



Australian Government

MSS404052 Apply statistics to operational processes

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSS404052A Apply statistics to operational processes

Application

This unit covers the ability to gather and analyse process data to support the control of processes and operations. It includes interpretation of sampling procedures, frequency distributions, random and non-random variations in data/control charts; use of control limits to determine whether or not monitored processes are in control; and communicating this information to others.

This unit applies to a person working in an organisation applying statistical process control on processes or operations. The statistical process control will usually be used to monitor the processes or operations and determine when action needs to be taken. The appropriate action will then be taken in accordance with standard procedures.

This unit primarily requires the application of skills associated with gathering and analysing data and communicating statistical information to others. This unit also has a strong emphasis on problem solving, initiative and enterprise, planning and organising, and self-management to solve problems and manage processes.

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

Pre-requisite Unit

Nil

Competency Field

Competitive systems and practices

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.

1 **Collect process data**

1.1 Interpret sampling scheme.

1.2 Obtain measurements in accordance with standard

- sampling procedures.
- 1.3 Handle data in accordance with procedures.
- 2 **Interpret data**
- 2.1 Plot data on appropriate control chart.
- 2.2 Distinguish between random and non-random patterns of results.
- 2.3 Identify results outside the control limits.
- 2.4 Recognise situations requiring action.
- 2.5 Take action in accordance with procedures.
- 2.6 Determine cost of non-conformance.
- 3 **Calculate control limits**
- 3.1 Consult relevant stakeholders to determine appropriate limits.
- 3.2 Use relevant methods to calculate/revise control limits.
- 3.3 Plot limits on control chart and complete other records in accordance with procedures.
- 3.4 Explain impact of limit to relevant stakeholders.

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.

Competitive systems and practices include one or

- lean operations
- agile operations

more of:

- preventative and predictive maintenance approaches
- 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.

**Sampling schemes
include one or more of:**

- sampling for attributes or sampling for variables
- batch, continuous or custom made products
- type of sample
- size of sample
- number of items/samples
- number/type of measurements to be done on each sample
- timing of sampling
- location of sampling points
- sampling equipment
- measurement/testing equipment/methods.

**Checking, analysing and
storing data includes one
or more of:**

- calculating means, ranges, mean of means and standard deviations (using appropriate calculation aids)
- entering data into a software package
- recording data either in writing or electronically
- other required manipulations of the data.

**Control charts include
one or more of:**

- run
- tally
- mean/range
- attributes
- other relevant charts.

Variations include all of:

- random variations for which no cause can be found
- non-random variations for which a cause can be found and so the cause of the variation eliminated (also called identifiable cause, assignable cause or special cause)
- non-random variations used to predict possible breaches of the control limits.

Limits include one or more of:

- control limits (also referred to as process capability) within which the process will operate if it is ‘under control’
- appropriate limits: 1 sigma warning limits, 2 sigma warning limits, 3 sigma control limits, and 6 sigma limits.

Costs of non-conformance include one or more of:

- reprocessing/rework
- expediting
- unplanned service
- excess inventory
- complaint handline
- downtime
- returns
- scrap
- labour costs
- material costs
- infrastructure costs/overhead
- utility costs.

Procedures (written, verbal, visual, computer based, etc.) include one or any combination of:

- work instructions
- standard operating procedures (SOPs)
- safe work method statements
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the process.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSS404052A Apply statistics to operational processes

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5b04f318-804f-4dc0-9463-c3fb9a3fe998>

Assessment Requirements for MSS404052 Apply statistics to operational processes

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Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment and must include on two (2) or more occasions:

- gathering, analysing and interpreting process data to support the control of processes and operations
- applying specified sampling procedures
- investigating the causes of variation in a process
- communicating with other employees to obtain samples/data and to explain results and limits
- calculating and plotting data and control limits
- completing other required documentation.

Knowledge Evidence

Must provide evidence that demonstrates knowledge relevant to their job role sufficient to fulfil their job role independently, including:

- purpose of sampling and measurement
- sampling methods to be used
- methods of calculating means, standard deviations and the like and their purpose in statistical control
- concept of limits, including 1, 2, 3 and 6 sigma limits
- types of control charts and their applications to different types of process/product and for different purposes
- process causes of variation and typical cause types of non-random variation
- non-process (e.g. measurement) causes of variation
- recognition of stable and unstable processes
- causes of stability/instability in the process
- calculation of control limits/process capability and the applications of different control limits
- the standard distribution curve and confidence limits.

Assessment Conditions

- The unit should be assessed holistically and the judgement of competence shall be based on a holistic assessment of the evidence.
- The collection of performance evidence:
 - should occur over a range of situations which include typical disruptions to normal, smooth operation of the workplace
 - will typically include a supervisor/third-party report focussing on consistent performance and problem recognition and solving. A supervisor/third-party report must be prepared by someone who has a direct, relevant, current relationship with the person being assessed and who is in a position to form a judgement on workplace performance relevant to the unit of competency
 - must include the application of statistics to an operational process in own workplace
 - will typically include the use of appropriate tools, equipment and safety gear requiring demonstration of preparation, operation, completion and responding to problems.
- Assessment should occur in operational workplace situations.
- Knowledge evidence may be collected concurrently with performance evidence (provided a record is kept) or through an independent process such as workbooks, written assessments or interviews (provided a record is kept).
- 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.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competency and currency.
- Technical competence can be demonstrated through:
 - relevant VET or other qualification/Statement of Attainment AND/OR
 - relevant workplace experience
- Currency can be demonstrated through:
 - performing the competency being assessed as part of current employment OR
 - having consulted with an organisation providing relevant environmental monitoring, management or technology services about performing the competency being assessed within the last twelve months.

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