



Australian Government

MEM23118 Apply production and service control techniques

Release: 1

MEM23118 Apply production and service control techniques

Modification History

Release 1. Supersedes and is equivalent to MEM23118A Apply production and service control techniques.

Application

This unit of competency defines the skills and knowledge required to apply techniques for production and service control to maintain efficient and effective supply of product or service delivery to customers and to provide data for improvements to enhance competitiveness. It includes monitoring and measurement of quality, costs, quantities and reliability of processes in the value chain, including maintenance activities to ensure customer requirements are met. It also requires the use of statistical process control (SPC), control charts and the graphical representation of results.

This unit applies to individuals who are required to control production and/or service delivery processes to ensure quality for product manufacture or the provision of services to defined quality and operational requirements. It is suitable for people working as service providers, supervisors or technicians and those pursuing manufacturing, engineering or related technical qualifications and careers.

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

Pre-requisite Unit

MEM30012 Apply mathematical techniques in a manufacturing engineering or related environment

Competency Field

Engineering science

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Establish scope of required production or service control	1.1 Identify products or services required by customers, including quality and delivery requirements 1.2 Identify current production or service control tasks, key performance indicators (KPIs), and context within organisation strategic objectives and markets

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.3 Identify software techniques required for production or service control, communications and reporting 1.4 Identify stakeholders to be consulted on the production or service control tasks 1.5 Confirm work health and safety (WHS) and regulatory requirements, codes of practice, standards and risk assessment requirements
2. Review current data collection and production or service provision	2.1 Determine measurable parameters of production process or service delivery 2.2 Determine parameters of product or service that are open to control and establish tolerances or acceptable variation 2.3 Review process control functions 2.4 Review production control performance indicators and indices 2.5 Review the role of probability in sampling and SPC 2.6 Review process capability and SPC evaluation, control charts and sampling 2.7 Review features and functions of graphical methods for display of data
3. Analyse data and apply production control principles to improve product manufacture or service provision	3.1 Obtain or record production or service data or appropriate data samples using manual and automated devices 3.2 Use software and control chart techniques to generate histograms, Pareto diagrams, flowcharts, tally-charts, scatter plots and/or run charts in accordance with procedures 3.3 Analyse data for trends and correlations and apply to process improvement, quality control and other support functions in accordance with procedures 3.4 Determine process capability indices for an appropriate sample of a product or service delivery 3.5 Establish required performance indicators for production or service operations 3.6 Take corrective action in accordance with procedures 3.7 Monitor production or service delivery using control charts to determine compliance of the product or service with specified performance limits 3.8 Take further corrective action as required

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
4. Report results	4.1 Provide required reports in accordance with procedures 4.2 Provide documentation including data, graphics, capability assessments, control and continuous improvement processes

Foundation Skills

This section describes those language, literacy, numeracy and employment skills 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.

Production control related tasks include:	- measuring and recording data either manually or using automated data collection - determining process capability indices for a large sample of a product with a particular dimension normally distributed within upper and lower specification limits - applying sampling plans to products or measurable aspects of services and justifying the choice of sampling plan based on the properties required of the plan - applying control charts to a sample from a product or service to determine acceptability of the product or service within set limits such as Three-Sigma (3σ) and Six-Sigma (6σ) limits - analysing data for trends and taking corrective action in accordance with procedures - selecting and employing appropriate control charts from c-chart, p-chart and X-bar and R or np control charts - employing a Pareto analysis to determine priority issues for solutions related to a specific problem.
Required performance indicators for production or service operations	- design features including dimensional and weight specifications and tolerances - production schedules

include one or more of the following:	• organisation or customer specified target error rates and waste including those set under lean systems including 6σ • equipment availability indices • mass balancing targets • WHS-related indicators • task time compliance.
WHS, regulatory requirements and organisational procedures include:	• WHS acts, regulations and relevant standards • codes of practice from Australian and overseas engineering and technical associations and societies • risk assessments • registration requirements • safe work practices • state and territory regulatory requirements.
Lean principles and techniques are those that relate to the following as drivers of the process and measures for process improvement including:	• cost • capacity and responsiveness • quality • reliability • waste minimisation.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM23118A Apply production and service control techniques.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM23118 Apply production and service control techniques

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include:

- identifying work health and safety (WHS) and regulatory requirements, risk management and related organisational procedures
- determining measurable and controllable parameters of product or service
- determining acceptable variation of production or service parameters
- using manual and automatic methods for measurement, data gathering and analysis
- applying software and control chart techniques for statistical process control (SPC), performance analysis and graphical representations on at least two occasions, including generating histograms, Pareto diagrams, flowcharts, tally charts, scatter plots and/or run charts from production or measurable service data
- applying sampling plans to products on at least two occasions to review production and service functions in order to recommend or make process improvements that are based on statistical analyses
- reporting and documenting results in accordance with procedures.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- process control
- production performance indicators
- process capability including:
 - capable processes definition
 - upper, lower and target specification limits
 - in-control
 - out-of-control, assignable causes and trends
 - corrective action plans including Western Electric, Wheeler or Nelson rules
 - capability indices
 - sample estimators
 - confidence intervals for indices and chi square distribution

- role of production or process control in supporting lean processes including:
 - value stream management
 - standardised work
 - demand pull
 - just-in-time (JIT)
 - process levelling
 - cycle time
 - quick changeover
 - preventative maintenance
 - waste minimisation
 - efficient process layout
- role of production control in quality maintenance including:
 - mistake proofing process
 - defect detection, production halt and correction procedures
 - total quality management (TQM), quality assurance (QA) procedures and quality control (QC), and SPC processes
 - role of SPC and process capability
- production control performance indicators and indices
- applications where role of probability in sampling and SPC is important
- SPC including:
 - data types and frequency distributions
 - population mean and standard deviation
 - sample mean and standard deviation
 - upper and lower specification limits and target
 - upper and lower process control limits and centre line
 - data mean and process control centre line offset
 - three sigma and six sigma
 - sigma shift to account for long-term drift of data
- types and functions of control charts
- attributes and variables of sampling plans
- features and functions of graphical methods for display of data including:
 - Ishikawa 'Fishbone' diagrams
 - histograms
 - Pareto analysis diagrams
 - flowcharts
 - tally charts
 - scatter plots
 - run charts, including control charts
- types of manual and automated data collection and information flow.
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Assessment Conditions

- Assessors must:
 - have vocational competency in competency in applying production and service control techniques at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the Standards for Registered Training Organisations 2015 or its replacement and comply with the National Vocational Education and Training Regulator Act 2011, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
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