



Australian Government

PUAFIR604A Determine origin and cause of structure fire

Release 3

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Modification History

Release	TP Version	Comments
3	PUA12 V2.1	Editorial changes.
2	PUA12 V2	Layout adjusted. No changes to content
1	PUA00 V8.1	Primary release on TGA

Unit Descriptor

This unit covers the competency required to manage the inspection and assessment of a structure fire to determine the origin and the cause.

It includes the excavation and examination of fire debris, identifying and recovering evidence relevant to the fire investigation, packaging items of evidence for examination and conducting a thorough analysis of fire behaviour, development and travel, and gathering evidence to establish fire cause.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Application of the Unit

Application of this unit is relevant to fire investigators who are required to determine the origin and cause of a structure fire.

The unit focuses on the skills and knowledge required to develop and apply a systematic approach to fire investigation in a structure environment.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

PUAFIR302B Suppress urban fire (Fire sector specific)

PUALAW001B Protect and preserve incident scene (Fire sector specific)

PUALAW002B Conduct initial investigation at incident scene (Fire sector specific)

Employability Skills Information

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 required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Coordinate structure fire investigation	<p>1.1 <i>Roles and responsibilities</i> of multi-<i>agency</i> and <i>support personnel</i> involved in a structure fire investigation are confirmed</p> <p>1.2 Cooperation with multi-agency personnel in the conduct of the investigation consistent with designated roles and responsibilities for a structure fire investigation is achieved</p> <p>1.3 Information required by fire investigator from multi-agency personnel is identified, sought and received</p> <p>1.4 Protective clothing and equipment are used in accordance with agency procedures</p> <p>1.5 Occupational health and safety (OHS) procedures appropriate to the incident are followed</p>
2. Secure fire scene and preserve evidence	<p>2.1 Legal obligations of fire scene investigators are adhered to throughout the investigation</p> <p>2.2 Methods of <i>scene security</i> prior to examination are implemented</p> <p>2.3 Procedures to monitor and log access to a fire scene are established and applied, as required</p> <p>2.4 Strategies for locating, collecting and processing evidence are implemented</p> <p>2.5 Methods of preservation of evidence at a fire scene are implemented</p> <p>2.6 Scene is protected from unnecessary damage, spoliation, destruction or contamination</p>
3. Conduct scene investigation	<p>3.1 External and <i>internal survey of scene</i> is conducted to identify hazards and action is taken to mitigate risk</p> <p>3.2 Scene is examined externally and internally to determine areas of interest and to record observation of factors which may have a bearing on the origin, cause or development of a structure fire</p> <p>3.3 Areas or items of evidence that have a potential bearing on the origin, cause or development of a structure fire are identified</p> <p>3.4 Effect of building construction and other factors relevant to fire development and spread are identified</p> <p>3.5 Nature and reactivity of materials involved in fire cause are identified</p>

- 3.6 Site indicators of fire spread with other sources of evidence are examined
 - 3.7 *Witness* and firefighter information is obtained in accordance with the rules of evidence
 - 3.8 Significance of evidence is assessed and prioritised for further review
 - 3.9 Burn patterns and effects of fire suppression are identified and assessed
 - 3.10 Area/likely point of origin and possible cause of structure fire are determined
 - 3.11 *Origin and cause determination* theories are assessed and tested
- 4. Collect and analyse evidence from a fire scene**
- 4.1 Appropriate sampling areas and items are identified using required *sampling equipment and resources*
 - 4.2 *Appropriate collection techniques* are applied eliminating contamination and loss of evidence
 - 4.3 Best available samples and items including control samples are collected
 - 4.4 Appropriate collection and packaging techniques are adopted
 - 4.5 Potential for destruction (spoliation) and contamination of evidence is eliminated
 - 4.6 Integrity and continuity of collected exhibits is maintained
 - 4.7 Evidence from fire scene is analysed and processed using a range of *recording and technological media*
 - 4.8 Witness accounts are reviewed against theories
 - 4.9 Findings are reported and documented according to required practice and agency policy
 - 4.10 Evidence is secured for subsequent action
 - 4.11 Investigation report is completed and forwarded to appropriate authorities/stakeholders

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- assess and investigate a scene externally and internally
- clearly articulate and justify findings
- collect and handle exhibits and items of interest

- elicit information from relevant witnesses
- interpret fire indicators
- interpret fire scene
- manage fire scene investigation cases
- present findings
- take notes
- take photographs with written explanations
- take videos with narrative and explanations
- write reports

Required Knowledge

- appropriate recording methods
- appropriate sampling
- categories of fire
- common causes of fire (accidental, chemical, deliberate, electrical, incendiary, natural, negligence)
- fire behaviour (flashover, backdraught, sequence of development)
- fire language
- human behaviour/impact on incident
- incendiary devices (commercial, home-made, industrial)
- OHS considerations
- scene protocol
- sequence of events of a fire
- what samples (if any) need to be taken

Evidence Guide

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to:

- collect and maximise the potential evidentiary value of physical evidence
- apply safe work practices at a fire scene
- identify area/point of origin and possible cause of fire
- apply evidence and forensic scientific principles to assess possible area/point of origin and causes.

Consistency in performance

Competency should be demonstrated over time and across a range of workplace and/or simulated situations.

Context of and specific resources for assessment

Context of assessment

Competency should be assessed in the workplace and in a simulated workplace environment.

Specific resources for assessment

Access is required to:

- legislation, policy, procedures and protocols relating to gathering and managing evidence
- case studies and workplace scenarios to capture the range of causes likely to occur for which evidence needs to be gathered and managed.

Guidance information for assessment

Assessment methods suitable for valid and reliable assessment of this unit may include a combination of:

- case studies
- demonstration
- observation
- questioning
- scenarios
- authenticated evidence from the workplace.

Range Statement

<p>The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. <i>Bold italicised</i> wording in the Performance Criteria is detailed below.</p>	
<p><i>Roles and responsibilities</i> may include:</p>	<ul style="list-style-type: none"> • Agency operating procedures • Legislative requirements • Memorandums of understanding
<p><i>Agencies</i> may include:</p>	<ul style="list-style-type: none"> • Coroner • Electrical authorities • Forensic scientists • Gas authorities • Industry peak bodies • Insurance investigators, assessors and construction companies (to 'make safe' properties) • Other statutory authorities • Police investigators
<p><i>Support personnel</i> may include:</p>	<ul style="list-style-type: none"> • Government and private forensic chemists • Insurance investigators and assessors • Statutory bodies
<p><i>Scene security</i> may include:</p>	<ul style="list-style-type: none"> • Legal obligations • Scene preservation
<p><i>Internal survey of scene</i> includes:</p>	<ul style="list-style-type: none"> • Development and testing of hypothesis/es on potential areas of origin • Determination of area of origin • Interpretation of smoke, heat and direct flame contact records • Recognition of area of least damage
<p><i>Witnesses</i> may include:</p>	<ul style="list-style-type: none"> • Firefighters • Members of statutory agencies • Members of the public • Property owners/occupants
<p><i>Origin and cause determination</i> must include:</p>	<ul style="list-style-type: none"> • Burn patterns (V patterns, inverted V patterns, hourglass patterns, circular-shaped patterns) • Identification of ignition sources • Scene interpretation • Scene processing
<p><i>Sampling equipment and resources</i> may include:</p>	<ul style="list-style-type: none"> • Accelerant detecting canine • Field-based sampling devices e.g. photo ionisation detectors
<p><i>Appropriate collection</i></p>	<ul style="list-style-type: none"> • Preservation of evidence

<i>techniques</i> may include:	<ul style="list-style-type: none">• Search techniques• Security of environment
<i>Recording and technological media</i> may include:	<ul style="list-style-type: none">• Audio• Computers• Log book• Note taking• Photography (digital, multimedia, closed circuit television [CCTV], other media images)• Sketches and plans• Video

Unit Sector(s)

Not applicable.