



Australian Government

MSMSUP406 Identify faults in electronic control

Release: 1

MSMSUP406 Identify faults in electronic control

Modification History

Release 1. Supersedes and is equivalent to MSAPMOPS406A Identify problems in electronic control

Application

This unit of competency covers the skills and knowledge required to recognise and diagnose control system faults in electrical/electronic control systems on process equipment. It includes the implementation of appropriate corrective action.

This unit of competency applies to technicians. The technician will be required to apply knowledge of electronic control systems and components to the identification and isolation of faults in equipment. The key factors are the diagnosis and the recommendation of action to resolve routine and non-routine faults, in order to return the equipment to production.

The operator will have detailed operational and process knowledge but is not required to demonstrate 'hands on' operation of equipment as part of this competency.

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.

This unit of competency applies to all common equipment used in the manufacturing industry and should be able to be applied to all equipment using electrical/electronic control systems. It applies to all work environments and sectors within the manufacturing industry.

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

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|---|--|-----|--|
| 1 | Identify electrical/electronic control system faults | 1.1 | Categorise the types of machine malfunctions due to electrical and/or electronic faults |
| | | 1.2 | Describe the effects on product quality of electrical and/or electronic faults |
| | | 1.3 | Identify possible faulty components from a circuit diagram and knowledge of the function of each component |
| 2 | Identify maintenance requirements | 2.1 | Determine recommended maintenance schedule from manufacturer instructions |
| | | 2.2 | Determine adequacy of current maintenance regime and any special requirements from fault and maintenance history |
| | | 2.3 | Determine criticality of machine to production and/or business |
| | | 2.4 | Develop maintenance schedule and requirements for machine |
| | | 2.5 | Liaise with all relevant stakeholders to ensure schedule is appropriate |
| | | 2.6 | Report outcome to appropriate personnel |
| 3 | Determine appropriate corrective action | 3.1 | Examine other possible faults |
| | | 3.2 | Short list possible fault causes |
| | | 3.3 | Conduct investigations of machine, products or data to determine most likely fault causes |
| | | 3.4 | Take appropriate action to ensure fault is rectified |
| | | 3.5 | Follow up on action to ensure completion in an appropriate timeframe |
| | | 3.6 | Recheck after corrective action to ensure fault has been rectified |

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

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

Procedures are written, verbal, visual, computer-based or in some other form, and 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

Tools and equipment Tools and equipment include one or more of the following:

- programmable logic controls (PLC) and ancillaries
- solid-state control/switching units
- switches, relays and solenoids
- position and pressure transducers
- temperature controllers

Hazards

Hazards include one or more of the following:

- electricity
- incorrect/failed connections
- insulation failure
- polarity of components
- gas
- equipment malfunction/failure
- industrial (machinery, equipment and product)
- noise, rotational equipment or vibration
- temperature from hot surfaces and equipment
- test equipment
- unauthorised personnel
- other hazards that might arise

Faults

Faults may arise from non-routine causes and must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant experts to:

- determine faults 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 faults outside area of responsibility to designated person

Non-routine faults are unexpected faults, or variations of previous faults and include one or more of the following:

- loss of flow, power
- power failure
- component malfunction
- poor maintenance procedures
- regular maintenance
- shutdown
- motor failure effect on cycle time
- short shots
- loss of clamp pressure
- no power
- electronic/electrical faults
- analysis with PLC

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

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSAPMOPS406A Identify problems in electronic control

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=d1287d36-dff4-4e9f-ad2c-9d6270054027>

Assessment Requirements for MSMSUP406 Identify faults in electronic control

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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 must include the ability to:

- recognise and analyse control system faults
- identify and select testing methods based on cost and time effectiveness
- identify and develop maintenance requirements
- propose solutions and carry out solutions within scope of authority
- apply operational knowledge to non-routine problems
- identify and implement corrective actions
- monitor process and equipment conditions.

Knowledge Evidence

Evidence must be provided that demonstrates knowledge of:

- fundamentals of electricity and electronics
- electronic circuit diagrams
- principles of electronic circuit components
- principles of PLC programming, troubleshooting and diagnosis
- appropriate testing procedures and use of equipment for a range of equipment faults
- interaction of process conditions on product quality
- routine and non-routine causes of equipment failures and processes to develop solutions.

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 operation of an operating plant
 - will typically include a supervisor/third-party report or other evidence, 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

- may use industry-based simulation for part only of the unit 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.
- As a minimum, assessors must satisfy the Standards for Registered Training Organisations 2015 assessor requirements.

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