Australian Government

Department of Education, Employment and Workplace Relations

MSS015004A Design sustainable product or process

Release: 1

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Modification History

Not applicable.

Unit Descriptor

This unit of competency covers the ability to redesign an existing, or design a new, product or process to achieve optimal sustainability outcomes
This unit does not cover analysing product life cycle which is covered by MSS015003A Analyse product life cycle for sustainability.

Application of the Unit

This unit applies to the design/redesign of processes and their associated products as appropriate to achieve optimal sustainability outcomes. The unit does not supply the technical competence for design of a particular product or process. It is anticipated that this unit would be undertaken in conjunction with appropriate technical design and technical supporting units which because of the variety of manufactured products and the varying technical skill required for their design are unable to be specified.
This unit applies inside organisations and their value chains. The unit has been developed with manufacturing operations as a focus. However, because of the range of organisations in a typical manufacturing value chain it may also be applied to other types of organisations.
This unit would typically be undertaken by a manager or technical specialist who had a major responsibility for sustainability as part of a broader work role, or sustainability may be their primary work responsibility. The manager or technical specialist may undertake this alone or as part of a team.
The technical measurement of operational performance or measurement of emissions or other environmental impact is not covered by this unit. Specific units covering these and similar aspects are contained within the MSS40211 Certificate IV in Environmental Monitoring and Technology.

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 parameters of new/improved product	1.1 Consult with relevant stakeholders to determine required function, performance and aesthetics of new product
	1.2 Identify market, expected time to market and cost constraints of product and production process
	1.3 Identify requirements with possible high sustainability impacts
	1.4 Negotiate requirements to achieve desired sustainability impacts
	1.5 Develop agreed definition of product requirements
2 Develop alternative product and process designs	2.1 Identify alternative resource requirements
	2.2 Identify alternative processes
	2.3 Determine the possible sustainability impacts of different combinations of resources and processes
	2.4 Test alternative product and process designs against original product requirement definitions
	2.5 Identify product requirements which may be causing significant sustainability impacts
	2.6 Renegotiate, where possible, product requirements to lessen sustainability impacts
	2.7 Short-list preferred resources and processes
3 Evaluate life cycle impacts	3.1 Estimate life cycle sustainability impacts for each short-listed alternative
	3.2 Identify process steps with greatest sustainability impact
	3.3 Evaluate process steps for alternatives/modifications with lower impact
	3.4 Select alternative which best meets requirements and has the lowest sustainability impact

4 Confirm design	4.1 Develop selected design as required
	4.2 Confirm life cycle sustainability impacts
	4.3 Review design against product requirements
	4.4 Obtain required authorisations
	4.5 Document design in the required form
5 Prepare for implementation	5.1 Consult with key stakeholders
	5.2 Identify key measures for monitoring implementation of design
	5.3 Identify data sources required by key measures
	5.4 Organise for data to be captured and manipulated, as required

Required Skills and Knowledge

Required knowledge includes:

- sustainability impacts from using different materials and different processes and to produce products of different specifications and life cycle outcomes
- alternative sources of materials and components and the sustainability differences of each
- alternative processes and the sustainability differences of each, including expression in terms of carbon equivalence
- product and process design
- design documentation
- methods of monitoring of product development and manufacture
- AS/NZS ISO 14000 Environmental Management Standards

Required skills include:

- communicating complex concepts and designs to stakeholders
- consulting and negotiating with stakeholders on possible alternatives
- analysing processes, logistics, material usages, costs and benefits, including expressing the results of analyses in carbon equivalence
- life cycle estimation
- determining sustainability impacts from material/components and process interactions
- designing products and manufacturing processes for optimal sustainability outcome

Evidence Guide

Overview of assessment	A person who demonstrates competency in this unit must be able to design products and associated processes to achieve optimal sustainability outcomes over the product life cycle. The assessment emphasis is on the ability to design for sustainability not on the engineering or other technical aspects of the design process.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	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: • including sustainability in definition of product requirements • design optimises the sustainability outcomes over product life cycle or process • design includes means of monitoring sustainability outcomes over product life cycle or process.
Context of and specific resources for assessment	• 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	• 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

Parameters of new product	Parameters of new product may include: • function • form • market • desired sustainability performance • cost

Sustainability impact	The sustainability impact of a product and process may include:
	• resource footprint (e.g. carbon and water) of product and process
	• current and future availability of raw materials
	• current and future availability of energy
	• waste generation and disposal
	• efficiency of process
	• the extent to which the production process and product affects the environment, including effects on:
	  • 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 cost of compliance

Resource	Resource includes: • both materials and energy
Review design	Review design includes: • ensuring product and process meets requirements • analysis to identify further improvements

Unit Sector(s)

Sustainability

Custom Content Section

Not applicable.