



Australian Government

Department of Education, Employment and Workplace Relations

MSS405022A Design a process layout

Release: 1

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Modification History

New unit, superseding MSACMT622A Design a process layout - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to design a process layout, typically a cellular flow, for either a jobbing shop or a continuous process manufacturer.

Application of the Unit

This unit provides the skill for a technical expert to apply the principles of competitive systems and practices to process design layout as distinct from volume production layout. While the application of the unit may be for an initial layout, in many cases it is likely to be for the redesign of an existing layout.

The unit is written on the assumption that there is an existing process. Where this is not the case, then additional competency in equipment/process design and selection will also be required through units from an appropriate technical qualification or Training Package.

This unit requires the application of skills associated with problem solving, initiative, enterprise, planning and organising in order to design a process for the manufacture of enterprise products that incorporates team operations, product flow, infrastructure and the layout of the physical environment and related technology. This unit has a strong emphasis gathering, analysing and applying information.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

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

1	Identify the products and processes used in the organisation	1.1	Obtain or develop a process map of the existing process
		1.2	Identify all/main products/classes of products
		1.3	Obtain forecast sales and sales pattern of products/classes
		1.4	Obtain profiles of products/classes
		1.5	Group the products/classes into compatible families
2	Engineer the process	2.1	Make a preliminary selection of required equipment/technology/process for each process or product family
		2.2	Estimate required resource times for each family
		2.3	Calculate total resourcing required for each family
		2.4	Estimate appropriate lot size
		2.5	Determine viability of proposed families
		2.6	Examine draft proposal for possible improvements in process consistent with the competitive systems and practices strategy of the organisation

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| 3 | Design the infrastructure | 3.1 | Consult on layout needs with all stakeholders |
| | | 3.2 | Identify physical infrastructure required by system |
| | | 3.3 | Identify information and control infrastructure required |
| | | 3.4 | Identify work organisation required |
| | | 3.5 | Identify occupational health and safety (OHS) and regulatory requirements to be taken into account |
| | | 3.6 | Identify workforce development and training requirements |
| | | 3.7 | Check the availability of required infrastructure and compatibility with requirements |
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| 4 | Layout the process | 4.1 | Draft proposed process flow map |
| | | 4.2 | Draft proposed configuration diagram |
| | | 4.3 | Draft proposed space plan/layout |
| | | 4.4 | Check availability of services/structural suitability, as appropriate |
| | | 4.5 | Validate proposed layout with all relevant stakeholders |
| | | 4.6 | Layout the process/work cell |
| | | 4.7 | Develop implementation plan in liaison with relevant stakeholders |
| | | 4.8 | Review layout after implementation |

Required Skills and Knowledge

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

Required skills

Required skills include:

- communicating at all levels in the organisation and to individuals of different levels of literacy and numeracy
- undertaking self-directed problem solving and decision-making on issues of a broad and/or highly specialised nature and in a wide variety of contexts
- producing process flow maps
- analysing the relationship between equipment, components, products, services and operators for existing and future layouts
- problem solving layout-related problems to root cause
- planning and organising implementation plans, including communication to stakeholders and any necessary training
- calculating and estimating size, volume and area and other layout related measures

Required knowledge

Required knowledge includes:

- typical customer requirements, including:
 - order size
 - order pattern
- processing requirements of products and jobs
- capabilities and maintenance requirements (e.g. access and services) of equipment
- abilities and skills of workforce
- OHS and regulatory requirements that may affect layout
- business requirements from layout

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and	A person who demonstrates competency in this unit must
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evidence required to demonstrate competency in this unit	be able to provide evidence of their ability to: • analyse products, operations and equipment and determine efficiencies that can be achieved by improved layout • determine OHS and regulatory impacts on a layout • supervise implementation of layouts • analyse implemented layouts and suggest further improvements.
Context of and specific resources for assessment	Assessment of performance must be undertaken in a workplace using or implementing one or more competitive systems and practices. Access may be required to: • workplace procedures and plans relevant to work area • specifications and documentation relating to planned, currently being implemented, or implemented changes to work processes and procedures relevant to the assessee • documentation and information in relation to production, waste, overheads and hazard control/management • reports from supervisors/managers • case studies and scenarios to assess responses to contingencies.
Method of assessment	A holistic approach should be taken to the assessment. Competence in this unit may be assessed by using a combination of the following to generate evidence: • demonstration in the workplace • workplace projects • suitable simulation • case studies/scenarios (particularly for assessment of contingencies, improvement scenarios, and so on) • targeted questioning • reports from supervisors, peers and colleagues (third-party reports) • portfolio of evidence In all cases it is expected that practical assessment will be combined with targeted questioning to assess underpinning knowledge. Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.

Guidance information for assessment	Assessment processes and techniques must be culturally appropriate and appropriate to the oracy, language and literacy capacity of the candidate and the work being performed.
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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.

Competitive systems and practices	Competitive systems and practices may include, but are not limited to: • lean operations • agile operations • preventative and predictive maintenance approaches • monitoring and data gathering systems, such as Systems Control and Data Acquisition (SCADA) software, Enterprise Resource Planning (ERP) systems, Materials Resource Planning (MRP) and proprietary systems • statistical process control systems, including six sigma and three sigma • Just in Time (JIT), kanban and other pull-related operations control systems • supply, value, and demand chain monitoring and analysis • 5S • continuous improvement (kaizen) • breakthrough improvement (kaizen blitz) • cause/effect diagrams • overall equipment effectiveness (OEE) • takt time • process mapping • problem solving • run charts • standard procedures • current reality tree Competitive systems and practices should be interpreted
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	so as to take into account: - the stage of implementation of competitive systems and practices - the size of the enterprise - the work organisation, culture, regulatory environment and the industry sector
Profiles	Profiles of products may include: - components/materials needed to manufacture - equipment/technology/processes required to manufacture - volume of activity to manufacture forecast amount
Compatible families	Compatible families include: products/classes requiring identical or similar operations equipment, technology or processes
Required resource times	Required resource times may include: - set-up time - equipment time - person time - process time
Lot size	Lot size may include: - external lot size - internal lot size - transfer batch size - kanban size
Viability	Viability includes: - appropriate calculated processing times - adequacy of equipment utilisation - acceptable maintenance implications - ability to meet OHS requirements - ability to meet environmental requirements - compliance with any legislative and regulatory requirements - acceptable to stakeholders
Stakeholders	Stakeholders include: - customers - employees - equipment suppliers and contractors (especially if new equipment required)

	Depending on the process and location, stakeholders may also include: • regulatory authorities • local community representatives • utilities (e.g. water and power)
Physical infrastructure	Physical infrastructure may include: • containers • material handling equipment • utilities supply (e.g. steam, air, gas, electricity and water)
Information and control infrastructure	Information and control infrastructure may include: • quality assurance • statistical process control (SPC)/six sigma • planning systems/software • data collection and control systems/software
Work organisation	Work organisation includes: • number of personnel • skills mix of workforce

Unit Sector(s)

Unit sector

Competitive systems and practices

Custom Content Section

Not applicable.