Australian Government

Department of Education, Employment and Workplace Relations

MSS405023A Develop a levelled pull system for operations and processes

Release: 1

MSS405023A Develop a levelled pull system for operations and processes

Modification History

New unit, superseding MSACMT623A Develop a levelled pull system of manufacturing - Equivalent

Unit Descriptor

This unit of competency covers the skills and knowledge required to develop and level a customer-driven demand pull system for operations and processes in order to balance the flow of work and minimise inventories.

Application of the Unit

This unit primarily applies to volume-based manufacturing organisations. However, the skills covered by the unit may also be applied in other organisations where the business is based on high volume processes initiated by customer demand signals (e.g. orders). The unit covers the production planning skills needed to develop and level a demand pull system which meets the business needs of the organisation. This may apply to the initial development of a pull system, or the continuous improvement of an existing system.
This unit primarily requires the application of skills associated with communication in gathering, analysing and applying information and consulting with stakeholders. Problem solving, initiative and enterprise, and planning and organising are required to determine effective operations sequences and flow systems. This unit also requires aspects of self-management and learning to ensure feedback and new learning is integrated into system designs.
Depending on the organisation and its operations the following units may also be relevant:

- *MSS402080A Undertake root cause analysis*
- *MSS405002A Analyse and map a value stream*
- *MSS405021A Develop a Just in Time system*
- *MSS405022A Design a process layout*
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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	Analyse production systems	1.1	Acquire an 'as is' value map of the process for all major products
		1.2	Separate repeated products from specials
		1.3	Consult with production, maintenance, supervisory and management workforce on current production system and processes
		1.4	Establish rate of flow required to meet customer demand
		1.5	Identify process steps causing problems
		1.6	Analyse inventories within process and determine causes of high inventories
		1.7	Determine costs of problems and inventories
		1.8	Develop improved flow sequence and future value map
2	Establish sequence	2.1	Identify equipment and processes which can be sequenced by co-location
		2.2	Identify equipment which is not suitable for co-location
		2.3	Identify pacemaker process
		2.4	Establish/review location of equipment for desired sequencing

3	Initiate or develop flow system	3.1	Determine rate and variability of demand for product
		3.2	Compare capability of flow sequence to demand rate and variability
		3.3	Set flow rate to level demand at pacemaker and handle variability
		3.4	Identify trigger for pacemaker process
		3.5	Establish kanban system for other process parts
4	Balance the work	4.1	Determine target time per product
		4.2	Standardise work processes and operations and establish procedures to monitor variation
		4.3	Adjust product/batch production to balance work
		4.4	Arrange for any required competency development of workforce
		4.5	Arrange for implementation of system
		4.6	Monitor operation of system and take appropriate action

Required Skills and Knowledge

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

Required skills

Required skills include:

- identifying and analysing production and other processes to identify variation from specifications
- solving problems to determine causes of variations to root cause
- communicating at all levels in the organisation and value stream and to audiences 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
- analysing long or critical process steps and determine if they are pacemaker step
- setting and standardising operational processes around the requirements of the pacemaker process
- planning and organising implementation of a levelled pull production system
- documenting process steps
- performing calculations and interpreting data, including charts and diagrams related to establishing rate of flow and variation in process steps

Required knowledge

Required knowledge includes:

- technical and regulatory limits that must be adhered to in operations
- processing requirements of products or services offered by the organisation
- capabilities of equipment
- capabilities and skills of the workforce
- production planning techniques
- methods of calculating rates of demand and flow of work (e.g. takt and pitch)
- techniques for achieving a smooth and consistent flow of work, such as:
  - identifying pacemaker process
  - levelling the flow of work
  - balancing the allocation of resources
  - balancing the allocation of work
  - Just in Time (JIT)
  - Heijunka boxes
  - visual displays

- relationship of level of inventory to efficiency and waste

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 evidence required to demonstrate competency in this unit	A person who demonstrates competency in this unit must be able to provide evidence of their ability to: • acquire a value stream map for current products and processes • analyse process • perform required calculations to determine flow rate and variability • correctly identify pacemaker process • balance the work • monitor implementation of a levelled pull system and suggest 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.

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 • 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 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
Product	Product includes: • individual products and product groups/families
Inventories	Inventories within process may include: • cycle stock which reflects the replenishment quantity and frequency • buffer stock to meet demand variability and forecast errors • safety stock required to guard against quality and delivery failures upstream
Pacemaker	Pacemaker processes is that process which sets the pace for the flow of operations/work through the enterprise. Pacemaker processes may include, but are not limited to: • process steps which are significantly longer than other production stages • critical technical or quality steps in the production process
Takt time	Takt time is the time required to complete one job cycle if the customer's time and volume expectations are to be met, i.e. the available time divided by the number of units required, and so may include, but is not limited to: • time per piece where applied to piece work

	• time per tonne or litre when applied to bulk product • time per work item when applied to an office or service environment • deadlines required to meet delivery dates when applied to project work
Pitch	Pitch is the takt time averaged over a defined period and with available resources giving the rate of flow required to meet customer demand
Balance work	Balance work means balancing: • time of production • effort required by workforce and equipment • work organisation • job design • quality considerations • waste and other cost considerations between stations/equipment/processes to achieve levelled pull within allowable time per product Balance work consideration also means: • undertaking adequate consultation with stakeholders • meeting occupational health and safety (OHS) and environmental requirements • any other regulatory and legislative requirements

Unit Sector(s)

Unit sector Competitive systems and practices

Custom Content Section

Not applicable.