

# Unit of Competency CPCSFS5005

## Research and evaluate fire system technologies and components

### Application

This unit of competency specifies the outcomes required to research, evaluate and select existing, new and incoming technologies and components for fire system detection and suppression systems. The unit also involves developing a broad understanding of the range of products available and their application, operation, performance and interaction.

This unit of competency supports the work of fire systems' designers and certifiers who need to:

- understand the characteristics, operation and interaction of fire system technologies and components
- select and assess fire system technologies and components.

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

### Prerequisite Unit

Nil.

### Elements and Performance Criteria

1. Research and evaluate fire suppression systems.	1.1	Research and identify the range of technologies and components for fire suppression systems.
	1.2	Assess the suitability of fire suppression systems to different types of buildings and situations with reference to relevant legislation, codes and standards and client requirements.
	1.3	Determine the performance characteristics and limitations of fire suppression systems.
	1.4	Analyse fire suppression system failures and propose appropriate design solutions.
	1.5	Select suitable and cost-effective fire suppression system technologies and components for buildings, situations and climatic conditions.
2. Research and evaluate fire detection and occupant warning systems.	2.1	Identify technologies and components available for fire detection and occupant warning systems.
	2.2	Assess the suitability of fire detection and occupant warning systems to different types of buildings and situations with reference to relevant legislation, codes and standards.
	2.3	Determine the performance characteristics and limitations of fire detection and occupant warning systems.
	2.4	Select suitable and cost-effective fire detection and occupant warning system technologies and components for buildings and situations.
3. Analyse and	3.1	Analyse and specify the required interactions for effective operation of fire

specify the interaction of fire systems.	<p>systems in different types of buildings and situations.</p> <p>3.2 Identify and examine the interfaces that affect interactions between fire systems in different types of buildings and situations.</p> <p>3.3 Select suitable fire detection and suppression systems for buildings and situations and specify the interactions and interfaces required for effective performance.</p>
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## 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 CPCSF55005A Research and evaluate fire system technologies and components.

## Links

Companion Volume Implementation Guide:

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad>

# Assessment Requirements for CPCSFS5005

## Research and evaluate fire system technologies and components

### Performance Evidence

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

- researching, evaluating and selecting fire detection and suppression systems for four types of fire systems design applications, including:
  - sprinklers
  - water mist
  - deluge/pre-action
  - gas suppression.

### Knowledge Evidence

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

- drawings, plans, reports and specifications
- manufacturer specifications and technical performance data for fire detection and suppression technologies and components
- applications for different fire systems design projects:
  - low-rise buildings
  - processing building applications
  - warehouse buildings under 13.7 m high
  - warehouse buildings over 13.7 m high
  - medium-rise buildings
  - high-rise buildings (over 25 metres)
  - buildings over 50 metres in height
- interactions and interfaces between fire detection and suppression systems
- suitability of fire detection and suppression systems technology and components
- performance and cost-effectiveness of different technologies and components
- workplace design tools and processes
- computer software functions and operation:
  - word processing
  - spreadsheet
  - email
  - internet
- relevant current legislation, codes and standards:
  - building Acts
  - building regulations
  - infrastructure supply regulations

- o the Building Code of Australia (BCA)
  - o National Construction Code (NCC)
  - o Australian standards for fire systems
  - o international standards for fire systems
  - o jurisdictional authorities in addition to the BCA and NCC
  - o other fire system standards commonly required by building insurers
- fire systems technology and components:
  - o water-based systems:
    - wet pipe sprinkler systems and components
    - deluge and drencher systems
    - dry pipe sprinkler systems and components
    - pre-action sprinkler systems and components
    - early suppression fast response (ESFR) sprinklers and components
    - water spray systems
    - water mist systems
    - wet chemical suppression systems
    - foam suppression systems
    - hydrants, hose reels and monitors
    - water supply tanks
    - fire pump sets
    - fire control panels
    - valves
  - o gaseous suppression systems
  - o detection and warning systems:
    - occupant warning systems
    - emergency warning and intercommunications systems (EWIS)
    - fire detection and alarm systems
    - smoke control systems
    - emergency lighting systems
    - fire control panels
- purpose and operation of fire systems:
  - o layout
  - o high hazard products
  - o system operation
  - o performance requirements
  - o maintenance standards
  - o system activation and operation
- characteristics and limitations of products and materials used in fire systems and issues relating to material compatibility:
  - o system activation and operation
  - o effect of fire, heat and smoke of component materials
  - o interaction with other systems and services
- interconnection of fire systems:
  - o cause and effect matrix
  - o interface with other services
- water supplies:
  - o common water sources

- o conservation requirements
  - o in-ground reticulation
  - o booster configurations
- fluid mechanics and hydraulics relating to:
  - o water supply
  - o pressure
  - o pump selection
  - o tank selection
  - o pressure vessels
  - o pipe range
- sustainability requirements and ratings:
  - o energy conservation
  - o water conservation
- electrical and electronics theory:
  - o units used to measure current (alternating current (AC) and direct current (DC)), power, capacitance, inductance and sound attenuation
  - o definition of voltage ratings and requirements applicable to fire detection and warning systems as defined in communication and electrical safety regulations, including extra-low voltage (ELV), low voltage (LV) and hazardous voltages
  - o basic operation of common electronic and electrical components used in fire detection and warning systems including:
    - basic operation of communication protocols on addressable systems
    - peripheral devices (printers)
    - interfaces to other communication systems to high level or low level
- communication technologies:
  - o data transfer
  - o networking
  - o communication protocols
  - o radio frequency technologies.

## Assessment Conditions

Assessors must meet the requirements for assessors contained 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>