

SEMBIT2-16 - SQA Unit Code F9JP 04

Contributing to the application of statistical process control (SPC) procedures



Overview

This unit covers the competences required for contributing to the application of statistical process control (SPC) procedures. It involves adhering to the principles and contributing to the processes of SPC to a selected process, and gathering all the necessary data for analysis in consultation with relevant people. You will be expected to contribute to the application of statistical process control procedures, utilising statistical and graphical methods to represent the process conditions. Typically, these would focus on simple run charts, tally charts, bar charts, histograms, run charts, box plots, time series charts, Pareto diagrams, and stem and leaf plots.

You will need to contribute to performing basic statistical process control, identifying special cause versus common cause. You will also be expected to contribute to identifying activities which will improve the process performance, and to contribute to the production of an action plan to implement the improvements. Calculation of the capability of the process will identify C_p and C_{pk} .

Your responsibilities will require you to comply with organisational policy and procedures for the activities undertaken, and to report any problems that you cannot solve, or that are outside your responsibility, to the relevant authority. You will be expected to take responsibility for your own actions within the activity, and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to the techniques and procedures used. You will need to understand the principles and procedures of statistical process control and its application, in adequate depth to provide a sound basis for carrying out the activities to the required criteria.

Applying safe working practices will be a key issue throughout.

Specific Unit Requirements

The word 'contribute' is used throughout this unit. This means that, although the outcomes of this unit may be carried out and achieved as part of a team, in order to prove consistent competent performance you must be able to demonstrate:

1. specific, quantifiable and auditable personal contributions in the achievement of this unit
2. competence in all the areas required by the standard

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3. your ability to combine the performance statements specified when contributing to the application of the principles and processes of this unit.

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Performance criteria

You must be able to:

- P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines
- P2 work to, and comply with all the required process monitoring documentation and work instruction sheets
- P3 contribute to selecting and/or confirming the process on which the process analysis is to be carried out
- P4 contribute to the consultation with relevant people and gathering of the necessary data for analysis
- P5 apply the principles and contribute to the processes of statistical process control to the chosen process
- P6 contribute to statistical and graphical methods to represent the process conditions
- P7 contribute to the identification of activities that will improve the process performance
- P8 contribute to the production of an action plan to implement the improvements

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Knowledge and understanding

You need to know and understand:

- K1 the health and safety requirements of the area in which you are carrying out the process control activities
- K2 where process control fits in within a continuous improvement environment
- K3 how process performance affects customer satisfaction and process costs
- K4 where and why statistical process control is used
- K5 the importance of standardisation within a process operation, and why process performance can only be determined when it is controlled
- K6 how process control can improve process performance
- K7 the benefits of prevention versus detection
- K8 the two types of variation within a process (common cause, special cause)
- K9 how to gather data and effectively analyse it, understanding how the data can be used to communicate abnormalities within a process
- K10 the main types of control charts used for SPC
- K11 what is meant by a 'population' and a 'sample'
- K12 the measurements of central tendency and variability
- K13 the properties of a normal curve of distribution
- K14 how to explain the terms mean, median, mode, standard deviation, range and variance
- K15 how to explain process capability (Cp and Cpk)
- K16 the extent of your own authority, and to whom you should report in the event of problems that you cannot resolve

Additional Information

Scope/range related to performance criteria

You must be able to:

1. contribute to basic statistical process control, using appropriate tools and techniques
2. contribute to the calculation of the capability of the process, and the identification of **both**:
 - 2.1. Cp
 - 2.2. Cpk
3. contribute to the production of charts for process and control information, to include **two** from:
 - 3.1. simple run charts
 - 3.2. tally charts
 - 3.3. bar charts
 - 3.4. histograms
 - 3.5. box plots
 - 3.6. time series charts
 - 3.7. Pareto diagrams
 - 3.8. stem and leaf plots
 - 3.9. run charts

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