



Australian Government

MEM15007 Conduct product and/or process capability studies

Release: 1

MEM15007 Conduct product and/or process capability studies

Modification History

Release 1. Supersedes and is equivalent to MEM15007B Conduct product and/or process capability studies

Application

This unit of competency defines the skills and knowledge required to conduct process capability studies, set control limits and select sampling plans and applies to the analysis of data from a production section or processes using appropriate statistical techniques.

Where interpretation of technical drawings is required unit MEM09002 Interpret technical drawing should also be selected.

Where the selection and use of manual handling is required unit MEM11011 Undertake manual handling should also be selected.

Where the selection and use of engineering measurement is required unit MEM12023 Perform engineering measurements should also be selected.

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

Band: B

Unit Weight: 6

Pre-requisite Unit

MEM12024	Perform computations
MEM12025	Use graphical techniques and perform simple statistical computations
MEM13015	Work safely and effectively in manufacturing and engineering
MEM15001	Perform basic statistical quality control
MEM15008	Perform advanced statistical quality control
MEM16006	Organise and communicate information

Competency Field

Quality

Elements and Performance Criteria

Elements describe the essential outcomes.

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

- | | | | |
|---|---|-----|--|
| 1 | Determine job requirements | 1.1 | Follow standard operating procedures (SOPs) |
| | | 1.2 | Comply with work health and safety (WHS) requirements at all times |
| | | 1.3 | Use appropriate personal protective equipment (PPE) in accordance with SOPs |
| | | 1.4 | Consult with production or process personnel within the enterprise's total quality plan about conducting studies |
| | | | |
| 2 | Conduct process capability studies | 2.1 | Determine procedure for conducting capability study |
| | | 2.2 | Prepare instructions for personnel conducting trial run |
| | | 2.3 | Analyse data from trial run and calculate the process capability |
| | | 2.4 | Estimate possible number of product defects from a particular process |
| | | 2.5 | Determine optimum target mean to suit process capability data |
| | | 2.6 | Prepare reports listing various options from process capability studies |
| | | 2.7 | Recommend design specifications based on an analysis of data |
| | | | |
| 3 | Set control limits | 3.1 | Calculate control limits for sample/subgroup average, range and standard deviation |
| | | 3.2 | Calculate warning limits for subgroup average, range and standard deviation |
| | | 3.3 | Determine course of action resulting from out-of-control situation and document according to SOPs |

Elements describe the essential outcomes.

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

4 Select sampling plans

- 4.1 Select appropriate sampling plan to suit production schedule and determine acceptable quality limits, taking into account specified producer and consumer risks
- 4.2 Document sampling plan, including implementation strategy

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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.

Procedure includes the following:

- frequency of sample and sample size

Data includes the following:

- periodic samples drawn from a trial run of the process

Process capability includes the following:

- the natural tolerance of the process which may be calculated at 3 sigma/standard deviations

Product defects include the following:

- from a consideration of 3 or 6 sigma standard deviations compared to specification requirements

Various options include one (1) or more of the following:

- adjustment of process to move average
- improvements to reduce process capability
- changes to reduce assignable causes

Appropriate sampling plan includes one (1) or

- plans within the adopted quality system
- sample size

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.

more of the following: • frequency of sample

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM15007B Conduct product and/or process capability studies

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 MEM15007 Conduct product and/or process capability studies

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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 on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- determining procedure for conducting capability study
- analysing data, identifying solutions and developing recommendations
- estimating the possible number of defects compared to the specification requirements
- preparing reports listing the various options
- determining process design specifications from process capability data
- selecting appropriate sampling plan
- documenting sampling plan and implementation strategy in accordance with SOPs.

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:

- safe work practices and procedures and use of personal protective equipment (PPE)
- process to be studied
- procedures for conducting process capability studies
- data used to calculate the process capability
- procedures for estimating the possible number of product defects
- options for improving the process and benefits of each
- procedures for determining the optimum target mean
- numerical operations and calculations/formulae for process capability, control limits and other outcomes within the scope of this unit
- procedures for setting control and warning limits
- concept of out-of-control situations
- action to be taken when an out-of-control situation is detected and procedures for documenting out-of-control situations
- acceptable level of quality
- variety of sampling plans and their application
- sampling plan to be applied to a given situation and reasons for selection

- acceptable quality limits
- risks associated with identifying acceptable quality limits for the producer and customer
- procedures for documenting and implementing sampling plans.

Assessment Conditions

- Assessors must:
 - have vocational competency in conducting product and/or process capability studies 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. This must 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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