



**Australian Government**

# **PMAOPS333 Operate wells and gathering systems**

**Release: 1**

# **PMAOPS333 Operate wells and gathering systems**

## **Modification History**

Release 1. Supersedes and is equivalent to PMAOPS333A Operate wells and gathering systems

## **Application**

This unit of competency covers the skills and knowledge required to monitor and operate wells and associated equipment in the field.

This unit of competency applies to work undertaken in any location in the field, including wells, nominated areas in the gathering system and other locations.

This unit of competency includes all such items of equipment and unit operations which form part of the well/system. A unit comprises two or more components of plant/equipment that are operated together to produce product, including as appropriate to the facility:

- wellheads
- chokes and control valves
- meters
- flow lines
- high point vents
- low point drains
- valves, including non-return and pressure/vacuum relief
- pumps and their prime movers
- product separation units
- instrumentation and control systems (e.g. variable speed drive (VSD) and proportional integral derivative (PID) control)
- testing equipment
- power units
- drive heads
- flares
- fuel gas systems
- chemical injection equipment
- field flares
- storage tanks.

This unit of competency applies to field operators who are required to recognise, report and resolve problems, undertake readings and checks, and make adjustments to plant and equipment.

In a typical scenario, the operator will be driving alone, on and off roads between wells and also to and from the base site or plant. While at a site, they will be operating and monitoring well and equipment performance by taking readings, making checks of and adjustments to plant and equipment. They will record and report their findings in accordance with procedures. They will also be expected to identify hazards and actual and potential process and plant problems and take action.

This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, or other senior operator, as appropriate.

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 | <b>Prepare for work</b>        | 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 well/gathering system                                                   |
|   |                                | 1.6 | Note any outstanding/incomplete work                                                                        |
|   |                                | 1.7 | Check operational status of well/gathering system                                                           |
|   |                                | 1.8 | Determine appropriate route/schedule for day's work                                                         |
| 2 | <b>Monitor site, plant and</b> | 2.1 | Complete routine site and equipment checks, logs and paperwork taking action on readings in accordance with |

|   |                                                                       |     |                                                                                   |
|---|-----------------------------------------------------------------------|-----|-----------------------------------------------------------------------------------|
|   | <b>equipment</b>                                                      |     | procedures                                                                        |
|   |                                                                       | 2.2 | Use well control systems                                                          |
|   |                                                                       | 2.3 | Identify and complete required lease maintenance                                  |
| 3 | <b>Operate well/<br/>system in<br/>accordance with<br/>procedures</b> | 3.1 | Read and interpret well/gathering system fluid levels                             |
|   |                                                                       | 3.2 | Adjust pump speed to meet required output                                         |
|   |                                                                       | 3.3 | Check meter readings validity                                                     |
|   |                                                                       | 3.4 | Complete any process-related calculations                                         |
|   |                                                                       | 3.5 | Recognise equipment/system faults and report                                      |
|   |                                                                       | 3.6 | Adjust well/gathering system to meet operational or other requirements            |
|   |                                                                       | 3.7 | Complete logs and reports as required                                             |
| 4 | <b>Start up<br/>well/system</b>                                       | 4.1 | Perform pre-start up checks                                                       |
|   |                                                                       | 4.2 | Correctly sequence all required equipment/plant/systems                           |
|   |                                                                       | 4.3 | Bring equipment/plant/systems into operation as required                          |
|   |                                                                       | 4.4 | Monitor critical variables during start-up and make adjustments as required       |
|   |                                                                       | 4.5 | Bring to required steady operating conditions smoothly and in an appropriate time |
| 5 | <b>Shut down well/<br/>system</b>                                     | 5.1 | Determine type of shutdown required                                               |
|   |                                                                       | 5.2 | Give advanced warning of shutdown where possible                                  |
|   |                                                                       | 5.3 | Shut down individual items and/or the entire well/system                          |
|   |                                                                       | 5.4 | Shut down to standby condition if required                                        |
|   |                                                                       | 5.5 | Shut down in an emergency if required                                             |
|   |                                                                       | 5.6 | Reset trips and alarms after shutdown                                             |

|   |                                                              |     |                                                                              |
|---|--------------------------------------------------------------|-----|------------------------------------------------------------------------------|
|   |                                                              | 5.7 | Leave plant in the required condition after shutdown                         |
| 6 | <b>Isolate and de-isolate system or component plant item</b> | 6.1 | Isolate system and/or any component plant item in accordance with procedures |
|   |                                                              | 6.2 | Make safe for required work                                                  |
|   |                                                              | 6.3 | Check system/plant item is ready to be returned to service                   |
|   |                                                              | 6.4 | De-isolate and prepare system for return to service.                         |
| 7 | <b>Finalise shift activities</b>                             | 7.1 | Complete shift tasks as appropriate                                          |
|   |                                                              | 7.2 | Ensure identified faults are correctly logged/reported for action            |
|   |                                                              | 7.3 | Ensure incomplete tasks are scheduled for follow-up                          |
|   |                                                              | 7.4 | Ensure all logs and reporting are complete and understood                    |

## 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.

**Hazards**

Hazards include one or more of the following:

- 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
- working at heights, in restricted or confined spaces, or in environments subjected to heat, noise, dusts or vapours
- 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

**Routine problems**

Routine problems are predictable, have known solutions and include one or more of the following:

- leakage
- solids (formation fines)
- vibration
- loss of control of pressure and/or flow
- hydrate formation and blockages
- liquid slugging
- corrosion

- erosion
- sulphate reducing bacteria
- scale formation
- equipment failure
- change in product parameters (e.g. temperature, flow, pressure and level)
- fouling or contamination

**Non-routine problems**

Non-routine problems are unexpected problems, or variations of previous problems and must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant experts, to:

- determine problems needing action
- determine possible fault causes
- develop solutions to problems which do not have a known solution
- follow through items initiated until final resolution has occurred
- report problems outside area of responsibility to designated person

Operational knowledge includes one or more of the following:

- procedures
- training
- technical information, such as journals and engineering specifications
- remembered experience
- relevant knowledge obtained from appropriate people

**Procedures**

All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, 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

**Product** Product includes anything produced by a process step and so includes:

- intermediate products, such as the product from one process step, which then becomes the feed for another

**Logs and reports** Logs and reports include one or more of the following:

- paper or electronic-based logs and reports
- verbal/radio reports
- reporting items found which require action

**Lease maintenance areas requiring action** Lease maintenance areas requiring action include one or more of the following:

- land erosion
- fence and gate integrity
- weeds and other growth
- actions of feral or other fauna
- other required items

**Levels** Levels include one or more of the following:

- chemical storage levels
- lubricating oil levels
- water and gas levels
- battery levels
- drain levels
- other levels

## Unit Mapping Information

Release 1. Supersedes and is equivalent to PMAOPS333A Operate wells and gathering systems

## 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 PMAOPS333 Operate wells and gathering systems

## Modification History

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## 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:

- undertake readings and observations to operate and monitor system and maximise performance
- perform pre-start checks, start-up/shutdown procedures, and isolations and de-isolations
- interpret fluid level readings and maintain fluid levels
- identify early warning signs of equipment/processes needing attention or with potential problems and take action
- identify hazards and risks and apply risk control procedures
- communicate effectively with team, group, supervisors and other personnel
- calculate volumetric flow rates and equipment efficiencies.

## Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- all items on a schematic of the production unit and functions of each, downhole drawings (DHDs) and their application to plant/well operation
- principles of operation of plant/equipment, reservoir management, free flow and pumped wells, pumping principles, gas flow principles, gas/water separation principles, draining and venting requirements, remote terminal unit, functions, operation and problems
- interactions between plant items/processes
- systems' operating parameters, integrity limits, product specifications and tolerances, flange pressure and temperature ratings (basic), temperature, pressure and flow
- process-specific science (physics and geology) to the level of being able to interpret the science and extract factors controlling the process and product, and including coal seam gas (CSG) formation, structure and completions, coal type and structure, well design and construction, fluid dynamics and statics as relevant to the system, natural gas and oil characteristics, hydrate formation, cathodic protection (basic), static electricity and earthing, corrosion control and chemical handling, and safety data sheets (SDS)
- local lease and well operations requirements and constraints
- impact of external factors (e.g. variations in weather and feed)
- function and troubleshooting of major components, problems and their solutions
- hierarchy of control
- hazards that may arise in the job/work environment, and:

- their possible causes
- potential consequences
- appropriate risk controls.

## Assessment Conditions

- The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence.
- The collection of performance evidence:
  - should occur over a range of situations which include typical disruptions to normal, smooth operations
  - will typically include a supervisor/third-party report 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 industrial style wells and gathering systems requiring operation
  - may use industry-based simulation for part of the unit particularly 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.

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