



Australian Government

PUAFIR309B Operate pumps

Release 2

PUAFIR309B Operate pumps

Modification History

Release	TP Version	Comments
2	PUA12 V2	Content reviewed Application of the Unit added Unit revised to reflect current work requirements Method of assessment added
1	PUA00 V8.1	Primary release on TGA

Unit Descriptor

This unit covers the competency required to operate a portable and/or appliance-mounted pump at an incident.

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

Application of the Unit

This unit applies personnel responsible for operating centrifugal, appliance-mounted and portable pumps and foams systems at an incident. Typically, this work requires the application of the basic principles of hydraulics i.e. the study and behaviour of water.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

PUAEQU001B Prepare, maintain and test response equipment
And one of the following four units:

PUAFIR203B Respond to urban fire

OR

PUAFIR218 Respond to isolated structure fire

OR

PUAFIR204B Respond to wildfire

OR

PUAFIR205B Respond to aviation incident (specialist)

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. Prepare pump to deliver water	1.1 Type of pump selected is appropriate to the operation/incident. 1.2 Suitability of water supply for operational purposes is determined. 1.3 Pump is sited and positioned to receive and deliver water supply in accordance with organisational requirements. 1.4 Pump and primer are engaged in accordance with manufacturer guidelines and organisational procedures. 1.5 Appropriate foam agents and foam equipment are prepared for the production of foam at an incident, where required.
2. Operate pump	2.1 Pump components, ancillary equipment and principles of operation are utilised to draught water from a static supply to boost water from a reticulated supply and/or to deliver water from the appliance tank in accordance with appliance capability. 2.2 Pump operation is in accordance with manufacturer specifications, organisational procedures and workplace health and safety (WHS) guidelines. 2.3 Principles of hydraulics are considered when determining pump settings. 2.4 Pumps are operated and observed to ensure that pressure and flow meet operational requirements and that safety to personnel is maintained. 2.5 Pump performance is monitored and maintained to ensure maximum efficiency of operation, to detect and correct pumping and safety problems, and to take appropriate action in accordance with organisational procedures. 2.6 Pump operations are carried out avoiding injury to personnel and damage to equipment and facilities. 2.7 Mechanical malfunctions are reported to supervisor according to organisational procedures.
3. Conclude pump operations	3.1 Pump operations are concluded in accordance with organisational procedures. 3.2 Ancillary equipment is collected and stowed in accordance with organisational requirements. 3.3 Maintenance procedures and checks are undertaken

to ensure pump and ancillary equipment are serviceable in accordance with organisational requirements.

Required Skills and Knowledge

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

Required Skills

- operate a pump using gauges and controls
- position a pump
- prime and operate a pump
- supply water to a location by use of a relay pump

Required Knowledge

- determination of water supply capacity
- discharge and flow rates
- hand signals to indicate water and pump requirements
- positioning pumps
- jet reaction
- power train for pump
- principles of hydraulics (flow and pressure)
- principles of priming and operating pumps
- pump components and their principles of operation
- pump gauges and controls
- relay pumping
- simple hydraulic calculations including friction loss
- types of foam concentrate
- types of pumps and primers

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

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

Assessment must confirm the ability to:

- maintain water supply to branch operators
- maintain appropriate levels of pressure
- respond appropriately to changing circumstances
- when using foam, supply/deliver the correct proportion of foam and water and maintain supply of foam concentrate
- when pumping from an appliance tank, monitor levels of water remaining in appliance tank to ensure minimum levels for crew protection
- pump without injury to personnel or damage to equipment

Consistency in performance

Competency should be demonstrated over time in a range of actual or simulated workplace environments.

Context of and specific resources for assessment

Context of assessment

Competency should be assessed on-the-job and/or in a range of simulated environments.

Specific resources for assessment

Access is required to:

- range of pumps

Method of assessment

In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook.

Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment.

Assessment may occur in an operational environment or in an agency-approved simulated work environment. Forms of assessment that are typically used include:

- direct observation
- interviewing the candidate
- journals and workplace documentation

- third party reports from supervisors
- written or oral questions

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 in the Performance Criteria is detailed below.

<i>Type of pump</i> may include:	• appliance-mounted pumps • centrifugal • ejector • free-standing, trailer or vehicle-mounted • multi-stage centrifugal • peripheral • petrol or diesel driven • portable pumps • positive displacement • series/parallel centrifugal • single-stage centrifugal • water turbine
<i>Suitability of water supply</i> may include:	• capacity • pressure • salinity • turbidity
<i>Primer</i> may include:	• diaphragm • exhaust ejector • force pump • rotary gear • rotary vane • water ring
<i>Organisational procedures</i> may include:	• fireground procedures • maintenance procedures and checks • manufacturer specifications • WHS guidelines • pumping practices • service procedures • standard operating procedures • training manuals
<i>Foam agents</i> may include:	• alcohol resistant type foam • aqueous film forming foam • Class A foam • protein foam
<i>Foam equipment</i> may include:	• Class A foam systems • Class B foam systems

	• compressed air foam system • electronic foam systems • foam-making branch pipes • high back-pressure (sub-surface injection) foam system • high expansion foam equipment • in-line inductors • in-line foam generators • medium expansion foam equipment • pick-up tubes • pressure-balanced foam systems • round-the-pump proportioners
<i>Ancillary equipment</i> may include:	• adaptors and matching pieces • breechings • couplings • delivery hose • hose clamps • hydrant tools and openers • ropes/lines • standpipes • suction hoses, spanners, strainers, baskets
<i>Static supply</i> may include:	• dams • lakes • portable dams • reservoirs • rivers • seawater • swimming pools • tanks
<i>Reticulated supply</i> may include:	• distributary mains • reticulation mains • trunk mains
<i>Principles of hydraulics</i> may include:	• discharge and flow rates • friction loss • head pressure calculations • jet reaction • required branch and nozzle pressures
<i>Observed may include</i>	• branch operator activities, where possible • checking water supply levels • monitoring of gauges and warning lights • pump operators working on other units when relay

	pumping • use of pressure relief valves and transfer valves • use of pump performance charts or tables illustrating information such as optimum nozzle pressure and friction loss
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Unit Sector(s)

Not applicable.