



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MSACMT632A Analyse cost implications of maintenance strategy**

**Revision Number: 1**

## MSACMT632A Analyse cost implications of maintenance strategy

### Modification History

Not applicable.

### Unit Descriptor

<b>Unit descriptor</b>	This unit covers the knowledge and skills needed to analyse the cost implications of different maintenance strategies and to adjust adopt the strategy to minimise or eliminate unnecessary costs.
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### Application of the Unit

<b>Application of the unit</b>	<p>In a typical scenario, an organisation is selecting or reviewing its proactive maintenance strategy. While technical factors are significant in the choice of maintenance strategy and tools, cost factors will also impact on the selection of a maintenance strategy. This unit covers the cost analysis of maintenance strategies and complements the technical analysis covered in <i>MSACMT681A Develop a proactive maintenance strategy</i>. The technical analysis may be performed by the same or a different person to the person undertaking the cost analysis.</p> <p>This unit primarily requires the application of skills associated with communication in gathering, analysing and applying costing information and consulting with maintenance personnel. Problem solving, initiative and enterprise, and planning and organising are required to analyse and estimate the cost of maintenance strategies.</p>
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### Licensing/Regulatory Information

Not applicable.

## Pre-Requisites

<b>Prerequisite units</b>	
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## Employability Skills Information

<b>Employability skills</b>	This unit contains employability skills.
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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.
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## Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Analyse cost components of maintenance	1.1. Determine cost of failure of plant/equipment 1.2. Determine cost of a planned shut down, maintain, start up activity 1.3. Determine cost of maintenance activity for a planned activity 1.4. Determine cost of maintenance activity for an unplanned activity 1.5. Determine costs of condition monitoring 1.6. Identify cost implications for maintenance strategy
2. Estimate life cycle costs of plant/ equipment	2.1. Determine initial capital cost 2.2. Estimate servicing, maintenance and repair costs 2.3. Estimate production and other costs associated with service, maintenance and repair 2.4. Determine depreciation and other applicable allowances 2.5. Estimate ancillary costs such as training, commissioning, productivity loss 2.6. Estimate technological life and costs of changing to current technology/costs of retaining obsolete equipment 2.7. Estimate annualised costs in present value terms. 2.8. Identify life cycle cost implications for strategy.
3. Liaise with proactive maintenance strategy developer	3.1. Identify cost implications for different strategies 3.2. Negotiate a strategy which minimises total costs 3.3. Monitor the implementation of the strategy to ensure the costs are minimised 3.4. Make required adjustments

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

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

#### Required skills

- calculation
- analysis
- problem solving

#### Required knowledge

- cost components of maintenance
- interrelationship of cost components and maintenance activities

## Evidence Guide

### EVIDENCE GUIDE

The Evidence Guide describes the underpinning knowledge and skills that must be demonstrated to prove competence. It is essential for assessment and must be read in conjunction with the performance criteria, the range statement and the assessment guidelines of the relevant training package

<b>Overview of assessment requirements</b>	The person will analyse and determine cost components for maintenance strategies. The strategies implemented will be cost effective.
<b>What are the specific resource requirements for this unit?</b>	Access to a workplace implementing competitive manufacturing strategies. No other specific resources are required.
<b>In what context should assessment occur?</b>	Assessment will need to occur in a workplace.
<b>Are there any other units which could or should be assessed with this unit or which relate directly to this unit?</b>	This unit may be assessed concurrently with appropriate units.
<b>What method of assessment should apply?</b>	<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>
<b>What evidence is required for demonstration of consistent</b>	Evidence from a single optimisation may be adequate, although generally analyses of a few

**EVIDENCE GUIDE****performance?**

products with different cost structures or customer benefit structures would be required.

## 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, if used in the performance criteria, is detailed below. 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) may also be included.

#### Maintenance strategies and techniques 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)
- Condition monitoring

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

**RANGE STATEMENT**

- performance takes into account losses due to minor stoppages, reduced speed and idling
- quality rate takes into account losses due to rejects, re-works 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 identifies critical or significant design or process characteristics that require special controls to prevent or detect failure modes. **FMEA** is a tool used to prevent problems from occurring.

Some industry sectors have highly adapted forms of **FMEA** and may practice traditional **FMEA** in say their routine maintenance while using another technique (such as **HAZOP**) for design and modification.

**Hazard and Operability Studies (HAZOP)** is a form of **FMEA** which has been practiced by the process industries for over 30 years and examines the implications of changes in process conditions to process stability.

**Condition monitoring** 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.

**Unit Sector(s)**

Unit Sector	CM Tools
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**Co-requisite units**

<b>Co-requisite units</b>	
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**Functional area**

<b>Functional Area</b>	
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