IMPROVE PROCESS QUALITY

UNIT CODE: UNIT CODE: MATH/OS/AS/CR/06/6/A

Unit description

This unit specifies the competencies required to improve industrial process quality. It involves determining process quality characteristics (attributes and/or variables), developing sampling plans, collecting quality-control data, performing Statistical Process Control (SPC), Preparing and interpreting control charts.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements. ***Bold and italicized terms are elaborated in the Range***
1. Determine process quality characteristics (attributes and/or variables)	1.1 Measurement outcome is determined as per product specification 1.2 Outcome is classified as per the measurement. 1.3 Controls tools are determined as per the workplace procedures
2. Develop sampling plans	2.1 ***Sampling plan*** is developed a to as per the workplace procedure 2.2 Probability of lot rejection is determined at each sampling levels as per sampling plan. 2.3 Develop a sample selection criterion as per the workplace procedure.
3. Collect quality-control data	3.1 Select the samples to be measured as per the develop selection plan. 3.2 Selected samples are measured the as per the quality specifications. 3.3 The measurements are recorded as per the determined measurement
4. Perform Statistical Process Control (SPC)	4.1 The standard deviation is computed as per the collected data. 4.2 The ***control limits*** are determined as per the sampled data.

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	4.3 Statistical process control is done as per the set process limits and the observed data.
5. Prepare and interpret control charts	5.1 The ***control charts*** are prepared as per measurements. 5.2 The control chart is interpreted as per the sampled data. 5.3 Recommendations on the production process are made as per the control charts.

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. control charts may include but not limited to:	• $\bar{X}$chart • R-chart • np-chart • c-chart • S^2chart
2. control limits may include but not limited to:	• upper control limit • centreline • lower control limit
3. Sampling plan may include but not limited to:	• Single Sampling Plan • Double Sampling Plan • Sequential Sampling Plan

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Creative thinking
- Use of computer and software to generate random numbers
- Analytical skills
- Communication skills
- Numeracy skills
- Accuracy in measurements
- Organisation skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- Randomisation
- Acceptance sampling
- Control charts
- Standard deviation charts
- R charts
- X-bar charts
- np charts
- Statistical control process
- Validation of measurements process

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Demonstrate knowledge of Process quality characteristics to be used. 1.2 Demonstrated knowledge of developing, selecting and apply sampling plans to a process. 1.3 Demonstrated knowledge of measuring selected samples. 1.4 Demonstrated knowledge of performing statistical process control (SPC) 1.5 Demonstrated knowledge of interpreting control charts
2. Resource Implications	The following resources should be provided: 2.1 Computer 2.2 Internet

	2.3 Statistical software 2.4 Stationery 2.5 Measuring tools
3. Methods of Assessment	3.1 Competency may be assessed through: 3.2 Portfolio Assessment 3.3 Interview 3.4 Case Study/Situation 3.5 Oral questioning 3.6 Written Tests
4. Context of Assessment	Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.