



Australian Government

MSS017002 Determine process loss through mass or energy balancing

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSS017002A Determine process loss through mass or energy balancing.

Application

This unit of competency covers the analysis of a process to determine loss of resources by the application of the first law of thermodynamics (more commonly known as mass and energy balancing). It includes the selection of mass or energy balancing or both as appropriate to the type of processes being examined and may be applied to an entire process, part of a large process, or part/all of a value chain.

This unit covers the analysis of a mass (material) and energy (usually heat or motive force) flows through a process to determine overall mass and energy efficiency, losses which occur through the process and how much loss occurs in each part of the process. This is achieved by the application of the techniques of mass balancing, energy balancing and combined mass and energy balancing. The application of this unit is especially suitable where high volumes of materials or large amounts of energy are used in a production process. The unit may also apply to other large energy or materials use processes in the value chain, such as logistics and transport.

This unit will lead to the identification of parts of the process which have the greatest resource loss/lowest resource use efficiency and so provides the basis for eliminating or reducing this loss and improving this efficiency.

A manager or senior technologist who has significant responsibility for sustainability in their work role would typically undertake this unit. Skills covered by this unit may be applied individually or in a team context.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Nil

Competency Field

Sustainable operations

Unit Sector

Not applicable

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|---|-----|---|
| 1 | Acquire required data | 1.1 | Identify system to be analysed. |
| | | 1.2 | Define appropriate boundaries for this system. |
| | | 1.3 | Identify relevant data which is available for the system and its subsystems. |
| | | 1.4 | Identify required data which is not currently available. |
| | | 1.5 | Negotiate with relevant stakeholders to obtain data which is not currently available. |
| | | 1.6 | Acquire necessary and appropriate data. |
| 2 | Calculate resource efficiency/loss | 2.1 | Undertake mass/energy balance over system. |
| | | 2.2 | Identify subsystems making greatest contributions to loss by mass/energy balances over selected subsystems. |
| | | 2.3 | Calculate sustainability impact of identified losses. |
| | | 2.4 | Calculate mass/energy efficiencies of system and analysed subsystems. |
| 3 | Prepare recommendations | 3.1 | Investigate subsystems responsible for significant loss. |
| | | 3.2 | Determine currently available responses. |
| | | 3.3 | Determine required longer term responses. |
| | | 3.4 | Draft recommended responses in appropriate form. |
| 4 | Communicate with relevant | 4.1 | Identify relevant stakeholders. |
| | | 4.2 | Determine stakeholder information needs and wants. |

	stakeholders	4.3	Analyse data which may be appropriate to communicate with stakeholders.
		4.4	Prepare and disseminate information to stakeholders, as appropriate.
		4.5	Negotiate solutions with stakeholders, as required.
5	Communicate required responses as appropriate	5.1	Identify what communications are required and to whom.
		5.2	Prepare appropriate reports and recommendations.
		5.3	Pitch reports and recommendations, as appropriate.
		5.4	Brief appropriate persons as required by determined responses.
		5.5	Finalise appropriate recording.

Foundation Skills

This section describes those required skills (language, literacy and numeracy) that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Sustainability incorporates all of

- survival of the ecology/physical environment (to manage the impact of the business to ensure the survival of the physical environment)
- economic viability (efficiency, cost and waste reduction and competitiveness to support survival of the business)
- social sustainability (to manage the impact of the business to ensure its continued survival within the community and the survival of the community).

Mass/energy balancing includes one or more of

- mass balancing is an analysis technique which allows for the calculation of mass flows and consumption through a process and losses of mass from the system/product
- energy balancing is an analysis technique which allows for the calculation of energy flows and consumption through a process and the losses of energy from the system/product
- mass and energy balancing may be undertaken as separate activities or in some circumstances as a combined mass/energy balance.

Appropriate response when impact cannot be prevented includes one or more of

- capture and storage (e.g. scrubbing) and similar 'end of pipe' solutions
- dilution/dispersion and similar techniques which reduce concentration but not amount
- other approaches which meet the sustainability requirements.

Unit Mapping Information

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Links

MSA Training Package Implementation Guides - <http://mskills.org.au/training-packages/info/>