



Australian Government

CPCPFS4027A Commission fire sprinkler systems

Release 1

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Modification History

New unit.

This version first released with CPC08 Construction, Plumbing and Services Training Package Version 9.

Unit Descriptor

This unit of competency specifies the outcomes required to commission fire sprinkler systems. It covers preparing for the work, identifying and confirming system specifications and requirements, physically testing and commissioning systems, and finalising work processes, including completing records and documentation.

Application of the Unit

This unit of competency supports the work of fire protection industry personnel responsible for commissioning fire sprinkler systems.

Work may be undertaken on commercial or industrial buildings, which may be new work sites or existing structures being renovated, extended, restored or maintained.

Licensing/Regulatory Information

Licensing, legislative, regulatory or certification requirements may apply to this unit. Candidates are advised to check for those requirements.

Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

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 required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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| 1 | Prepare for commissioning fire sprinkler systems. | <p>1.1 <i>Commissioning inspections and tests required to validate that fire sprinkler system performance meets design requirements are determined in consultation with approving authority.</i></p> <p>1.2 <i>Documentation</i> required for commissioning is obtained and reviewed.</p> <p>1.3 Tasks are planned according to <i>industry, legislative and workplace requirements</i> and sequenced in conjunction with others involved in or affected by the work.</p> <p>1.4 <i>Tools, equipment</i> and materials for commissioning are selected and checked for serviceability.</p> <p>1.5 Work area is prepared to support efficient commissioning process.</p> |
| 2 | Confirm that installation of system components correspond to design requirements. | <p>2.1 <i>Fire sprinkler system components</i> and locations are identified on drawings and specifications.</p> <p>2.2 Building is inspected to confirm that locations of system components correspond to design requirements, or location anomalies are reported.</p> <p>2.3 Types of sprinkler heads are confirmed as compatible, or anomalies are reported.</p> <p>2.4 Spaces between sprinkler heads are confirmed as correct, or anomalies are reported.</p> <p>2.5 Pipework is inspected and confirmed as functional, or jointing and supporting defects are reported.</p> |

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| | | 2.6 | Valves are inspected for different commissioning tests to confirm correct type, adequate labelling, and orientation in required position. |
| | | 2.7 | Pressure gauge schedule, block plan and interface diagram are confirmed as corresponding to design requirements. |
| | | 2.8 | Water supply components, including any installed pumpsets, are checked and verified against design requirements. |
| | | 2.9 | Changes to the building or existing conditions that could affect component performance are identified. |
| 3 | Conduct pressure tests and restore system to normal pressure. | 3.1 | Static air-pressure test is conducted to confirm integrity of the system, and results are recorded according to relevant standards and workplace requirements. |
| | | 3.2 | High pressure hydraulic test is conducted to confirm integrity of the system, and results are recorded according to relevant standards and workplace requirements. |
| | | 3.3 | Leaks are identified and reported. |
| | | 3.4 | System is drained and re-charged at normal pressure according to relevant standards and workplace requirements. |
| 4 | Conduct functional tests. | 4.1 | Water supply functional proving test is conducted, and results are recorded according to relevant standards. |
| | | 4.2 | Functional tests of system components and interfaces are conducted, and results recorded according to relevant standards and design requirements. |
| | | 4.3 | Tests are conducted according to environmental and sustainability requirements. |
| 5 | Finalise commissioning process. | 5.1 | System functionality and compliance with design specifications are confirmed. |
| | | 5.2 | Componentry is set to operational function and pipework is charged with water according to specifications. |

- 5.3 Tools, equipment and materials are checked and stored and work area is left in good order.
- 5.4 Documentation is completed and processed according to workplace requirements.

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- communication skills to:
 - determine commissioning test requirements
 - enable clear and direct communication, using questioning to identify and confirm requirements, and share information
 - follow and give instructions
 - use language and concepts appropriate to cultural differences
 - use and interpret non-verbal communication, such as hand signals
 - identify and report faults in tools, equipment or materials to appropriate personnel
- numeracy skills to apply measurements and calculations
- planning and organising skills to:
 - plan and sequence tasks in consultation with other relevant personnel
 - set out work
- reading skills to interpret drawings and specifications
- teamwork skills to work with others to action tasks
- technical skills to use tools and equipment to commission sprinkler systems
- technology skills to:
 - access site-specific instructions in a variety of media
 - use mobile communication technology
- writing skills to record results of functional tests and complete other workplace documentation

Required knowledge

- design and installation performance requirements of relevant installation standards, such as:
 - National Fire Protection Association (NFPA)
 - Factory Mutual performance-based codes of practice
 - Australian Standard AS 2118.1 Automatic fire sprinkler systems
- industry and regulatory requirements for commissioning fire sprinkler systems
- job safety analyses (JSA), safety data sheets (SDS) and safe work method statements (SWMS)
- performance measures for fire sprinkler systems as referenced in design drawings and specifications
- properties of water, including pressure, flow rates and atmospheric pressure

- SI system of measurements
- standards applicable to installing and commissioning fire sprinkler systems
- workplace and equipment safety requirements, including personal protective equipment requirements relevant to the job

Evidence Guide

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

Overview of assessment This unit of competency could be assessed in the workplace or a close simulation of the workplace environment providing that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit A person should demonstrate the ability to:

- locate, interpret and apply relevant information, standards and specifications to testing and commissioning fire sprinkler systems
- apply safety requirements throughout the work sequence, including the use of personal protective clothing and equipment
- as a minimum, the ability to commission:
 - one wet system connected to fixed pumpsets
 - one wet system connected to town main supply
 - one pre-action fire sprinkler system
- commissioning must ensure:
 - correct identification of location, design specification and details of proposed system
 - correct selection and use of appropriate processes, tools and equipment
 - completion of work to specification
 - compliance with regulations, standards and workplace quality procedures and processes
 - effective communication with others
 - safe work practices.

Context of and specific resources for assessment Assessment of this unit:

- must be in the context of the work environment
- may be conducted in an off-site context, provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills
- must meet relevant compliance requirements.

Resource implications for assessment include:

- an induction procedure

- realistic tasks or simulated tasks covering the minimum task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work practices and addressing hazards and emergencies
- safety data sheets, job safety analyses and safe work method statements
- research resources, including industry-related systems information.

Method of assessment

Assessment for this unit must verify the practical application of the required skills and knowledge, using one or more of the following methods:

- direct observation of tasks in real or simulated work conditions
- questioning to confirm the ability to identify and interpret the essential underpinning knowledge required for practical application.

Guidance information for assessment

This unit could be assessed on its own or in combination with other units relevant to the job function.

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Assessment processes and techniques should, as far as is practical, take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

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, if used in the performance criteria, is detailed below. 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) may also be included.

Fire sprinkler systems
may include:

- deluge
- dry pipe
- pre-action

- storage sprinklers
 - wall wetting
 - water mist
 - wet pipe.
- Approving authority** may be:
- client representative
 - council representative
 - fire brigade official
 - fire protection consultant engineer
 - insurance company representative
 - system designer.
- Documentation** may include:
- as-installed drawings
 - design calculations
 - logbooks
 - operator manuals.
- Industry, legislative and workplace requirements** may include:
- codes and standards
 - environmental and sustainability
 - licensing
 - quality assurance
 - workplace health and safety.
- Tools and equipment** may include:
- digital tachometers
 - flow testing equipment
 - hand tools
 - laser levels
 - measuring devices
 - personal protective equipment
 - pressure gauges.
- Fire sprinkler system components** may include:
- air compressors
 - alarm valves
 - ball valves
 - brackets
 - discharge nozzles
 - flow switches
 - pipework
 - pressure gauges
 - pressure reducing valves
 - pressure relief valves
 - pressure switches
 - pumpsets
 - solenoids
 - sprinkler heads
 - water supply valves.

Functional tests may include checking the effective operation of:

- brigade booster connections
- control and actuator mechanisms, such as:
 - pressure switches
 - flow switches
- control valves, such as:
 - pressure reducing
 - pressure relief
 - tank inflow
- interfaces to other systems, including:
 - booster pumps
 - building services
 - control indicating equipment (CIE)
 - control of booster pumpsets
 - fire detection
 - heating, ventilation and air conditioning (HVAC)
 - occupant warning systems
 - valve monitoring controls
- remote water proving points
- water supply components, such as tank inflow and suction lines.

Unit Sector(s)

Plumbing and services

Custom Content Section

Not applicable.