Unit of Competency CPCPFS3043 Conduct functional water flow testing

Application

This unit specifies the skills and knowledge required to complete functional water flow proving and load tests on water-based fire-suppression systems.

It includes identifying compliance requirements, isolating relevant plant and system interfaces, conducting functional water flow testing, resetting the system and completing mandatory reporting requirements.

In some jurisdictions, this unit of competency may form part of accreditation, licensing, legislative, regulatory or certification requirements.

Prerequisite Unit

CPCPCM2043 Carry out WHS requirements

Elements and Performance Criteria

1. Plan the work	1.1 Identify, confirm and apply water flow testing requirements from relevant job plans and specifications, codes, Australian Standards, manufacturer's specifications and jurisdictional requirements. 1.2 Identify and apply workplace policies and procedures, work health and safety (WHS) and environmental requirements. 1.3 Check location and equipment against legislative and industry requirements and take action according to organisational requirements to ensure compliance. 1.4 Select and check serviceability of tools, equipment and personal protective equipment (PPE). 1.5. Identify and isolate relevant plant and system interfaces. 1.6 Confirm that wastewater from flow test will not cause any damage or issues to site or surrounding area 1.7 Identify appropriate test points and required water flow test equipment. 1.8 Locate and identify types of water supply isolating valves.
2. Prepare for work.	2.1 Apply appropriate workplace procedures and risk control measures. 2.2 Depressurise flow test point pipework. 2.3 Attach water flow test equipment according to manufacturer instructions and organisational requirements. 2.4 Install gauges of known accuracy. 2.5 Determine system water pressure and flow requirements from block plan. 2.6 Select and chart at least four points to take readings when flow testing according to manufacturer's charts for the flow test equipment. 2.7 Operate valves to isolate water supplies. 2.8 Document all information from site block plan.
3. Conduct functional water flow proving and	3.1 Perform tests on each water supply to verify that systems function as intended, stopping at a minimum of four points and recording installation, town's main and/or pump suction and discharge pressures.

load test, and record results.	3.2 Record pump driver RPM at the drive shaft, temperature of driver and oil pressure. 3.3 Monitor cooling system closely while conducting flow test. 3.4 Record temperature of pump room when conducting test. 3.5 Compare test results with legislative and industry requirements. 3.6 Identify all defects and nonconformances and report according to AS 1851 Routine service of fire protection systems and equipment. 3.7 Document and graph results and forward report to relevant persons for action. 3.8 Reinstate system according to organisational requirements.
4. Clean up.	4.1 Clear the work area, and dispose of, reuse or recycle materials in accordance with state and territory legislation and workplace policies and procedures. 4.2 Clean tools and equipment, check for serviceability and report any damage, and store and secure according to workplace procedures.

Foundation skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Supersedes and is equivalent to CPCPFS3043A Conduct functional water flow testing.

Links

Companion Volume Implementation Guide: https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad

Assessment Requirements for CPCPFS3043
Conduct functional water flow testing

Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria for this unit by:

- conducting a load test on a wet and general electrical pumpset according to AS 1851 Routine service of fire protection systems and equipment
- conducting a load test on a wet and general diesel pumpset according to AS 1851 Routine service of fire protection systems and equipment
- conducting a functional water-flow test on a hydrant system incorporating a pumpset
- conducting two functional water-flow tests on a hydrant system:
    - one with a portable flow meter
    - one connected by a length of fire hose.

Knowledge Evidence

To be competent in this unit, a person must demonstrate knowledge of:

- basic principles of hydraulics
- basic principles of operation and purpose of components of a water-based fire protection system:
    - 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
    - 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:
    - 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
    - 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
- controls on the pumpset controller panel:

    - fuel gauges
    - indicators
    - main isolating switch
- water-based fire-suppression system applications as defined in AS 2118 Automatic fire sprinkler systems
- legislative and industry requirements:
    - relevant Commonwealth and state or territory building acts, regulations and codes, such as the National Construction Code (NCC)
    - AS 1851 Routine service of fire protection systems and equipment
- relevant legislation relating to testing of fire protection equipment
- organisational requirements:
    - 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
    - using electronic job scheduling and communication devices
- commissioning tests detailed in relevant Australian standards and manufacturers documentation to verify performance of an installed, repaired or altered piece of equipment or system
- checking for compliance including 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
- checking for compliance, including reviewing documentation to verify that installed systems comply with legislative and industry requirements such as:
    - buildings 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
- water-based fire-suppression systems as defined in AS 2118 Automatic fire sprinkler systems and AS 2419 Fire hydrant installations:
    - combined sprinkler and hydrant systems
    - deluge systems
    - dry systems
    - hydrant systems
    - pre-action or recycle systems
    - residential and domestic systems
    - tail-end systems

- 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:
    - differential pressure gauges
    - hand tachometers
    - manometers
    - orifice plates
    - pitot tube water flow test instrument
    - ultrasonic flow measuring equipment
    - ultrasonic thickness gauges
    - venturi devices
- system interface 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 air conditioning (HVAC) services
    - fire brigade monitoring providers
- other life safety systems:
    - warning systems
    - fire indicator panel (FIP)
- methods of applying sustainability principles and concepts
- routine service frequency schedules:
    - reference to AS 1851 Routine service of fire protection systems and equipment schedules of work conducted at regular frequencies that relate to the work scope for weekly, monthly, and six-monthly inspection and testing activities
- how to access relevant information, including codes and standards
- tools, materials and equipment used for conducting functional water flow testing
- work health and safety (WHS) requirements for conducting functional water flow testing.

Assessment Conditions

Assessors must satisfy the requirements for assessors listed in the Standards for Registered Training Organisations.

This unit must be assessed in the workplace or a close simulation using realistic workplace conditions, materials, activities, responsibilities, procedures, safety requirements and environmental considerations.

Links

Companion Volume Implementation Guide:
https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad