



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **PMAOPS500A Optimise production systems**

**Revision Number: 1**

## **PMAOPS500A Optimise production systems**

### **Modification History**

Not applicable.

### **Unit Descriptor**

|                        |                                                                                                                                          |
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| <b>Unit descriptor</b> | This unit covers the application of in depth knowledge of process and plant to the optimisation of complex operating production systems. |
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## Application of the Unit

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| <b>Application of the unit</b> | <p>In a typical scenario, a senior technician reviews the operation of a complex production system or whole production plant, with a view to improving the efficiency of operation of the process to improve the yield, utilization of services or production of waste. The operation will be thoroughly reviewed by gathering data on usage patterns, production rates, operational practices and conditions with a view to determining areas of improvements or possible gains in efficiency or reductions in variability. Optimization is often a multi-pass process whereby the process is modified, reviewed and modified again as required. The stimulus for optimization is usually not in response to a problem, but a desire to improve the performance of an operating process. The corrective action may well be beyond the scope of competency and responsibility of the senior technician to implement.</p> <p>Typical systems optimisations may include:</p> <ul style="list-style-type: none"> <li>• utilisation of services across a production facility</li> <li>• variability of product properties produced from a multi-line batch reaction process</li> <li>• variability of plant performance from shift to shift, day to day, week to week</li> </ul> <p>The senior technician would:</p> <ul style="list-style-type: none"> <li>• gather historical plant operating or product quality data</li> <li>• review the data for trends or dependencies</li> <li>• investigate cause and effect responses</li> <li>• recommend a solution to the problem.</li> </ul> <p>Generally the technician would work alone for this unit, although the ability to communicate with all internal and external stakeholders is vital.</p> |
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## Licensing/Regulatory Information

Not applicable.

## Pre-Requisites

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| Prerequisite units |  |
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## Employability Skills Information

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| <b>Employability skills</b> | This unit contains employability skills. |
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## 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. |
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## Elements and Performance Criteria

| ELEMENT                                   | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Identify process or system for review. | 1.1. Review process or plant performance to determine likely areas of improvement.<br>1.2. Gather data on the process or system design<br>1.3. Design the data collection system for the required data.                                                                                                                                                                                                                                                           |
| 2. Collect and analyse data.              | 2.1. Collect or review available data from the process or plant<br>2.2. Analyse the data for trends or dependencies<br>2.3. Postulate possible cause and effect scenarios                                                                                                                                                                                                                                                                                         |
| 3. Develop tests or trials.               | 3.1. Propose controlled tests or trials to review the plant or process patterns<br>3.2. Discuss possible solutions to cause with relevant people<br>3.3. Arrange for required tests or controls to be undertaken in appropriate time frame<br>3.4. Collect further data from tests or trials<br>3.5. Review plant or process data and compare with original data.<br>3.6. Prepare further tests or trials as required, or until possible solutions are developed. |
| 4. Develop improvement solution           | 4.1. Agree required improvement solution with appropriate people<br>4.2. Arrange for required improvement solution to be undertaken in appropriate time frame<br>4.3. Follow items initiated through until final resolution has occurred<br>4.4. Check effectiveness of solution and take appropriate action<br>4.5. Complete reports to procedure.                                                                                                               |

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills

This unit requires skills of:

- data collection and analysis
- problem solving for multi-variable processes
- negotiation
- communication
- basic mathematics

#### Required knowledge

Competence includes a deep understanding of:

- plant equipment, its characteristics and limitations
- impact of variations in plant/process and the distinctive signs of each variation
- process chemistry, physics and biochemistry as relevant (eg to the extent of writing chemical equations and identifying factors controlling reaction rate and yield or equivalent, or determining mass or heat transfer rates for a process)
- problem isolation techniques
- problem analysis techniques
- organisation approval processes

## 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, the Range Statement and the Assessment Guidelines for the Training Package.

#### Overview of 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 a range of problems, problem causes and environments.

Simulation may be required to allow for assessment of parts of this unit. Simulation should be based on the actual problems and should include the use of case studies/ scenarios and role plays.

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of what-if scenarios.

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

Competence must be demonstrated in the ability to define and analyse the problem as well as deal with the stakeholders. The stakeholders should be satisfied with the solution, as well as the solution being technically sound.

Consistent performance should be demonstrated. In particular look to see that:

- different types of processes or plant units can be analysed and resolved
- different types of stakeholders can be satisfied
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate action is taken.

These aspects may be best assessed using a range of scenarios/case studies/what-ifs. These assessment activities should include a range of optimisation projects which may have been generated from the past history and similar sources.

#### Context of and specific resources for

Assessment will require a suitable method of gathering evidence of problem solving ability over a

| <b>EVIDENCE GUIDE</b>                      |                                                                                                                                                                                      |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>assessment</b>                          | range of situations. A bank of scenarios/case studies/what-ifs will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions. |
| <b>Method of assessment</b>                | In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.                                                                 |
| <b>Guidance information for assessment</b> | Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the assessee 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. Add any 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.

|                                             |                                                                                                                                                                                                                                                                                                                                                        |
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| <b>Codes of practice/ standards</b>         | Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.                                                                                                                                                                                                                     |
| <b>Context</b>                              | This unit of competency includes reviews of the plant, plant equipment or process which may make itself evident through desire for improved quality, higher yields, less waste or better control.                                                                                                                                                      |
| <b>Health, safety and environment (HSE)</b> | All operations to which this unit applies are subject to stringent health, safety and environment requirements, which may be imposed through State 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)

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| <b>Unit sector</b> | Operational/technical |
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## Competency field

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| <b>Competency field</b> |  |
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## Co-requisite units

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| <b>Co-requisite units</b> |  |  |
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