



Australian Government

PMC554091 Analyse refractory failures

Release: 1

PMC554091 Analyse refractory failures

Modification History

Release 1. Supersedes and is equivalent to PMC554091B Analyse refractory failures.

Application

This unit of competency covers the skills and knowledge required to analyse refractory failures to determine failure mode.

This unit of competency applies to operators who are required to identify and analyse failure mode, organise simple testwork programs and make recommendations based on evidence.

This unit of competency applies to technician applying specialised theoretical and technical knowledge and well developed skills in situations that require autonomy, discretion and judgement. The person may work alone or as a member of a team or group and will work in liaison with customers, installers, engineers and technical experts, as appropriate.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Technical

Unit Sector

Not applicable

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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

Foundation Skills

This section describes those required skills (language, literacy and numeracy) that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Regulatory framework The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used.

Applicable legislation, regulations, standards and codes of practice include:

- health, safety and environmental (HSE) legislation, regulations and codes of practice relevant to the workplace, equipment and production processes and hazardous materials
- Australian/international standards relevant to the materials being used and products being made
- any relevant licence and certification requirements.

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 such requirements the legislative requirements take precedence.

- Hazards** Hazards must be identified and controlled. Identifying hazards requires consideration of:
- health and safety risks
 - sustainability risks
 - regulatory risks.

Unit Mapping Information

Release 1. Supersedes and is equivalent to PMC554091B Analyse refractory failures.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=45a7f1d5-61a5-447a-9688-7abbd7e1a5c7>

Assessment Requirements for PMC554091 Analyse refractory failures

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and demonstrate the ability to:

- read and interpret technical reports, technical specifications and data
- confirm information and resources for the work
- identify failure modes, including:
 - spalling mode
 - abrasion modes
 - corrosion modes
 - impact/compression/tensile modes
- determine methods to investigate the failure, including:
 - specifying testwork
 - observing relevant procedures
 - analysing relevant plant records and logs
- collect evidence resulting from the investigations
- develop a report on the analysis, including summary of:
 - the nature of the failure
 - the cause
 - the methods used to determine this cause
 - conclusions drawn
 - recommendations made
- distinguish between causes of failure, including:
 - mechanical (wear and impact)
 - thermal (thermal stresses and flame impingement)
 - other causes
- identify hazards and apply relevant hazard controls
- apply complex and/or theoretical mathematical calculations.

Knowledge Evidence

Must provide evidence that demonstrates knowledge relevant to their job sufficient to fulfil their job role, including knowledge of:

- properties of all common refractory materials

- types of failure modes, including:
 - spalling mode
 - abrasion modes
 - corrosion modes
 - impact/compression/tensile modes
- common causes of failures
- methods of investigating failures
- impact of failures on refractory life
- regulatory framework
- hierarchy of control
- hazards that may arise in the job/work environment and:
 - their possible causes
 - potential consequences
 - appropriate risk controls.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence shall be based on a holistic assessment of the evidence.
- The collection of performance evidence is best done from a report and/or folio of evidence drawn from:
 - a single project which provides sufficient evidence of the requirements of all the elements and performance criteria
 - multiple smaller projects which together provide sufficient evidence of the requirements of all the elements and performance criteria.
- A third-party report, or similar, may be needed to testify to the work done by the individual, particularly when the project has been done as part of a project team.
- Assessment should use a real project in an operational workplace. Where this is not possible or where personal safety or environmental damage are limiting factors assessment must occur using a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Assessment in a simulated environment should use evidence collected from demonstration of skills and one or more of:
 - walk-throughs
 - pilot plant operation
 - industry-based case studies/scenarios
 - ‘what ifs’.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition the assessor or anyone acting in subject matter expert role in assessment shall demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they shall assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
 - relevant VET or other qualification/Statement of Attainment
 - appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
 - appropriate workplace experience supervising/evaluating the type of work being assessed under routine and non-routine conditions
- Currency can be demonstrated through one or more of:
 - being currently employed undertaking the type of work being assessed
 - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation's policies and procedures
 - having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment
 - conducting on the job training/assessments of the type of work being assessed
 - being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work.

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