

CORE UNITS OF COMPETENCY

MAINTAIN ENVIRONMENTAL HEALTH AND SAFETY (EHS) STANDARDS

UNIT CODE: ENG/OS/CE/CR/1/6

Unit description

This unit covers the knowledge, understanding and skills required for a Chemical Engineering Technician to maintain health and safety in a workplace where chemical production activities are performed. It includes maintaining shop floor housekeeping, carrying out job risk assessment, monitoring waste and hazardous pollutants, training process members on EHS standards and safety plans, and diagnosing equipment functionality to ensure their and safety in the workplace.

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. Maintain shop floor housekeeping	1.1 Appropriate <i>personal protective equipment (PPE)</i> is worn according to the <i>cleaning method</i> used 1.2 <i>Necessary cleaning materials & equipment</i> are identified according to <i>SOP</i> 1.3 Work areas including <i>various surfaces</i> are inspected according to <i>standard operating procedures (SOP)</i> . 1.4 Cleaning activity is carried out according to <i>SOP</i> . 1.5 Workplace procedures are followed to deal with any accidental damage caused during the cleaning process according to <i>safety standards</i> 1.6 <i>Process equipment and materials</i> are identified and stored in demarcated areas according to <i>SOP</i>
2. Carry out job risk assessment.	2.1 Risk assessment is defined why, when and where it would be carried out according to safety standards. 2.2 <i>Methods of identifying risk</i> are selected according to safety standards. 2.3 The level of risk is assessed to eliminate or minimise according to safety standard 2.4 Risk assessment information is recorded according to safety standards 2.5 Risk assessment report is prepared according to safety standards
3. Manage process waste	3.1 Different <i>types of waste and hazards</i> are identified according to safety standards

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	3.2 Waste is disposed/treated according to safety standards. 3.3 Environmental hazards and safety incidents are responded to and monitored according to safety standards 3.4 Environmental hazards/incidents and wastes are recorded and reported according to safety standards
4. Train teamwork for emergency evacuation	4.1 New team members are trained on emergency evacuation procedures according to safety standards 4.2 Process members are trained on how to use <i>safety equipment</i> according to safety standards 4.3 Process members are trained on how to use emergency exits according to safety standards. 4.4 Process members are trained on <i>safety plans</i> according to safety standards 4.5 Process members to carry out a mock emergency evacuation drill according to safety standards.
5. Train teamwork for EHS standard	5.1 New team members are trained on health and safety according to safety standards 5.2 Process members are trained on how to use <i>safety equipment</i> according to safety standards 5.3 Process members are trained on how to use PPE according to safety standards. 5.4 Process members are trained on <i>safety plans</i> according to safety standards
6. Monitor safety incidents and near misses	6.1 Acquire occurrence book according safety standards 6.2 Inspect operation according to SOP 6.3 Identify near misses and incidences according to safety standards 6.4 Record near misses and incidences in the occurrence book according to safety standards.
7. Check safety equipment functionality	7.1 Safety equipment is inspected according to the safety standards. 7.2 Safety equipment is tested according to the manufacturer's manuals 7.3 The reports of inspection and testing are recorded according to safety standards

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8. Monitor environmental pollutions	8.1 Acquire occurrence book according to environmental management systems (EMS) 8.2 Inspect processes according to EMS. 8.3 Inspect process outlets according to EMS. 8.4 Identify sources of pollutants according to EMS 8.5 Record findings in the occurrence book according to EMS

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. Others include but not limited to:	1.1 Equipment 1.2 Products 1.3 Other employees 1.4 Company visitors
2. Various surfaces include but not limited to:	2.1 Floor 2.2 Walls 2.3 Ceilings 2.4 Equipment surfaces
3. Standard Operating Procedures (SOP) include but not limited to:	3.1. Inspection methods 3.2. Cleaning activities 3.3. Operation manuals 3.4. Testing procedures 3.5. Data record formats 3.6. Company Instructions
4. Cleaning materials include but not limited to:	4.1 Detergents 4.2 Acids 4.3 Solvents 4.4 Water 4.5 Alkali
5. Cleaning equipment include but not limited to:	5.1 Hard-water cleaner 5.2 Squeezer 5.3 Vacuum cleaner 5.4 Bucket 5.5 Brushes 5.6 Cleaning in place units
6. Personal protective	6.1 Helmet

Variable	Range
equipment (PPE) include but not limited to:	6.2 Gloves 6.3 Face mask and Goggles 6.4 Protective clothing 6.5 Foot protection 6.6 Hearing protection 6.7 Respiratory protection
7. Cleaning methods include but not limited to:	7.1. Wet 7.2. Dry
8. Methods of identifying hazards include but not limited to:	8.1 Health & Safety audits 8.2 Consultation with other workers 8.3 Near miss & Accident reports 8.4 Research papers 8.5 Manufacturers of equipment and materials 8.6 Monitoring records
9. Types of waste include but not limited to:	9.1 Solid 9.2 Liquid 9.3 Gaseous
10. Hazardous pollutants include but not limited to:	10.1 Non-Physical hazards such as noise, electricity, heat and cold 10.2 Chemical hazards such as toxic gases, noxious fumes and corrosive liquids 10.3 Radiation hazards, for example, from x-ray machines, high powered lasers, radioactive materials 10.4 Biological hazards such as specimen containers carrying potentially infected materials and bacteria and viruses from air conditioning systems
11. Safety plans include but not limited to:	11.1 Fire plan 11.2 Evacuation plan 11.3 Emergency Plan 11.4 Drill plan 11.5 First-Aid Plan
12. Safety standards include but not limited to:	12.1 OSHA, 2007 12.2 OHSAS 18001 for occupational health and safety management 12.3 ISO 14001 for Environmental Management System
13. Manuals include but not limited to:	13.1 Fire Extinguishers 13.2 Flame Detectors 13.3 Flame monitors 13.4 Flame Safeguard 13.5 Gas Detectors 13.6 Fire Sprinkler Systems

Variable	Range
	13.7 Air Horn
14. Safety equipment include but not limited to:	14.1 Fire Extinguishers 14.2 Flame Detectors 14.3 Flame monitors 14.4 Flame Safeguard 14.5 Gas Detectors. 14.6 Fire Sprinkler Systems. 14.7 Air Horn. 14.8 Smoke detectors 14.9 Heat detector
15. Utilities include but not limited to:	15.1. Compressed air 15.2. Inert Gas 15.3. Fuel 15.4. Water (Process water, Potable water, Cooling water, Hot water, Boiler feed water, Fire hydrant, and Waste water) 15.5. Steam (Low pressure, High pressure). 15.6. Electricity. 15.7. Natural gas. 15.8. Manufactured gas. 15.9. Refrigerants. 15.10. Thermal Fluids

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 policies on health, safety and environmental procedures at the Workplace
1.2	Company's reporting structure
1.3	Company's documented policies
1.4	Company's documentation policy
1.5	Occupational health, safety and environmental standards
1.6	Escalation protocol for reporting identified issues, hazards and breakage
2. Technical Knowledge	
The individual on the job needs to know and understand:	
2.1	Inspection procedures
2.2	The purpose and usage of <i>Personal Protective Equipment</i> .

	Different types of cleaning materials
2.3	Administration of first aid at workplace.
	Methods of identifying risks and hazards
2.4	Reporting procedure for signs of damage and potential hazards .
2.5	Methods to minimize process risks.
2.6	Safe handling of chemicals.
2.7	Material handling procedure.
2.8	Precautionary activities to be followed for work place safety.
2.9	Safety plans to be followed in case of emergencies.
2.10	Waste disposal, treatment and equipment.
2.11	The range of signs and symbols used for the warning of workplace hazards and prohibited practices
2.12	Methods to minimize environmental hazards
	Carrying out Job Risk assessment

FOUNDATION SKILLS

<i>The individual needs to demonstrate the following additional skills:</i>	
<ul style="list-style-type: none"> • Observational • Critical thinking • Management • Interpersonal • Report writing 	<ul style="list-style-type: none"> • Analytical • Communication • Problem solving • Computer Proficiency • Creative thinking

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 Implemented housekeeping for the production area according to SOP</p> <p>1.2 Carried out job risk assessment according to SOP</p> <p>1.3 Worn appropriate PPE during cleaning according to SOP</p> <p>1.4 Treated/disposed waste according to SOP</p> <p>1.5 Verified safety equipment functionality and recorded according to safety standards</p> <p>1.6 Monitored environmental pollutions</p>
2. Resource Implications	<p><i>The following resources must be provided:</i></p> <p>2.1 A production line equipment in line with the process.</p> <p>2.2 Cleaning materials & equipment</p> <p>2.3 Personal Protective Equipment</p> <p>2.4 Waste and hazards monitoring equipment</p> <p>2.5 Safety equipment</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	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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