



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **CPCSFS5013A Support commissioning processes and finalise fire systems design projects**

Release: 1

## CPCSFS5013A Support commissioning processes and finalise fire systems design projects

### Modification History

Not Applicable

### Unit Descriptor

<b>Unit descriptor</b>	<p>This unit of competency specifies the outcomes required to confirm the post-installation details of fire systems and produce amended drawings and documentation, and to prepare detailed commissioning procedures and specifications. The unit also covers reviewing issues and solutions arising during fire systems design projects and making subsequent improvements to fire systems design project processes.</p> <p>Licensing, legislative, regulatory or certification requirements may apply to this unit and so the varying state or territory requirements should be confirmed with the relevant body.</p>
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### Application of the Unit

<b>Application of the unit</b>	<p>This unit of competency supports the role of fire systems' designers with responsibility for producing 'as built' drawings, block plans, tactical fire plans, and operations and maintenance manuals for fire systems.</p> <p>Fire systems designs are limited to those within the deemed-to-satisfy provisions of the Building Code of Australia or detailed fire systems designs for alternative solutions designed by fire engineers. This unit does not apply to fire systems for special hazard locations.</p>
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### Licensing/Regulatory Information

Refer to Unit Descriptor

## Pre-Requisites

<b>Prerequisite units</b>	Nil
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## Employability Skills Information

<b>Employability skills</b>	This unit contains employability skills.
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## 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.
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## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Produce accurate final drawings for fire systems.	1.1. Progressive changes to fire systems design drawings resulting from construction phase issues are documented according to workplace and project procedures. 1.2. Site visits are conducted, if possible, to confirm and record final component sizes, locations and building dimensions. 1.3. Accurate 'as built' drawings are prepared, named, notated, filed and submitted according to workplace procedures and project requirements. 1.4. Appropriate block plans and tactical fire plans are produced as required.
2. Prepare commissioning details, and operation and maintenance manuals for fire systems.	2.1. <i>System performance requirements and commissioning procedures and specifications</i> are prepared according to workplace and project requirements. 2.2. <i>Standard operating procedures</i> for the fire system are prepared based on relevant <i>codes and standards</i> and component manufacturer's recommendations. 2.3. <i>Regular maintenance procedures</i> for the fire system are produced based on component manufacturer's recommendations and relevant regulatory requirements. 2.4. Operation and maintenance <i>signage</i> is installed, as required according to relevant workplace, project and regulatory requirements.
3. Review and evaluate the fire systems design process.	3.1. Project documentation is reviewed and processed, and issues that arose and their solutions are noted. 3.2. Project issues and solutions are discussed with relevant workplace personnel and process improvement strategies are explored. 3.3. Project planning, methodologies and quality assurance systems are amended to incorporate agreed process improvement strategies.

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

## REQUIRED SKILLS AND KNOWLEDGE

### Required skills

- accurate measuring
- accurate naming and filing of drawings, including:
  - formal document control
  - formal amendments, including:
    - history
    - transmittal notices
- editing and creating drawings, including:
  - layout
  - section
  - detail
  - external references
  - freezing layers
- operating computer software packages and systems, including:
  - word processing
  - spreadsheet
  - email
  - internet
  - proprietary project management software
- language and literacy skills for:
  - listening to and communicating clearly with colleagues, installers, suppliers and contractors
  - letter writing, especially to formalise:
  - recognition of conflicts and errors on drawings supplied by other service contractors
  - agreements with other services, for example whichever service is fitted last must fit around existing services
  - reading and interpreting drawings, plans and specifications, including:
    - architectural
    - structural
    - mechanical
    - hydraulic
    - electrical
- developing constructive and cooperative working relationships with project team members, workplace colleagues, suppliers, installers and clients
- initiating and running meetings with lead contractor and other service contractors
- organising own work, including creating personal systems and checklists for planning, managing and checking work

## **REQUIRED SKILLS AND KNOWLEDGE**

- lateral thinking and problem solving
- maintaining concentration, focus and attention to detail for long periods
- managing detailed input to concurrent fire systems design projects at different stages of the process and with diverse sets of regulatory requirements

### **Required knowledge**

- workplace design tools and processes
- level of accuracy required in detailed design drawings
- naming conventions for design drawings and drawing register
- fire science, including:
  - fire behaviour and dynamics
  - impact of fire on structures and materials
  - products of combustion
  - fire control strategies
  - fire retardants
  - fire detection technologies
  - fire suppression technologies
  - fire containment
- computer software functions and operation, including:
  - word processing
  - spreadsheet
  - email
  - internet
  - proprietary project management software
- relevant current legislation, codes and standards, including:
  - building Acts
  - building regulations
  - infrastructure supply regulations
  - the Building Code of Australia
  - Australian standards for fire systems
  - international standards for fire systems
  - other fire system standards commonly required by building insurers
- protection requirements for different buildings
- fire systems' technology and components, including:
  - water-based systems, including:
    - wet pipe sprinkler systems
    - deluge and drencher systems
    - dry pipe sprinkler systems
    - pre-action sprinkler systems

## REQUIRED SKILLS AND KNOWLEDGE

- early suppression fast response (ESFR)
- hydrants, hose reels and monitors
- water supply tanks
- fire pump sets
- detection and warning systems, including:
  - emergency warning and intercommunications systems (EWIS)
  - fire detection and alarm systems
  - smoke control systems
  - emergency lighting systems
- purpose and operation of fire systems, including:
  - layout
  - special products and hazards
  - system operation
  - performance requirements
  - maintenance standards
  - system activation and operation
- passive fire safety elements:
  - identification of passive elements
  - impact of fire systems design on passive elements
  - specifications required to safeguard integrity of passive fire element performance where penetrations are necessitated by the fire systems design
- characteristics and limitations of products and materials used in fire systems and issues relating to material compatibility
- interconnection of fire systems, including:
  - cause and effect matrix
  - interface with other services
- instruments used in commissioning and measuring fire system performance
- basic principles of structural engineering
- characteristics of building materials
- construction industry terminology
- roles and responsibilities of relevant building project personnel, including:
  - architect
  - lead contractor
  - mechanical engineer
  - hydraulic engineer
  - electrical engineer
- contractual processes

## Evidence Guide

<b>EVIDENCE GUIDE</b>	
<p>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.</p>	
<p><b>Overview of assessment</b></p>	<p>This unit of competency could be assessed in the workplace or a close simulation of the workplace environment, provided that the simulated or project-based assessment fully replicates workplace conditions, materials, activities, responsibilities and procedures.</p> <p>This unit could be assessed as an activity involving the preparation of final fire systems design project documentation, including drawings, specifications and commissioning support documentation. The activity should also include the review of project processes and outcomes to inform continuous improvement strategies.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>A person who demonstrates competency in this unit must be able to provide evidence of the required skills and knowledge specified within this unit.</p> <p>In particular the person should demonstrate:</p> <ul style="list-style-type: none"> <li>• the ability to: <ul style="list-style-type: none"> <li>• produce final 'as installed' drawings for fire systems design projects</li> <li>• save, file and share design drawings</li> </ul> </li> <li>• an understanding of relevant regulatory approval and fire systems design certification processes</li> <li>• the ability to identify, interpret and apply relevant current legislation, codes, standards and regulatory requirements impacting on the finalisation of fire systems design projects, including commissioning procedures and certification</li> <li>• the ability to review project processes and outcomes for a range of fire systems design projects, including low-rise, medium-rise, high-rise (over 25 metres) and buildings over 45 metres in height, and identify and discuss opportunities for learning and process improvement</li> </ul>



<b>EVIDENCE GUIDE</b>	
	<ul style="list-style-type: none"> <li>the ability to incorporate learning and agreed process improvements into planning and methodologies for a range of fire systems design projects.</li> </ul>
<b>Context of and specific resources for assessment</b>	<p>Assessment of essential underpinning knowledge may be conducted in an off-site context. It is to comply with relevant regulatory or Australian standards' requirements.</p> <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"> <li>design and installation drawings, plans and specifications</li> <li>copies of codes, standards, legislation and regulatory requirements</li> <li>access to information and communications technology - hardware and software.</li> </ul>
<b>Method of assessment</b>	<p>Assessment must:</p> <ul style="list-style-type: none"> <li>satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package</li> <li>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</li> <li>reinforce the integration of employability skills with workplace tasks and job roles</li> <li>confirm that competency is verified and able to be transferred to other circumstances and environments.</li> </ul>
<b>Guidance information for assessment</b>	<p>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.</p> <p>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.</p>

## 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.

<p><i>System performance requirements</i> may include:</p>	<ul style="list-style-type: none"> <li>• for water-based systems:             <ul style="list-style-type: none"> <li>• speed of response</li> <li>• time taken to reach full-flow conditions</li> <li>• area of coverage</li> <li>• nozzle locations</li> <li>• droplet profile and characteristics</li> <li>• duration of response</li> </ul> </li> <li>• for detection and warning systems:             <ul style="list-style-type: none"> <li>• correct sensors</li> <li>• sensitivity to fire size</li> <li>• speed of detection and response</li> <li>• fire location coverage.</li> </ul> </li> </ul>
<p><i>Commissioning procedures and specifications</i> may include:</p>	<ul style="list-style-type: none"> <li>• procedures listed in Australian standards, such as:             <ul style="list-style-type: none"> <li>• AS2118.1-2006 Section 15</li> <li>• AS1670.1-2004 Section 7</li> <li>• AS2118 Automatic fire sprinkler systems</li> <li>• AS2419 Fire hydrant installations</li> </ul> </li> <li>• U.S. National Fire Protection Association (NFPA) codes</li> <li>• material safety data sheets (MSDS)</li> <li>• manufacturer recommendations.</li> </ul>
<p><i>Standard operating procedures</i> may include:</p>	<ul style="list-style-type: none"> <li>• site-specific workplace standard operating procedures</li> <li>• work method statements</li> <li>• job safety advice</li> <li>• quality assurance documentation.</li> </ul>
<p><i>Codes and standards</i> may include:</p>	<ul style="list-style-type: none"> <li>• the Building Code of Australia</li> <li>• current relevant Australian standards for fire systems</li> <li>• current relevant international standards for fire</li> </ul>

<b>RANGE STATEMENT</b>	
	systems <ul style="list-style-type: none"><li>• codes and standards stipulated by the building insurer.</li></ul>

<b>RANGE STATEMENT</b>	
<b><i>Regular maintenance procedures</i></b> may include:	<ul style="list-style-type: none"> <li>• site-specific maintenance instructions</li> <li>• manufacturer's specific maintenance instructions</li> <li>• local government regulations, such as:               <ul style="list-style-type: none"> <li>• part 59, South Australia</li> </ul> </li> <li>• Australian standards, such as:               <ul style="list-style-type: none"> <li>• AS1851-2005</li> </ul> </li> <li>• material safety data sheets (MSDS).</li> </ul>
<b><i>Signage</i></b> may include:	<ul style="list-style-type: none"> <li>• technical design data, including systems performance and layout on a block plan</li> <li>• pressure switch setting plaque</li> <li>• interface cause and effect drawing</li> <li>• operating instructions</li> <li>• manufacturer's technical plates or labels</li> <li>• signs in the pump room for water-based systems, including:               <ul style="list-style-type: none"> <li>• system pressure</li> <li>• town mains pressure</li> <li>• pump cut-in pressure</li> <li>• pressure gauge schedule</li> <li>• block plans</li> </ul> </li> <li>• signage for detection and warning systems, including:               <ul style="list-style-type: none"> <li>• system interface matrix</li> <li>• block plans</li> <li>• device lists.</li> </ul> </li> </ul>

## Unit Sector(s)

<b>Unit sector</b>	Fire systems design
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## Co-requisite units

<b>Co-requisite units</b>	Nil
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## Competency field

Competency field	
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