



Australian Government

Department of Education, Employment and Workplace Relations

MSACMT483A Support proactive maintenance

Revision Number: 1

MSACMT483A Support proactive maintenance

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit covers the knowledge and skills needed by a person who leads a production or maintenance team in a proactive maintenance environment.
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Application of the Unit

<p>Application of the unit</p>	<p>This unit applies to a team leader in a <i>competitive manufacturing</i> organisation where proactive maintenance strategies such as Total Productive Maintenance (TPM) or Reliability Centred Maintenance (RCM) are used and the team leader needs to lead the team to take an active role in proactive maintenance. The unit assumes that team members and in particular the team leader are in possession of technical knowledge appropriate to their position about the manufacturing process and equipment and are able to apply this to the maintenance strategy.</p> <p>The unit covers the leading of a team in proactive maintenance activities such as keeping records, visual checks, analysis of failures and effects on production, housekeeping etc. The unit does not cover breakdown maintenance, condition monitoring or non destructive testing.</p> <p>This unit requires the application of skills associated with communication, teamwork, problem solving, initiative, enterprise, planning and organising in order to lead a team in the development and implementation of proactive maintenance strategies. This unit has a strong emphasis on developing and resourcing the team to interpret information and monitor equipment and operation.</p>
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

<p>Prerequisite units</p>	
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Employability Skills Information

<p>Employability skills</p>	<p>This unit contains employability skills.</p>
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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. Lead team in monitoring process and equipment.	1.1. Demonstrate to team how to observe the process/equipment continuously and critically using appropriate senses (sight, hearing etc) to identify any potential or actual problems 1.2. Identify to team data indicators that must be monitored and recorded 1.3. Ensure team monitors identified data indicators frequently and critically 1.4. Ensure symptoms of operations outside the desired range of conditions and performance are recognised 1.5. Analyse cause of equipment non standard performance within scope of knowledge and skill 1.6. Ensure team members take timely and appropriate action to solve problem or to refer problem to appropriate manager or specialist
2. Apply proactive maintenance strategy.	2.1. Obtain and discuss maintenance strategy with relevant people 2.2. Identify aspects of maintenance strategy which require specific input from team 2.3. Discuss maintenance strategy with team members 2.4. Ensure team members have resources and training to be able to make the required contributions
3. Analyse standard procedures and work practices.	3.1. Examine team procedures and practices for compatibility with maintenance strategy 3.2. Identify areas where production procedures/practices should be changed to comply with maintenance strategy 3.3. Identify areas where maintenance strategy should change to comply with production procedures and practices 3.4. Identify other activities or areas where changes might increase equipment reliability 3.5. Take appropriate action to have the required changes made
4. Facilitate team contribution to proactive maintenance.	4.1. Monitor team's contribution to proactive maintenance 4.2. Arrange for competency development of team

ELEMENT	PERFORMANCE CRITERIA
	<p>members as required</p> <p>4.3. Facilitate ongoing examination by the team of process reliability and <i>overall equipment efficiency (OEE)</i></p> <p>4.4. Arrange for follow through and implementation of team originated improvements</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills:

- communication techniques
- negotiation skills
- information finding and analysing/using skills
- team work
- problem solving
- planning and organising

Required knowledge:

- understanding of the production process as it applies to the team area of responsibility
- understanding of proactive maintenance strategies

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, the Range Statement and the Assessment Guidelines for this Training Package.

Overview of assessment requirements	The assessment should identify that a team leader is able to provide leadership to a team whose responsibilities include the implementation of a proactive maintenance strategy.
What critical aspects of evidence is required to demonstrate competency in this unit?	Evidence of leadership to a team in supporting a proactive maintenance strategy would be required.
In what context should assessment occur?	Assessment needs to occur in an organisation implementing a proactive maintenance strategy preferably through project based assessment.
Are there any other units which could or should be assessed with this unit or which relate directly to this unit?	This unit could be assessed concurrently with other leadership related units.
What method of assessment should apply?	<p>Assessors must be satisfied that the person can consistently perform the unit as a whole, as defined by the elements, performance criteria, skills and knowledge. A holistic approach should be taken to the assessment.</p> <p>Assessors should gather sufficient, fair, valid, reliable, authentic and current evidence from a range of sources. Sources of evidence may include direct observation, reports from supervisors, peers and colleagues, project work, samples, organisation records and questioning. Assessment should not require language, literacy or numeracy skills beyond those required for the unit.</p> <p>The assessee will have access to all techniques, procedures, information, resources and aids which would normally be available in the workplace.</p> <p>The method of assessment should be discussed and agreed with the assessee prior to the commencement of the assessment.</p>
What evidence is required for	Evidence from one significant change may be

EVIDENCE GUIDE	
demonstration of consistent performance?	sufficient. For less significant changes, a range of changes will be needed to generate sufficient evidence.
What are the specific resource requirements for this unit?	Access to an organisation implementing a proactive maintenance strategy.

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 in the Performance Criteria is detailed below. Add any 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.

Competitive manufacturing

Competitive manufacturing is used to describe the range of systemic manufacturing practice concepts and approaches. It covers but is not limited to:

- lean manufacturing
- agile manufacturing
- preventative and predictive maintenance approaches
- monitoring and data gathering systems such as Systems control and data acquisition software (SCADA), enterprise resource planning systems (ERP), Manufacturing resource planning (MRP), and proprietary systems such as SAP etc.
- statistical process control systems including six sigma and three sigma
- just in time, kanban and other pull related manufacturing control systems
- supply, value, and demand chain monitoring and analysis
- other continuous improvement systems.

Competitive manufacturing should be interpreted so as to take into account the stage of implementation of competitive manufacturing approaches, the enterprise's size and work organisation, culture, regulatory environment and manufacturing sector.

Team

Team may include work teams from all sections of the organisation including production, maintenance, technical, administration/finance, sales/marketing.

Strategies may include:

Total Productive Maintenance (TPM)
 Reliability Centred Maintenance (RCM)
 Root Cause Analysis (RCA)
 Mean Time Between Failures (MTBF)
 Failure Mode and Effects Analysis (FMEA)

RANGE STATEMENT

Condition monitoring

Total Preventative Maintenance/Total Productive Maintenance (TPM) which is an application of total quality management to maintenance with the intention of increasing reliability, getting it right first time and increasing **Overall equipment efficiency (OEE)**.

Reliability Centred Maintenance (RCM) moves maintenance from reactive, or even planned/programmed towards a focus on **uptime** and **OEE**.

RCA There are many possible causes of any problem. Eliminating some will have no impact, others will ameliorate the problem. However elimination of the **root cause** will eliminate the problem. There should only be one **root cause** for any problem and so the analysis should continue until this one cause is found. Elimination of the **root cause** permanently eliminates the problem.

Uptime refers to the overall availability of the plant - it is the inverse of downtime - or the unavailability of the plant. Ideal uptime is 100%.

Overall equipment efficiency (OEE) is the combination of the main factors causing loss of productive capacity from equipment/plant and is:

$$OEE = \text{availability} \times \text{performance} \times \text{quality rate}$$

where:

- availability takes into account losses due to breakdown, set up and adjustments
- performance takes into account losses due to minor stoppages, reduced speed and idling
- quality rate takes into account losses due to rejects, reworks and start up waste

Mean time between failure (MTBF) is one key measure of the effectiveness of a maintenance procedure, and is an indicator as to whether **root causes** are being found and resolved. If **MTBF** is reducing, then it is an indicator that the maintenance regime is failing.

Failure Mode and Effects Analysis (FMEA) is a systematic approach that identifies potential failure modes in a system, product, or manufacturing / assembly operation caused by either design or manufacturing / assembly process deficiencies. It also

RANGE STATEMENT

	<p>identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. <i>FMEA</i> is a tool used to prevent problems from occurring.</p> <p>Some industry sectors have highly adapted forms of <i>FMEA</i> and may practice traditional <i>FMEA</i> in say their routine maintenance while using another technique (such as <i>HAZOP</i>) for design and modification.</p> <p><i>Hazard and Operability Studies (HAZOP)</i> is a form of <i>FMEA</i> which has been practiced by the process industries for over 30 years and examines the implications of changes in process conditions to process stability.</p> <p><i>Condition monitoring</i> involves often quite sophisticated monitoring of equipment including such things as vibration monitoring, instrumental analysis of lubricating oil etc to determine the current state of the equipment, monitor the change in this condition and predict when it needs servicing/maintenance to maintain reliability.</p>
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Unit Sector(s)

Unit Sector	CM Tools
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corequisite units

Corequisite units	
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Functional area

Functional Area	
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