

MAINTAIN ELECTRO-MECHANICAL SYSTEMS

UNIT CODE: ENG/OS/MC/CR/03/6/A

Unit description

This unit describes the competencies required by a technician in order to maintain electro-mechanical systems. It involves observing occupational health and safety, troubleshooting electro-mechanical faults, servicing and/or repairing electrical and mechanical system faults, testing electro-mechanical systems, scheduling maintenance of electro-mechanical systems.

ELEMENTS AND PERFORMANCE CRITERIA

<p>ELEMENT These describe the key outcomes which make up workplace function.</p>	<p>PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range.</i></p>
<p>1. Observe occupational health and safety</p>	<p>1.1 <i>Personal protective equipment</i> (PPE) are used according to OSHA 2007 1.2 <i>Tools and equipment</i> are stored and maintained correctly according to manufacturer’s specifications 1.3 Tools and equipment are used correctly according to designated purpose 1.4 Workspace housekeeping is maintained according to Standard operating procedures (SOPs) 1.5 Workplace is planned according to design specifications. 1.6 Safety signs are placed and observed according to OSHA 2007</p>
<p>2. Troubleshoot electro-mechanical faults</p>	<p>2.1 Proper authorization is obtained according to statutory policy 2.2 Circuit diagram is interpreted according to system manual 2.3 Tools and equipment are identified according to machine manual requirement 2.4 Electro-mechanical fault is identified according to recommended steps/procedures in the service manual</p>
<p>3. Service and/or repair electrical system</p>	<p>3.1 Tools and equipment are operated correctly according to manufacturer specifications. 3.2 Electrical system is serviced according manufacturer specifications. 3.3 <i>Faulty devices</i> are detached from the system according to necessary safety procedures 3.4 Faulty devices are repaired/replaced according to the service manual and specifications</p>

	3.5 Electrical faults and/or repairs are documented according to SOPs
4. Service and/or repair mechanical system faults	4.1 Tools and equipment are operated correctly according to manufacturer specifications 4.2 Mechanical system is serviced according manufacturer specifications. 4.3 Faulty devices are detached from the system according to necessary safety procedures 4.4 Faulty devices are repaired/replaced according to the service manual and specifications 4.5 Mechanical faults and/or repairs are documented according to SOPs
5. Test electro-mechanical system	5.1 Termination/insulation of electrical wiring contacts are verified according to IEEE standards. 5.2 Validation of mechanical linkages and joints are done according to service manual 5.3 Electro-mechanical system is tested to confirm its proper operation according to manufacturer specifications 5.4 Test results are documented according to SOPs
6. Schedule maintenance of electro-mechanical system	6.1 Normal service schedule is determined according to manufacturer specifications 6.2 New service schedule is developed after breakdown repairs according to operational specifications 6.3 Maintenance schedule is documented according to SOPs

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
Personal protective equipment may include but is not limited to:	<ul style="list-style-type: none"> • Goggles • Ear muff • Safety mask • Helmets/head gear • Safety boots • Gloves • Overall/dust coat
Tools and equipment may include but is not limited to:	<ul style="list-style-type: none"> • Hand tools • Power tools

Variable	Range
	<ul style="list-style-type: none"> • Machines
Faulty devices may include but is not limited to:	<ul style="list-style-type: none"> • Sensors • Motor drives • Gears • Pulleys • Bearings • Drive shafts • Instruments • Electrical wiring • Mechanical linkages • Belts and chains

REQUIRED KNOWLEDGE

The individual needs to demonstrate knowledge of:

- Mechatronic programming
- Technical report writing
- PPE
- Interpretation of technical drawings
- Documentation
- Types of tools and equipment
- Electrical and mechanical machine drives
- Machine operation
- Types of maintenance
- Circuit interpretation
- Scheduling/planning for maintenance

REQUIRED SKILLS

The individual needs to demonstrate skills in:

- Communication skills
- Problem solving
- Data collection and analysis
- Use of tools and equipment
- Technical drawing
- Service and repair of system components
- Fault diagnosis
- Interpretation of circuit
- Basics on electrical circuits
- Basics on mechanical installation
- Use of test and measuring instruments

- Planning
- Organisation

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EVIDENCE GUIDE

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency.	1.1 Place and observe safety signs 1.2 Identified electro-mechanical faults 1.3 Serviced and/or repaired electrical system faults 1.4 Serviced and/or repaired mechanical system faults 1.5 Tested electro-mechanical system after service/repair 1.6 Scheduled maintenance of electro-mechanical systems
2. Resource Implications.	2.1 Computers 2.2 Software 2.3 Whiteboards 2.4 Tools and equipment 2.5 Whiteboard markers 2.6 Manuals
3. Methods of Assessment.	<i>Competency may be assessed through:</i> 3.1 Practical 3.2 Observation 3.3 Questionnaire 3.4 Case studies 3.5 Written examinations 3.6 Oral presentation
4. Context of Assessment.	4.1 Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions.
5. Guidance information for assessment.	5.1 This unit may be assessed on an integrated basis with others within this occupational sector.

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