greatest benefit to the NSWFB is its use in association with BA in smoke filled buildings or compartments.

1.3 Risk Assessment

1.3.1 On arrival at an incident the OIC will need to decide whether or not to use a TIC.

⚠ **NOTE**

TICs are not intrinsically safe and therefore should not be used in a flammable atmosphere.

1.3.2 The practicalities of using a TIC with communications equipment, BA guide lines and fire fighting equipment must be considered, especially when nominating team members. There **must** be a minimum of two members including the TIC operator.

1.3.3 To assist the OIC as to when and where the TIC can be of benefit to firefighters, the following points should be considered:

- the nature of the incident;
- the nature and state of the premises involved;
- the hazards associated with the premises/circumstances e.g. risk of flammable atmosphere;
- if casualties/rescuers are involved;
- prior knowledge/pre-planning; and
- will the use of the TIC be of any value or would it be a hindrance.

1.4 Operations

1.4.1 Following a decision by the OIC to use a TIC, the BA Control will record in the remarks column on the Stage 1 or 2 Tally Board, that a TIC is in use, the task being performed and its location.

1.4.2 The TIC operator is potentially the most valuable member of the BA team and should be protected by other team members.

1.4.3 Should the TIC fail, egress could become increasingly difficult, especially if no other senses or guide lines were used to gain access to the risk area. For this reason NSWFB standard search and rescue techniques and safe working practices must be adhered to at all times.

BA Team Leader

1.4.4 The BA team leader should ensure that the team pauses at regular intervals to allow the TIC operator to scan the area. All relevant information should be relayed to the Incident Commander via the BA team leader.

NOTE

Regardless of the size of the BA team, the team leader must not be the carrier or operator of the TIC.

1.4.5 The team leader must have unrestricted use of his/her hands for safe progress by touch and feel.

1.4.6 On advice from the TIC operator the team leader may confirm the images displayed e.g. casualty under table.

1.4.7 The team leader must be discouraged from making rapid progress into hazardous areas with the added risk of leaving other team members behind.

1.4.8 Communication between the TIC operator, the team leader and the remainder of the team is of paramount importance. Good communication will not only improve the safety of the team, but will also maximise the ability of the TIC and (should the circumstances permit), will allow for quicker progress.

1.4.9 As the team progresses, the team leader should stop at frequent intervals to allow the TIC operator to scan the area, and then to brief the team about their surroundings.

Team Members

1.4.10 Care must be taken by all team members with regard to being conscious of:

- travel distances;
- memorising landmarks; and
- hazards encountered.

1.4.11 Despite the many advantages provided by the TIC, it does not increase the working duration of BA. All members of the BA team must remain conscious of their pressure readings.

General

1.4.12 Given that the TIC only compliments current techniques, the failure of a TIC should not adversely affect operations. Should a TIC fail (for whatever reason), it is a matter for the team leader to decide whether to proceed as planned or return to BA Entry Control.

1.4.13 The use of a TIC will simplify the technique for laying guide lines or branch lines. The team leader will adopt the standard techniques for moving in restricted visibility, whilst at the same time carrying the guide line bag. A second team member (who may also be the TIC operator), will be able to advise the team leader of the images displayed, including the identification of tie off points.

1.5 Safety

1.5.1 The TIC is not intrinsically safe and therefore should not be taken into a flammable atmosphere.

1.5.2 The lens of the TIC is very sensitive and lens *burn out* can still occur whilst the TIC is turned off. To avoid this, the TIC should be stowed in its carry case until it is required for use.

1.5.3 The TIC is designed to assist firefighters in their search and rescue capability. **It is not intended to replace all other techniques!**

THERMAL IMAGING CAMERA CHECK SHEET

The purpose of this Check Sheet is to provide a list of the actions that relate to the risk assessment, operations and safety associated with the use of a Thermal Imamging Camaera (TIC).

RISK ASSESSMENT

- On arrival at an incident the OIC will need to decide whether or not to use a TIC.

⚠ **NOTE**

TICs are not intrinsically safe and therefore should not be used in a flammable atmosphere.

- The practicalities of using a TIC with communications equipment, BA guide lines and fire fighting equipment must be considered, especially when nominating team members. There **must** be a minimum of two members including the TIC operator.
- To assist the OIC as to when and where the TIC can be of benefit to firefighters, the following points should be considered:
  - ☐ the nature of the incident;
  - ☐ the nature and state of the premises involved;
  - ☐ the hazards associated with the premises/ circumstances e.g. risk of flammable atmosphere;
  - ☐ if casualties/rescuers are involved;
  - ☐ prior knowledge/pre-planning; and
  - ☐ will the use of the TIC be of any value or would it be a hindrance.

OPERATIONS

- Following a decision by the OIC to use a TIC, the BA Control will record in the remarks column on the Stage 1 or 2 Tally Board, that a TIC is in use, the task being performed and its location.
- The TIC operator is potentially the most valuable member of the BA team and should be protected by other team members.
- Should the TIC fail, egress could become increasingly difficult, especially if no other senses or guide lines were used to gain access to the risk area. For this reason NSWFB standard search and rescue techniques and safe working practices must be adhered to at all times.

BA Team Leader

- The BA team leader should ensure that the team pauses at regular intervals to allow the TIC operator to scan the area. All relevant information should be relayed to the Incident Commander via the BA team leader.

⚠ **NOTE**

Regardless of the size of the BA team, the team leader must not be the carrier or operator of the TIC.

- The team leader must have unrestricted use of his/her hands for safe progress by touch and feel.
- On advice from the TIC operator the team leader may confirm the images displayed e.g. casualty under table.
- The team leader must be discouraged from making rapid progress into hazardous areas with the added risk of leaving other team members behind.
- Communication between the TIC operator, the team leader and the remainder of the team is of paramount importance. Good communication will not only improve the safety of the team, but will also maximise the ability of the TIC and (should the circumstances permit), will allow for quicker progress.
- As the team progresses, the team leader should stop at frequent intervals to allow the TIC operator to scan the area, and then to brief the team about their surroundings.

Team Members

- Care must be taken by all team members with regard to being conscious of:
  - ☐ travel distances;
  - ☐ memorising landmarks; and
  - ☐ hazards encountered.
- Despite the many advantages provided by the TIC, it does not increase the working duration of BA. All members of the BA team must remain conscious of their pressure readings.

General

- Given that the TIC only compliments current techniques, the failure of a TIC should not adversely affect operations. Should a TIC fail (for whatever reason), it is a matter for the team leader to decide whether to proceed as planned or return to BA Entry Control.
- The use of a TIC will simplify the technique for laying guide lines or branch lines. The team leader will adopt the standard techniques for moving in restricted visibility, whilst at the same time carrying the guide line bag. A second team member (who may also be the TIC operator), will be able to advise the team leader of the images displayed, including the identification of tie off points.

SAFETY

- The TIC is not intrinsically safe and therefore should not be taken into a flammable atmosphere.
- The lens of the TIC is very sensitive and lens *burn out* can still occur whilst the TIC is turned off. To avoid this, the TIC should be stowed in its carry case until it is required for use.
- The TIC is designed to assist firefighters in their search and rescue capability. **It is not intended to replace all other techniques!**

15.2 SAFE WORK WITH HELICOPTERS

1 Introduction

The NSWFB has the use of a helicopter to transport personnel and equipment to and from tactical operations, forensic activities, bomb disposal, chemical, biological and radiological (CBR) detection and decontamination, urban search and rescue (USAR), hazardous materials response (HazMat), fire operations and specialist reconnaissance operations.

The helicopter is a shared resource operated jointly by the NSW Police and NSW Fire Brigades as part of the NSW Government counter terrorism strategy.

Except for the details of communication with Fire-Air 1, this guideline also applies when the NSWFB charters helicopters or uses those of other agencies.

2 Application

This guideline applies to all NSWFB personnel who may be involved in activities involving helicopters. It is intended to provide basic information on safe operation with helicopters to reinforce the information provided in basic training and on the NSWFB Aviation CD.

To ensure a safe working environment, these procedures must be followed when using a helicopter.

3 Helicopter transport

3.1 Authority to travel

Only NSWFB authorised personnel may travel on NSWFB tasked aircraft.

Only personnel essential to the accomplishment of the allocated task or undertaking training may be included on any flight.

3.2 Manifest

All passengers on any flight must be listed on a manifest (see Appendix 1).

A copy of a completed manifest is to be left with the OIC at the point of departure.

If the point of departure is unmanned, manifest details must be forwarded by radio or telephone to the appropriate communication centre.

3.3 Emergency briefings

NSWFB personnel are not to travel on any aircraft unless they have received an emergency briefing from the pilot or aircrew.

All personnel travelling in an aircraft **must** familiarise themselves with and thoroughly understand the aircraft's safety briefing card.

In an emergency, the pilot will instruct passengers on how to prepare for the emergency.

4 Helicopter safety

4.1 Introduction

Safety must be the prime consideration in all training and operational aviation activities.

All NSWFB personnel must be fully conversant with aviation safety procedures.

To ensure that safety is maintained at the highest possible level at all times, personnel involved with aviation activities must think 'airmanship'.

Airmanship can be defined as 'the safe and efficient handling of aircraft both in the air and on the ground'. It applies to all facets of aviation and includes:

- good discipline
- common sense
- a sound knowledge of procedures
- a sense of responsibility for yourself and others
- carrying out procedures and tasks correctly, avoiding short cuts
- having a positive attitude
- being physically and mentally fit to fly or conduct ground operations
- thinking safety at all times.

4.2 Dress

When involved in helicopter operations, NSWFB personnel must dress correctly. The minimum dress and equipment standard is:

Aircrew

- flying suit—sleeves rolled down and zipper fully up
- flame retardant gloves, not rolled down
- flight boots
- helmet
- street directory, maps, documentation relevant to the task
- kneeboard, pens, pencils
- torch.

Other NSWFB personnel

- uniform or overalls—sleeves rolled down and buttoned
- firefighting boots or covered shoes, no elastic sided boots
- no ties or caps to be worn when approaching or leaving a helicopter.

CAUTION Due to a high risk of fire, nylon clothing must not be worn next to the skin.

4.3 Danger areas

Extreme caution must be taken when personnel are moving within or near the following areas:

- under the main rotor disc

- tail rotor

- turbine disintegration zone.

4.4 Blade sailing

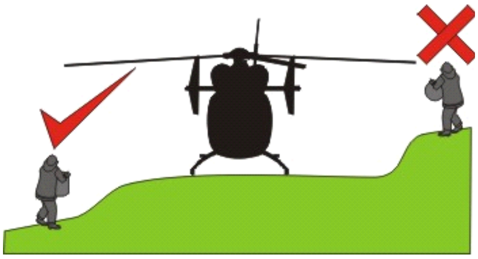
Blade sailing is when rotor blades not under power rise and fall in a swinging motion while still turning. They may drop to a height of five feet above ground level.

Do not approach or depart under the rotor disc after the engines have been shut down until the rotor blades have stopped moving.

4.5 Approaching helicopters

When required to approach a helicopter:

- remove headgear/tie as appropriate. These items could be ingested by the engine, or damage the main and/or tail rotor blades
- remain outside the sweep of the main rotor until the pilot gives clearance. Use the 'thumbs up' signal to indicate to the pilot or aircrew that you are ready to approach the helicopter
- when the pilot or aircrew approves your approach with a 'thumbs up' signal, approach the helicopter between the 10 o'clock and 2 o'clock positions only



- if the helicopter is sitting on a slope, only approach from the downhill (low) side
- watch the pilot in case you are instructed to abort your approach
- walk, do not run, towards the helicopter in a slightly crouched position.

- carry any objects or equipment at waist height and horizontally. Keep a firm hold on any hand-held items
- be aware of the hazard of rotor downwash creating dust. If you are blinded by swirling grit or dust, sit down and await assistance
- if you need to move to the other side of the helicopter prior to boarding, move around the front of the helicopter
- never go near a helicopter tail rotor. Do not move to the rear of the fuselage of a rear loading helicopter without a member of the aircrew and do not go beyond the point where the tail boom joins the fuselage
- never approach a helicopter from the rear.

CAUTION Only approach a helicopter from a position where the pilot can see you.

4.6 Approaching helicopters at night

Approaching helicopters at night is essentially the same procedure as during the day with the following considerations:

- stand clear of the rotor disc in a position between 10 o'clock and 2 o'clock holding a torch at head height. Flash the torch to attract the pilot's attention.
- the pilot will indicate the clearance under the rotor disc for approach by flashing the landing light on and off.

CAUTION Do not shine the torch in the pilot's eyes, as this will affect his/her night vision.

4.7 Actions within helicopters

Turn off all mobile phones while in the aircraft.

Secure seat belt, ensuring that it fits correctly.

Seat belts are to be secured at all times. All passengers must remain seated, with seat belts fastened, during all stages of flight and after landing, until instructed by a crew member to do otherwise.

Connect helmet/headset to communications lead.

No smoking in the aircraft at any time.

Do not move around inside the aircraft, without first receiving permission from the pilot. Helicopters are lightweight finely balanced machines. Any sudden movement within the aircraft will alter the centre of gravity, requiring the pilot to make a control adjustment.

Do not drop anything, or do anything that makes a loud noise. Loud noise may cause undue concern to the pilot. Inform a member of the crew immediately if something is dropped.

Do not throw anything from the aircraft.

Do not interrupt radio transmissions or aircrew conversations within the aircraft.

If suffering from airsickness, inform a member of the aircrew immediately.

If experiencing ear discomfort, inform a member of the aircrew immediately.

4.8 Departing helicopters

Close window if appropriate.

When instructed by the aircrew, undo seat belt and re-fasten the belt behind you prior to moving from the seat.

Disconnect helmet/remove headset as appropriate.

Alight from the aircraft carefully when instructed to do so by the aircrew.

Move to a position between 10 o'clock and 2 o'clock where you can clearly see the pilot. Give the pilot a 'thumbs up' signal.

Walk out from under the rotor disc only when the pilot returns the 'thumbs up' signal.

Walk, do not run in a crouched position and watch the rotor disc at all times. Do not walk backwards.

4.9 Departing helicopters at night

When departing the helicopter, there are two methods of obtaining clearance:

- stand at the front of the helicopter and flash a light at head height; the pilot flashes the landing light to give clearance, or
- move to the pilot's window and give a 'thumbs up' signal in front of the pilot; the pilot gives a 'thumbs up' signal to give clearance.

CAUTION **Do not shine torches into the helicopter.**

4.10 Loading and unloading

When loading and unloading equipment from a helicopter:

- obtain the pilot's permission before loading any equipment
- estimate the weight of the items to be transported and inform the pilot
- carry equipment horizontally and at waist height
- place all items carefully to avoid damage to the helicopter.

4.11 Emergencies

Airborne emergencies can vary in severity and the action taken may vary. General considerations concerning emergencies are as follows:

- the pilot is trained to handle emergencies
- the emergency will be explained by the pilot
- passengers are to observe ‘sterile cockpit’ rules and remain quiet to allow crew make appropriate radio calls and converse in the cockpit
- follow all instructions
- remove spectacles, false teeth and any sharp objects from pockets
- adopt the crash position
- only exit the aircraft on pilot’s command or when the rotors stop.

All NSWFB personnel must receive an emergency briefing from the pilot or aircrew prior to boarding any aircraft.

4.12 Communications

To communicate with the helicopter, the following points must be observed:

- for the purpose of air clearance and registration, the call sign of the helicopter resource shared between the NSWFB and NSW Police is Polair 5. However, while under the direction of the NSWFB, it shall be referred to Fire-Air 1
- as per In Order 2003/22, the helicopter will communicate on the GRN talk group for the area in which the incident has occurred. If the helicopter remains to support operations after the initial attack, it will operate on a talk group designated by the IC.
- the helicopter’s mobile telephone number is 0416 067 526
- as aircrew and pilot workloads are high during winching operations, do not contact the helicopter at these times except in an emergency.

4.13 Winching

At times, NSWFB personnel may need to be winched in or out of a particular incident. Prior to requesting the helicopter for a winching operation, the following points should be taken into account:

- maximum winch height is 83 m (274 ft)
- maximum load is approximately 270 kg (600 lbs), depending on fuel state
- when approaching the helicopter in a winching operation, do not grab the skid or aircrew, let the aircrew manoeuvre you around the skid and into the aircraft
- take the load to the cable. Do not take the cable to the load.

Eye and hearing protection must be worn when working around helicopters.

CAUTION **Before touching the winch cable, allow the cable to touch ground. This will earth the cable and discharge any static electricity.**

5 Helicopter marshalling

5.1 Introduction

There will be occasions when a pilot requires visual guidance from a firefighter on the ground to manoeuvre a helicopter in difficult terrain, in a confined area or during winch/cargo hook operations. This guidance is called marshalling.

5.2 Safety

When marshalling helicopters, have a definite plan of what you want the aircraft to do.

If you are unsure of a command and need to reassess the situation, signal the pilot to hover and be sure of your actions, prior to continuing with the operation.

Only personnel directly involved with the operation are to be in the vicinity of the aircraft. Ensure spectators are well clear.

CAUTION **NSWFB personnel are to spend the minimum time necessary directly under hovering helicopters.**

5.3 Description

A series of standard marshalling signals are used to communicate with the pilot during operations close to the ground.

If it is necessary to communicate with the pilot during marshalling, contact the aircraft via GRN.

Pilots will comply with all signals except when they consider that by so doing, the safety of the aircraft or of persons or property on the ground may be jeopardised.

5.4 Procedures

When NSWFB personnel are required to assist in the marshalling of helicopters, the following points must be observed:

- the marshaller must be positioned so the pilot has a clear view of all marshalling signals.
- marshallers must contrast with their background to ensure that the pilot can see all signals clearly. Wearing a bushfire jacket can help.

Ensure all signals are slow, deliberate and unambiguous.

The pilot-in-command has ultimate responsibility for the disposition of the aircraft.

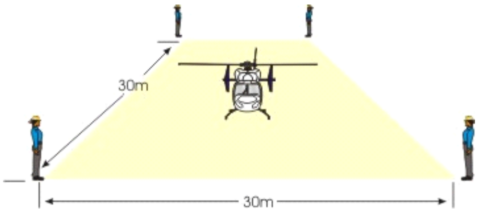
CAUTION **Misunderstood instructions can lead to serious safety hazards.**

5.5 Landing Sites

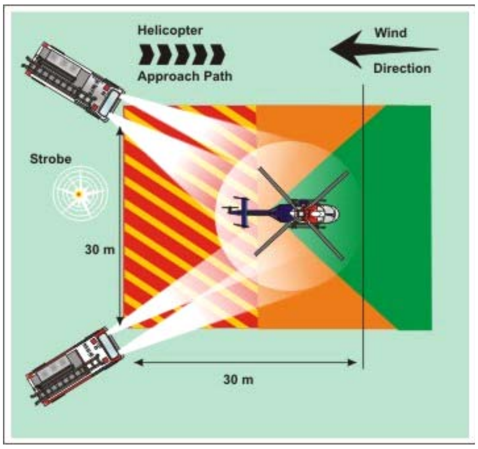
Occasionally, NSWFB personnel may have to prepare a helicopter landing site.

When this is necessary, the following points must be observed:

- position the landing site in an area 30 m x 30 m minimum, on solid, level ground away from power lines or wires, and clear of trees or similar obstacles



- mark the corners of the landing site by placing a firefighter at each corner and cordon off to prevent unauthorised entry. Do not use tape or loose materials
- clear all loose debris from the area, e.g. paper bags, cigarette cartons, aluminium cans etc, and secure all NSWFB equipment near the landing site
- in dry, dusty conditions, the landing site may require wetting down to maintain visibility during landing and take off.



During night landings, place a strobe light and two vehicles with beacons flashing facing into the wind and facing inwards at 45° to the approach line with their headlights on. Ensure that the strobe light is turned off once the helicopter has identified or flown over the landing site.

CAUTION **Do not face lights into the aircraft approach path. The light may diffuse on the windscreen and blind the pilot.**

5.6 Signals

Commonly used marshalling signals can be found on the NSWFB Aviation CD.

Appendix 1

NSWFB Passenger Manifest

Date:

Aircraft Type: **Aircraft callsign:**

Point of Departure: **Time of Departure:**

Point of Destination: **Estimated Time of Arrival:**

Number	Rank	Name	Station	Pltn.

NSW FIRE BRIGADES

Standard Operational Guidelines

POST INCIDENT MANAGEMENT

Section Seventeen

2 OPERATIONAL ANALYSIS (POST INCIDENT)

2.1 Introduction

2.1.1 Operational Analysis (Post Incident) is a process whereby a written report highlighting an issue or issues at an incident debrief will enable recommendations and actions to be documented.

2.1.2 The process is not intended to lay blame or to criticise individual performance, but review the organisational performance to enable actions to be taken to improve deficiencies, and to recognise areas of strength.

2.1.3 Lessons learnt from the analysis can be integrated into the Prevention, Preparedness, Response and Recovery (PPRR) phases of future incidents. This will enable a review of Command, Control, Co-ordination and Intelligence (C_3I), combined with operational strategies, tactics and tasks that will ensure improvements in operational effectiveness.

2.2 Application

2.2.1 The Operational Analysis (Post Incident) process applies to all operational incidents. Major debriefs and reports will be formally activated, however, this structure may be used for any incident.

2.2.2 Critical Incident Debrief (CID) application is separate to the Operational Analysis process as the CID process is to manage critical incident human issues (*SOG 17.3 CID*), and reduce the personal impact of incident exposure.

2.3 Process

2.3.1 The team conducting the operational debrief should ensure that all personnel attending the briefing fully understand the reason and scope of the briefing.

2.3.2 The formal debriefing process and report should be conducted and compiled by person/s that were not involved in the incident.

2.3.3 The format of the debrief should be consistent with the contents of the written report detailed in para 2.4.3 and the bullet points listed under 2.7 to 2.12 inclusive.

2.3.4 If there is a single operational debrief that includes all personnel attending the incident then the first attending crew should start the debriefing discussion.

2.3.5 Due to the sheer size of some incidents it is not always possible to conduct a single operational debrief. When this occurs, phased debriefing should be considered in conjunction with the CID process, however, the operational debrief should be conducted separately to the CID. These debriefs may be best carried out at the incident as part of the demobilisation plan.

2.4 Written Report

2.4.1 The Operational Analysis and data collection process should endeavour to address each subject heading and sub points listed, but should not be restricted to only the items listed.

2.4.2 The Operational Analysis and report is to be developed with reference to: *Australasian Fire Authorities Council (AFAC) - National Fire Curriculum Learning Manual 5.05 Operational Analysis.*

2.4.3 The report should be structured in accordance with the following sections:

Table of Contents;

1 Summary;

2 Scope;

3 Incident Description;

4 Prevention/Preparedness;

5 Response;

6 Recovery;

7 Co-ordination;

8 Other Issues;

9 Recommendation/Actions Plans; and

Signature/Approval

2.5 Summary

2.5.1 Within Section 1 summarize all sections of the report.

2.6 Scope

2.6.1 Within Section 2 detail the following:

- objective of report;
- limitations/assumptions; and
- process of data collection.

2.7 Incident Description

2.7.1 Within Section 3 detail the following:

- narrative description of incident;
- incident details relating to:

  type - photographs, drawings and diagrams attached as at appendix.

  date, time - incident log attached as an appendix.

  location - map attached as an appendix.

  casualties, fatalities - provide details as an appendix.

  resources - statistical summary in the form of personnel and appliances attached as appendices.

2.8 Prevention/Preparedness

2.8.1 Within Section 4 detail the following:

Prevention

- prevention plans; and
- fire safety approvals - building drawings.

Preparedness/Planning

- pre-incident plans;
- scenario planning;
- evacuation plans;
- emergency management/disaster plans;
- mutual aid agreements (MAA); and
- training.

2.9 Response

2.9.1 Within Section 5 detail the following:

Initial Response

- circumstances leading up to the incident;
- notification;
- turnout;
- standard resource allocation;
- pre-determined attendance (PDA); and
- pre-planned mutual support and notification procedures.

Incident Appreciation/Initial Incident Action Plan

- information collection (on-site);
- incident appreciation - size up;
- action plan preparation - RECEO;
- safety considerations - hazards and risks;
- evacuation;
- initial attack strategies;
- resources requested;
- deployment of personnel/equipment;
- briefing of personnel; and
- communications - information flow and support from communication centres.

Incident Control

- controlling authority;
- liaison and co-ordination with local emergency management structure, other combat agencies, support agencies and other organisations;
- Incident Management Team (IMT);

  - Incident Controller, Operations Officer, Planning Officer, Logistics Officer, Safety Officer, Divisions, Sectors etc...;
- incident management structure control

  - location of incident control centre, incident co-ordination centre;
- IMT meetings, shift duration, changeovers;
- incident action plan

  - strategies, process to develop, communication to enable tactics and tasks to be developed and implemented.

Planning

- situation

  - mapping, technical drawings/diagrams, weather, SITREPs;
- resources

  - personnel, appliances, deployment plan, relief plan, demobilisation plan, equipment, plant;
- management support

  - office support, control centre facilities/layout;
- information

  - management of media, media releases;
- technical specialist

  - tasks/purpose, requests, approval, deployment, stand down;
- action planning

  - situation analysis, incident action plan - development, briefings.

Operations

- operations incident structure - command

  - sectorisation, forward control points, strike team management, staging areas, assembly areas etc.;

- incident action plans

  - mapping, weather information, site information, briefing/debriefing;

- tactics/tasks

  - development, communication of strategies, tactics and tasks, methods used, effectiveness;

- safety considerations;

- communications

  - disciplined use of command and sector channels;

- welfare of personnel

  - chaplain, refreshment, food, clothing;

- equipment

  - effectiveness of equipment used; and

- shift changeovers

  - briefing, shift duration, shift management, hot debriefing.

Logistics

- supply

  - inventory management, equipment, protective clothing, personal effects, consumables;

- facilities

  - incident control centre, accommodation, stores/workshop areas etc.;

- ground support

  - mechanical technicians, communications technicians, transport plan;

- communications

  - communication plan, operational and command channels, radios, telephones, information technology - computers;

- medical

  - medical plan, injuries, illness;

- catering

  - catering plan; and

- finance

  - financial management, cost analysis attached as an appendix.

2.10 Recovery

2.10.1 Within section 6 detail the following:

Post Incident Management

- operational debriefing process;
- CID;
- equipment recovery process;
- environmental management; and
- incident site management handover.

2.11 Co-ordination

2.11.1 Within Section 7 detail the following:

Emergency Management

- multi-agency incident management structure; and
- integration of ICS across all agencies.

State Co-ordination/Major Incident Co-ordination Centre (MICC)

- activation of Major Incident Management Plan (MIMP);
- activation of MICC;
- role, structure, resourcing;
- use of plans;
- inter agency communication and co-ordination;
- effective support to incident from MICC - planning, logistics and operation;
- communications

  - established communications link to IMT, internal - through senior officers, operation updates to NSWFB personnel, communication to personnel's families (if required). External - ministry, media (if necessary) etc.;

- resource management/co-ordination state wide.

2.12 Other Issues

2.12.1 Within Section 8 detail the following:

- effectiveness of overall incident management - ICS, multi-agency etc.;
- development/review of legislation, regulations, policy, guidelines, procedures;
- training issues;
- community impact; and
- public perceptions/understanding.

2.13 Recommendation/Action Plans

2.13.1 Recommendations be identified to include timelines and management responsibilities to progress identified issues as action plans to resolve issues.

2.14 Signature/Approval

2.14.1 The Operational Analysis Report is to be submitted as a draft and marked without prejudice to DSO for discussion with the relevant Regional Commander prior to finalisation and signature/approval.

2.14.2 Acknowledgement is to be made to team members who conducted the operational debriefs and to personnel who were responsible for compiling the report.

NSW FIRE BRIGADES

Standard Operational Guidelines

INCIDENT/EMERGENCY SUPPORT

Section Eighteen

18.1 INCIDENT CREW MANAGEMENT SYSTEM

1 Introduction

The Incident Controller (IC) is responsible for ensuring that all personnel at incidents (including operational and non-operational personnel, and representatives of other agencies) can be located at all times. The IC must ensure that personnel are monitored to a level appropriate for the tasks they are engaged in.

The Incident Crew Management System (ICMS) is used to identify every person in attendance at an incident and record where they are. It is used to conduct regular checks to ensure that everyone at the scene can be located and checked.

2 Application

ICMS must be used at all incidents. It must also be used during major exercises and other activities, eg hazard reduction burns.

The ICMS does not replace SOG 9.4, Breathing apparatus control. When self-contained breathing apparatus is used at an incident, SOG 9.4, Breathing apparatus control, must be implemented in conjunction with the ICMS.

The ICMS consists of the following elements:

- an appliance tag carried on all major appliances showing the station number and type of appliance
- an ICMS board that is carried in senior officers' response vehicles
- a colour coded passport issued to each firefighter showing name, service number, barcode and photo identification.

3 Appliance tags

The appliance driver is responsible for ensuring that the appliance tag is hanging on its hook inside the appliance.

4 Passports

4.1 Permanent Firefighters

- attach your passport to the appliance tag as soon as you are rostered on an appliance
- if you are rostered on another appliance during the shift, transfer your passport to the new appliance
- at the end of shift, remove your passport from the appliance tag and clip it to your structural firefighter's helmet

4.2 Retained Firefighters

- attach your passport to the appliance tag when responding to an incident or attending any other activity with your appliance
- when responding to an incident in a private vehicle, immediately report to the IC on arrival and attach your passport to the appliance tag

- on return to station, remove your passport from the appliance tag and clip it to your structural firefighter's helmet.

4.3 Senior Officers

- attach your passport to your structural firefighter's helmet.
- on arrival at an incident, hand your passport to the ICMS Manager.

5 Responding to an incident or other activity

Before responding to an incident or leaving the station to undertake some other activity, the officer in charge of an appliance must ensure that:

- the passport of every responding firefighter is attached to the appliance tag
- there are no passports attached to the appliance tag belonging to firefighters not on the appliance.

⚠ **NOTE**

An appliance must not respond until the passports attached to the appliance tag match the firefighters on the appliance. If this is going to cause a significant delay, notify your Communication Centre immediately.

6 ICMS Stages

6.1 Stage 1 ICMS

- Stage 1 ICMS is implemented at all incidents and requires that appliance tags with attached passports are left on the appliances.
- ICMS remains at Stage 1 for incidents not attended by a senior officer.

6.2 Stage 2 ICMS

- the first arriving senior officer is responsible for implementing Stage 2 ICMS as soon as possible after assuming command
- the IC should delegate an officer to act as the ICMS Manager. One or more firefighters will be also tasked to assist the ICMS Manager to collect appliance tags with passports attached, update the ICMS board etc.

⚠ **NOTE**

If there are no available officers (eg Country zones), a firefighter will be delegated as ICMS Manager instead.

- where appliances may change location, for example Strike Teams for bushfire or during storm recovery operations, the appliance tags with passports attached must be brought to the relevant Control Point as soon as possible. This may be a Forward Command Point operated by the Strike Team Leader or a Fire Control Centre/SES Headquarters manned by the FRNSW Commander.
- if there are insufficient personnel to effectively implement Stage 2 ICMS, the IC must send a message to the Communication Centre promptly requesting the attendance of additional personnel to implement it.

- Communication Centres must ensure that any appliance responding to implement ICMS is notified that this is their designated task.

On arrival at an incident where Stage 2 ICMS is in operation, the officer in charge of an appliance must:

- report to IC or Operations Officer and give the appliance tag and attached passports to the ICMS Manager
- if responded directly to a specific location at the incident, report to the Sector Commander and notify the ICMS Manager by radio so that the appliance tag and passports can be collected
- if directed to report to the Staging Area, retain the appliance tags and passports on the appliance until deployed at the incident.

7 Role of the ICMS Manager

The ICMS Manager is responsible for:

- establishing the ICMS board at the Control Point
- collecting appliance tags, with passports attached, from appliances at the scene
- receiving appliance tags from arriving appliances
- allocating passports to non-operational personnel and representatives of other agencies authorised by the IC to enter the area of operations
- allocating the appropriate appliance tags to the roles and sectors at the instruction of the IC
- communicating with Division and Sector Commanders on the tactical radio channel and monitoring the task radio channel for crew movements
- conducting ICMS checks with Division and Sector Commanders and crew leaders and recording the times that these are conducted
- providing updates on ICMS checks to the IC or Operations Officer as required
- returning the appliance tag to the officer in charge of an appliance when it leaves the incident.

8 Crew management

The most effective way to locate personnel and ensure operational safety is for all members of a crew to remain together. Splitting crews and/or unauthorised action (‘freelancing’) has contributed to many firefighter injuries and deaths.

9 Non-operational personnel

The IC is responsible for ensuring the health and safety of non-operational personnel at emergency incidents. ICMS boards include spare passports to be used for non-operational personnel authorised by the IC to assist with incident management or related activities.

After authorised non-operational personnel have been briefed by the IC they will be escorted to the ICMS board and their attendance, location and activities will be recorded by the ICMS Manager. Their names and agencies will be entered on the passport and attached to the ICMS board with the passports of the firefighters detailed to accompany them.

10 ICMS checks

ICMS checks are undertaken by the IC (Stage 1 ICMS) or the ICMS Manager (Stage 2 ICMS) to ensure that every person working at the incident is located and OK.

ICMS checks must be completed at all incidents:

- every 15 minutes, and
- whenever there is a sudden change in conditions at the incident, eg flashover, structural collapse, explosion, change in wind or weather, etc.

Regardless of the operation of ICMS, crew leaders are responsible for maintaining awareness of the location and activities of firefighters under their command.

ICMS checks may be conducted visually or by radio.

The following is an example of radio messages during an ICMS check:

R/T Channel	Message
Tactical	ICMS Manager to Sector Commander A, Crew ICMS Check
Task	Sector Commander A to SO 15 and SO 16, Crew ICMS Check
Task	SO 15 replying, SO and crew OK
Task	SO 16 replying, SO and crew OK
Tactical	Sector Commander A to ICMS Manager, Personnel in Sector A OK
Tactical/Task	(Repeat through the other Sectors where firefighters are working)
Tactical	ICMS Manager to IC, ICMS check completed at this time

If a person is not contacted or located during a check:

- the ICMS Manager must notify the IC immediately
- the IC must mobilise the Rapid Intervention Team (SOG 18.2) immediately and inform the Communication Centre.

11 Leaving the incident

When an appliance is released from an incident, the officer in charge of the appliance must:

- check that the appliance tag is in the appliance, or collect the tag from the ICMS Manager
- check that the passports attached to the appliance tag belong to the firefighters on the appliance.

If the passports do not match, start an investigation immediately.

18.1 INCIDENT CREW MANAGEMENT SYSTEM

The Incident Crew Management System (ICMS) *identifies* every person attending an incident and *records* where they are. ICMS must be used at *all incidents*, plus major exercises and other activities (such as hazard reduction burns).

ICMS Stage 1

Implemented at *all incidents*.

- ☐ Leave appliance tags and attached passports on the *appliance*.
- ☐ Incident Controller (IC) conducts *ICMS checks*.

ICMS Stage 2

Implemented once a *senior officer* attends the incident and assumes command as IC.

- ☐ IC appoints an officer as ICMS Manager, with crew to assist.

ICMS Check

Conduct ICMS check – visually or by radio:

- ☐ Every 15 minutes, and
- ☐ Whenever there is a sudden change in incident conditions – eg structural collapse, flashover, explosion, change in wind or weather, etc.

⚠ **NOTE**

If a person cannot be located, activate the Rapid Intervention Team (RIT).

ICMS Manager role

Set up Stage 2 ICMS:

- ☐ Establish the *ICMS board* at the Control Point.
- ☐ Collect *appliance tags* with *passports attached* from every appliance at the incident. Receive appliance tags from arriving appliances.
- ☐ Allocate passports to non-operational NSWFB personnel, and representatives from other agencies authorised by the IC to enter the hot zone.
- ☐ Allocate appropriate appliance tags to the roles and sectors as instructed by the IC.
- ☐ When an appliance leaves the incident, return the appliance tags to the officer-in-charge of the appliance.

Monitor and check crew movements:

- ☐ Communicate with Division and Sector commanders and crew leaders on the tactical channel. Monitor the task channel for crew movements.
- ☐ Conduct *ICMS checks* with Division and Sector commanders and crew leaders. Record the time each check was done.
- ☐ Provide the Incident Management Team with updates on ICMS checks as required.

18.2 RAPID INTERVENTION TEAMS

1 Introduction

Incident Controllers (ICs) must ensure that they have sufficient resources at incidents to rescue trapped or injured firefighters promptly.

A Rapid Intervention Team (RIT) is a dedicated crew of firefighters with a leader, which is equipped and prepared to respond immediately to rescue firefighters.

2 Application

The IC must ensure that a RIT is established in the following situations:

- structure fires where a marginal or offensive fire fighting strategy is in use, ie firefighters are conducting search and rescue or internal fire attack
- hazardous material incidents where firefighters are working in the hot zone wearing chemical spillage clothing or fully encapsulated suits
- other incidents (eg confined space operations) or exercises where firefighters may operate in hazardous conditions or at the discretion of the IC.

3 Types of RIT

Two types of RIT may be established, depending on the resources available:

- initial RIT
- full RIT

3.1 Initial RIT

An initial RIT is established at small incidents where up to four pumpers are in attendance or in the initial stages of a larger incident.

- the RIT must consist of at least two personnel, eg IC and pump operator. Members of the RIT may be engaged in other activities outside the involved structure or hazardous area, eg, operating the pump
- the initial RIT must monitor the location and activities of the firefighters working in the hazardous area, visually or by radio
- members of the initial RIT must have the appropriate personal protective equipment (PPE), self-contained breathing apparatus (SCBA) and portable radios nearby so that they may be donned quickly
- if the initial RIT must enter the hazardous area to rescue trapped or injured firefighters, they must request additional assistance from the ComCen.

3.2 Full RIT

A full RIT is deployed where five or more pumpers are in attendance and firefighters will be entering a hazardous area.

Where a RIT is required in the greater Sydney area, Newcastle, Illawarra, Central Coast and Lake Macquarie, an additional pumper should be requested. The ComCen must inform the responding crew that they are being responded as a RIT and confirm the response with the IC.

In other areas of NSW, the IC is responsible for forming the RIT, with a Captain or Deputy Captain assigned as the RIT Leader. If insufficient resources are available on-scene, the IC must immediately request the ComCen to dispatch the necessary appliances.

NOTE: Depending on the size and complexity of an incident, the IC may need more than one RIT to respond quickly to crews working in hazardous locations.

- a full RIT consists of a leader (an officer when possible) and three fire fighters
- the RIT must be positioned with the necessary equipment (Section 5) so that they can rescue trapped or injured firefighters if required
- the RIT should not be tasked with firefighting or related incident control activities. If the IC authorises this, then that team should be immediately replaced with another RIT.

4 Command and control

The RIT Leader reports to the IC or Operations Officer (OO) if one has been appointed. The RIT Leader must maintain radio contact with the IC or OO on the tactical talk group at all times.

RIT members must maintain radio contact with the RIT Leader at all times.

5 Equipment

The RIT must assemble the necessary equipment and PPE for the type of incident and operations being conducted. This equipment is placed in a convenient location immediately outside the hazardous area and PPE partially donned to enable the RIT to deploy quickly.

For a structure fire this PPE and equipment will include as a minimum:

- structural Fire Fighting Ensemble
- portable radio
- SCBA (Extended Duration BA, if available)
- extension SCBA mask and 3m extension hose
- forcible entry tools (eg Rapid Intervention Kit, Hooligan Tool, sledge hammer)
- charged hoseline to support search and rescue
- thermal imaging camera if available (*SOG 15.1*), and
- Stokes Litter if available.

For a hazmat incident this PPE and equipment will include as a minimum:

- chemical spillage clothing or fully encapsulated suits in accordance with the substances involved
- portable radio
- SCBA

- extension SCBA mask and 3m extension hose, and
- Stokes Litter if available.

NOTE: Specialist or rescue personnel should not be used to stand-by as members of a RIT. If heavy or specialised rescue equipment is required to rescue trapped or injured firefighters, a fire rescue unit may be deployed to assist the RIT and will report to the RIT Leader.

6 Responsibilities of the RIT

The RIT must:

- report to the IC and consult the Safety Officer re the current risk assessment, most appropriate location for the RIT and the incident Communications Plan
- assemble the necessary equipment and PPE and stand-by at the nominated position
- monitor radio communications on both the tactical and task radio talkgroups
- maintain contact with BA Control and the ICMS Manager
- formulate rescue strategies if firefighters become trapped or injured
- while maintaining readiness to respond quickly to a firefighter down, the RIT can undertake any tasks that will support such rescue operations, for example:
  * survey the structure exterior to identify all means of firefighter egress
  * place ladders at secondary egress points for internal fire crews working on the upper levels of a structure
  * light egress points, if required.

NOTE: These tasks must be undertaken in consultation with the responsible Sector Commander or Operations Officer to ensure that they do not compromise firefighting operation. In undertaking these tasks, the RIT must ensure that they do not become involved in operations, but remain available to respond to trapped or injured firefighters as quickly as possible.

7 Activating the RIT

Any firefighter can activate the RIT. Prefix any notification of possible or actual trapped or injured firefighters with the phrase **'Red, Red, Red, Firefighter Down'**. The OO or IC should respond the RIT immediately but the RIT can respond itself and notify the OO or IC accordingly.

18.2 RAPID INTERVENTION TEAMS

A Rapid Intervention Team (RIT) is a *dedicated team of firefighters* at an incident, with a leader, equipped and prepared to respond immediately to *rescue* injured or trapped firefighters.

The Incident Controller (IC) is responsible for establishing a RIT.

Establishment

Establish a RIT for:

⇨ Structure fire incidents where a marginal or offensive fire fighting strategy is in use.

⇨ Hazardous material incidents where firefighters are working in the hot zone wearing chemical spillage clothing or fully encapsulated suits.

⇨ Other incidents (eg confined spaces) or exercises that could be hazardous.

Any firefighter can activate the RIT for *possible* or *actual* trapped or injured firefighters:

- ☐ Prefix notification with ***"Red, Red, Red, Firefighter down"***
- ☐ IC or Operations Officer must immediately direct the RIT to respond.

RIT may *self-respond* and notify the Incident Management Team.

Initial RIT

Initial RIT is required for *small incidents* where up to *four pumpers* attend, or in the initial stages of a larger incident.

RIT must have at least *two members* – eg IC and a pump operator.

- ☐ Monitor the location and activities of firefighters – visually or by radio.
- ☐ Have appropriate PPE and SCBA, with portable radios close by.
- ☐ If needed to respond, request assistance from the Communication Centre.

Full RIT

Full RIT is required for incidents where *five or more pumpers* attend and firefighters will enter the hazardous area.

RIT must have at least *four members* – a leader (officer if possible) and three firefighters.

- ☐ Report to the IC and consult with the Safety Officer. Be aware of the current risk assessment and the incident communications plan.

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- ☐ With the IC, determine the most appropriate location for the RIT. Assemble the necessary equipment, wear appropriate PPE, and stand by.
- ☐ Monitor radio communications on both tactical and task radio talkgroups.
- ☐ Formulate rescue strategies for firefighter trapped or injured scenarios.
- ☐ Undertake tasks that will support such rescue operations – eg identify all means of firefighter egress, place ladders at secondary egress points, provide lights for egress points.

⚠ **NOTE**

Do not undertake firefighting or incident-related activities. If the IC authorises this, the team must be replaced with another RIT.

Full RIT equipment

Structural incident:

- ☐ structural firefighting ensemble
- ☐ portable radio
- ☐ SCBA (extended duration BA if available)
- ☐ SCBA extension mask and extension hose
- ☐ forcible entry tools
- ☐ charged hoseline
- ☐ thermal imaging camera
- ☐ Stokes Litter

Hazmat incident:

- ☐ chemical spillage/FE suit
- ☐ portable radio
- ☐ SCBA
- ☐ SCBA extension mask and extension hose
- ☐ Stokes Litter

18.3 INCIDENT GROUND REHABILITATION

1 Introduction

The purpose of incident ground rehabilitation is to minimise firefighter injury and illness from stress, fatigue and dehydration by providing relief from hot and cold environments, physical and mental rest, food and fluids, health monitoring, and treatment if required.

2 Application

Incident ground rehabilitation applies at all emergency incidents and training exercises involving strenuous physical activity, long duration activities, or severe environmental conditions.

3 Levels of rehabilitation

There are two levels of incident ground rehabilitation:

- **Level 1 Rehab** – recommended for small incidents not requiring the response of a specialist incident ground rehabilitation capability. Level 1 Rehab uses equipment carried on front line firefighting appliances. Generally, the Incident Controller (IC) manages Level 1 Rehab.
- **Level 2 Rehab** – recommended for:
  - long duration incidents
  - in circumstances where crew rotation is limited
  - hot and dry, or cold and wet, conditions
  - where working conditions are arduous
  - where breathing apparatus usage and rotation is high, or
  - where conditions are such that specialist incident ground rehabilitation capabilities are required.

  Generally, the IC appoints a dedicated Rehabilitation Officer for these incidents.

4 Responsibilities

The **Incident Controller** is responsible for:

- Establishing incident ground rehabilitation.
- Assessing the level of rehabilitation required.
- Ensuring that fresh crews are available to relieve fatigued crews.
- Ensuring that fatigued crews are rested and rehabilitated before being re-tasked.
- Appointing a Rehabilitation Officer if required.

The **Incident Controller** (for incidents requiring Level 1 Rehab) **or Rehabilitation Officer** (for incidents requiring Level 2 Rehab) is responsible for:

- Selecting an appropriate site for a Rehabilitation Area.
- Managing the Rehabilitation Area.
- Obtaining resources required to staff and operate the Rehabilitation Area.

Where appointed, the Rehabilitation Officer reports to the Incident Controller or Logistics Officer. The Rehabilitation Officer should consult with the Safety Officer.

Firefighters are responsible for:

- Drinking adequate fluid to ensure that they are well hydrated on arrival for duty, throughout the working day, and at incidents.
- Eating healthy, nutritious meals at regular intervals, to ensure that they have adequate energy levels.
- Liaising with the Rehabilitation Officer or Health Officer on their levels of fatigue and sense of wellbeing.
- Being aware of the effects of personal medication – such as antihistamines (eg Actifed, Benadryl), diuretics, or stimulants – that may impair the body's ability to perspire.

5 Response of rehabilitation vehicles/trailers – Level 2 Rehab

In the Greater Metropolitan Area – the rehabilitation vehicle, when available, is generally responded to fourth alarm incidents and above. The rehabilitation vehicle can also be special called by the IC.

In regional areas – the IC can request the response of a rehabilitation vehicle/trailer, when available, for long duration incidents.

6 Planning rehabilitation operations

As the incident progresses, the IC or Rehabilitation Officer if appointed must continually reassess the need for rehabilitation.

If an incident goes on for longer than originally estimated, additional rehabilitation resources may be required.

As an incident winds down and the number of firefighters at the scene decreases, the Rehabilitation Area can be scaled back.

⚠ **NOTE**

The Rehabilitation Officer must obtain the IC's approval before reducing the rehabilitation capability.

7 Location

The Rehabilitation Area must be located:

- In the cold zone (upwind, uphill).
- Far enough away from the combat site so that personnel can safely remove their personal protective equipment (PPE) and self contained breathing apparatus (SCBA) to promote rest.

⚠ **NOTE**

Firefighters wearing SCBA must pass through BA Control before moving to the Rehabilitation Area.

- Far enough away from the combat site to be protected from sudden changes in the magnitude of the incident.

- Close enough to allow prompt re-entry to the operation after adequate recuperation.
- Away from hazards such as falling tree limbs, flying debris, structural collapse.
- In an area accessible by health personnel and ambulances.

The Rehabilitation Area should be protected from:

- Exhaust fumes from all appliances, vehicles and equipment – including equipment involved in rehabilitation.
- Extreme environmental conditions.

In hot weather, it should be a cool, shaded area exposed to any available breeze. In cold weather, it should be warm and dry.

⚠ **NOTE**

The IC or Rehabilitation Officer, if appointed, should maintain an awareness of changing weather conditions.

8 Resources required

Level 1 Rehab

The IC is responsible for obtaining the resources necessary to staff and operate the Rehabilitation Area effectively. Front line firefighting appliances carry many of these resources. If additional resources are required, the IC may have to source them locally, or consider requesting a Level 2 Rehab capability.

Resources that may be required include:

- Antiseptic hand rub and other washing facilities
- Bottled water, refreshments and meals in accordance with the *Hydration and nutrition policy*
- Means of providing cooling or heating – buckets of cool water, spare dry clothing
- Shelter from the elements – awnings, windbreaks
- Means of identifying the Rehabilitation Area – barrier tape, witches hats

Level 2 Rehab

The Rehabilitation Officer is responsible for obtaining the resources necessary to staff and operate the Rehabilitation Area effectively. The rehabilitation vehicle/trailers carry many of these resources. If the rehabilitation vehicle/trailer is not available, the Rehabilitation Officer may have to source them locally.

Resources that may be required include:

- Antiseptic hand rub and other washing facilities
- Bottled water, refreshments and meals in accordance with the *Hydration and nutrition policy*
- Means of providing cooling or heating – fans, buckets of cool water, Kore Kooler chairs, heaters, blankets, spare dry clothing (T-shirts, socks, gloves and flash hoods)
- Tables and chairs
- Shelter from the elements – awnings, windbreaks
- Means of identifying the Rehabilitation Area – eg barrier tape, witches hats

9 Work/rest cycles

Firefighters must constantly monitor their own level of fatigue and sense of well being, and report any concerns. As a guide, after the depletion of one BA cylinder or 20 minutes of intense work (without SCBA), firefighters should rest and rehydrate.

Level 1 or Level 2 Rehabilitation must be considered after:

- the depletion of two BA cylinders
- each wear of a fully encapsulated suit, or
- 40 minutes of intense work without SCBA.

Rehabilitation should last at least 20 minutes. The IC may vary work/rest cycles to suit environmental conditions or an individual firefighter's condition.

10 Entering the Rehabilitation Area

Before entering the Rehabilitation Area:

- Remove SCBA, helmet, flash hood, gloves, structural firefighting or bushfire coat and overtrousers.
- Wash hands with antiseptic rub.

11 Cooling techniques

Use the following active methods to cool your body:

- Remove as much of your PPE as appropriately possible.
- Completely immerse forearms and hands in water (temperature range between ambient temperature and 10°C) for 10-20 minutes.
- Apply cool water to your arms and neck:
  - Where there is Level 2 Rehab, use the rehabilitation vehicle's Kore Kooler chairs, which have cool water bags in the armrests.
  - Put paper towels soaked in cool or ice water around your neck and wrist.
  - Run cool water over your wrists.
  - Put your hands/wrists in buckets of cool water.
- Rest in the shade.
- Stand in front of a fan or in a breeze.

⚠ **NOTE**

Dry excess water and perspiration from your skin before re-donning PPE.

12 Warming techniques

In cold weather, establish the Rehabilitation Area in warm areas with heaters. Where possible, remove wet socks, gloves, T-shirts and flash hoods, and replace with dry clothing.

13 Closing down the Rehabilitation Area

Where Level 2 Rehab is established, the Rehabilitation Officer is responsible for accounting for rehabilitation equipment and taking stock of all consumables. Quantities used must be documented for replacement.

18.3 INCIDENT GROUND REHABILITATION

A *Rehabilitation Area* must be established at all emergency incidents and training exercises involving strenuous physical activity, long duration activities, or severe environmental conditions.

Levels of rehabilitation

Level 1 Rehab

- ⇨ Established at small incidents.
- ⇨ Uses equipment carried on front line appliances.
- ⇨ Generally managed by the Incident Controller (IC).

Level 2 Rehab

- ⇨ Established at long duration incidents, or where conditions are such that specialist incident capabilities are required.
- ⇨ Generally managed by a dedicated Rehabilitation Officer, appointed by the IC.

Rehabilitation vehicle/trailer

- ⇨ For Level 2 Rehab.
- ⇨ In the Greater Metropolitan Area – rehabilitation vehicle (when available) responded to *fourth alarm incidents* and above. Can also be *special called* by the IC.
- ⇨ In regional areas – rehabilitation vehicle/trailer (when available) can be *requested* by the IC.

Rehabilitation Area

- ☐ In the *cold zone* – upwind, uphill.
- ☐ *Far enough away* from the combat zone so personnel can safely remove PPE and SCBA; protected from sudden changes in the magnitude of the incident.
- ☐ *Close enough* to allow prompt re-entry after recuperation.
- ☐ *Away from hazards* – falling tree limbs, flying debris, structural collapse.
- ☐ *Accessible* to health personnel and ambulances.
- ☐ *Protected* from exhaust fumes and extreme environmental conditions.
- ☐ In *hot weather*, cool and shaded, exposed to available breezes; in *cold weather*, warm and dry.

Firefighters must be sent to the Rehabilitation Area for rest and rehabilitation if they have:

- ⇨ Worked in BA for *two cylinders*,
- ⇨ Worn an *FE suit*, or
- ⇨ Undertaken intense physical work without BA *for 40 minutes*.

Fatigued firefighters are not required to return to operations before they are well rested, well hydrated and released from the Rehabilitation Area.

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Before entering the Rehabilitation Area, firefighters must:

- ☐ *Remove* SCBA, helmet, flash hood, gloves, structural firefighting or bushfire coat, and overtrousers.
- ☐ *Wash hands* with antiseptic rub.

⚠ **NOTE**

Firefighters wearing BA must pass through BA Control *before* moving to the Rehabilitation Area.

Rehabilitation Officer role

- ☐ Select an appropriate site.
- ☐ Manage the Rehabilitation Area.
- ☐ Obtain resources required to staff and operate the area.
- ☐ Report to the IC or Logistics Officer. Consult with the Safety Officer.
- ☐ Release firefighters from the Rehabilitation Area after they are rested and hydrated.
- ☐ Continually assess the need for rehabilitation – *obtain additional resources* if the incident goes on for longer than estimated; *scale back* as the incident winds down (with the IC's approval).
- ☐ When the Rehabilitation Area is closed, account for equipment and consumables used – note for replacement on return to station.

Resources

The following resources may be required in the Rehabilitation Area:

- ☐ Antiseptic hand rub and other washing facilities
- ☐ Bottled water, refreshments and meals
- ☐ Tables and chairs
- ☐ Cooling or heating equipment
- ☐ Blankets, towels, spare dry clothing
- ☐ Shelter from the elements
- ☐ Means of identifying the Rehabilitation Area

Cooling techniques

Ways to cool include:

- ⇨ Remove as much PPE as appropriate.
- ⇨ Completely immerse forearms and hands in water (temperature range between ambient and 10^{o}C) for 10-20 minutes.
- ⇨ Apply cool water to arms and neck.
- ⇨ Rest in the shade.
- ⇨ Stand in front of a fan or in a breeze.

Warming techniques

- ⇨ In cold weather, establish Rehabilitation Area in warm areas with heaters.
- ⇨ Remove wet clothing and replace with dry clothing.

18.4 INCIDENT GROUND HEALTH MONITORING

1 Introduction

The purpose of incident ground health monitoring is to minimise the risk of firefighter injury and illness on the incident ground, with a focus on management of heat stress and cardiovascular risk.

Monitoring is undertaken to:

- ascertain job rotation and rest break sequencing
- provide health information to firefighters in order for them to manage their own safety and health
- assist Incident Controllers to ensure firefighters are fit to continue work that is likely to be arduous and/or prolonged, and
- assist Incident Controllers to provide adequate rest, rehabilitation, rotation and re-tasking.

The focus of incident ground health monitoring is to identify symptoms of heat stress, cold-related illnesses or cardiovascular risk that may lead to sudden incapacity or compromised health on the incident ground.

2 Application

This guideline applies to any incident or training exercise where NSWFB personnel are actively engaged at incidents or training exercises involving the wearing of breathing apparatus, strenuous physical activity, long duration activities, or severe environmental conditions (for example, extreme hot or cold conditions).

3 Activation of incident ground monitoring

The Communication Centre (ComCen) will notify the Ambulance Service of NSW to provide medical personnel for incident ground health monitoring for:

- Structure fire 3rd Alarm and above
- Hazmat incident 2nd Alarm and above
- Bushfire 4th Alarm and above.

If the Ambulance Service of NSW cannot provide appropriately qualified personnel in a timely manner, the ComCen will contact an alternative provider.

Incident Controllers, particularly in regional NSW, must also request the response of medical personnel for incident ground health monitoring for:

- Any incident where the Incident Controller believes incident ground health monitoring is necessary, or
- Anticipated multiple breathing apparatus wears.

The ComCen must notify the Incident Controller that the request has been made and the estimated time of arrival of the medical personnel.

4 What will be monitored

Medical personnel will use non-invasive techniques to monitor:

- Blood pressure
- Pulse rate
- Respiratory rate
- Core temperature
- SpO_2 (oxygen saturation)
- Irregular pulse (by ECG)

5 Rehabilitation and return to operations

Medical personnel will inform you of the results of the monitoring and whether you are fit to return to operations or whether you may require rest and rehabilitation.

Employees are reminded of their obligations and responsibilities under the Occupational Health and Safety Act 2000:

> ***20 Duties of employees***
>
> *(1) An employee must, while at work, take reasonable care for the health and safety of people who are at the employee's place of work and who may be affected by the employee's acts or omissions at work.*
>
> *(2) An employee must, while at work, co-operate with his or her employer or other person so far as is necessary to enable compliance with any requirement under this Act or the regulations that is imposed in the interests of health, safety and welfare on the employer or any other person.*

If you are deemed fit for operations after rehabilitation (rest, hydration, rotation, re-tasking), no information is required by the Incident Controller other than that you are available for tasking.

6 If you are unable to resume operations by the conclusion of the incident

6.1 Notifications

If medical personnel consider that your symptoms indicate a risk of sudden incapacity and you are not fit to resume operations by the conclusion of the incident, you should follow the instructions of the medical personnel and inform the Incident Controller.

⚠ **NOTE**

The Incident Controller does not require specific details of the medical information and need only be informed that you are not fit to continue.

The Incident Controller must:

- ensure that arrangements are made for the firefighter to receive appropriate medical attention
- ensure that the ComCen is notified
- arrange a replacement, if required
- ensure that the firefighter is transported to their station, home or a medical facility as appropriate, and
- ensure a *Notification of injury, illness, exposure or near miss (NIIENM) form* is submitted and the Health and Safety Branch is notified.

6.2 Immediate medical treatment

If you require immediate treatment at hospital, the medical personnel will arrange transport.

The Incident Controller must be notified immediately if any firefighter is transported to hospital.

6.3 Return to work during the shift

Unless the firefighter requires transportation to hospital, and subject to medical advice, the firefighter must remain at work for the duration of the incident and shift or until dismissed from duty.

6.4 Return to duty

If you are unable to complete the shift or return to operational duties before the completion of the incident, you must obtain a medical clearance from your treating doctor or the Brigades Medical Officer before you will be allowed to return to full duties.

NOTE

If the medical clearance is from your own doctor, it must be checked and approved by the Brigades Medical Officer.

The NSWFB will pay all costs associated with any assessment required for clearance to return to operational duties.

18.4 INCIDENT GROUND HEALTH MONITORING

Health monitoring occurs at incidents or training exercises – those involving the wearing of breathing apparatus, strenuous physical activity, long duration, or severe environmental conditions – in order to minimise the risk of firefighter injury and illness.

Health monitoring:

- ⇨ Focuses on identifying symptoms of *heat stress, cold-related illnesses* and *cardiovascular risk* that may lead to sudden incapacitation or compromised health on the incident ground.
- ⇨ Assists the Incident Controller (IC) to provide adequate rest, rehabilitation, rotation and re-tasking of firefighters.
- ⇨ Is carried out by *medical personnel* from the *Ambulance Service of NSW*, or an alternative external provider.

The ComCen notifies the *Ambulance Service of NSW* to provide medical personnel for:

- ⇨ Structure fire, 3rd Alarm and above
- ⇨ Hazmat incident, 2nd Alarm and above
- ⇨ Bushfire, 4th Alarm and above

The IC can also request incident ground health monitoring for any incident where it is felt necessary.

Role of medical personnel

- ☐ Use *non-invasive techniques* to monitor blood pressure, pulse rate, respiratory rate, core temperature, SpO_2 (oxygen saturation), and irregular pulse (by ECG).
- ☐ Inform the firefighter of the *results* and whether they are fit to return to operations, or require rest and rehabilitation.
- ☐ If a firefighter needs medical treatment at hospital, arrange transport.

⚠ **NOTE**

The IC does not require specific details of medical results – just whether a firefighter *is* or *is not* fit for return to operations after rehabilitation.

Firefighter – not fit for operations

If not fit for operations, firefighters must:

- ☐ Follow instructions from medical personnel.
- ☐ Ensure that the IC is informed.
- ☐ Subject to medical advice, remain at work for the duration of the incident and shift, or until dismissed from duty.

The IC must:

- ☐ Ensure that the firefighter receives appropriate medical attention.
- ☐ Notify the ComCen.
- ☐ Arrange a replacement, if required.
- ☐ Ensure that the firefighter is transported to their station, home, or a medical facility as appropriate.
- ☐ Ensure that a NIIENM form is completed and submitted, and Health and Safety Branch informed.

If unable to complete the shift or return to operational duties before completion of the incident, firefighters must obtain a *medical clearance* before being returning to full duties. This can be obtained from:

- ⇨ the Brigades Medical Officer, or
- ⇨ the firefighter's own doctor, checked and approved by the Brigades Medical Officer.

NSW FIRE BRIGADES

Standard Operational Guidelines

EMERGENCY MANAGEMENT

Section Nineteen

1 DISASTER PLANNING AND RESPONSE

1.1 Introduction

1.1.1 The NSWFB has the capability, through its strategically located resources, to assist the community at many different types of emergencies. Major natural and technological disasters can occur at any time, and by their nature may overwhelm normal capabilities of the emergency services.

1.1.2 This Standard Operational Guideline deals mainly with measures which may have to be implemented, particularly in the major population centres of Sydney, Newcastle, and Wollongong during or after a disaster such as an earthquake, tsunami, cyclone, terrorist act, widespread riots, explosion, catastrophic technological accident, or meteorite impact. The SOG can also be modified to other situations such as major bushfires (see *SOG 3.1 to 3.7* inclusive). Country stations may also be faced with such situations and should adjust the procedures to suit their individual circumstances.

1.1.3 In the event of a major disaster, communications and other systems may be disabled and coordination will at best be difficult. Successful protection of the community will depend upon the resourcefulness of on-duty crews, who may have to operate alone with little information for an extended period.

1.1.4 This SOG assumes that a catastrophic event has occurred which will stretch NSWFB resources to the maximum. Transition to *Disaster Mode* (see para 1.4) includes the following key procedures:

- Immediate actions required to preserve operational response capabilities.
- Special communications procedures required in the event of Communications Centres (ComCens) being inoperable or disabled.
- Adjustment of response, command and control procedures to ensure continuing control of emergencies in the event of widespread devastation.
- Continuation of special procedures until expressly terminated by the Commissioner or a nominated Assistant Commissioner.

1.2 Emergency Management

1.2.1 Where an emergency is beyond the capacity of a designated Combat Agency, or where there is no designated Combat Agency, emergency management procedures detailed in the *State Emergency and Rescue Management Act*, *Local*, *District*, and *State DisPlans* are implemented.

1.2.2 The NSW Police Service will act as the Coordinating Authority.

1.2.3 The NSWFB will act under the direction of designated Emergency Controllers and command NSWFB operations using the Incident Control System (see *SOG 1.1*).

1.3 Command and Control

1.3.1 While the ICS provides a logical and structured approach to incident management, after a major disaster Station Commanders may not have access to the support of additional officers to set up an Incident Management Team.

1.3.2 Many decisions and judgements may have to be made without the benefit of information, support and advice which would normally be available to officers. This will require difficult decisions on prioritisation of tasks based upon risks and available resources.

Communications

1.3.3 After an earthquake or other major event, radio and telephone communications may be inoperable and ComCens disabled. It is also possible that the computer aided dispatch system and the 000 telephone system will be inoperable.

1.3.4 Simplex (mobile to mobile) radio communications should still be possible but this will be limited by range.

1.3.5 Station Commanders must endeavour by whatever means are available to contact the ComCen. If this proves impossible, attempts to contact the Operational Commander or other NSWFB units should be made. Station Commanders should attempt contact using:

- PABX;
- local exchange;
- radio - (1) local ComCen, or (2) another ComCen, or (3) Operational Commander;
- cellular phone; or
- E-mail.

1.3.6 By agreement with the Australian Broadcasting Commission (ABC), urgent NSWFB broadcasts will be made on designated radio stations during major emergencies or disasters. See Appendix 1 for lists of these radio stations and their coverage.

Injuries and Damaged Infrastructure

1.3.7 Fire stations, ComCens and fire appliances may be damaged or inoperable. On-duty firefighters could also be injured or trapped.

1.3.8 Water, power and gas reticulation systems may be damaged, causing fires, electrical hazards and depleted fire fighting water supplies. Use of static water supplies may be necessary. Each station should maintain a record of such sources.

1.3.9 Many buildings may be damaged and in a state of collapse, trapping people and causing fires.

⚠ **NOTE**

Following an earthquake, the danger of conflagration is possible and containment of fires will be a major priority.

Logistics

1.3.10 Access to logistics support such as food and fuel may be difficult and innovative solutions may be required.

1.3.11 Support from other emergency services and NSWFB resources may not be immediately available.

1.3.12 Relief crews may also be cut off or unavailable, requiring crews to continue working beyond their normal hours of duty.

1.4 Disaster Mode

Initial Actions - ComCen

1.4.1 Upon becoming aware of a catastrophic event over a wide area which will require a large coordinated response, the responsible ComCen will initiate *Disaster Mode*. The following actions are required:

- The ComCen will advise by group broadcast on all local radio frequencies that *Disaster Mode* has been invoked.
- This information will also be simultaneously communicated via fire station equipment (FSE) and pagers to key personnel.
- The Response Coordinator, at Operational Communications, Sydney, local Police and Ambulance Services will be advised.
- Degraded response levels in accordance with para 1.5 will be initiated.

1.4.2 Where the local ComCen is disabled or out of action, another ComCen should carry out the initial actions detailed in para 1.4.1.

Response Coordinator

1.4.3 The Response Coordinator, Operational Communications Sydney, will carry out the following actions on initiation of *Disaster Mode:*

- Notify the Commissioner, Director State Operations (DSO), Assistant Commissioners and Directors.
- Initiate other necessary notifications.

- Determine the need for response of support resources to the disaster area, such as Incident Control Vehicle (ICV), rescue appliances, bulk water tankers, Strike Teams, and Urban Search and Rescue (USAR) reconnaissance party (see *SOG 11.5*) or Task Force.

- Arrange for aircraft as necessary to transport specialised personnel, resources, and to carry out reconnaissance. Aerial reconnaissance will be an immediate priority.

- Prepare for activation of the Major Incident Coordination Centre (MICC) and in consultation with Manager State Operations (MSO), recall key staff to operate the MICC.

- In consultation with MSO, arrange for command staff to take up positions as required at incident sites, other services' control centres, and Emergency Control Centres (ECC), including the State Emergency Operations Centre.

- Gather as much information as possible about the disaster from NSWFB and other sources.

- Consider the need for requesting Mutual Aid from the NSW Rural Fire Service (RFS) and/or interstate fire services (through the State Emergency Operations Controller), particularly where there are any doubts about water supplies, or access for Strike Teams from outside the affected area.

1.4.4 If Sydney Communications is disabled and the Response Coordinator is unable to carry out these functions, a Supervisor from another ComCen should do so.

On-Call Officers

1.4.5 Upon becoming aware of a disaster in the vicinity of their workplace (business hours) or residence (after hours), officers provided with NSWFB vehicles must make themselves available for duty, and where applicable carry out the following actions:

- Those officers with specialised coordination functions, such as MICC responsibilities, must endeavour to attend for duty.

- Other officers, such as Zone Commanders, should determine whether the greatest need for their services exists in their current vicinity, or in their normal work location.

- Where Operational Commanders are unable or are having difficulty carrying out status checks of stations, senior officers may be able to assist by relaying radio messages or even physically attending stations.

- Officers without specific duties should assist by gathering intelligence on the scope and scale of the disaster, and reporting this to a ComCen or the Operational Commander.

- Sydney Communications lists senior officers in pager groups according to place of residence. This facility will be used to advise senior officers of disasters/major emergencies in their locality.

Operational Commanders (on shift) and Country Zone Commanders

1.4.6 Upon becoming aware of a disaster within or adjoining their area of responsibility, Operational Commanders and Country Zone Commanders will:

- Determine the status of personnel, appliances and fire stations in their operational area.

- In the initial stages, and at least until status of stations in their area is ascertained, remain in a central location rather than respond to any incidents. The Operational Commander should gather intelligence on the overall scope of the disaster, including individual major incidents from Station Commanders.

- After considering resource and incident status, determine the need for assistance from the NSWFB and other services, including Mutual Aid from other fire services (interstate assistance must be requested through the State Emergency Operations Controller - SEOCon).

- Report resource needs to Operational Communications, Sydney (via local ComCen, if operable).

- Set up a command and control structure within the limitations of available permanent, retained and recalled personnel, and prioritisation of individual incidents.

- Make contact with local and district emergency operation controllers as appropriate.

Station Commanders

1.4.7 Upon becoming aware of a disaster within or adjoining their area of responsibility, Station Commanders will:

- Immediately check on the welfare of on-duty personnel and if necessary initiate first aid on NSWFB personnel.

- In the case of a retained Brigade, ensure that the Brigade is alerted and a crew made available for response at the fire station.

- Determine the serviceability of appliances and fire station. Should there be any doubts as to the structural integrity of the fire station, appliances will be immediately removed and personnel evacuated.

- Conduct a rapid size up of conditions in the immediate area of the fire station, paying particular attention to any sign of fire such as smoke plumes (daytime) or orange glow (night).

- Immediately after the safety of personnel has been secured, attempt to contact the ComCen or Operational Commander by radio, or whatever other means are available. Report status, availability and initial observations of the surrounding area.

Drive Through Assessment

1.4.8 When the Station Commander has determined station status, a rapid drive through assessment of the station area must be conducted as soon as possible.

1.4.9 This may be difficult if roads are damaged or blocked by rubble, and there may be many appeals for help. However, it is important in the initial period to (as far as possible) avoid becoming committed at an individual incident. An overview of conditions will be essential to enable responses to be properly prioritised. In practice this may prove to be very difficult as there may be numerous appeals for assistance.

1.4.10 Station Commanders should observe and act on the following:

- Saving of life, containment of fires, and initial containment of dangerous HazMat incidents are the top priorities. Where there are multiple fires, these should be prioritised on the basis of the likelihood of spread.

- Contact the ComCen or Operational Commander and communicate the results of the drive through assessment. If necessary, seek assistance in determining action priorities.

- If not ordered to respond elsewhere, commit resources to individual incidents according to priorities determined during the assessment.

- Where the Station Commander has responsibility on a local emergency management committee, endeavour to make appropriate contact.

NOTE

All stations should have predetermined drive through routes of their station areas which will enable a proper size up of conditions. A map should be kept in the appliance cabin at all times. It is possible that there will be no radio or telephone communication available. In this case, the only communication may be by simplex radio, limited by range. In such circumstances, successful operations will depend upon proper size up and initiative of individual fire crews.

Communications - Resource Status

1.4.11 Following initial impact of a disaster, the immediate focus will be on determining the status of NSWFB resources, and the scale of the disaster. This will be accomplished through a mandatory status check conducted by the ComCen, or where this is not possible by the Operational Commander. For example, the City of Sydney Operational Commander would first contact No. 1 Station, followed by No. 3 Station, No. 4 Station and so on.

1.4.12 Radio traffic will be restricted to urgent assistance messages and reporting of status only, until otherwise notified.

1.4.13 Station Commanders will contact the ComCen or Operational Commander as soon as possible and report:

- any firefighter injuries;
- serviceability of appliances;
- condition of fire station; and
- initial size up of disaster impact in vicinity of fire station.

1.4.14 Operational Commanders will determine the status of all fire stations within their area of responsibility as a first priority.

1.5 Degraded Response

Response Levels

1.5.1 In the event of a major disaster, the following priorities will guide operations of the NSWFB:

- assess the magnitude of the disaster quickly and accurately;
- protect life;
- protect property;
- protect the environment;
- evacuate endangered people; and
- assist with restoration of essential services such as water supply.

1.5.2 When in *Disaster Mode*, it will be necessary to prioritise calls for assistance, and in some cases not respond to calls.

Degraded Response Levels

1.5.3 The computer aided dispatch system has default response levels for most incident types, e.g. two stations to an initial report of structure fire.

1.5.4 In the event of a major emergency or disaster, there may be insufficient resources available to provide the normal response level, and in some cases it will be necessary to disregard calls not constituting an immediate threat to life or property.

Emergency Level Response

1.5.5 In the event of a major emergency where there is unusually high demand for NSWFB services resulting in increased response times, the Response Coordinator where possible, in consultation with DSO and Manager Operational Communications, may institute

Emergency Level Response in order to maintain response capabilities. If Sydney Communications is inoperable, the Supervisor from another ComCen will initiate *Emergency Level Response.*

1.5.6 *Emergency Level Response* will involve:

- Single station response to automatic fire alarms.
- Single station response to reported structure fires, unless numerous calls received.

NO RESPONSE to the following types of incident:

- Fire that had occurred - investigation.
- Lockouts.
- Leaking hydrants/sprinkler systems.
- Line faults on automatic fire alarms.
- Animal rescues.
- Fireworks.
- Alarm bell ringing (unless confirmed as a fire alarm).

Disaster Level Response

1.5.7 In the event of a major disaster the priorities of the NSWFB will be:

1. Control and containment of fires and saving of life.
2. Search and rescue operations in collapsed structures, including activation of USAR Task Forces (see *SOG 11.5*).
3. Containing hazardous materials incidents which constitute an immediate threat.
4. Rendering assistance to the Ambulance Service if requested, by providing basic life support (BLS) at mass casualty incidents.
5. Providing water for fire fighting in areas where reticulated systems have failed.
6. Recalling personnel to staff reserve appliances.

1.5.8 The DSO and Manager Operational Communications may invoke Disaster Level Response to preserve the NSWFB ability to meet its obligations. In the event that contact cannot be established with either of these officers, the Response Coordinator at Sydney Communications, or if unavailable, the Supervisor at another ComCen outside the affected area may have to make this decision. *Disaster Level Response* will involve single appliance response to all calls, and NO RESPONSE to the following types of calls:

- Automatic fire alarms (thermal and smoke) except residential and health care facilities.

- Domestic smoke alarms.
- Fire alarms monitored by security companies.
- Line faults on automatic fire alarms.
- **Partial** codes to sprinkler installations.
- Leaking hydrants/sprinkler systems.
- Fire that had occurred - investigation.
- Lockouts.
- Animal rescues.
- Fireworks.
- Alarm bell ringing.

Incident Strategies

1.5.9 The first priority during a disaster will be saving of life, containment of fires in order to avoid conflagration, and initial containment of HazMat incidents.

1.5.10 Should communications systems break down or many simultaneous incidents occur, crews may have to operate without the level of assistance and support they could normally expect.

1.5.11 Under these circumstances, fire fighting strategies may have to be adjusted to the circumstances to maximise effectiveness of limited resources. For example, unless a rescue is involved, defensive strategies should be employed at structure fires aimed at containing fire spread and protecting exposures, rather than internal attack. It may also be necessary to seek assistance from members of the public or other emergency services to use hose lines from portable pumps and hydrants, thus enabling the pumper and crew to respond to other fires.

1.5.12 HazMat strategies may have to be restricted to initial containment and restriction of access only.

1.6 Disaster Command and Control

Major Incident Coordination Centre

1.6.1 The Major Incident Coordination Centre (MICC) will be activated by the DSO in accordance with SOGs upon declaration of *Disaster Mode*. Where the disaster prevents this, a ComCen outside the affected area should undertake MICC functions to the best of its ability.

Emergency Management

1.6.2 The Commissioner will appoint an officer to represent the NSWFB at the State Emergency Operations Centre (located at the NSW Police Centre) when a disaster occurs or is imminent.

1.6.3 The officer will liaise closely with the DSO at the MICC and with the Commissioner.

1.6.4 The DSO, in consultation with the relevant Regional Commanders, will ensure that officers are appointed to operate at local and district EOCs as required.

On Scene Management

1.6.5 ICS will be used by the NSWFB to manage operations at incident scenes. Close liaison with other services is important.

MICC Structure and Responsibilities

1.6.6 The MICC will process information, ensure that key personnel including the Commissioner, Assistant Commissioners and Directors, are provided with regular updates, and will coordinate the provision of assistance and ordering of Mutual Aid.

1.6.7 The MICC may have to deal with and prioritise competing resource requests. The general structure and functional responsibilities detailed in Fig 1.1 will be implemented.

Crisis Management Team

1.6.8 The Commissioner will establish a Crisis Management Team comprising senior executives and seconded specialists.

1.6.9 The purpose of the team will be to look at aspects of recovery and threats to the organisation arising from the disaster, **not** operational issues.

1.7 Fire Station Readiness Contingency Plans

Purpose

1.7.1 Each fire station will develop and maintain a local operational readiness contingency plan outlining measures which may have to be instituted during, or subsequent to a disaster or major emergency, on the assumption that there may not be normal levels of support and infrastructure available.

1.7.2 In the event of a disaster, brigades will refer to their local operational readiness contingency plans for guidance, and implement contingencies as appropriate to the situation.

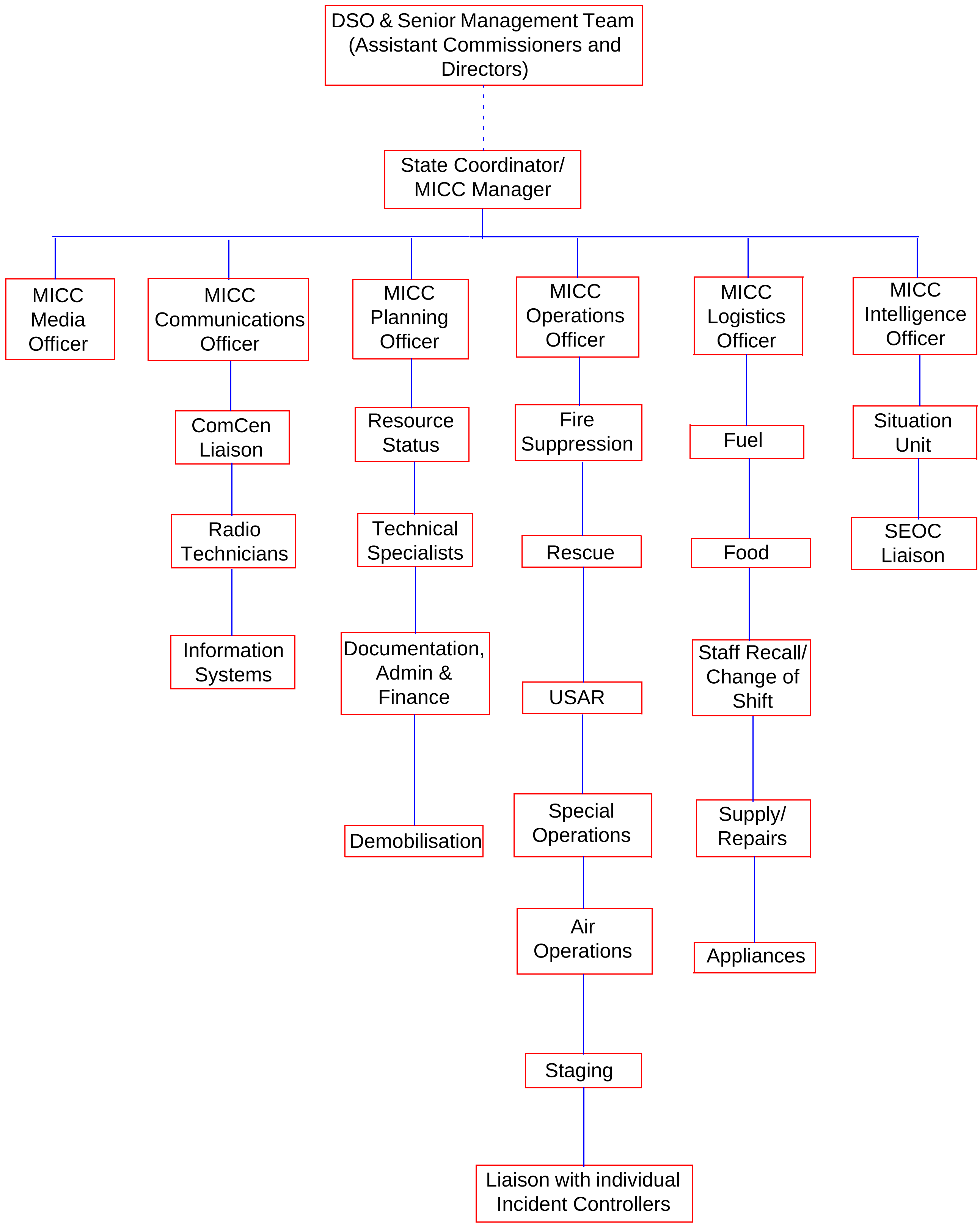

Fig 1.1 Major Incident Coordination Centre Structure

Appendix 1

⚠ **NOTE**

In Table 1A all radio frequencies in black type are FM. All frequencies in red type are AM. The frequencies shown indicate best reception with marginal reception shown in brackets.

LOCATION	LOCAL RADIO	RADIO NATIONAL	ABC CLASSIC FM	TRIPLE J
Albury	106.5/675	990	104.1	103.3
Appin	97.3	576	95.7	98.9
Armidale	101.9	720	103.5	101.1
Balina	94.5/738	96.9	95.3	96.1
Balranald	(594)	93.1		
Batemans Bay	103.5	105.1	101.9	
Bathurst	549	96.7	102.7	101.9
Batlow	109.1	89.1	88.3	(100.1)
Bega	810	100.9	99.3	100.1
Bellingen	92.3/684	99.5	97.9	91.5
Bermagui	103.5	100.9	(99.3)	100.1
Blayney	549	104.3	102.7	101.9
Blue Mountains	702/549	576	92.9/102.7	101.9/105.7
Bombala	94.1	100.9	99.3	100.1
Bonalbo	91.3	92.1		
Bourke	657			
Bowral	97.3	1431	95.7	98.9
Braidwood	103.5/666	846		
Brewarrina	657			
Broken Hill	999	102.9	103.7	102.1
Brunswick Heads	738/94.5	96.9	95.3	96.1

Table 1A ABC Radio Frequencies (NSW)

LOCATION	LOCAL RADIO	RADIO NATIONAL	ABC CLASSIC FM	TRIPLE J
Bulahdelah	1233	1512	106.1	102.1
Byrock	657			
Byron Bay	94.5/738	96.9	95.3	96.1
Camden	702/97.3	576	95.7/92.9	98.9/105.7
Campbelltown	702/97.3	576	95.7/92.9	98.9/105.7
Canowindra	549	104.3	102.7	101.9
Casino	94.5/738	96.9	95.3	96.1
Cessnock	1233	1512	106.1	102.1
Cobar	657/106.1			
Coffs Harbour	92.3	99.5	97.9	91.5
Collarenebri	648			
Condobolin	549	88.9		
Coolamon	89.9	89.1	88.3	90.7
Cooma	1602	95.3	(99.3)	100.1
Coonabarabran	107.1	107.9	105.5	102.3
Coonamble	107.1	107.9	105.5	102.3
Cootamundra	89.9	89.1	88.3	
Corowa	675	756	104.1	103.3
Cowra	549	104.3	102.7	101.9
Crescent Head	684	97.1	98.7	96.3
Crookwell	(549)	(576)		
Culcairn	106.5/675	990/102.1	104.1	103.3
Deniliquin	675	99.3	97.3	
Dorrigo	92.3	99.5	97.9	91.5
Dubbo	107.1	107.9	105.5	102.3
Dunedoo	107.1	107.9	105.5	102.3

Table 1A ABC Radio Frequencies (NSW)

LOCATION	LOCAL RADIO	RADIO NATIONAL	ABC CLASSIC FM	TRIPLE J
Eden	106.3	107.9	(99.3)	100.1
Emmaville	819	93.1		
Evans Head	738			96.1
Finley	675		104.1	103.3
Forbes	549	104.3	102.7	101.9
Forster	(95.5)/756	97.1	106.1	102.1
Gerrigong	97.3	603	95.7	98.9
Gilgandra	107.1	107.9	105.5	102.3
Glen Innes	819	(105.1)	(96.7)	
Gloucester	100.9	102.5	107.9/106.1	102.1
Goodooga	99.3	100.9		
Gosford	702/(1233)	576/1512	92.9/106.1	105.7/102.1
Goulbourn	90.3/666	1098		88.7
Grafton	738	99.5	97.9	
Grenfell	549/(101.9)	104.3	102.7	101.9
Griffith	100.5	98.9	97.3	
Gulgong	107.1			
Gundagai	89.9	89.1	88.3	90.7
Gunnedah	99.1	100.7	96.7	99.9
Guyra	101.9	720	103.5	
Harden	89.9	89.1	90.7	
Hay	88.1	88.9	97.3	
Hillston	675/100.5		97.3	
Holbrook	106.5/675	990/102.1	104.1	103.3
Huskisson	97.3	603	95.7	98.9
Inverell	99.1	100.7	96.7	99.9

Table 1A ABC Radio Frequencies (NSW)

LOCATION	LOCAL RADIO	RADIO NATIONAL	ABC CLASSIC FM	TRIPLE J
Invanhoe	106.1	107.7		
Jerilderie	675	94.1	(97.3)	
Jervis Bay	97.3	603	95.7	98.9
Jindabyne	95.5	97.1	(99.3)	100.1
Junee	89.9	89.1	88.3	90.7
Kandos	93.3			
Katoomba	702	576	(92.9)	(105.7)
Kempsey	684/92.3	97.1	97.9	91.5
Khancoban	89.7	91.3	88.1	
Kiama	97.3	1431/603	95.7	98.9
Kurri Kurri	1233	1512	106.1	102.1
Kyogle	94.5/738	96.9	95.3	96.1
Lake Cargellico	549		(97.3)	
Leeton	100.5	98.9	97.3	96.5
Lightning Ridge	92.1	93.7		
Lismore	94.5/738	96.9	95.3	96.1
Lithgow	1395	92.1		
Macksville	(92.3)/684	99.5	97.9	91.5
Maclean	94.5/738	96.9	95.3	96.1
Maitland	1233	1512	106.1	102.1
Manilla	648	100.7	96.7	99.9
Menindee	97.3	95.7		
Merimbula	810	100.9	99.3	100.1
Merriwa	101.9	103.5		
Milton	97.3	603	95.7	98.9
Mittagong	97.3	576	95.7	98.9

Table 1A ABC Radio Frequencies (NSW)

LOCATION	LOCAL RADIO	RADIO NATIONAL	ABC CLASSIC FM	TRIPLE J
Molong	549	104.3	102.7	101.9
Moree	99.1	100.7	96.7	99.9
Morisset	1233	1512	106.1	102.1
Moruya	103.5	105.1	101.9	
Moss Vale	97.3	576	95.7	98.9
Moulamein	102.1		(103.7)	(105.3)
Mudgee	99.5	104.3	102.7	101.9
Mullumbimby	738/94.5	96.9	95.3	96.1
Mungindi	99.1	100.7	96.7	99.9
Murrurundi	102.5	104.1		
Murwillumbah	94.5	96.9	95.3	96.1
Muswellbrook	1044/105.7	(1512)	106.1	102.1
Nambucca Heads	(684/92.3)	99.5	97.9	91.5
Narooma	103.5	105.1	101.9	
Narrabri	99.1	100.7	96.7	99.9
Narrandera	100.5/675	98.9	97.3	
Narromine	107.1	107.9	105.5	102.3
Nelson Bay	1233	1512	106.1	102.1
Newcastle	2NC1233	1512	106.1	102.1
Nowra	97.3	603	95.7	98.9
Nyngan	95.1			
Oberon	549	104.3	102.7	101.9
Orange	549	104.3	102.7	101.9
Parkes	549	104.3	102.7	101.9
Penrith	702	576	92.9	105.7
Picton	97.3	576	95.7	98.9

Table 1A ABC Radio Frequencies (NSW)

LOCATION	LOCAL RADIO	RADIO NATIONAL	ABC CLASSIC FM	TRIPLE J
Port Macquarie	(684/95.5)	97.1	98.7	96.3
Portland	94.1	92.5		
Queanbeyan	666	846	102.3	101.5
Quirindi	648	104.7	103.1	
Raymond Terrace	1233	1512	106.1	102.1
Richmond	702	576	92.9	105.7
Rylstone	93.3			
Scone	105.7			
Shellharbour	97.3	1431	95.7	98.9
Singleton	1233/1044	1512	106.1	102.1
South West Rocks	684	97.9	99.5	
Swansea	1233	1512	106.1	102.1
Sydney	2BL702	576	92.9	105.7
Talbingo	88.9	91.3	88.1	
Tamworth	648	104.7	103.1	94.7
Taree	95.5/756	97.1	98.7	96.3
Tea Gardens	1233	1512	106.1	102.1
Temora	89.9	89.1	88.3	90.7
Tenterfield	819	(106.4)	(101.7)	
Thredbo	88.9	90.5		
Tottenham	99.3			
Trangie	107.1	107.9	105.5	102.3
Trundle	549		102.7	101.9
Tumbarumba	92.5			
Tumut	97.9	99.5		
Tuncurry	756/95.5	97.1	98.7	102.1

Table 1A ABC Radio Frequencies (NSW)

LOCATION	LOCAL RADIO	RADIO NATIONAL	ABC CLASSIC FM	TRIPLE J
Tweed Heads	720/91.7	96.9	95.3	96.1
Ulladulla	97.3	603	95.7/101.9	98.9
Uralla	101.9	720	103.5	
Wagga Wagga (region)	89.9	89.1	88.3	101.1
Wagga Wagga (city)	102.7	104.3	105.9	101.1
Walcha	88.5	90.1		
Walgett	105.9	107.7		
Warialda	99.1	100.7	96.7	99.9
Warren	107.1	107.9	105.5	102.3
Wauchope	(684/95.5)	97.1	98.7	96.3
Wee Waa	648/99.1	100.7	96.7	99.9
Wellington	107.1/549	104.3	102.7	101.9
Wentworth	104.3	105.9	102.7	101.1/101.9
Werris Creek	648	104.7	103.1	
West Wyalong	549/(89.9)	(104.3)	(102.7)	(101.9)
White Cliffs	(1584)			
Wilcannia	1584	1485		
Windsor	702	576	92.9	105.7
Wollongong	97.3	1431	95.7	98.9
Woolgoolga	92.3	99.5	97.9	91.5
Wyong	702/(1233)	576/1512	106.1/92.9	102.1/105.7
Yamba	94.5/738	96.9	95.3	96.1
Yass	666/(89.9)	(846)	(102.3)	
Young	96.3	101.1	102.7/105.7	

Table 1A ABC Radio Frequencies (NSW)

DISASTER PLANNING AND RESPONSE

CHECK SHEET

The purpose of this Check Sheet is to provide details of the actions required by nominated personnel in response to a disaster being declared.

INTRODUCTION

- The NSWFB has the capability, through its strategically located resources, to assist the community at many different types of emergencies. Major natural and technological disasters can occur at any time, and by their nature may overwhelm normal capabilities of the emergency services.
- This Check Sheet deals mainly with measures which may have to be implemented, particularly in the major population centres of Sydney, Newcastle, and Wollongong during or after a disaster such as an earthquake, tsunami, cyclone, terrorist act, widespread riots, explosion, catastrophic technological accident, or meteorite impact. The Check Sheet can also be modified to other situations such as major bushfires. Country stations may also be faced with such situations and should adjust the procedures to suit their individual circumstances.
- In the event of a major disaster, communications and other systems may be disabled and coordination will at best be difficult. Successful protection of the community will depend upon the resourcefulness of on-duty crews, who may have to operate alone with little information for an extended period.
- This Check Sheet assumes that a catastrophic event has occurred which will stretch NSWFB resources to the maximum. Transition to *Disaster Mode* includes the following key procedures:

  - Immediate actions required to preserve operational response capabilities.
  - Special communications procedures required in the event of Communications Centres (ComCens) being inoperable or disabled.
  - Adjustment of response, command and control procedures to ensure continuing control of emergencies in the event of widespread devastation.
  - Continuation of special procedures until expressly terminated by the Commissioner or a nominated Assistant Commissioner.

DISASTER MODE - INITIAL ACTIONS

ComCen

- Upon becoming aware of a catastrophic event over a wide area which will require a large coordinated response, the responsible ComCen will initiate *Disaster Mode*. The following actions are required:

☐ The ComCen will advise by group broadcast on all local radio frequencies that *Disaster Mode* has been invoked.
☐ This information will also be simultaneously communicated via fire station equipment (FSE) and pagers to key personnel.
☐ The Response Coordinator, at Operational Communications, Sydney, local Police and Ambulance Services will be advised.
☐ Degraded response levels will be initiated.

Response Coordinator

- The Response Coordinator, Operational Communications Sydney, will carry out the following actions on initiation of *Disaster Mode:*

☐ Notify the Commissioner, Director State Operations (DSO), Assistant Commissioners and Directors.
☐ Initiate other necessary notifications.

- ☐ Determine the need for response of support resources to the disaster area, such as Incident Control Vehicle (ICV), rescue appliances, bulk water tankers, Strike Teams and Urban Search and Rescue (USAR) reconnaissance party (see *SOG 11.5*) or Task Force.
- ☐ Arrange for aircraft as necessary to transport specialised personnel, resources, and to carry out reconnaissance. Aerial reconnaissance will be an immediate priority.
- ☐ Prepare for activation of the Major Incident Coordination Centre (MICC) and in consultation with Manager State Operations (MSO), recall key staff to operate the MICC.
- ☐ In consultation with MSO, arrange for command staff to take up positions as required at incident sites, other services' control centres, and Emergency Control Centres (ECC), including the State Emergency Operations Centre.
- ☐ Gather as much information as possible about the disaster from NSWFB and other sources.
- ☐ Consider the need for requesting Mutual Aid from the NSW Rural Fire Service (RFS) and/or interstate fire services (through the State Emergency Operations Controller), particularly where there are any doubts about water supplies, or access for Strike Teams from outside the affected area.

- If Sydney Communications is disabled and the Response Coordinator is unable to carry out these functions, a Supervisor from another ComCen should do so.

On-Call Officers

- Upon becoming aware of a disaster in the vicinity of their workplace (business hours) or residence (after hours), officers provided with NSWFB vehicles must make themselves available for duty, and where applicable carry out the following actions:

- ☐ Those officers with specialised coordination functions, such as MICC responsibilities, must endeavour to attend for duty.
- ☐ Other officers, such as Zone Commanders, should determine whether the greatest need for their services exists in their current vicinity, or in their normal work location.
- ☐ Where Operational Commanders are unable or are having difficulty carrying out status checks of stations, senior officers may be able to assist by relaying radio messages or even physically attending stations.
- ☐ Officers without specific duties should assist by gathering intelligence on the scope and scale of the disaster, and reporting this to a ComCen or the Operational Commander.
- ☐ Sydney Communications lists senior officers in pager groups according to place of residence. This facility will be used to advise senior officers of disasters/major emergencies in their locality.

Operational Commanders (on shift) and Country Zone Commanders

- Upon becoming aware of a disaster within or adjoining their area of responsibility, Operational Commanders and Country Zone Commanders will:

- ☐ Determine the status of personnel, appliances and fire stations in their operational area.
- ☐ In the initial stages, and at least until status of stations in their area is ascertained, remain in a central location rather than respond to any incidents. The Operational Commander should gather intelligence on the overall scope of the disaster, including individual major incidents from Station Commanders.
- ☐ After considering resource and incident status, determine the need for assistance from the NSWFB and other services, including Mutual Aid from other fire services (interstate assistance must be requested through the State Emergency Operations Controller - SEOCon).
- ☐ Report resource needs to Operational Communications, Sydney (via local ComCen, if operable).
- ☐ Set up a command and control structure within the limitations of available and recalled personnel, and prioritisation of individual incidents.
- ☐ Make contact with local and district emergency operation controllers as appropriate.

Station Commanders

- Upon becoming aware of a disaster within or adjoining their area of responsibility, Station Commanders will:

☐ Immediately check on the welfare of on-duty personnel and if necessary initiate first aid on NSWFB personnel.
☐ In the case of a retained Brigade, ensure that the Brigade is alerted and a crew made available for response at the fire station.
☐ Determine the serviceability of appliances and fire station. Should there be any doubts as to the structural integrity of the fire station, appliances will be immediately removed and personnel evacuated.
☐ Conduct a rapid size up of conditions in the immediate area of the fire station, paying particular attention to any sign of fire such as smoke plumes (daytime) or orange glow (night).
☐ Immediately after the safety of personnel has been secured, attempt to contact the ComCen or Operational Commander by radio, or whatever other means are available. Report status, availability and initial observations of the surrounding area.

Drive Through Assessment

- When the Station Commander has determined station status, a rapid drive through assessment of the station area must be conducted as soon as possible.
- This may be difficult if roads are damaged or blocked by rubble, and there may be many appeals for help. However, it is important in the initial period to (as far as possible) avoid becoming committed at an individual incident. An overview of conditions will be essential to enable responses to be properly prioritised. In practice this may prove to be very difficult as there may be numerous appeals for assistance.
- Station Commanders should observe and act on the following:

☐ Saving of life, containment of fires, and initial containment of dangerous HazMat incidents are the top priorities. Where there are multiple fires, these should be prioritised on the basis of the likelihood of spread.
☐ Contact the ComCen or Operational Commander and communicate the results of the drive through assessment. If necessary, seek assistance in determining action priorities.
☐ If not ordered to respond elsewhere, commit resources to individual incidents according to priorities determined during the assessment.
☐ Where the Station Commander has responsibility on a local emergency management committee, endeavour to make appropriate contact.

⚠ **NOTE**

All stations should have predetermined drive through routes of their station areas which will enable a proper size up of conditions. A map should be kept in the appliance cabin at all times. It is possible that there will be no radio or telephone communication available. In this case, the only communication may be by simplex radio, limited by range. In such circumstances, successful operations will depend upon proper size up and initiative of individual fire crews.

Communications - Resource Status

- Following initial impact of a disaster, the immediate focus will be on determining the status of NSWFB resources, and the scale of the disaster. This will be accomplished through a mandatory status check conducted by the ComCen, or where this is not possible by the Operational Commander. For example, the City of Sydney Operational Commander would first contact No. 1 Station, followed by No. 3 Station, No. 4 Station and so on.
- Radio traffic will be restricted to urgent assistance messages and reporting of status only, until otherwise notified.
- Station Commanders will contact the ComCen or Operational Commander as soon as possible and report:
    - any firefighter injuries;
    - serviceability of appliances;
    - condition of fire station; and
    - initial size up of disaster impact in vicinity of fire station.

- Operational Commanders will determine the status of all fire stations within their area of responsibility as a first priority.

DEGRADED RESPONSE

Response Levels

- In the event of a major disaster, the following priorities will guide operations of the NSWFB:

  - assess the magnitude of the disaster quickly and accurately;
  - protect life;
  - protect property;
  - protect the environment;
  - evacuate endangered people; and
  - assist with restoration of essential services such as water supply.

- When in *Disaster Mode*, it will be necessary to prioritise calls for assistance, and in some cases not respond to calls.

Degraded Response Levels

- The computer aided dispatch system has default response levels for most incident types, e.g. two stations to an initial report of a structure fire.

- In the event of a major emergency or disaster, there may be insufficient resources available to provide the normal response level, and in some cases it will be necessary to disregard calls not constituting an immediate threat to life or property.

Emergency Level Response

- In the event of a major emergency where there is unusually high demand for NSWFB services resulting in increased response times, the Response Coordinator in consultation with DSO and Manager Operational Communications may institute *Emergency Level Response* in order to maintain response capabilities. If Sydney Communications is inoperable, the Supervisor from another ComCen will initiate *Emergency Level Response*.

- *Emergency Level Response* will involve:

  - Single station response to automatic fire alarms.
  - Single station response to reported structure fires, unless numerous calls received.

NO RESPONSE to the following types of incident:

  - Fire that had occurred - investigation.
  - Lockouts.
  - Leaking hydrants/sprinkler systems.
  - Line faults on automatic fire alarms.
  - Animal rescues.
  - Fireworks.
  - Alarm bell ringing (unless confirmed as a fire alarm).

Disaster Level Response

- In the event of a major disaster the priorities of the NSWFB will be:

1. Control and containment of fires and saving of life.
2. Search and rescue operations in collapsed structures, including activation of USAR Task Forces (see *SOG 11.5*).
3. Containing hazardous materials incidents which constitute an immediate threat.
4. Rendering assistance to the Ambulance Service if requested, by providing basic life support (BLS) at mass casualty incidents.
5. Providing water for fire fighting in areas where reticulated systems have failed.
6. Recalling personnel to staff reserve appliances.

- The DSO and Manager Operational Communications may invoke *Disaster Level Response* to preserve the NSWFB ability to meet its obligations. In the event that contact cannot be established with either of these officers, the Response Coordinator at Sydney Communications, or if unavailable, the Supervisor at another ComCen outside the affected area may have to make this decision. *Disaster Level Response* will involve single appliance response to all calls, and NO RESPONSE to the following types of calls:

  - Automatic fire alarms (thermal and smoke) except residential and health care facilities.
  - Domestic smoke alarms.
  - Fire alarms monitored by security companies.
  - Line faults on automatic fire alarms.
  - **Partial** codes to sprinkler installations.
  - Leaking hydrants/sprinkler systems.
  - Fire that had occurred - investigation.
  - Lockouts.
  - Animal rescues.
  - Fireworks.
  - Alarm bell ringing.

Incident Strategies

- The first priority during a disaster will be saving of life, containment of fires in order to avoid conflagration, and initial containment of HazMat incidents.
- Should communications systems break down or many simultaneous incidents occur, crews may have to operate without the level of assistance and support they could normally expect.
- Under these circumstances, fire fighting strategies may have to be adjusted to the circumstances to maximise effectiveness of limited resources. For example, unless a rescue is involved, defensive strategies should be employed at structure fires aimed at containing fire spread and protecting exposures, rather than internal attack. It may also be necessary to seek assistance from members of the public or other emergency services to use hose lines from portable pumps and hydrants, thus enabling the pumper and crew to respond to other fires.
- HazMat strategies may have to be restricted to initial containment and restriction of access only.

DISASTER COMMAND AND CONTROL

Major Incident Coordination Centre

- The Major Incident Coordination Centre (MICC) will be activated by the DSO in accordance with SOGs upon declaration of *Disaster mode*. Where the disaster prevents this, a ComCen outside the affected area should undertake MICC functions to the best of its ability.

Emergency Management

- The Commissioner will appoint an officer to represent the NSWFB at the State Emergency Operations Centre (located at the NSW Police Centre) when a disaster occurs or is imminent.
- The officer will liaise closely with the DSO at the MICC and with the Commissioner.
- The DSO, in consultation with the relevant Regional Commanders, will ensure that officers are appointed to operate at local and district EOCs as required.

On Scene Management

- ICS will be used by the NSWFB to manage operations at incident scenes. Close liaison with other services is important.

MICC Structure and Responsibilities

- The MICC will process information, ensure that key personnel including the Commissioner, Assistant Commissioners and Directors, are provided with regular updates and will coordinate the provision of assistance and ordering of Mutual Aid.
- The MICC may have to deal with and prioritise competing resource requests.

Crisis Management Team

- The Commissioner will establish a Crisis Management Team comprising senior executives and seconded specialists.
- The purpose of the team will be to look at aspects of recovery and threats to the organisation arising from the disaster, **not** operational issues.

FIRE STATION READINESS CONTINGENCY PLANS

Purpose

- Each fire station will develop and maintain a local operational readiness contingency plan outlining measures which may have to be instituted during, or subsequent to a disaster or major emergency, on the assumption that there may not be normal levels of support and infrastructure available.
- In the event of a disaster, brigades will refer to their local operational readiness contingency plans for guidance, and implement contingencies as appropriate to the situation.