



Australian Government

Department of Education, Employment and Workplace Relations

MSAPMOPS401A Trial new process or product

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor

This competency typically applies to a technician in a plant who is taking a lead technical role in the trialling of a new product or the trialling of a new or significantly altered process. This competency does not apply to minor modifications to existing products or processes.

Similarly it does not apply to a technician or operator taking part in such trials, and/or who is following directions set by the technician, chemist, engineer, supervisor or manager.

The technician is expected to be a technical expert in that part of the plant/process where the trial is being conducted.

Application of the Unit

Application of this unit

The technician would be expected to operate and control all equipment required for the trial. Generally the technician would be part of a team during the trial, and would usually be working in conjunction with a process/product development expert such as a chemist or engineer. The technician is often the most technically competent member of an operational team. As such they may not have the 'hands on' role of operating items of equipment, but they are expected to have the competence to direct the operation of equipment as appropriate throughout the trial. At all times they would be liaising and cooperating with other members of the team.

Trialling refers to the scale-up and other development steps required to take a new product or process from its design/laboratory trials to full commercial operation on a plant. Trialling may be done on a pilot plant where available and/or on a full scale plant.

The technician would:

- identify and rectify operational problems within their scope
- analyse the trial, both while it is occurring and after completion, and suggest improvements
- be alert for indications of developing problems and take required action to ensure the trial remains safe to people, the environment and the plant.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisites

This unit has **no** prerequisites.

Employability Skills Information

Employability Skills

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

ELEMENT	PERFORMANCE CRITERIA
Elements describe the essential outcomes of a unit of competency	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT ELEMENT	PERFORMANCE CRITERIA Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
1. Contribute to the selection of equipment/process conditions.	1.1 Liaise with appropriate technical expert(s). 1.2 Interpret properties of materials and desired product characteristics. 1.3 Interpret technical specifications/drawings of plant requirements. 1.4 Recommend equipment/ancillary equipment appropriate for the materials, products and conditions. 1.5 Recommend process conditions appropriate for the equipment, materials and product characteristics. 1.6 Recommend feed rates/order/condition appropriate to the process conditions, equipment, materials and product characteristics. 1.7 Ensure hazard identification and analysis procedures are completed, including consultation with stakeholders, and findings included in plan. 1.8 Ensure recommendations meet the identified need.
2. Prepare for trials.	2.1 Determine the availability of resources required such as materials, equipment, people and skills. 2.2 Estimate time required for trial. 2.3 Liaise with relevant stakeholders. 2.4 Schedule trial at a convenient time. 2.5 Develop documentation for the trial. 2.6 Identify potential hazards and required hazard control procedures by applying the hierarchy of control. 2.7 Determine clearance requirements and special safety and storage requirements. 2.8 Verify decisions with appropriate experts/stakeholders. 2.9 Ensure people with adequate skills are available for the trial.
3. Conduct test runs/trials	3.1 Ensure hazard controls are implemented prior to commencement. 3.2 Run trials. 3.3 Maintain communication with all relevant people.

ELEMENT	PERFORMANCE CRITERIA
ELEMENT	Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
	3.4 Closely monitor critical parameters. 3.5 Recognise actual and potential problems. 3.6 Make adjustments to process conditions as required during trial. 3.7 Sample and test product as required. 3.8 Record and report performance data. 3.9 Ensure all materials, products and waste are handled correctly. 3.10 Leave plant in a condition suitable for routine production to recommence.
4. Evaluate results and identify modifications.	4.1 Interpret data from trial. 4.2 Identify factors which might be related to low rates or low charge amounts. 4.3 Recommend modifications and improvements required. 4.4 Develop and check standard operating procedure. 4.5 Complete documentation and report to appropriate personnel. 4.6 Ensure all relevant staff have required skill levels for the introduction of the new process.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level required for this unit. Competence includes an understanding of the plant systems and all integral equipment involved in the trial to the level needed to control the system and recognise and resolve problems. In particular it includes the ability to:

- identify all items on a schematic of the plant and describe the function of each
- describe the nature/condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- state the major design features of plant equipment, plant conditions and variables and the impact of these on the properties of materials passing through them
- describe the causes and remedies of common problems such as those selected in the Range Statement
- apply the hierarchy of control to minimise the risk of hazards identified
- describe methods of changing rate and the advantages and disadvantages of each
- describe methods of controlling other process variables and the advantages and disadvantages of each.

Competence also includes the ability to isolate the causes of problems to an item of equipment within the plant system and to be able to distinguish between causes of problems/alarm/fault indications such as:

- process material variations
- instrument failure/wrong reading
- electrical failure
- mechanical failure
- operational problem.

Language, literacy and numeracy requirements

This unit requires the ability to communicate and liaise with people at a range of levels about technical matters.

Reading is required to the level of interpreting technical specifications, manuals and procedures; and writing technical documentation such as specifications and procedures required for the trial.

Numeracy is required to the level of interpreting technical specifications and test results, analysing process data and determining required variations in process variables.

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.

Overview of assessment

Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the Elements, Performance Criteria and skills and knowledge.

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.

Critical aspects

It is essential that competence is 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 on recovery from a disaster.

Consistent performance should be demonstrated. For example, look to see that:

- hazards are identified and controlled
- early warning signs of equipment/processes needing attention or with potential problems are recognised
- the range of possible causes can be identified and analysed and the most likely cause determined
- appropriate and timely action is taken to ensure the safety and success of the trial
- obvious problems in related plant areas are recognised and an appropriate contribution made to their solution.

Context and method of assessment

This unit of competency requires a significant body of knowledge which will be assessed through questioning and the use of 'what if' scenarios both on the plant (during demonstration of normal operations and walk throughs of abnormal operations) and off the plant.

Competence in this unit may be assessed:

- using a pilot plant or a production plant as appropriate
- using a range of scenarios/case studies and 'what ifs' as the stimulus with a walk-through forming part of the response
- using a range of problems, including new, unusual and improbable situations which may have been generated from the past incident history of the plant, incidents on similar plants around the world, hazard analysis activities and similar sources
- using a suitable simulation and/or a range of case studies/scenarios
- through a combination of these techniques.

In all cases it is expected that practical assessment will be combined with targeted questioning to assess the underpinning knowledge; and theoretical assessment will be combined with appropriate practical/simulation or similar assessment. Assessors need to be aware of any cultural issues that may affect responses to questions.

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.

Specific resources for assessment

This section should be read in conjunction with the Range Statement for this unit of competency. Resources required include suitable access to an operating plant or equipment that allows for appropriate and realistic simulation. A bank of case studies/scenarios and questions will also be required to the extent that they form part of the assessment method. Questioning may take place either in the workplace, or in an adjacent, quiet facility such as an office or lunchroom. No other special resources are required.

Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

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. 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. Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.

Context

This unit includes all items of equipment and unit operations which form part of the trial.

Liaison

Liaison with technical experts may (depending on trial requirements and company protocols) include one or more of:

- manufacturers
- chemists
- engineering personnel
- designers
- OHS advisors
- maintenance personnel
- potential customers.

Hazard analysis

Hazard analysis procedures may include:

- JSA/JHA (Job Safety Analysis/Job Hazard Analysis)
- hazard and operability (HAZOP) studies
- hazard analysis (HAZAN) studies
- other company specified procedures.

It is not expected that the candidate will be able to conduct technical hazard analysis procedures (such as HAZOP or HAZAN) but they should be able to interpret and use the outcomes of such analyses where relevant.

Hazards

Hazards may be determined from:

- materials safety data sheets (MSDSs)
- other relevant documentation such as hazard logs, incident reports
- company hazard identification procedures
- hazard analysis results
- standard operating procedures.

Waste handling

Waste handling may include:

- collection for re-use
- recycling
- disposal in accordance with health and environmental regulations.

Problems

Typical problems for the trial might include:

- mixing is poor
- materials do not behave as expected
- process/reaction does not proceed /proceeds too slowly
- process/reaction proceeds too quickly/runs away
- yield is low
- quality is out of specification
- process is unstable
- instrumentation is not sufficiently sensitive/too sensitive
- variable catalyst activity
- surging flow/pressure.

Health, Safety and Environment (HSE)

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.

Procedures

All operations are performed in accordance with procedures.

Procedures means all relevant workplace procedures, work instructions, temporary instructions and relevant industry and government codes and standards.

Unit Sector(s)

Not applicable.