



Australian Government

PMASUP346 Control corrosion

Release: 1

PMASUP346 Control corrosion

Modification History

Release 1. Supersedes and is equivalent to PMASUP346A Control corrosion

Application

This unit of competency covers the skills and knowledge required to control corrosion in plant, equipment and/or pipelines (plant) by the use of chemical or biological controls.

This unit of competency applies to operators who are required to monitor plant for signs of corrosion, monitor the concentration of inhibiting chemicals or similar, and maintain an appropriate dosing regime in order to control the rate of corrosion.

This unit of competency applies to an individual working alone or as part of a team or group and working in liaison with other shift team members and the control room operator, as appropriate.

Corrosion typically refers to any electrochemical process leading to the decay of metal. However, this competency may also be contextualised and applied to decay processes in non-metals.

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

Pre-requisite Unit

Nil

Competency Field

Support

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

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

1	Identify corrosion controls in use	1.1	Identify sites susceptible to corrosion on work area
		1.2	Identify the causes and effects of corrosion at these sites
		1.3	Identify the corrosion inhibitors used in work area
		1.4	Determine hazards associated with corrosion and

			corrosion control
		1.5	Control hazards associated with corrosion and corrosion control
		1.6	Coordinate with appropriate personnel
2	Dose corrosion inhibitor in accordance with procedures	2.1	Monitor indicators of rate of corrosion
		2.2	Monitor inhibitor dosing equipment
		2.3	Adjust rate of dosing
		2.4	Monitor inhibitor stocks
		2.5	Recognise situations requiring action
		2.6	Take action, as required
3	Test plant for corrosion in accordance with procedures	3.1	Identify corrosion testing methods used in work area
		3.2	Complete testing activities as required by procedures
		3.3	Examine test results and take action
4	Isolate and de-isolate dosing plant	4.1	Isolate dosing plant
		4.2	Make safe for required work
		4.3	Check dosing plant is ready to be returned to service
		4.4	De-isolate and prepare dosing plant for return to service

Foundation Skills

This section describes those language, literacy, numeracy and employment skills 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, and include one or more of the following:

- legislative requirements, including work health and safety (WHS)
- industry codes of practice and guidelines
- environmental regulations and guidelines
- Australian and other standards
- licence and certification requirements

All operations to which this unit applies are subject to stringent health, safety and environment (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 HSE requirements, the HSE requirements take precedence.

Procedures All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, include one or more of the following:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

Hazards Hazards include one or more of the following:

- noise, rotational/reciprocating equipment or vibration
- plant services (steam, condensate and cooling water)
- hazardous products and materials
- other hazards that might arise

Routine problems Routine problems are predictable and have known solutions and include one or more of the following:

- lifting equipment failures
- fire and explosion
- burns
- atmospheric hazards
- manual handling hazards
- static electricity

Non-routine problems Non-routine problems are unexpected problems, or variations of previous problems and must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant experts, to:

- determine problems needing action
- determine possible fault causes
- develop solutions to problems which do not have a known solution
- follow through items initiated until final resolution has occurred
- report problems outside area of responsibility to designated person

Operational knowledge includes one or more of the following:

- procedures
- training
- technical information, such as journals and engineering specifications
- remembered experience
- relevant knowledge obtained from appropriate people

Corrosion control system This unit of competency includes all such items of equipment and unit operations which form part of the corrosion control system, including as appropriate to the facility:

- dosing pumps
- flow rate controllers
- analytical instrumentation related to corrosion
- head tanks
- test coupons or similar
- brushes
- inspection devices

Work area Work area refers to the systems or units the technician is responsible for.

Depending on the organisation and context it might be a plant area, a well head or pipeline covering thousands of kilometres.

Corrosion inhibitors

Corrosion inhibitors include or more of the following:

- anodic or cathodic inhibitors
- film formers
- oxygen scavengers
- pH adjusters/buffers
- biocides
- additives and carriers, such as:
 - solvent base
 - surfactants
 - dispersants
 - demulsifiers
 - de-foamers

Inhibitor dosing

Inhibitor dosing includes one or both of the following:

- continuous
- batch injection

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>

Assessment Requirements for PMASUP346 Control corrosion

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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 include the ability to:

- identify corrosion and its causes and effects
- monitor rate of corrosion
- monitor and adjust rates of inhibitor dosing
- undertake corrosion tests and interpret results
- isolate and de-isolate equipment
- recognise early warning signs of equipment/processes needing attention or with potential problems
- identify hazards and risks and apply risk control procedures
- communicate effectively with team/workgroup, supervisors and other personnel
- complete forms and documentation.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- the galvanic series
- electrochemical corrosion
- types of corrosion/causes of anode formation
- factors controlling the rate of corrosion
- types of corrosion inhibitors used and their action
- hazards associated with corrosion inhibitors and relevant hazard controls
- costs and hazards of corrosion
- principles of operation of dosing equipment
- physics and chemistry relevant to the process unit and the materials processed
- process parameters and limits (e.g. temperature, pressure, flow and pH)
- hierarchy of control
- relevant alarms and actions
- plant process idiosyncrasies
- all items on a schematic of the plant item and the function of each
- types and causes of problems within operator's scope of skill level and responsibility.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence based on a holistic assessment of the evidence.
- The collection of performance evidence:
 - should occur over a range of situations which include typical disruptions to normal, smooth operations
 - will typically include a supervisor/third-party report focusing on consistent performance and problem recognition and solving. A supervisor/third-party report must be prepared by someone who has a direct, relevant, current relationship with the person being assessed and who is in a position to form a judgement on workplace performance relevant to the unit of competency
 - must include the use of industrial type plant, appropriate tools, equipment and safety gear requiring demonstration of preparation, operation, completion and responding to problems
 - may use industry-based simulation for part of the unit particularly where safety, lack of opportunity or significant cost is an issue.
- Assessment should occur in operational workplace situations. Where this is not possible, or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment reflecting 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 one or more of:
 - walk-throughs
 - pilot plant operation
 - demonstration of skills
 - industry-based case studies/scenarios
 - ‘what ifs’.
- Knowledge evidence may be collected concurrently with performance evidence (provided a record is kept) or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept).
- 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 must demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they must 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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