PRMPFES47A Inspect and test control and indicating equipment

Release: 1

PRMPFES47A Inspect and test control and indicating equipment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor
This unit of competency specifies the outcomes required to complete routine monthly and six-monthly inspect and test procedures to verify that control and indicating equipment (CIE) for a fire alarm system functions as intended. The unit encompasses working safely, conducting compliance tests, conducting visual inspections, identifying non-compliance defects and mandatory reporting requirements as well as general isolations and resetting CIE.
Licence to practise: The skills and knowledge described in this unit do not require an electrical licence or an Australian Communications and Media Authority cabling licence to practise.
Note: Service technicians are **not** permitted to undertake any installation, replacement, maintenance and repair functions that are **restricted** to licensed trades or occupations (subject to relevant state and territory regulations).

Application of the Unit

Application of the unit
This unit of competency supports one or more extinguishing agent handling licences prescribed under the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*.

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Not Applicable

Employability Skills Information

Not Applicable

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the range statement. Assessment of performance is to be consistent with the evidence guide.

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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Plan to conduct routine monthly or six-monthly inspect and test operations on CIE.	1.1 Obtain and understand *occupational health and safety* (*OHS*) *policies and procedures* for a given work area.
	1.2 Follow established OHS, ozone depleting substance (ODS) and synthetic greenhouse gas (SGG) emission risk control measures and *organisational requirements* in preparation for *maintenance activity*.
	1.3 Note safety *hazards* and implement established risk control measures.
	1.4 Organise all necessary *work permits* prior to entering customer premises.
	1.5 Consult *relevant persons* to coordinate work effectively with other work site staff.
	1.6 Determine location of *system components and materials* from specifications and *installation drawings*.
	1.7 Arrange inspection and test procedures to suit *CIE* in accordance with *legislative and industry requirements*, Australian standards, job schedule and manufacturer instructions.
	1.8 Confirm *documentation* needed to conduct tests according to *work procedures* and job requirements.
	1.9 Check *tools*, *equipment and test devices* for correct operation and safety according to *work procedures* and job requirements.
2 Inspect CIE.	2.1 Follow ODS, SGG and *OHS policies and procedures* and apply risk control measures when inspecting *CIE*.
	2.2 Identify *CIE* functions in manufacturer instructions to be used to conduct routine tests in accordance with AS 1851.
	2.3 Identify alarm zone circuits, plant and other *system interfaces* to be isolated to allow the conduct of *maintenance activity* according to OHS, *ODS and SGG extinguishing agent* emission requirements and *work procedures*.
	2.4 Identify circuits and *actuation control devices* to be isolated.
	2.5 Conduct visual inspections as described in AS 1851 for monthly and six-monthly routine

ELEMENT	PERFORMANCE CRITERIA
	testing.
	2.6 Validate **CIE** inspection results against requirements described in AS 1851.
3 Test CIE.	3.1 Follow ODS, SGG and **OHS policies and procedures** and apply risk control measures when testing **CIE**.
	3.2 Isolate circuits, **actuation control devices**, **back-to-base facilities** and other **system interfaces** according to **work procedures**.
	3.3 Confirm alarm zone circuits, plant and other **system interfaces** are isolated to make sure the system cannot be activated during testing.
	3.4 Perform monthly and six-monthly tests in accordance with AS 1851 and confirm **CIE** and components function according to manufacturer instructions, system **finalised design documentation** and **organisational requirements**.
	3.5 Discuss and document methods to deal with unexpected situations with **relevant persons**.
	3.6 Obtain approval of authorised **relevant persons** to deal with unexpected situations safely.
4 Report inspect and test findings.	4.1 Follow ODS, SGG and **OHS policies and procedures**, risk control measures and **work procedures** when reporting inspect and test findings.
	4.2 Clean and make safe work site and equipment according to **work procedures**.
	4.3 Identify and report non-compliance defects according to **work procedures**.
	4.4 Make recommendations for rectifying defects according to **work procedures**.
	4.5 Reset **CIE** to operational state.
	4.6 Complete **documentation** according to **work procedures** and notify **relevant persons**.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the essential skills and knowledge and their level, required for this unit.

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Required skills:

- check routine service details of fire alarm system components and materials
- read and interpret final design documentation and manufacturer instructions
- identify work area hazards in preparation for inspection and test procedures
- select and safely use tools, equipment and materials appropriate to specific tasks
- identify and isolate zone circuits, plant, back-to-base facilities, actuation control devices and other system interfaces
- physically isolate actuation control devices to inhibit operation
- perform routine monthly and six-monthly inspect and test procedures in accordance with AS 1851
- test actuation control devices for operation and reset to operational state
- verify compliance and functionality of CIE against monthly and six-monthly schedules in AS 1851
- document test results and non-compliance defects
- reset CIE to operational state
- use appropriate workplace housekeeping procedures and remove any debris caused by inspect and test operations in the work area
- plan and organise work in order to estimate time to complete activities and prioritise tasks
- report and record information neatly and legibly
- use effective customer service skills and relate to people from a range of social, cultural and ethnic backgrounds and with a range of physical and mental abilities
- apply language, literacy and numeracy skills to:
    - communicate with others in a clear and concise manner in verbal, non-verbal and written modes
    - read, understand and comply with work instructions and specifications
    - read, understand and record measurements.

Required knowledge:

- implications of **not** applying legislative requirements to job functions
- environmental conditions that cause actuation control devices to create false alarms
- action to take when a breach of OHS, ODS and SGG or other policies occurs
- intent of Australian standard AS 1851 in relation to CIE inspect and test operations
- methodology used to conduct AS 1851 monthly and six-monthly maintenance schedules relevant to conventional and addressable CIE
- detection and warning components connected to CIE
- local controls (LC), Local Control Stations (LCS), aural alarms, visual warning devices (VWD) and actuation control devices on fire suppression systems interfaced to CIE
- key operational principles of CIE specifically interfaced to fire suppression systems
- operation of actuation control devices
- key functional differences between a conventional and addressable CIE
- awareness of on-site work permit requirements
- selection of appropriate tools, equipment and materials for conducting monthly and six-monthly inspect and test procedures on CIE in accordance with AS 1851 procedures
- common controls and indicators on CIE
- types of electrical safeguards used to protect persons and property
- safety requirements for using tools, equipment and materials
- relevant federal, state or territory legislation that affects organisational operations, including:

- anti-discrimination and diversity
- equal employment opportunity
- industrial relations.

KEY COMPETENCIES

The seven key competencies represent generic skills considered necessary for effective participation by an individual in the workplace.

Performance level 1 - at this level the candidate is required to undertake tasks effectively.

Performance level 2 - at this level the candidate is required to manage tasks.

Performance level 3 - at this level the candidate is required to use concepts for evaluating and reshaping tasks.

Key competency	Example of application	Performance level
How are ideas and information communicated?	Discuss and confirm customer requirements and complete inspect and test documentation.	1
How can information be collected, analysed and organised?	Gather information from a number of sources, including regulatory, manufacturer, organisational and customer sources, so that accurate inspect and test activities occur.	2
How are activities planned and organised?	Plan inspect and test activities to assemble appropriate tools, equipment and test devices on-site and organise work schedules to suit customer and organisational requirements.	2
How is teamwork used?	Apply consultative and collaborative approaches through support and assistance provided to customers and work groups.	1
How are mathematical ideas and techniques used?	Apply mathematical techniques through inspect and test activities.	1
How are problem-solving skills applied?	Identify potential problems throughout inspect and test activities, especially with regard to ambiguous information received from information sources and identify processes to be followed when faults are detected.	2
How is the use of technology applied?	Demonstrate sound technical knowledge of equipment to allow accurate inspect and test activities to occur.	2

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, the range statement and the Assessment Guidelines for this Training Package.

Overview of assessment	• Competency in this unit will underpin competency in other aspects of the candidate's role in managing their work tasks.
	• This unit could be assessed on its own or in combination with other units of competency relevant to the job function.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	• Competency is to be demonstrated through at least two practical demonstrations covering the full range of performance criteria. The type of CIE interfaced to fire suppression systems tested should correlate to the workplace setting of the candidate.
	• Ability to transfer skills to other situations described in the range statement may be inferred from this assessment. (Oral questioning may be used to provide evidence of this ability.)
	• A person who demonstrates competency in this unit must be able to provide evidence of:
	• locating, interpreting and applying relevant information, standards and specifications
	• complying with site safety plan, OHS regulations, ODS and SGG regulations (where required) and state and territory legislation applicable to workplace operations
	• complying with organisational policies and procedures, including quality requirements
	• communicating and working effectively and safely with others
	• organising appropriate work permits
	• adhering to safety procedures during inspect and test procedures
	• identifying risk reduction measures
	• identifying and locating system components and materials

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- - identifying, selecting and using tools, equipment and test equipment
  - identifying and isolating alarm zone circuits, back-to-base facilities, actuation control devices, plant and other system interfaces
  - confirming circuits, plant and other system interfaces are isolated
  - completing mandatory and optional test and verification requirements applicable to installed fire suppression systems
  - performing test procedures on CIE interfaced to fire suppression systems
  - visually inspecting fire suppression systems
  - identifying and reporting non-compliance defects
  - developing recommendations to rectify defects
  - resetting CIE and fire suppression system to operational state without unwanted CIE outputs or alarms
  - completing workplace housekeeping requirements
  - creating appropriate records and documentation.
- Competency in this unit shall be demonstrated using at least two different situations involving CIE specifically interfaced to different fire suppression systems:
  - conventional fire indicating panels and microprocessor analogue fire indicating panel fire detection systems
  - fire alarm systems that comply with AS 1670.1
  - emergency warning and inter-communication systems that comply with AS 1670.4
  - fire alarm systems interfaced with activating mechanisms of a fire suppression system.

Specific resources for assessment	• The following resources should be available:
	• access to customer premises or a simulated workplace environment
	• assessment documentation
	• all necessary tools, specialist equipment,

	manuals and relevant documentation
	• training and assessment record books.
	• Where applicable, physical resources should include equipment modified for people with disabilities.
	• Access must be provided to appropriate learning and/or assessment support when required.
	• Assessment processes and techniques must be culturally appropriate, and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.
Context of assessment	• For valid and reliable assessment of this unit, competency should be demonstrated over a period of time and be observed by the assessor (or assessment team working together to conduct the assessment).
	• Competency is to be demonstrated in a range of situations, reflecting the practical requirements of the workplace, which may include customer and workplace interruptions and involvement in related activities normally experienced in the workplace.
	• Assessment of competency over the full range of performance criteria should be made through practical demonstrations at a customer's premises. However, at times this may not be practicable and, in these situations, the conditions normally available to the candidate may be simulated in an environment suitable for assessment.
	• Candidates should also be given the opportunity to practise and undertake self-assessment of performance before requesting formal assessment.
	• Oral questioning or a written assessment may be used to assess underpinning knowledge. (In assessment situations where the candidate is offered a preference between oral questioning and written assessment, questions are to be identical.)
	• Assessment of evidence should establish the candidate's ability to perform the job to the standard required in the workplace.
	• Supplementary evidence may be obtained from relevant authenticated correspondence or

reports from supervisors or team leaders. Other forms of evidence may include audit reports, customer survey reports and appraisal reports.

- Candidate should be encouraged to compile a portfolio of examples of completed documentation relevant to the candidate's organisation. One accurate example of each completed document is suggested as sufficient to infer competency and ability to transfer appropriate skills to each document type when required in the workplace. (Oral questioning may contribute as evidence of this ability.)

- Information derived from enterprise policies and practices must be treated as commercial-in-confidence.

- In all cases where practical assessment is used it will be combined with targeted questioning to assess the underpinning knowledge.

- Questioning will be undertaken in such a manner as is appropriate to the oracy, language and literacy levels of the candidate and any cultural issues that may affect responses to the questions. It will reflect requirements of the unit of competency and the work being performed.

- Where assessment is for the purpose of recognition (RCC or RPL), the evidence provided will need to be authenticated and show that it represents current competency demonstrated over a period of time.

- Performance and assessment of this unit must be carried out within the relevant requirements of the following legislative and industry framework:

  - building Acts, regulations and codes
  - Australian and international standards identified as relevant to the required inspect and test procedures
  - environmental regulations
  - manufacturer specifications
  - organisational requirements, including policies and procedures relating to ODS, SGG and OHS
  - OHS legislation, codes and regulations
  - ODS and SGG legislation, codes and

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regulations.

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording in the performance criteria is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

Note: Australian standards are frequently revised and users must always check for currency.

Occupational health and safety policies and procedures may relate to:	• employer and employee rights and responsibilities
	• the OHS hierarchy of control
	• assessing the work site for hazards and risks prior to preparing it for the work procedure
	• displaying signs and using barriers in work area
	• hazard and risk identification and reporting
	• risk assessment and control measures
	• incident and accident investigation
	• OHS audits and safety inspections
	• safe operating procedures and instructions, including:
	    • working safely around electrical wiring, cables and overhead powerlines
	    • working safely around tools and equipment
	    • working safely on ladders and raised platforms
	    • risk and hazard recognition
	    • emergency procedures
	    • awareness of electrical hazards
	    • following confined spaces procedures
	    • using personal protective equipment (PPE), including:
	    • safety glasses or goggles
	    • safety boots or shoes
	    • hard hats
	    • earmuffs or plugs
	    • appropriate gloves and overalls
	    • sunhats
	    • dust masks
	• equipment maintenance and use

| | • use and storage of hazardous substances |
| | • first aid. |

Organisational requirements may include:	• legal and organisational policies and guidelines
	• personnel practices and guidelines outlining work roles, responsibilities and delegations
	• legislation relevant to inspect and test operations for control and indicating equipment
	• OHS policies, procedures and programs
	• procedures and work instructions to prevent the emission of ODS and SGG in the workplace
	• documentation and information systems and processes
	• use of electronic job scheduling and communication devices.

| *Maintenance activity* may include: | • actions to conduct routine maintenance according to AS 1851 |
| | • actions to conduct non-routine maintenance, such as general isolation of a system to allow building works to be completed and subsequent resetting of the system after works completed. |

Hazards may include:	• ergonomic, such as incorrect manual handling methods
	• environmental, such as improper use of ODS and SGG, hazardous materials and other chemicals
	• environmental, including from ODS and SGG emissions that could be caused by:
	• transporting, storing and manual handling containers containing ODS and SGG agents
	• servicing and maintaining container valve assemblies
	• installing and removing container valve assembly, manifold connection components and activating mechanisms
	• conducting interface tests during commissioning, servicing and decommissioning procedures between container activating mechanisms, CIE and fire alarm system
	• obstructive, such as blocked access to emergency entry or exit points
	• hazards associated with electrical or mechanical faults
	• any source of potential harm
	• any situation with a potential to cause loss

	• equipment in a work site
	• people in a work site
	• work methods, plans and procedures.
Work permits may include permits to:	• enter a work site
	• enter a restricted area within a work site
	• enter a work site at specific times
	• ensure that specific OHS requirements are met before entering a work site.
Relevant persons may include:	• team leaders
	• supervisors
	• managers
	• colleagues
	• building owners or nominated representatives
	• customers.
System components and materials may include:	• fire indicator panel components
	• standby batteries
	• remote indicating equipment, such as:
	• mimic panels
	• sub-fire indicator panels.
	• colour graphic visual display units (VDUs)
	• fire detection equipment, such as:
	• data gathering control units
	• analogue and analogue addressable smoke, heat and gas detectors
	• warning system equipment, such as:
	• alarm bells
	• mimic and location panels
	• warning and strobe lights
	• warning speakers
	• fire suppression systems equipment, such as:
	• actuation control devices (pneumatic, electrical, mechanical and manual operation)
	• container discharge valves
	• flexible discharge hose and fittings
	• pilot and slave tubes
	• fittings
	• interface equipment to other fire protection and building services systems, such as:
	• door system release controls
	• electrical interface relays and contacts
	• flow switches and pressure switches

- optical couplers
- utility shutdown devices
- solenoid valves and other activating mechanisms

- interface communication devices, such as:
  - remote public address system (PA) outputs
  - two-way radios
  - warden inter-communication phones.

Installation drawings may include:	- installation drawings that meet the requirements of AS 4214 and AS 1670 including:
	  - 'for construction' drawings
	  - 'as installed' and 'as built' drawings.

Control and indicating equipment (***CIE***) may include:	- fire indicating panels (FIP) approved to AS 1603 or AS 4428
	- equipment specifically interfaced to fire suppression systems:
	  - alarm operation requirements
	  - dual zone operations
	  - shutdown operations
	  - inhibit discharge switches
	  - system warning indications
	  - discharge time delays
	  - system operation indicators
	  - inoperative status indicators
	  - actuation circuit supervision indicators.

Legislative and industry requirements may include:	- relevant federal, state and territory building Acts, regulations and codes, such as *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* - OHS legislation, codes and regulations - relevant current Australian standards e.g. AS 1603, AS 1670, AS 1851, AS 4214 and AS 4428 - fire protection industry codes of good practice - manufacturer system manuals - Building Code of Australia (BCA) - dangerous goods regulations - licensing arrangements, such as extinguishing agent handling licence - environmental regulations, including ODS and SGG legislation, codes and regulations - building surveyor requirements, such as occupancy permits

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- other relevant legislation relating to fire protection equipment, including international, shipping and marine codes
- Australian petroleum industry requirements.

Documentation may include:
- service test record logbooks
- manufacturer system documentation
- job cards
- customer recommendation forms
- service agreements
- expense claims
- equipment recommendation forms
- corrective action reports
- test results and test reports
- product documentation
- maintenance record system.

Work procedures may include:
- instructions from colleagues, supervisors and managers
- specific customer requirements
- assignment instructions
- equipment manufacturer requirements
- reporting and documentation requirements
- ODS, SGG and OHS requirements
- PPE requirements.

Tools, *equipment and test devices* may include:
- hand tools, including:
  - hammers
  - spirit levels
  - pliers
  - screwdrivers
  - spanners
- power tools, including:
  - battery drills
  - hammer drills
- manual handling aids, including:
  - hand trucks
  - lifting straps
  - trolleys
- servicing tools and test devices, including:
  - barcode readers
  - electrical multi-meter
  - hydrostatic test equipment
  - re-charging and pressurising equipment

	· safety equipment

- · safety equipment
- · scales
- · service tag punch
- · simulator actuators
- · sound meters
- · fire equipment spare parts, including:
  - · anti-tamper seals
  - · batteries
  - · bulbs and globes
  - · service tags.

System interfaces may include:	· operating signals between CIE and building services systems, such as: 　· controls for pressurisation systems, air conditioning system shutdowns and smoke spills 　· utilities shutdown devices 　· building warning systems 　· building management systems.
ODS and SGG materials **are listed using the format**: **Product name (other names)**; **use**. **Check the latest amendments to the** *Ozone Protection and Synthetic Greenhouse Gas Management Act* **for the current list of** *ODS and SGG extinguishing agents* **which may include**:	· **Blitz III** (HCFC Blend D); used in flooding systems · **CFC 11** (trichlorofluoromethane, CCl_3F); may be found as a propellant in some powder fire extinguishers (this product is banned in Australia) · **FC-2-1-8** (CEA-308, $CF_3CF_2CF_3$); used in flooding systems · **FC-3-1-10** (CEA-410, C_4F_{10}); used in flooding systems · **FC-5-1-14** (CEA-614, C_6F_{14}); used as a streaming agent · **FE-227** (heptafluoropropane, HFC-227ea); used as a total flooding extinguishing agent - is a replacement for Halon 1301 · **FE-25** (pentafluoroethane, HFC-125); used in inerting and explosion suppression applications and retro-fit to existing Halon 1301 systems · **FE-36** (hexafluoropropane, HFC-236fa); used in portable fire extinguishers - is a replacement for Halon 1211 and Halon 1301 · **FE-13** (trifluoromethane, HFC-23); used as a total flooding agent · **FE-241** (chlorotetrafluoroethane, HFC-124); used as a total flooding agent for non-occupied spaces and as a streaming agent · **FM100**® (HBFC-22B1); used in portable fire extinguishers · **FM200**® (heptafluoropropane, HFC-227ea); used in chemical storage areas, clean rooms, communications facilities, laboratories, museums, robotics and emergency power facilities

- **Halotron** (HCFC Blend B); used as a total flooding agent and streaming agent
- **Halon 1211** (BCF); used as a streaming agent - requires a special permit in Australia
- **Halon 1301** (BTM); used as a total flooding agent - requires a special permit in Australia
- **Halon 2402** (**dibromotetrafluoroethane**, $C_2Br_2F_4$); limited use in military systems - requires a special permit in Australia
- **HCFC 22** (**chlorodifluoromethane**, $CHClF_2$); used as a propellant in some powder fire extinguishers (this product is banned in Australia)
- **HFC 134a** (unsymmetric tetrafluoroethane, CH_2FCF_3); used as a propellant in some powder fire extinguishers
- **NAF-S-III** (HCFC Blend A); used as a total flooding agent - is a replacement for Halon 1301
- **NAF-P-III** (HCFC Blend C); used as a streaming agent - is a replacement for Halon 1211
- **NAF-P-IV** (HCFC Blend E); used as a streaming agent
- **SF6** (sulfurhexofluoride, SF_6); used as an inerting agent for sealed high voltage switchgear.

Actuation control devices (also known as actuators) may include:	- **electrical** operation: signal generated from the CIE panel as part of a fire alarm detection system - **pneumatic** operation: from fire detector (typically heat) - **mechanical** operation: via signal from Local Control Station or fire detector - **manual** operation: by direct push lever or pull cable system.
Back-to-base facilities:	- monitoring equipment which is connected by alarm signalling equipment (ASE) from CIE to a communication path (telephone line or radio link) to a monitoring centre - monitoring centres can be operated by or on behalf of a fire authority for the purposes of mobilising and directing firefighting resources to site where the CIE is installed.

Finalised design documentation may include:	- documentation that meets the requirements of AS 4214 and AS 1670, including:
	  - system concentration and calculations
	  - technical bulletins
	  - material safety data sheets on agents and equipment

- manufacturer information.

Unit Sector(s)

Sector
Fire Protection Equipment

Competency field

Competency field
Asset Maintenance