



Australian Government

Department of Education, Employment and Workplace Relations

MSS014005A Apply proactive maintenance strategies to sustainability

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers using a proactive maintenance strategy to improve the sustainability outcomes of equipment, plant or process. This unit includes the interaction between maintenance worker and operator as appropriate.

Application of the Unit

This unit applies where an organisation has decided to adopt or is implementing total preventative maintenance/total productive maintenance (TPM), reliability centred maintenance (RCM) or similar strategies (jointly referred to as 'proactive maintenance' in this unit) to improve their sustainability outcomes as well as their maintenance outcomes.

The unit applies to employees who have maintenance related responsibilities, including but not limited to, mechanical, electrical, fabrication and other tradespersons, technicians and operators with maintenance related responsibilities.

The unit scope includes processes and operations, products made, internal and external support services and the services offered, and use of sites by another organisation, such as a contractor or value chain member organisation.

Environmental sensitivities referred to in this unit are at the issue level. The technical measurement of operational performance or measurement of emissions or other environmental impact is not covered by this unit.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills

Elements and Performance Criteria Pre-Content

Not applicable.

Elements and Performance Criteria

- 1 Define sustainability issues for work area
 - 1.1 Identify sustainability goals of enterprise as they relate to work area
 - 1.2 Identify actual or possible sustainability issues in work area
 - 1.3 Determine current maintenance strategy for work area
 - 1.4 Identify changes to maintenance strategy which may improve sustainability outcomes
 - 1.5 Consult with stakeholders with regard to sustainability issues and possible maintenance changes
- 2 Assess current maintenance practice for sustainability implications
 - 2.1 Evaluate current maintenance procedures for plant/equipment sustainability implications
 - 2.2 Discuss current maintenance practices with relevant stakeholders to determine any plant/equipment sustainability issues
 - 2.3 Recommend changes to improve plant/equipment sustainability impact in accordance with procedures
- 3 Implement the sustainable maintenance strategy and practices for the work area
 - 3.1 Arrange for changes to be incorporated into procedures and work plans
 - 3.2 Identify training needs in liaison with relevant personnel
 - 3.3 Assist personnel to develop required competencies within scope of authority
 - 3.4 Collect data as required by own work plan
 - 3.5 Develop required information and compare with performance indicators
 - 3.6 Recommend sustainability improvements in accordance with procedures
 - 3.7 Monitor implementation of improvements and recommend any further required changes

Required Skills and Knowledge

Required knowledge includes:

- requirements of the proactive maintenance strategy being implemented
- principles of operation of the equipment/plant
- likely abilities of operations personnel with regard to inspections and servicing
- maintenance procedures relevant to jobs, equipment and processes
- methods of making/recommending improvements
- environmental impacts of materials and energy used/emitted
- environmental sensitivities of all areas impacted by the work/process area (and related areas where impact spreads beyond immediate area, e.g. by loss of containment)
- root cause analysis and problem solving
- mitigation strategies as relevant to work/process area
- sustainability issues relevant to the work/process area

Required skills include:

- communicating with relevant personnel
- planning, organising and prioritising tasks
- reading and interpreting technical information and procedures
- recording data and converting to maintenance and sustainability relevant information
- solving problems to root causes
- identifying maintenance strategies and practices and their impact on sustainability as they apply to equipment and processes in a work area
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Evidence Guide

Overview of assessment	A person who demonstrates competency in this unit must be able to assess current proactive maintenance practices for plant and equipment and adapt and implement these practices to achieve improvements in sustainability.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different situations and contexts. Critical aspects of assessment and evidence include:</p> <ul style="list-style-type: none"> • identifying key features of maintenance strategies, including breakdown maintenance, TPM, RCM and OEE • identifying current maintenance strategies and practices in a work area • analysing work area maintenance strategies and practices for sustainability related implications • developing and implementing sustainability improvements.
Context of and specific resources for assessment	<ul style="list-style-type: none"> • This unit of competency is to be assessed in the workplace or a simulated workplace environment. • Assessment should emphasise a workplace context and procedures found in the candidate's workplace. • This unit of competency may be assessed with other relevant units addressing sustainability at the enterprise level or other units requiring the exercise of the skills and knowledge covered by this unit. • The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
Method of assessment	<ul style="list-style-type: none"> • In all cases, practical assessment should be supported by questions to assess underpinning knowledge and those aspects of competency which are difficult to assess directly. • Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. • The language, literacy and numeracy demands of assessment should not be greater than those required to undertake the unit of competency in a work-like environment.
Guidance information for assessment	

Range Statement

Process	<p>Process may include:</p> <ul style="list-style-type: none"> • any manufacturing, logistics, administrative, information technology or other business process which uses equipment or plant that requires maintenance
Interactions with the environment	<p>Interactions with the environment may include:</p> <ul style="list-style-type: none"> • drawing physical resources from the environment • releasing materials to the environment (e.g. emissions) • drawing energy from/releasing energy to the environment
Environmental sensitivities	<p>Environmental sensitivities may include:</p> <ul style="list-style-type: none"> • fragile areas and rare or threatened species • heritage or culturally sensitive issues • hazardous emissions • real or perceived overuse of scarce resources • regulated emissions or other regulatory issues • noise • community perceptions or other issues
Sustainability issues	<p>Sustainability issues (as relevant to the work/process area) may include:</p> <ul style="list-style-type: none"> • need to reduce the carbon footprint of product and process through reduction in use of: <ul style="list-style-type: none"> • energy • water • raw materials • emissions • embedded carbon in transport, storage, rework and errors, and inefficient processes and design <p>Sustainability related issues may also exist irrespective of the carbon equivalence aspects of the issue. This may include:</p> <ul style="list-style-type: none"> • current and future availability of raw materials • current and future availability of energy • extent and type of waste generation and disposal • efficiency of process in terms of consumption of materials and energy regarded as in short supply or which are regarded as environmentally sensitive • the extent to which the production process, product and waste affects the environment, including effects on:

	<ul style="list-style-type: none"> • climate • quality of local air and water • ecology • noise • relationship with the local and broader community, (e.g. effect of operations on aesthetic appearance, preservation of heritage, and proximity to schools and religious facilities) • extent of regulatory oversight and extent and cost of compliance
Procedures	<p>Procedures include:</p> <ul style="list-style-type: none"> • all work instructions, standard operating procedures, formulas/recipes, batch sheets, temporary instructions and similar instructions provided for the smooth running of the plant • good operating practice as may be defined by industry codes of practice (e.g. good manufacturing practice (GMP) and responsible care) and government regulations <p>Procedures may be:</p> <ul style="list-style-type: none"> • written, verbal, computer-based or in some other form
TPM	<p>TPM refers to:</p> <ul style="list-style-type: none"> • the strategic application of total quality management to maintenance with the intention of increasing reliability, getting it right first time and increasing overall equipment efficiency (OEE)
RCM	<p>RCM refers to:</p> <ul style="list-style-type: none"> • a strategy which moves maintenance from reactive, or even planned/programmed, towards a focus on uptime and OEE
Similar strategies	<p>Mean time between failure (MTBF):</p> <ul style="list-style-type: none"> • 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 <p>Failure mode and effects analysis (FMEA):</p> <ul style="list-style-type: none"> • 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

	<p>controls to prevent or detect failure modes. FMEA is a tool used to prevent problems from occurring</p> <p>Some industry sectors have highly adapted forms of FMEA and may practice traditional FMEA in their routine maintenance while using another technique, such as hazard and operability studies (HAZOP), for design and modification</p> <p>HAZOP is:</p> <ul style="list-style-type: none"> • 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 <p>Condition monitoring:</p> <ul style="list-style-type: none"> • involves monitoring of equipment usually through technical analysis or visual inspection of: <ul style="list-style-type: none"> • performance in use, including vibration monitoring, noise and extent of exhausts • instrumental analysis of lubricating oil and exhausts • components, such as bearings, seals and hoses <p>to determine the current state of the equipment, monitor the change in this condition and predict when it needs servicing/maintenance to maintain reliability and performance against sustainability related criteria (e.g. emissions)</p>
OEE	<p>OEE is:</p> <ul style="list-style-type: none"> • the combination of the main factors causing loss of productive capacity from equipment/plant and is where: <ul style="list-style-type: none"> • 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 the losses due to rejects, reworks and start-up waste
Maintenance practices	<p>Maintenance practices are the detailed application of the maintenance strategy to individual items of equipment and the maintenance responsibilities and tasks to employees and contractors. Examples that may impact on sustainability include:</p> <ul style="list-style-type: none"> • increased inspection frequency of equipment above minimum requirements • lubrication and filter changeovers above minimum requirements in order to achieve higher

	<p>environmental performance</p> <ul style="list-style-type: none">• replacement at set intervals to eliminate/reduce breakdowns• duplicate circuits• remote monitoring• increased training of operators in equipment monitoring and minor maintenance
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Unit Sector(s)

Sustainability

Custom Content Section

Not applicable.