



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **PRMPFES45A Install gaseous agent containers and actuation devices**

**Release: 1**

## PRMPFES45A Install gaseous agent containers and actuation devices

### Modification History

Not Applicable

### Unit Descriptor

#### Unit descriptor

This unit of competency specifies the outcomes required for fire system technicians to receive and install gaseous agent containers, manifold connections, actuation control devices and activating mechanisms. All work in this area must be completed in accordance with relevant legislative, industry, finalised design documentation and installation drawings, and customer and organisational requirements, including policies and procedures relating to ozone depleting substances (ODS), synthetic greenhouse gases (SGG) and occupational health and safety (OHS).

**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

#### Prerequisite unit

The unit of competency PRMPFES06C *Prepare for installation and servicing operations* must be assessed prior to this unit.

### 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.

## Elements and Performance Criteria

### ELEMENT

### PERFORMANCE CRITERIA

- |  |   |
|--|---|
| 1 Interpret and comply with legal and industry requirements relating to installation operations. | <p>1.1 Apply knowledge and understanding of <b>legislative requirements</b>, including relevant state and territory building codes, to <b>work procedures</b> and clarify where necessary with <b>relevant persons</b>.</p> <p>1.2 Apply knowledge and understanding of <b>ODS and SGG</b> emission legislative and industry requirements to the installation of gaseous agent containers and actuation devices.</p> <p>1.3 Identify <b>potential and actual breaches</b> of legislative and industry requirements and take action according to <b>organisational requirements</b> and ODS, SGG and <b>OHS policies and procedures</b>.</p> |
| 2 Receive system components.   | <p>2.1 Check procurement details and specifications of <b>system components and materials</b> against <b>finalised design documentation</b> and <b>installation drawings</b>.</p> <p>2.2 Check all <b>pre-tested or prefabricated components</b> have correct documentation identifying compliance with Australian standards.</p> <p>2.3 Confirm components and materials are in <b>acceptable condition</b> and meet quality control checks.</p> <p>2.4 Assemble labour, <b>tools, equipment and materials</b>, and <b>hardware components</b> at work site.</p>   |
| 3 Prepare for installation of gaseous agent containers and actuation devices.                    | <p>3.1 Organise necessary <b>work permits</b> prior to entering customer premises.</p> <p>3.2 Adhere to <b>safety procedures</b> according to <b>organisational requirements, customer requirements</b> and manufacturer requirements.</p> <p>3.3 Identify potential risks and <b>hazards</b>.</p> <p>3.4 Identify, select and check required <b>tools, equipment and materials</b>, and use safely and efficiently.</p> <p>3.5 Confirm installation site as appropriate with <b>relevant persons</b> and <b>finalised design documentation</b> and <b>installation drawings</b>.</p> <p>3.6 Check appropriate safety measures are in</p>   |

**ELEMENT****PERFORMANCE CRITERIA**

- place prior to the installation process.
- 4 Install gaseous agent containers and actuation devices.
- 4.1 Fix support systems, components and fittings according to *finalised design documentation* and *installation drawings*.
- 4.2 Correctly support containers and fix support frame according to *installation drawings*.
- 4.3 Install container bank manifold and connection components.
- 4.4 Physically check flexible hose connections are free from kinks and check for tightness.
- 4.5 Remove transport caps on actuation outlets, plugs and locking devices according to manufacturer and organisational requirements.
- 4.6 Safely install manual and pneumatic *actuation control devices*, pilot and slave tubes and fittings.
- 4.7 Install *auxiliary shutdown fire system and equipment* interface and alarm device connections.
- 4.8 Physically check pilot and slave tube connections are free from kinks and check for tightness.
- 4.9 Check *actuation control devices* are set to operate and engage safety device, as needed.
- 4.10 Leave installation site clean and tidy with materials disposed of or recycled in accordance with state or territory legislative and industry requirements.
- 4.11 Complete *documentation* according to *work procedures*.

**Required Skills and Knowledge****REQUIRED SKILLS AND KNOWLEDGE**

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

**Required skills:**

- check procurement details of received gaseous agent containers and actuation devices
- read and interpret finalised design documentation and installation drawings
- identify hazards in the work area in preparation for installations operations
- select and safely use tools, equipment and materials appropriate to a specific task

- remove transport caps according to manufacturer and organisational requirements
- install system and components to match requirements of installation drawings
- install manual and pneumatic actuation control devices, pilot and slave tubes and fittings
- check pilot and slave tube connections are free from kinks and check for tightness
- use detection equipment to find hidden utilities
- convert basic units of measurement and pressure
- apply methods of holding work when using power tools
- use appropriate workplace housekeeping procedures and remove any debris caused by installation operations in the work area
- plan and organise work in order to estimate time to complete activities and prioritise tasks
- apply quality control requirements to accepting received system components and materials
- report and record information neatly and legibly when completing documentation
- 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:**

- key features of legislation, regulations and codes applicable to fire protection equipment installation procedures
- purpose of the Building Code of Australia (BCA)
- implications of **not** applying legislative requirements to job functions
- action to take when a breach of OHS, ODS and SGG and other policies occurs
- intent of Australian standard AS 1851 in relation to installation of gaseous agent containers and actuation devices
- awareness of on-site work permit requirements
- appropriate tools, equipment and materials selection for gaseous agent containers and actuation devices installation procedures
- types and purposes of relevant hardware items
- operation of various activating mechanisms
- records and documentation required to install gaseous agent containers and actuation devices
- types of electrical safeguards used to protect persons and property
- maintenance requirements for relevant hand and power tools
- 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.

| <b>Key competency</b>                                     | <b>Example of application</b>  | <b>Performance level</b> |
|---|--|--------------------------|
| How are ideas and information communicated?               | Discuss and confirm customer requirements in a clearly structured and defined manner and complete administrative documentation accurately and clearly.   | 2                        |
| How can information be collected, analysed and organised? | Gather information from a number of sources, including regulatory, manufacturer and organisational sources ensuring all work falls within service technician's scope of responsibility.  | 3                        |
| How are activities planned and organised?                 | Design planning of installation activities with regard to assembling appropriate tools and hardware for on-site services and organising work schedules to suit customer and organisational requirements.   | 3                        |
| How is teamwork used?                                     | Apply consultative and collaborative approaches through support and assistance provided to customers and work groups.  | 2                        |
| How are mathematical ideas and techniques used?           | Apply mathematical techniques and time management principles for on-site installation activities and reporting requirements while adhering to designated work schedules.   | 1                        |
| How are problem-solving skills applied?                   | Identify and apply problem-solving and systematic techniques throughout installation activities while considering ambiguous information received from information sources, potential risks and due processes to be followed when unusual problems are encountered. | 3                        |
| How is the use of technology applied?                     | Demonstrate sound technical knowledge of features of equipment and accuracy throughout installation activities while being able to use, organise, record and present information using technology.   | 3                        |

## 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 underpins 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

- 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 and 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
  - in a minimum of two different settings:
    - identifying risk reduction measures
    - identifying, selecting and assembling hardware and components
    - identifying, selecting and using tools, equipment and materials effectively to perform installation procedures on gaseous agent containers and actuation devices
    - checking procurement details and specifications of gaseous agent containers, actuation devices and materials
    - applying quality control checks to gaseous agent containers, actuation devices and materials
    - adhering to safety procedures during installation procedures
    - installing system components, fittings, actuation control devices, activating mechanisms and auxiliary shutdown interface as required by



- installation guidelines
- completing workplace housekeeping requirements
  - creating appropriate records and documentation.
- Specific resources for assessment**
- Resource implications for assessment include access to:
    - actual or simulated work environment, including gaseous agent containers and actuation devices
    - finalised design documentation and installation drawings for a gaseous fire suppression system
    - assessment documentation, including training and assessment record books
    - all necessary tools, specialist equipment, materials and spare parts
    - relevant manuals and other documentation, including Australian standards.
  - 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 may be made through practical demonstrations. Consideration should be given to assessing consistency of outcome over an appropriate period of time.
  - Candidates should also be given the opportunity to practise and undertake self-assessment of performance before requesting formal assessment.
  - All safety requirements must be adhered to during all practical activities.
  - 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 that demonstrate an understanding of the requirements for receiving and installing gaseous agent containers and actuation devices.
- Candidate should be encouraged to compile a portfolio of examples of completed documentation relevant to 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 installation 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 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.

***Legislative requirements*** may include:

- relevant current Australian and international standards e.g. AS 4214, NFPA 12 and NFPA 12A
- relevant federal, state and territory building Acts, regulations and codes e.g. *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*
- Building Code of Australia (BCA)
- building surveyor requirements
- OHS legislation, codes and regulations
- dangerous goods regulations
- licensing arrangements
- environmental regulations, including ODS and SGG legislation, codes and regulations
- other relevant legislation relating to fire protection equipment, including international, shipping and marine codes
- Australian petroleum industry requirements.

***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
- personal protective equipment (PPE) requirements.

***Relevant persons*** may include:

- team leaders
- supervisors
- managers
- colleagues
- customers.

*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<sub>3</sub>F); may be found as a propellant in some powder fire extinguishers (this product is banned in Australia)
- **FC-2-1-8** (CEA-308, CF<sub>3</sub>CF<sub>2</sub>CF<sub>3</sub>); used in flooding systems
- **FC-3-1-10** (CEA-410, C<sub>4</sub>F<sub>10</sub>); used in flooding systems
- **FC-5-1-14** (CEA-614, C<sub>6</sub>F<sub>14</sub>); 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, HCFC-124); used as a total flooding agent for non-occupied spaces and as a streaming agent
- **FM100**<sup>®</sup> (HBFC-22B1); used in portable fire extinguishers
- **FM200**<sup>®</sup> (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<sub>2</sub>Br<sub>2</sub>F<sub>4</sub>)**; limited use in military systems - requires a special permit in Australia
- **HCFC 22 (chlorodifluoromethane, CHClF<sub>2</sub>)**; used as a propellant in some powder fire extinguishers (this product is banned in Australia)
- **HFC 134a** (unsymmetric tetrafluoroethane, CH<sub>2</sub>FCF<sub>3</sub>); 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

***Potential and actual breaches***  
could be identified by:

- **SF<sub>6</sub>** (sulfurhexofluoride, SF<sub>6</sub>); used as an inerting agent for sealed high voltage switchgear.
- direct observation
- workplace quality assurance teams.

***Organisational requirements***  
may include:

- legal and organisational policies and guidelines
- personnel practices and guidelines outlining work roles, responsibilities and delegations
- legislation relevant to the installation operation
- 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.

***OHS policies and procedures***  
may include:

- 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 PPE, including:
    - safety glasses or goggles
    - safety boots or shoes
    - hard hats
    - earmuffs or plugs

***System components and materials*** may include:

- appropriate gloves and overalls
- sunhats
- dust masks
- equipment maintenance and use
- use and storage of hazardous substances
- first aid.
- actuation control devices (pneumatic, electrical, mechanical and manual operation)
- agent discharge nozzles
- agent distribution pipework and hose networks
- container bank manifold connections
- container discharge valves
- control equipment
- detection devices
- extinguishing agent containers (tanks and cylinders)
- flexible discharge hose and fittings, including hose check valve connected between container valve and fixed pipework manifold arrangement
- pilot and slave tubes
- fittings between container valves.

***Finalised design documentation*** may include:

- finalised design documentation that meets the requirements of AS 4214 or equivalent that may include information about:
  - system concentration and calculations
  - technical bulletins
  - material safety data sheets on agents and equipment
  - manufacturer information.

***Installation drawings*** may include:

- installation drawings that meet the requirements of AS 4214 or equivalent and may include information about:
  - 'for construction' drawings
  - 'as installed' or 'as built' drawings.

***Pre-tested or prefabricated components*** may include:

- container with valve assembly
- flexible discharge hose with fittings.

***Acceptable condition*** may include:

- use of transport caps
- use of safety devices.

***Tools, equipment and materials*** may include:

- hand tools, including:
  - hammers
  - spirit levels

- pliers
  - screwdrivers
  - spanners
  - power tools, including:
    - battery drills
    - hammer drills
    - nail guns
  - manual handling aids, including:
    - hand trucks
    - hooks
    - lifting magnets and straps
    - suction grips
    - trolleys
    - wheelbarrows
  - servicing tools and equipment, including:
    - hydrostatic test equipment
    - re-charging and pressurising equipment
    - safety equipment
    - scales
    - service tag punch
  - fire equipment spare parts, including:
    - anti-tamper seals
    - hoses
    - labels
    - nozzles
    - pressure indicators
    - seals
    - service tags
    - valves
  - non-licensed mechanical handling aids, including:
    - cranes
    - hoists
    - manually operated forklifts and pallet trucks.
- Hardware components* may include:
- actuation control devices
  - agent discharge nozzles
  - agent distribution pipework and hoses
  - bolts and nuts
  - container valves
  - control equipment
  - double-sided tape

- extinguishing agent containers (tanks and cylinders)
- hex nipples
- identifying signs
- liquid adhesives
- nails
- pipe adaptor bush fittings
- plugs
- pneumatic detection devices
- screws
- support brackets
- thread sealant.

***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.

***Safety procedures*** may include:

- confirmed acceptable floor loading
- container handling techniques
- job safety analysis (JSA) performed for installation, in particular, manual handling.

***Customer requirements*** may include:

- providing routine services
- providing non-routine or urgent services
- confirming installation instructions
- confirming variations to installation instructions
- sighting work permits
- sign-in and sign-out procedures for entry to or exit from premises
- written or verbal confirmation of services provided and future services, such as maintenance.

***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, such as 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, control and indicating equipment (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.

**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.

**Auxiliary shutdown fire system and equipment:**

- may include auxiliary shutdown valves that interrupt fuel or electricity supplies before the extinguishing agent is discharged
- may interact with:
  - air conditioning equipment
  - fire dampers
  - lock out switches for gas extraction.

**Documentation** may include:

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

## **Unit Sector(s)**

### **Sector**

Fire Protection Equipment

## **Competency field**

### **Competency field**

Asset Maintenance