



Australian Government

Department of Education, Employment and Workplace Relations

CPCPFS3023A Conduct functional water flow testing

Release: 1

CPCPFS3023A Conduct functional water flow testing

Modification History

Not Applicable

Unit Descriptor

Unit descriptor

This unit of competency specifies the outcomes required to complete functional water flow proving and load tests on water-based fire-suppression systems. The unit covers working safely while conducting water flow testing. It involves satisfying mandatory reporting requirements as well as general isolations and resetting the water-based fire-suppression system.

The fire protection 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 functional testing of water-based fire protection systems.

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 or territory legislative and industry requirements.

Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units

CPCPCM2023A

Carry out OHS requirements

Prerequisite units

	OR BOTH:
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 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.
2. Prepare system and equipment to conduct functional water flow proving test.	2.1. Workplace procedures are followed and risk control measures applied when setting up on water-based fire-suppression systems . 2.2. Appropriate test points are identified. 2.3. Water flow test equipment required is identified according to manufacturer instructions and legislative and industry requirements. 2.4. Required water flow test equipment is attached according to manufacturer instructions and organisational requirements. 2.5. Relevant plant and other system interfaces are identified and isolated according to organisational requirements. 2.6. Water supply isolating valves are located, types of valves identified, and valves operated as required to isolate water supplies according to organisational requirements. 2.7. Sustainability principles and concepts are applied to work preparation and application.
3. Conduct functional water flow proving and load test, and record results.	3.1. Test methods are implemented according to frequency schedule and legislative and industry requirements. 3.2. Tests are conducted on each water supply, as required, to verify that systems function as intended. 3.3. Test results are compared with legislative and industry requirements. 3.4. Results are documented according to legislative and industry requirements. 3.5. Report is prepared and forwarded to relevant persons for action according to legislative and industry requirements. 3.6. 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

- language, literacy and numeracy skills to:
 - communicate with others clearly and concisely, verbally and in writing
 - interpret data from a range of flow testing equipment
 - read, understand and comply with work instructions and specifications
 - read, understand and record measurements
 - record and report information neatly and legibly
- planning and organising skills to:
 - estimate time to complete activities
 - prioritise tasks
- technical skills to:
 - attach flow and pressure test equipment according to manufacturer specifications
 - check test equipment for calibration and operation according to manufacturer specifications
 - interconnect test equipment into recording devices
 - operate valves, switches and levers to test system operation
 - use:
 - portable tachometer on pump shaft to read speed
 - clamp or tong current meter to read motor operating current
 - throttling control valve to control water flow
 - work safely when applying workplace housekeeping procedures

Required knowledge

- basic principles of hydraulics
- basic principles of operation and purpose of components of a water-based fire protection system:
 - alarm 'dry' (i.e. deluge) control valve assembly components
 - alarm 'wet' control valve assembly components
 - booster valve assembly
 - circulation and system pressure relief valves
 - compression ignition engine governing controls
 - differential pressure gauges
 - hand tachometers

REQUIRED SKILLS AND KNOWLEDGE

- hydrant landing valve assembly
- isolation and control valves
- manometers
- orifice plates
- Pitot tube water flow test instrument
- pressure and flow switches
- pressure gauges
- pump controllers and ancillary equipment for control and indication
- pumpsets
- solenoid valves
- system block plans
- system pressure gauge schedules
- throttling valves
- ultrasonic flow measuring equipment
- ultrasonic thickness gauges
- Venturi devices
- water supply tanks: atmospheric, pressure and suction with priming tanks
- general operation of a pumpset, covering:
 - compression ignition engine governing control devices
 - cooling systems
 - design speed requirements
 - exhaust systems
 - fuel systems
 - full load operation
 - normal running operation
 - pre-start and post-start checks
 - pumpset performance curve
 - pumpset controllers
 - starting and stopping methods
 - suction and discharge connections and pressures readings
- general operation of water-based fire-suppression systems
- terminology used in relation to water-based fire-suppression systems
- water-based fire-suppression system components:
 - air compressors fitted to control valves
 - circulation and system pressure relief valves
 - controls on the pumpset controller panel:
 - fuel gauges
 - indicators

REQUIRED SKILLS AND KNOWLEDGE

- main isolating switch
- electric motor specification plate
- flow switches and associated testing equipment
- isolating valves associated with water-based fire-suppression system
- mains water supply underground key-operated valve location
- most hydraulically disadvantaged testing point on a system hose reel and hydrant system
- pressure gauges
- pumpsets associated with water-based fire-suppression systems
- pump starting switches
- suction inlet strainers or screen on a static water supply for water-based fire-suppression system
- system block plans
- system main alarm bell or alarm strobe indicating building entry point for emergency personnel
- system pressure gauge schedules
- water supply tanks, water level indicators and automatic inflow valves
- water-based fire-suppression system control and alarm valves and ancillary equipment for control and alarm operation indication or interface
- water-based fire-suppression system applications, as defined in AS 2118

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 basic functional water flow testing of a range of water-based fire-suppression systems.

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 functional water flow testing
- apply safety requirements throughout the work sequence, including electrical safety, personal protective clothing and equipment
- conduct functional water-flow testing of the following water-based fire-suppression systems:
 - deluge systems
 - hydrant systems
 - pre-action or recycle systems
 - residential and domestic systems
 - wet and general systems with no pumpset system
 - wet and general systems with pumpset system and tank.

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 the water-based fire-suppression system
- calibrated water flow measuring and pressure gauge equipment
- operational water-based fire-suppression systems.

Method of assessment Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Property Services Training Package

EVIDENCE GUIDE

- 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:

- CPCPFS3021A Inspect and test fire pumpsets.

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:

- 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
- relevant legislation relating to testing of fire protection

RANGE STATEMENT

equipment, including:

- dangerous goods regulations
- environmental regulations
- international shipping codes
- licensing arrangements
- marine codes for different Australian states
- occupational health and safety (OHS) legislation, regulations and codes
- 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 policies and guidelines, including personnel practices and guidelines outlining work roles, responsibilities and delegations
- legislation relevant to service operation
- using electronic job scheduling and communication devices.

Checking for compliance may include:

- undertaking commissioning tests detailed in relevant Australian standards and manufacturers' documentation to verify performance of an installed, repaired or altered piece of equipment or system
- applying inspections, tests and survey requirements to equipment and systems, according to relevant Australian standards, to determine that they are:
 - 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
 - environmental regulations
 - relevant commonwealth and state or territory building Acts, regulations and codes
 - relevant Australian standards listed on essential service listing.

Action may include:

- advising client
- documenting non-compliance
- making equipment safe

RANGE STATEMENT

Water-based

fire-suppression systems

are defined in AS 2118 Automatic fire sprinkler systems and AS 2419 Fire hydrant installations, and may include:

- reporting, as required.
- 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
- alternate wet and general systems.

Test points are:

- specific locations where test equipment can be attached to measure and record water flow and pressure to meet legislative and industry requirements.

Water flow test equipment may include:

- differential pressure gauges
- hand tachometers
- manometers
- orifice plates
- Pitot tube water flow test instrument
- ultrasonic flow measuring equipment
- ultrasonic thickness gauges
- Venturi devices.

System interfaces may include:

- components such as flow, pressure, tamper and valve positioning switches 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.

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.

Frequency schedules include:

- schedules conducted at regular frequencies, as defined in AS 1851, and relating to weekly, monthly, and six-monthly inspection and testing activities.

Unit Sector(s)

Unit sector Plumbing and services

Co-requisite units

Co-requisite units

Competency field

Competency field