Australian Government

Department of Education, Employment and Workplace Relations

PMAOPS433A Manage wells and gathering systems

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers the skills and knowledge needed by a senior field operator, or similar person, who manages a group of wells and gathering systems. The management is of the technical aspects of well/system operation, and while this person may also manage well operating personnel that is not part of this competency. It includes operating individual wells so as to optimise the output from all wells being managed.

Application of the Unit

Application of the unit	This unit of competency applies to senior operators, field technicians or people of similar responsibility who are responsible for a number of wells and their associated systems. In a typical scenario, the senior operator will examine data from a group of wells and then make/recommend changes so as to optimise the output of the group of wells and/or to better match their output to the requirements of the organisation for that group of wells. They would also be expected to undertake investigations and to solve well and operating problems which are beyond the ability of the well operator. This competency is typically performed by senior operators working independently while in communication with field operators, plant operators and production management with whom they would work as part of a team. At all times they would be liaising and cooperating with other members of the team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Employability Skills Information

Employability skills	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 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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare for work	1.1. Identify work requirements 1.2. Identify and control hazards 1.3. Coordinate with appropriate personnel 1.4. Determine appropriate schedule and priorities for work
2. Operate site, well/ system and equipment	2.1. Complete site checks 2.2. Use well control systems 2.3. Take required readings 2.4. Operate plant 2.5. Start up/shut down well/system 2.6. Isolate/de-isolate an item of, or an entire well/system
3. Optimise wells and gathering systems	3.1. Analyse network 3.2. Interpret network communication 3.3. Determine processing plant requirements and the impact of this on well and system operation 3.4. Investigate status of individual wells 3.5. Advise well operator of needed adjustments 3.6. Recommend well stimulation or other required action 3.7. Ensure flows from wells and systems meet plant and organisation needs 3.8. Complete logs and reports as required
4. Prioritise and organise work	4.1. Ensure required maintenance work has been requested 4.2. Prioritise maintenance work in liaison with appropriate personnel 4.3. Organise well shutdowns to suit production requirements where practical 4.4. Coordinate field operators to ensure their work and priorities match plant and organisation requirements
5. Solve problems	5.1. Provide guidance to operators for shutdown/startup as required 5.2. Develop the technical problem solving capability of well operators 5.3. Analyse data from wells and systems to identify systemic or recurring problems 5.4. Take appropriate action to solve problems

ELEMENT	PERFORMANCE CRITERIA
6. Finalise shift activities	6.1. Complete shift tasks as appropriate 6.2. Ensure identified faults are correctly logged/reported for action 6.3. Ensure incomplete tasks are scheduled for follow up 6.4. Ensure all logs and reporting are complete and understood 6.5. Check operators have completed required tasks

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- recognising conditions which will lead to out of specification operation
- implementing enterprise procedures within time constraints and in a manner relevant to the correct use of the equipment
- conveying information relevant to the operation clearly and effectively
- maintaining appropriate levels of quality assurance
- reading and numeracy to interpret workplace documents and technical information
- mathematics to the level of calculating volumetric flow rates and other process/equipment conditions (e.g. efficiency)
- problem recognition and solving

Required knowledge

Required knowledge, to the breadth and depth required for the operation of the well and gathering systems includes:

- oil/gas formation, structure and completions for coal seam gas (CSG), traditional or other oil/gas formations
- coal type and structure or other bedrock structures
- well design and construction
- hydrate formation
- free flow and pumped wells
- pumping principles
- gas flow principles
- gas/water separation principles
- draining and venting requirements
- typical issues causing problems and the resolution of those problems
- lease requirements
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- duty of care obligations
- hierarchy of control
- static electricity and earthing
- corrosion control and chemical handling and material safety data sheets (MSDS)
- communication protocols (e.g. radio, phone, computer, paper and permissions/authorities)
- routine problems, faults and their symptoms and the corrective action to be taken
- relevant alarms and actions

REQUIRED SKILLS AND KNOWLEDGE
• plant process idiosyncrasies • all items on a schematic of the plant item and the function/principles of operation, problem solving of each • physics and chemistry relevant to each unit and the processes used • flange pressure and temperature ratings (basic) • cathodic protection (basic) • relevant environmental and heritage requirements • protective systems • control systems • remote terminal unit, functions, operation and problems • downhole drawings (DHDs) and their application to plant/well operation • mathematical formulae and their application to well flow rates and plant operation/efficiency • pump, drivehead, fuel gas systems operations and principles • fluid dynamics and statics as relevant to the system • natural gas and oil characteristics as applicable • reservoir management • environmental aspects and conditions

Evidence Guide

EVIDENCE GUIDE	
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.	
Overview of assessment	This unit of competency requires an application of the knowledge contained in the use of the equipment, to the level needed to maintain control and recognise and resolve problems.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessment for this unit of competency will be on a plant. It is essential that the equipment be understood and that the importance of critical material properties, settings and readings is known. Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. The emphasis should be on the ability to stay out of trouble rather than recovery from a disaster. Consistent performance should be demonstrated. In particular look to see that: • early warning signs of equipment processes needing attention or with potential problems are recognised • the range of possible causes can be identified, analysed and the most likely cause determined • appropriate action is taken to ensure a timely return to full performance • obvious problems in related plant/system areas are recognised and an appropriate contribution made to their solution. Competence must be demonstrated in the operation of all ancillary equipment to the level required for this unit of competency.
Context of and specific resources for assessment	Assessment of this unit should include demonstrated competence on actual plant and equipment in a work environment. The unit will be assessed in as holistic a manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation.

EVIDENCE GUIDE	
	Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual plant and include walk-throughs of the relevant competency components. Simulations may also include the use of case studies/scenarios, role plays and 3D virtual reality interactive systems. In the case of evacuation training or training for competencies practised in life-threatening situations, simulation may be used for the bulk of the training. A bank of scenarios/case studies/what-ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units. Individual enterprises may choose to add prerequisites and co-requisites relevant to their processes.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy capacity of the candidate and the work being performed.

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.	
Procedures	Procedures may be written, verbal, computer-based or in some other form. They include: • all work instructions • standard operating procedures • formulas/recipes • batch sheets • temporary instructions • any similar instructions provided for the smooth running of the plant For the purposes of this Training Package, 'procedures' also includes good operating practice as may be defined by industry codes of practice (e.g. Responsible Care) and government regulations All work will comply with procedures
Site	Site may be: • a well • a nominated area in the gathering system • another location where the operator is required to work
Equipment	Typical items of plant and equipment included in this unit of competency are: • wellheads • choke and control valves • meters • flow lines • high point vents • low point drains

RANGE STATEMENT	
	• valves including non-return and pressure/vacuum relief • pumps and their prime movers • product separation units • instrumentation and control systems (variable speed drive (VSD) and proportional, integral derivative (PID)) • testing equipment • power units • drive heads • flares
Equipment condition and operation checks and adjustments	Equipment condition and operation checks and adjustments may include: • chemical injection equipment • storage tanks • pumps and pump speed • autodumps • drains and drain points • vents and high points • leaks • other items • valve operation • strainers (pump, line or other) • drive head power units, belt tension and hydraulic oil levels • fuel gas system/desiccant • field flares • corrosion control system/cathodic protection • control/float valves
Levels	Levels may include: • chemical storage levels • lubricating oil levels • water and gas levels • battery levels • drain levels • other levels
Interwell communications	Interwell communications include: • pressure • flow

RANGE STATEMENT	
	• other technical parameters
Well status	Well status includes interpreting data from: • well flows • flow rates, pressure and temperature • downhole conditions and information
Required calculations	Required calculations may include: • production figures • comparison of figures to targets • equipment efficiencies
Logs and reports	Logs and reports may be paper or electronic based and may also include verbal/radio reports Reports include reporting items found which require action
Appropriate action	Appropriate action includes: • 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
Lease maintenance areas requiring action	Lease maintenance areas requiring action may include: • land erosion • fence and gate integrity • weeds and other growth • actions of feral or other fauna • other required items
Identified faults	Identified faults may include: • instrumentation failure/malfunction • electrical failure/malfunction • mechanical failure/malfunction • control system failure/malfunction • mismatch between flow rates and system requirements

RANGE STATEMENT	
	• wear, tear and corrosion of plant and equipment • quality measurement inaccuracy (e.g. analyser or sampling deficiency)
Typical problems	Typical problems may include: • 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
Health, **safety and environment** (**HSE**)	All operations to which this unit applies are subject to stringent 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

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		