Australian Government

Department of Education, Employment and Workplace Relations

CPCPFS3022A Conduct annual functional testing of complex water-based fire-suppression systems

Release: 1

CPCPFS3022A Conduct annual functional testing of complex water-based fire-suppression systems

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to complete annual inspection and testing procedures to verify that complex water-based fire-suppression system equipment functions as intended.

The unit involves working safely, isolating and resetting water-based fire-suppression systems, conducting compliance tests, visually inspecting, identifying non-compliance defects, and fulfilling mandatory reporting requirements.

The service technician is not permitted to undertake any installation, replacement, maintenance and repair functions that are restricted to licensed trades or occupations (subject to relevant state or territory regulations).

Different states and territories may have regulatory mechanisms that apply to this unit. Candidates are advised to check for regulatory limitations.

Application of the Unit

Application of the unit

This unit of competency supports fire protection technicians responsible for annual functional testing of water-based fire protection systems, including functional water flow tests. Individuals operate within the scope of their defined roles and responsibilities and perform the functional water flow tests as part of their work duties to verify that equipment functions as intended, according to work procedures and relevant Australian standards.

The unit must be applied strictly according to relevant state and territory legislative and industry requirements.

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units

CPCPCM2023A	Carry out OHS requirements
OR BOTH:	

Prerequisite units

CPPCMN2002A	Participate in workplace safety arrangements
	AND
CPPFES2006A	Prepare for installation and servicing operations

Employability Skills Information

Employability skills 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 performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Apply compliance requirements to service operations.	1.1. ***Legislative and industry requirements*** are interpreted, confirmed and applied to ***organisational requirements***. 1.2. Location and equipment are ***checked for compliance*** with legislative and industry requirements, and ***action*** is taken according to organisational requirements. 1.3. Preparations are made for conducting ***annual functional testing*** according to organisational requirements on ***complex components*** of ***water-based fire-suppression systems***.
2. Conduct inspections and record results.	2.1. Workplace procedures are followed and risk control measures applied when inspecting water-based fire-suppression systems. 2.2. ***Key control valves*** are identified and their functions determined with reference to installation drawings in order to conduct routine inspection and tests according to legislative and industry requirements. 2.3. Visual inspections are conducted on complex components as described in legislative and industry requirements. 2.4. Inspection results are recorded according to legislative and industry requirements. 2.5. Visual ***installation and design survey*** inspections are conducted according to legislative and industry requirements. 2.6. Installation and design survey report is prepared according to legislative and industry requirements. 2.7. ***Sustainability principles and concepts*** are applied ***to work preparation and application***.
3. Conduct testing and record results.	3.1. Plant and other ***system interfaces*** to be isolated are identified to allow testing according to legislative and industry requirements. 3.2. Test methods for complex components are used according to legislative and industry requirements. 3.3. Testing procedures are conducted on complex components at required ***frequency schedule*** to verify that system functions as intended. 3.4. Test results are compared with legislative and industry requirements. 3.5. Results are documented according to legislative and industry requirements. 3.6. Report is prepared and forwarded to persons for action according to legislative and industry

ELEMENT	PERFORMANCE CRITERIA
	requirements. 3.7. System is reinstated according to organisational requirements.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- customer service skills
- language, literacy and numeracy skills to:
  - communicate with others clearly and concisely, verbally and in writing
  - read and comply with work instructions and specifications
  - read and record measurements
  - record and report information neatly and legibly
- planning and organising skills to:
  - estimate time to complete activities
  - prioritise tasks
- interpersonal skills to relate to people from a range of social and cultural backgrounds
- technical skills to:
  - operate valves, switches and levers to test system operation
  - work safely when applying workplace housekeeping procedures

Required knowledge

- definitions of basic principles of operation and purpose of components of complex water-based fire protection systems
- general operation of a gauge
- general operation of complex water-based fire-suppression systems
- metric and imperial pressure gauge readings
- systems:
  - air compressors fitted to systems
  - circulation and system pressure relief valves
  - controls on the pumpset controller panel:
    - fuel gauges
    - indicators
    - main isolating switch

REQUIRED SKILLS AND KNOWLEDGE

- flow switches and associated testing equipment
- isolating valves associated with water-based fire-suppression system
- pressure gauges
- pressure reducing equipment
- pumpsets associated with water-based fire-suppression system
- pump starting switches
- purpose and key requirements of system block plan for installations installed since 1972
- suction inlet strainers and screens on a static water supply for water-based fire-suppression system
- system main alarm bell and/or alarm strobe indicating building entry point for emergency personnel
- system pressure gauge schedules, where required
- water-based fire-suppression system control and alarm valves and ancillary equipment for control and alarm operation indication/interface
- water supply tanks, water level indicators and automatic inflow valves
- water supply underground key-operated valve location
- terminology used in relation to water-based fire-suppression systems
- water-based fire-suppression system applications as defined in AS 2118 Automatic fire sprinkler systems or AS 2419 Fire hydrant installations

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, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

This unit of competency could be assessed by observation of practical demonstration of the inspection and testing procedures to verify that complex water-based fire-suppression system equipment functions as intended.

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 the required skills and knowledge specified in this unit.
In particular the person should demonstrate the ability to:

- apply sustainability principles and concepts when conducting annual functional testing of complex water-based fire-suppression systems
- apply safety requirements throughout the work sequence, including electrical safety, personal protective clothing and equipment
- conduct relevant annual inspection and test requirements (other then water flow testing) according to the current Australian standard on water-based fire suppression systems, including complex components for the following systems:
  - general sprinkler systems with no pumpset system
  - general sprinkler systems with pumpset system and tank
  - combined sprinkler and hydrant systems
  - deluge systems
  - pre-action or recycle systems
  - pressure reducing valves
  - pressure relief valves
- perform an installation and design survey on a Class 5 to 9 building of at least 5 stories or greater then 10,000 square metre building to produce an inspection report on:
  - pipework external condition
  - sprinkler head condition
  - sprinkler head obstructions
  - sprinkler head location and spacing
  - sprinkler head compatibility and ambient conditions

EVIDENCE GUIDE

	(RTI and sprinkler head and spray pattern) • external sprinkler requirements • design standard suitable for current building occupation requirements, such as classification and storage heights.
Context of and specific resources for assessment	Assessment of essential underpinning knowledge may be conducted in an off-site context. It is to comply with relevant regulatory or Australian standards' requirements. Resource implications for assessment include: • adequate water supply and draining or recycling arrangements to operate water-based fire-suppression system • necessary tools, specialist equipment, manuals and relevant documentation • operational water-based fire-suppression system • pictures and cut-away sections of control assemblies and valves to show operation • training and assessment record book.
Method of assessment	Assessment methods must: • satisfy the endorsed Assessment Guidelines of the Property Services Training Package • include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application • reinforce the integration of employability skills with workplace tasks and job roles • confirm that competency is verified and able to be transferred to other circumstances and environments.
Guidance information for assessment	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. This unit could be assessed on its own or in combination with other units relevant to the job function, for example: • CPCPFS3020A Conduct basic functional testing of

EVIDENCE GUIDE

water-based fire-suppression systems
- CPCPFS3021A Inspect and test fire pumpsets
- CPCPFS3023A Conduct functional water flow testing.

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, 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.

Legislative and industry requirements may include:
- dangerous goods regulations
- environmental regulations
- licensing arrangements
- OHS legislation, regulations and codes
- relevant commonwealth and state or territory building Acts, regulations and codes, such as Building Code of Australia (BCA)
- relevant Australian standards, such as:
  - AS 1851 Maintenance of fire protection systems and equipment
  - note: Australian standards are frequently revised and users must always check for currency and amendments
- other relevant legislation relating to fire protection equipment, including:
  - international shipping codes
  - marine codes for different Australian states
  - requirements of Australian petroleum industry.

Organisational requirements may be located in quality assurance and procedures manuals and may include:
- client-specific contractual requirements
- documentation and information systems and processes
- legal and organisational policy and guidelines
- legislation relevant to service operation
- personnel practices and guidelines outlining work roles, responsibilities and delegations
- use of electronic job scheduling and communication devices.

Checking for compliance may include:
- applying inspections, tests and survey requirements to equipment and systems, according to relevant Australian standards, to determine that they are:

RANGE STATEMENT

- capable of operating as intended when originally installed
- still suitable for the fire hazard or risk being protected, as no change in occupancy or use of the area protected has occurred since the equipment or system was installed or last modified
- providing the coverage and protection needed to meet original design and performance requirements

- reviewing documentation to verify that installed systems comply with legislative and industry requirements, such as:
  - building's essential services or fire safety measures listing
  - relevant commonwealth and state or territory building Acts, regulations and codes
  - relevant Australian standards listed on essential service listing
  - environmental regulations.

RANGE STATEMENT

Action may include:

- advising client
- documenting non-compliance
- making equipment safe
- reporting, as required.

Annual functional testing:

- is inspection, testing and surveying according to AS 1851 Maintenance of fire protection systems and equipment for water-based fire-suppression systems
- includes:
  - annual frequency inspection, testing and surveying activities, except water flow proving testing
  - operating:
    - pressure reducing valves to verify operation is at required pressures
    - pressure relief valves to verify operation is at required pressures
    - accelerator/exhauster and double interlock valves to verify operation is at required pressures and delivery time on dry pipe or pre-action systems.

Complex components may include:

- components of a water-based fire-suppression system associated with:
  - double interlock systems
  - pressure reducing systems
  - accelerator/exhauster systems.

Water-based fire-suppression systems include systems defined in:

- AS 2118 Automatic fire sprinkler systems (known as the SAA code for automatic fire sprinkler systems)
- AS 2419 Fire hydrant installations, including systems such as:
  - alternate wet and dry systems
  - combined sprinkler and hydrant systems
  - deluge systems
  - dry systems
  - hydrant systems
  - pre-action or recycle systems
  - residential and domestic systems
  - tail-end systems.

Key control valves may include those:

- specified in AS 2118 Automatic fire sprinkler systems
- installed in the:
  - associated control valve trim
  - activation small bore pipework to the alarm and control valve assembly.

RANGE STATEMENT

Installation and design survey may include:

- annual survey required by AS 1851 Maintenance of fire protection systems and equipment to determine that water-based fire-suppression system's design and installation are not impaired by changes to:
  - building structure
  - occupant use
  - environment
- conducted from floor level to identify:
  - design standard suitable for current building occupation requirements:
    - building classification
    - storage heights
  - external sprinkler requirements
  - pipework corrosion or damage
  - sprinkler head:
    - compatibility and ambient conditions
    - head condition
    - head location and spacing
    - head obstructions
    - spray pattern
    - temperature rating and response time index (RTI).

Sustainability principles and concepts:

- cover the social, economic and environmental use of resources to meet current and future needs
- may include:
  - efficient use of material
  - efficient energy and water use
  - rain harvesting and disposal.

System interfaces may include:

- components, such as:
  - flow switches
  - pressure switches
  - tamper switches
  - valve positioning switches
- devices that operate signals between the water-based fire-suppression system and other services, such as:
  - building heating, ventilation and cooling (HVAC) services
  - fire brigade monitoring providers
  - other life safety systems, such as:
    - warning systems
    - fire indicator panel.

RANGE STATEMENT

Frequency schedules are:

- schedules of work conducted at regular frequencies as defined in AS 1851 Maintenance of fire protection systems and equipment (general section) that relate to the work scope for annual inspection, and testing and survey maintenance schedules.

Unit Sector(s)

Unit sector Plumbing and services

Co-requisite units

Co-requisite units

Competency field

Competency field