Australian Government

Department of Education, Employment and Workplace Relations

PMC554091B Analyse refractory failures

Revision Number: 1

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Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency covers analysing a refractory failure to determine failure mode. It involves understanding failure modes, differentiating different modes and understanding forensic procedures.

Application of the Unit

Application of the unit	Refractories may fail due to a number of reasons, and these may be mechanical (wear, impact) or thermal (thermal stresses, flame impingement) or due to other reasons. The analysis of failures is important so that replacement refractories can be better designed to reduce this failure and extend the time between failure/ replacement. This unit covers all common types of refractory failures. The failure needs to be recognised and distinguished from other possible causes. Possible causes for the failure also need to be identified particularly if failure is unexpected/refractory life is shorter than expected This unit would typically be undertaken by a technician working either alone or in liaison with another refractory expert.

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. Establish the suitability of resources	1.1. Check all information conforms with resources 1.2. Record discrepancies in information 1.3. Report any inaccuracies in information to the person in charge 1.4. Identify and select materials, components, tools and equipment
2. Analyse failure modes	2.1. Identify spalling modes 2.2. Identify corrosion mode 2.3. Identify abrasion modes 2.4. Identify impact/compression/tensile modes
3. Undertake forensic procedures	3.1. Plan required investigation 3.2. Specify required testwork/analyses 3.3. Interpret test results 3.4. Formulate simple reports

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Required skills include: • observing workplace procedures • identify and solving problems • working in a team or individually, as required • reading and numeracy to interpret workplace documents and technical information
Required knowledge
Required knowledge includes: • basis of various failure modes • organisation of simple testwork programs • make appropriate judgements on results • reporting results in report format

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	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.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Competence must be demonstrated in the ability to recognise and analyse potential situations requiring action and then in implementing appropriate corrective action. Consistent performance should be demonstrated. In particular look to see that: • investigation of a failure is undertaken and an evidence based conclusion as to the failure mode is developed.
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. Assessment will occur over a range of situations which will include disruptions to normal, smooth operation. Simulation or case studies/scenarios may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual plant and will include 'walk-throughs' of the relevant competency components. A bank of scenarios/case studies/what ifs and questions will be required to probe the reasoning behind observable actions.
Method of assessment	It may be appropriate to assess this unit concurrently with relevant teamwork and communication units. It may be appropriate to assess this unit concurrently with other relevant units. Where the analysis of refractory failure is to occur on-site or in a vessel then competency in the appropriate OHS and/or permit units is also required.
Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the language and literacy

EVIDENCE GUIDE	
	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	All operations are performed in accordance with standard procedures and work instructions
Investigation	Investigation involves: • the collection of evidence, and may require the specifying of appropriate tests and the analysis of plant records and logs
Reports	The report should summarise: • the nature of the failure • the cause • the methods used to determine this cause • conclusions drawn and recommendations made
Occupational health and safety (**OHS**)	All operations are subject to stringent OHS requirements and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and OHS requirements, the OHS requirements take precedence

Unit Sector(s)

Unit sector	Operational/technical

Competency field

Competency field	

Co-requisite units

Co-requisite units		