

OPERATE PROCESS EQUIPMENT

UNIT CODE: ENG/OS/CE/CR/5/6

Unit description

This unit covers the knowledge, understanding and skills required for a Chemical Engineering Technician to operate process equipment in a workplace where chemical production activities are performed. It includes preparing and starting process equipment carrying out process quality control checks & records, monitoring, packing and storing finished product.

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. Clean process equipment	1.1 <i>PPE</i> is provided according to the <i>Safety standards</i> 1.2 Necessary cleaning material and equipment are identified according to SOP. 1.3 Area to be cleaned are identified according to SOP 1.4 Clean the equipment according to SOP.
2. Inspect process equipment	2.1 <i>Process equipment</i> is inspected at the beginning of the production according to SOP 2.2 Testing procedures is performed to ensure the process equipment work optimally according to SOP 2.3 Maintenance teams are coordinated for preventive maintenance according to SOP
3. Operate process equipment	3.1 Pre-start checks are conducted according to SOP 3.2 <i>Process parameters</i> are set according to SOP 3.3 Process equipment is started to perform warm up according to SOP 3.4 <i>Raw materials</i> are loaded according to SOP 3.5 Labelling and segregation of material and finished products are carried out according to SOP
4. Monitor process parameters	4.1 Measure process parameters according to SOP 4.2 Recording the process parameters in the production log sheet 4.3 Report to the supervisor according to SOP

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5. Carry out process quality Control checks	5.1 Equipment checks are performed and recorded according to SOP's 5.2 Products and materials are checked according to quality standards 5.3 Non-conformities are identified according to <i>quality standards</i> 5.4 Causes of non-conformities are identified according to quality standards 5.5 Corrective actions are carried out according to quality standards 5.6 Results are recorded in quality documents according to quality standards
6. Maintain production records	6.1 Obtain the records according to SOP 6.2 File the records according to SOP 6.3 Store records according to SOP
7. Maintain workstation cleanliness	7.1 <i>PPE</i> is provided according to the <i>Safety standards</i> 7.2 Necessary cleaning material and equipment are identified according to SOP. 7.3 Inspect the workstation according to SOP 7.4 Areas to be cleaned are identified according to SOP 7.5 Clean the workstation according to SOP.
8. Pack the finished product	8.1 Select <i>packaging materials</i> according to <i>SOP</i> 8.2 Package the products according to SOP 8.3 Non-conforming products are segregated according to quality standards 8.4 Packaged Products are recorded according to SOP
9. Transfer processed product.	9.1 Storage locations are identified according to SOP 9.2 Packaged products are transferred (store or dispatch) to designated location according to SOP 9.3 Records are maintained according to quality standards

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. Process equipment Includes but not limited to	1.1 Reactor 1.2 Conveyer belts 1.3 Date code machine 1.4 Packing machine 1.5 Diagnostic equipment 1.6 Testing equipment 1.7 Labelling machine 1.8 Filters 1.9 Driers 1.10 Compressors 1.11 Refrigeration equipment 1.12 Pumps
2. Standard Operating Procedures (SOP) includes but not limited to:	2.1 Sampling instructions 2.2 Operation manuals 2.3 Cleaning methods 2.4 Testing procedures 2.5 Data record format 2.6 Inspection report 2.7 Out of specification procedure 2.8 Company Instructions 2.9 Packaging specification 2.10 Storage and delivery requirements
3. Materials Includes but not limited to:	3.1 Incoming materials 3.2 In process materials 3.3 Packaging materials 3.4 Process consumables
4. Process parameters Includes but not limited to:	4.1 Temperature 4.2 Pressure 4.3 Flow rate 4.4 Rotation speed 4.5 pH 4.6 Agitation 4.7 Cooling rate
5. Quality standards Includes but not limited to:	5.1 Customer specifications 5.2 ISO 9001 5.3 ISO17025
6. Safety standards Includes but not limited to:	6.1 Operation SOP's 6.2 OSHA 2007 6.3 OHSAS 18001 for occupational health and safety management. 6.4 ISO 14001 for environmental management.

Variable	Range
7. Personal protective equipment Includes but not limited to:	7.1 Helmet 7.2 Gloves 7.3 Face mask and Goggles 7.4 Protective clothing 7.5 Foot protection 7.6 Hearing protection 7.7 Respiratory protection
8. Packaging materials Includes but not limited to:	8.1 Paper/Paperboard/Fibreboard 8.2 HDPE (High-density polyethylene) and PET (polyethylene terephthalate) Rigid Packaging 8.3 LDP (Low-density polyethylene), LLDPE (Linear low-density polyethylene) Flexible Packaging 8.4 Aluminium Packaging 8.5 Glass/Jars

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 and the Standard Operating Procedures (SOP)
1.2	Different quality management systems (ISO-9000, ISO-14001, OHSAS-18000).
1.3	Production norms of the company
1.4	Organization's policy, vision and strategy
1.5	Knowledge of company instructions and the SOP
1.6	Different quality management systems (ISO-9000, ISO-14001, OHSAS-18000 etc.)
1.7	Documentation
2. Technical Knowledge	
The individual on the job needs to know and understand:	
2.1	Measuring units and methods of performing calculations
2.2	Reference standards/materials
2.3	Operation of equipment
2.4	Process parameters (e.g. time, temperature, pressure)
2.8	Material handling
2.10	Packaging specifications
2.13	Handling of non-conformities

FOUNDATION SKILLS

The individual needs to demonstrate the following foundation skills:

<ul style="list-style-type: none"> • Management skills • Problem solving • Observational skills • Computing proficiency • Trouble shooting 	<ul style="list-style-type: none"> • Communication skills • Analytical Thinking • Interpersonal skills • Decision Making skills
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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><i>Assessment requires evidence that the learner:</i></p> <p>1.1 Inspected and tested the process equipment and recorded according to SOP</p> <p>1.2 Set the <i>Process parameters</i> and operated according to <i>SOP</i>.</p> <p>1.3</p> <p>1.4 Products, materials and equipment are checked according to SOP's</p> <p>1.5 Identified and recorded non-conformities according to SOP</p> <p>1.6 Packed and transferred finished product according SOP's</p> <p>1.7 Maintained housekeeping according to SOP</p>
2. Resource Implications	<p><i>The following resources must be provided:</i></p> <p>2.1 A production line that is equipped with process equipment</p> <p>2.3 Consumables for process e.g. packaging materials, cleaning materials, sample containers and spare parts</p> <p>2.5 Testing equipment and its accessories</p> <p>2.6 <i>Personal protective equipment (PPE)</i></p> <p>2.7 Tools</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> <p>3.6 Situation Analysis</p> <p>3.7 Demonstration and oral questioning</p>
4. Context of Assessment	<p>Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions.</p>
5. Guidance information for assessment	<p>This unit may be assessed on an integrated basis with others within this occupational sector</p>