



Australian Government

PMAOPS201 Operate fluid flow equipment

Release: 1

PMAOPS201 Operate fluid flow equipment

Modification History

Release 1. Supersedes and is equivalent to PMAOPS201B Operate fluid flow equipment

Application

This unit of competency covers the skills and knowledge required to operate pumps and valves and other fluid flow equipment in a processing plant.

This unit of competency applies to operators who are required to identify, operate, monitor and troubleshoot the pumps and valves and contribute to a safe working environment. It is typically performed by all operators in a processing plant.

This unit of competency applies to an individual who may work alone although under routine direction and supervision. They may work as part of a team or group and will work in liaison with other shift team members and the control room operator, as appropriate.

In a typical scenario, an operator uses a number of general purpose pumps, piping and valves to move liquids from a storage tank area into the processing plant, within and between plant units, to the finished goods tanks. The operator utilises in-line mixers, strainers and filters, valves, controls and meters to complete this work.

This competency covers all general duty pumps, their associated drivers (motors) and valves. The effect of pipe fittings on pump performance and problems/problem analysis is also included.

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

Pre-requisite Unit

Nil

Competency Field

Operations

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | | | |
|---|-------------------------|-----|---------------------------------|
| 1 | Prepare for work | 1.1 | Receive and give shift handover |
|---|-------------------------|-----|---------------------------------|

- 1.2 Identify work requirements
 - 1.3 Identify and control hazards
 - 1.4 Coordinate with appropriate personnel
 - 1.5 Check for recent work undertaken on plant item
 - 1.6 Note any outstanding/incomplete work
 - 1.7 Check operational status of fluid flow equipment
- 2 **Operate pumps**
 - 2.1 Identify the type of pump
 - 2.2 Start up and shut down pump as required
 - 2.3 Adjust flow and head/pressure as appropriate to type of pump
 - 2.4 Complete routine checks and reports and take appropriate action as required
- 3 **Operate pump drivers**
 - 3.1 Monitor critical variables such as amps, temperature and vibration
 - 3.2 Keep critical variables in range
 - 3.3 Recognise trends/patterns which indicate a potential or actual problem with the pump driver
 - 3.4 Take action to ensure driver as required
- 4 **Operate valves**
 - 4.1 Identify the type of valve
 - 4.2 Operate valve in a manner appropriate to the valve type
 - 4.3 Complete routine checks and reports and take appropriate action as required
- 5 **Recognise and take appropriate action on**
 - 5.1 Monitor fluid flow system frequently and critically throughout shift using measured/indicated data and smell, sight, sound and feel as appropriate

	abnormal fluid system situations	5.2	Identify impacts of any changes upstream and downstream
		5.3	Recognise situations which may require action
		5.4	Resolve routine problems
		5.5	Take actions on other abnormal situations to make safe and have the situation resolved
6	Isolate and de-isolate equipment	6.1	Complete any required pre-start checks
		6.2	Start up/shut down/changeover fluid flow equipment according to the equipment type and duty in liaison with other personnel
		6.3	Isolate equipment
		6.4	Make safe for required work
		6.5	Check plant is ready to be returned to service
		6.6	De-isolate and prepare plant for return to service

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Regulatory framework

The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used, and include one or more of the following:

- legislative requirements, including work health and safety (WHS)
- industry codes of practice and guidelines

- environmental regulations and guidelines
- Australian and other standards
- licence and certification requirements

All operations to which this unit applies are subject to stringent health, safety and environment (HSE) requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

Procedures All operations must be performed in accordance with relevant procedures. Procedures are written, verbal, visual, computer-based or in some other form, and include one or more of the following:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

Equipment Equipment includes one or more of the following:

- pumps (various types of centrifugal and positive displacement)
- valves, such as globe, needle, gate, butterfly, plug cock, wedge plug, ball cock, non-return, diaphragm, pneumatic globe and pneumatic butterfly)
- piping systems and components, including bends and elbows, tee pieces, expansion mechanisms, pipe joints, reducers, nipples, orifices, in-line mixers, filters and strainers, flexible hoses and couplings
- shaft seals, such as stuffing boxes, mechanical seals, fluid seals and labyrinth seals

Routine problems Routine problems must be resolved by applying known solutions.

Routine problems are predictable and include one or more of the following:

- cavitation
- seal leaks

- head loss/low flow
- bearing problems

Known solutions are drawn from one or more of the following:

- procedures
- training
- remembered experience

Non-routine problems must be reported according to according to relevant procedures.

Responding to abnormal situations

Responding to abnormal situations includes the following:

- determining problems needing action
- determining possible fault causes
- rectifying problem using appropriate solution within area of responsibility
- following through items initiated until final resolution has occurred
- reporting problems outside area of responsibility to designated person

Operate

Operate is to monitor, adjust/change the plant item/unit/system to meet specifications, by one or more of the following:

- manually in the plant
- using local controller in the plant

Hazards

Hazards include one or more of the following:

- smoke, darkness and heat
- dust or other atmospheric hazards
- electricity
- gas
- gases and liquids under pressure
- structural hazards
- structural collapse
- equipment failures
- industrial (machinery, equipment and product)
- equipment or product mass
- noise, rotational equipment or vibration
- plant services (steam, condensate and cooling water)
- limited head spaces or overhangs

- working at heights, in restricted or confined spaces, or in environments subjected to heat, noise, dusts or vapours or other atmospheric hazards
- flammability and explosivity
- hazardous products and materials
- unauthorised personnel
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- extreme weather
- other hazards that might arise

Start up/shut down as required

Start up/shut down as required includes the following:

- start up and shut down to/from normal operating conditions
- start up and shut down to/from isolated, cold or empty
- start up and shut down to/from other conditions/situations experienced on the plant

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMAOPS201B Operate fluid flow equipment

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>

Assessment Requirements for PMAOPS201 Operate fluid flow equipment

Modification History

Release 1. Supersedes and is equivalent to PMAOPS201B Operate fluid flow equipment

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria, and include the ability to:

- apply pre-start, start-up and shutdown procedures
- monitor and operate fluid flow equipment to meet specifications
- recognise early warning signs of equipment/processes needing attention or with potential problems
- determine the most likely cause of routine problems
- take appropriate action to ensure a timely return to full performance
- isolate and de-isolate equipment
- identify hazards and apply hazard control procedures.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- principles of operation of fluid flow equipment
- plant process idiosyncrasies
- physics relevant to fluid flow equipment
- process parameters and limits
- all items on a schematic of the fluid flow system and the function of each
- correct methods of starting, stopping, operating and controlling flow
- relevant alarms and actions
- routine problems, faults and their resolution
- function and troubleshooting of major internal components of pumps and valves and their typical problems.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence.
- The assessment must include at least:
 - one (1) type of centrifugal pump, and
 - one (1) type of positive displacement pump, and
 - two (2) different types of valves.
- The collection of performance evidence:

- should occur over a range of situations which include typical disruptions to normal, smooth operation of an operating plant
- will typically include a supervisor/third-party report or other evidence, focusing on consistent performance and problem recognition and solving. A supervisor/third-party report must be prepared by someone who has a direct, relevant, current relationship with the person being assessed and who is in a position to form a judgement on workplace performance relevant to the unit of competency
- must include the use of an appropriate industrial item of equipment requiring demonstration of operation, start-up and shutdown procedures and responding to problems
- may use industry-based simulation for part only of the unit where safety, lack of opportunity or significant cost is an issue.
- Assessment should occur in operational workplace situations. Where this is not possible, or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment reflecting realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Assessment in a simulated environment should use evidence collected from one or more of:
 - walk-throughs
 - pilot plant operation
 - demonstration of skills
 - industry based case studies/scenarios
 - 'what ifs'.
- Knowledge evidence may be collected concurrently with performance evidence (provided a record is kept) or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept).
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition, the assessor or anyone acting in subject matter expert role in assessment must demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they must assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment

- appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
- appropriate workplace experience supervising/evaluating the type of work being assessed under routine and non-routine conditions
- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation's policies and procedures
 - having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment
 - conducting on-the-job training/assessments of the type of work being assessed
 - being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>