



Australian Government

Department of Education, Employment and Workplace Relations

PMASUP540B Analyse equipment performance

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This competency covers the analysis of the performance, and performance verification, of existing equipment.
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Application of the Unit

Application of the unit	In a typical scenario an experienced technician will set up and operate performance verification trials and then analyse the results to determine actual compared to theoretical performance of equipment and equipment components. It includes: • calculating the theoretical performance of an item of equipment • gathering data to determine the actual performance of the item of equipment • calculation of actual versus theoretical performance • making recommendations as to the appropriate action to be taken based on the performance verification results. This competency is typically performed by a senior technician who will take the lead in the data gathering phase and then analyses the data.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		
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Employability Skills Information

Employability skills	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. Determine theoretical performance.	1.1. Identify item of plant or equipment to be analysed 1.2. Locate and interpret design specification 1.3. Identify process materials being processes/to be processed during verification trial 1.4. Determine process material properties under process conditions 1.5. Calculate theoretical performance of component(s) with that material under those conditions.
2. Conduct trial.	2.1. Design verification trial to be compatible with theoretical analysis 2.2. Determine measurements needed from trial to yield required data 2.3. Select equipment suitable to give required measurements 2.4. Arrange for verification trial with relevant process personnel 2.5. Set up required measurement equipment 2.6. Supervise trial and ensure trial conditions are appropriate 2.7. Collect trial data for analysis.
3. Verify performance of plant/equipment.	3.1. Compare theoretical with actual performance 3.2. Determine significance of variation between theoretical and actual performance 3.3. Investigate any suspicious results and take appropriate action.
4. Recommend required action.	4.1. Determine appropriate action to bring performance to desired level 4.2. Initiate the corrective action in accordance with company procedures. 4.3. Determine measures to increase equipment productivity 4.4. Re-check performance after corrective action is implemented.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Competence, for the practical completion of the job, includes the ability to:

- calculate equipment and component performance from the design specification
- determine equipment and design performance from practical trials
- determine the 'limiting component' in the performance of an item of equipment or a process
- determine possible performance of an item of equipment/process if practical improvements were made to the 'limiting item'.

Required knowledge

Knowledge and understanding of the materials, equipment and process sufficient to predict their interactions and their impacts on performance.

Knowledge of the enterprise procedures and policies along with the ability to implement them within appropriate time constraints and in a manner relevant to the job.

Knowledge of:

- methods of identifying and calculating theoretical performance
- ways of trialling, trial design and implementation
- methods of data analysis to determine trial outcomes
- methods of interpreting information deduced from trial data.

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 disruptions to normal, smooth operation.

Assessment might typically be by an analysis project.

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 and off the plant.

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

Competence must be demonstrated in the ability to carry out the analysis without undue disruption to the process.

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

- trial design is appropriate
- data taken during trial matches that required for the analysis
- the analysis is carried out in a structured manner
- recommended changes can be justified based on the comparison of trial and theoretical data.

Context of and specific resources for assessment

Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of projects will be required as will a bank of questions which will be used to probe the reasoning behind the observable actions.

Method of assessment

In all plants it may be appropriate to assess this unit concurrently with relevant teamwork and communication units.

In a major hazard facility, it may be appropriate to

EVIDENCE GUIDE	
	assess this unit concurrently with relevant OHS units.
Guidance information for assessment	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.

Codes of practice/ standards	Where reference is made to industry codes of practice, and/or Australian/international standards, the latest version must be used.
Context	This competency unit includes the analysis of plant, equipment and equipment components. This competency applies to all work environments and sectors within the chemical, hydrocarbons and oil refining industry, but does require both a theoretical/ mathematical and a practical analysis of the process. The competency does not require a knowledge of industry sectors and materials other than that in which the technician works. It assumes an understanding of the operation of all relevant equipment and processes but does not necessarily require them to be used personally. Typical problems include: • worn equipment/components • validation of new equipment/components to design specification • performance analysis in order to upgrade process performance.
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.

Unit Sector(s)

Unit sector	Support/generic
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Competency field

Competency field	
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Co-requisite units

Co-requisite units		
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