

AUDIT PRODUCTION PROCESS

UNIT CODE: ENG/OS/CE/CR/6/6

UNIT DESCRIPTION

This unit covers the knowledge, understanding and skills required for a Chemical Engineering Technician to implement continuous process improvement initiatives in a workplace where chemical production activities are performed. It includes analyzing process data to optimize process units, improving overall equipment efficiency, reducing process waste, carrying out process innovation to facilitate new product development, identifying training needs and documenting continuous improvement initiatives.

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. <i>Bold and italicized terms are elaborated in the Range</i>
1. Analyse process data	1.1 Process data is recorded according to <i>standard operating procedure (SOP)</i> . 1.2 Process data is analysed using format according to SOP. 1.3 Deviations are investigated and action taken to optimise process units according to SOP 1.4 Analysed data and investigation findings are documented and reported according to SOP
2. Improve equipment efficiency	2.1 Equipment is checked for optimal functionality according to SOP 2.2 <i>Equipment performance data</i> are recorded according to SOP 2.3 Performance data is analyzed and action taken to improve equipment efficiency
3. Optimize production process	3.1 Analyze process and product data according to production output. 3.2 Analyze equipment performance according to SOP 3.3 Determine optimum conditions according to production requirements. 3.4 Obtain approval according to company procedures. 3.5 Optimize the process according to SOP.
4. Reduce process waste	4.1 Identify types of wastes generated according to EMS standards. 4.2 Quantify process waste generated according to EMS standards. 4.3 Monitor waste generated according to SOP.

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	4.4 Identify techniques of waste management according to EMS. 4.5 Seek approval according to SOP 4.6 Reduce process waste according to approved techniques.
5. Initiate process innovation	5.1 Opportunities for <i>improvements</i> are identified according to SOP 5.2 Identified improvements are recorded and implemented according to SOP 5.3 Impact of implemented improvements are monitored and documented according to SOP 5.4 Continuous improvement initiative documents are maintained according to SOP
6. Participate in new product development	6.1 Identify a need for a new product development according to market demand. 6.2 Lease with R&D section according to SOP 6.3 Obtain materials and formulation necessary for new product development according to development standards. 6.4 Obtain approval according to SOP 6.5 Develop new product according to the market needs.
7. Identify production equipment need	7.1 Evaluate the existing equipment and similar equipment in the market according to performance data. 7.2 Identify any abnormalities according to obtained data. 7.3 Report finding according to SOP
8. Identify training needs	8.1 Job evaluation is done to determine the skill requirements according to SOP 8.2 Staff appraisal is done to build skills inventory according to SOP 8.3 Skill gap analysis is carried out to determine the <i>training needs</i> according to SOP. 8.4 Training needs are documented and reported according to SOP
9. Document continuous improvement initiatives	9.1 Requisite for documentation tools according to SOP 9.2 Identify improvement initiatives according to SOP 9.3 Record the improvements initiatives according to SOP 9.4 Store the documents according to filing system available.

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. Standard Operating Procedure (SOP) include but not limited to:	1.1 Operation manuals 1.2 inspection procedure 1.3 Testing procedures 1.4 Data record format 1.5 Organisation procedures 1.6 Manufacturers manual
2. Equipment performance data include but not limited to:	2.1 Breakdown logs 2.2 Downtime record sheets 2.3 Through put record
3. Improvements include but not limited to:	3.1 Process improvements 3.2 Product improvement 3.3 Waste reduction 3.4 Process automation
4. Training needs include but not limited to:	4.1 Skill gaps 4.2 New method 4.3 New equipment 4.4 Process changes 4.5 New employees

REQUIRED KNOWLEDGE AND UNDERSTANDING

The individual needs to demonstrate knowledge and understanding of:

1. Organizational Context (Knowledge of the Company/Organization and its processes)	
The individual on the job needs to know and understand:	
1.1	Company's Quality policy, vision and strategy
1.2	Different quality management systems (ISO-9000, ISO-14001, OHSAS-18000).
1.3	Different quality management systems (ISO-9000, ISO-14001, OHSAS-18000 etc.)
1.4	Documentation
1.5	Standard Operating Procedures
1.6	Escalation protocols
2. Technical Knowledge	
The individual on the job needs to know and understand:	
2.1	Workplace procedures and requirements
2.2	Training Needs assessment
2.3	Use of equipment as per standard operating procedure
2.4	World class manufacturing practices

2.5	Emerging trends in chemical engineering
2.6	Research and development methods
2.7	Range of tools, equipment and materials for continuous improvement initiatives
2.8	statistical analysis
2.9	Manufacturer's instructions
2.10	Equipment maintenance logs
2.11	Statistical process control tools e.g. pareto, graphs, charts etc.

FOUNDATION SKILLS

The individual needs to demonstrate the following foundation skills:

<ul style="list-style-type: none"> • Management Skills • Problem solving • Observational skills • Computer proficiency 	<ul style="list-style-type: none"> • Communication skills • Analytical Thinking • Interpersonal skills • Decision Making
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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	<p>Assessment requires evidence that the learner:</p> <p>1.1 Recorded, analyzed and investigated process performance data according to SOP</p> <p>1.2 Monitored and recorded process waste generated according to SOP</p> <p>1.3 Identified, implemented and reported continuous improvement initiatives according to SOP</p> <p>1.4 Identified training needs according to SOP</p> <p>1.5 Maintain continuous improvement initiatives documents</p> <p>1.6 Maintained housekeeping according to SOP</p>
2. Resource Implications	<p>The following resources must be provided</p> <p>2.1 A production line that is equipped with process equipment</p> <p>2.2 Research tools</p> <p>2.3 Opportunities for benchmarking/capacity building</p> <p>2.4 IT facilitation</p> <p>2.5 Fully equipped library</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Observation with the use of checklists</p> <p>3.2 Interviewing to test knowledge</p> <p>3.3 Written tests</p> <p>3.4 Portfolio Assessment</p> <p>3.5 Interview</p>

	3.6 Situation Analysis 3.7 Demonstration and oral questioning
4. Context of Assessment	Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions.
5. Guidance information for assessment	This unit may be assessed on an integrated basis with others within this occupational sector.

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