

## **CORE UNITS OF LEARNING**

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## OPERATE INDUSTRIAL BOILER

**UNIT CODE:** ENG/CU/IPO/CR/01/4/A

### Relationship to Occupational Standards

This unit addresses the unit of competency: Operate Industrial Boiler

**DURATION OF UNIT:** 100 hours

### UNIT DESCRIPTION

This unit describes competencies required to operate industrial boilers. It involves applying industrial boiler operation safety procedures, identifying industrial boiler parts, starting-up industrial boiler operations, running and monitoring industrial boiler, shutting down industrial boiler, performing industrial boiler basic maintenance and generating industrial boiler operations reports.

### Summary of Learning Outcomes

1. Apply Industrial Boiler Operation Safety Procedures
2. Identify Industrial Boiler Parts
3. Start-up Industrial Boiler Operations
4. Run and Monitor Industrial Boiler
5. Shut down industrial boiler
6. Perform industrial boiler basic maintenance
7. Generate industrial boiler operations report

### Learning Outcomes, Content and Suggested assessment methods

Learning Outcomes	Content	Suggested Assessment Methods
1. Apply Industrial Boiler Operation Safety Procedures	<ul style="list-style-type: none"><li>• PPE<ul style="list-style-type: none"><li>○ Thermally insulated gloves</li><li>○ Eye Protection</li><li>○ Helmet</li><li>○ Ear protection (muffs or plugs)</li><li>○ Respiratory devices eye protection</li><li>○ Working protective gloves</li><li>○ Whole body fire-resistant clothing</li><li>○ Safety boots</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Written</li><li>• Oral</li><li>• Observation</li></ul>

Learning Outcomes	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> <li>• OSHA               <ul style="list-style-type: none"> <li>○ Personal safety equipment</li> <li>○ Responsibility of the employee</li> <li>○ Responsibility of the employer</li> <li>○ Work area safety</li> <li>○ Work area hazards</li> <li>○ Accident reporting procedure</li> </ul> </li> <li>• Perform basic First Aid               <ul style="list-style-type: none"> <li>○ Fire burns</li> <li>○ Cuts and bruises</li> <li>○ Electric shock</li> <li>○ Chemical eye splashes</li> <li>○ Resuscitation</li> </ul> </li> <li>• Firefighting and Evacuation               <ul style="list-style-type: none"> <li>○ Classes of fire (A, B, C, D)</li> <li>○ Methods of extinguishing different classes of fire</li> <li>○ Types and color codes of fire extinguishers</li> <li>○ Evacuation</li> </ul> </li> </ul>	
2. Identify Industrial Boiler Parts	<ul style="list-style-type: none"> <li>• Definition of terms</li> <li>• Types of boilers               <ul style="list-style-type: none"> <li>○ Haycock and wagon top boilers</li> <li>○ Cylindrical fire tube boiler</li> <li>○ Multi tube boilers</li> <li>○ Solid fuel firing</li> <li>○ Fire tube boilers</li> <li>○ Water tube boilers</li> <li>○ Super heater</li> </ul> </li> <li>• components of a boiler               <ul style="list-style-type: none"> <li>○ Feed water heaters</li> <li>○ Fuel heater</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Written assessment</li> <li>▪ Observation</li> <li>▪ Oral</li> </ul>

Learning Outcomes	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> <li>○ Deaerators</li> <li>○ Pumps</li> <li>○ Combustion air blowers</li> <li>○ Flue</li> <li>○ Economizers</li> <li>○ Steam traps</li> <li>○ Piping</li> <li>○ Shell</li> <li>○ Control system</li> </ul>	
3. Start-up Industrial Boiler Operations	<ul style="list-style-type: none"> <li>● Apply boiler start-up SOP <ul style="list-style-type: none"> <li>○ Boiler start-up procedure</li> <li>○ Purge boiler furnace</li> <li>○ Boiler firing methods</li> <li>○ Oil fired</li> <li>○ Wood/Bagasse fired</li> <li>○ Gas fired</li> <li>○ Steam traps and steam line purge system operations</li> <li>○ Reticulation line pressure</li> </ul> </li> <li>● Record Keeping <ul style="list-style-type: none"> <li>○ Operating log books</li> <li>○ Records of faults</li> <li>○ Daily check charts</li> <li>○ Workplace record</li> <li>○ Operational Manuals</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Written</li> <li>● Oral</li> <li>● Observation</li> </ul>
4. Run and Monitor Industrial Boiler	<ul style="list-style-type: none"> <li>● Check for abnormal operation <ul style="list-style-type: none"> <li>○ Visual check</li> <li>○ Audio checks</li> <li>○ Smell</li> <li>○ Temperature</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Written</li> <li>● Oral</li> <li>● Observation</li> </ul>
5. Shut Down Industrial Boiler	<ul style="list-style-type: none"> <li>● Apply boiler shut down SOP <ul style="list-style-type: none"> <li>✓ Boiler shut down procedure</li> <li>✓ System checks <ul style="list-style-type: none"> <li>○ Water system</li> <li>○ Draught system</li> <li>○ System</li> <li>○ Fuel System</li> </ul> </li> <li>✓ Housekeeping</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Written</li> <li>● Oral</li> <li>● Observation</li> </ul>

Learning Outcomes	Content	Suggested Assessment Methods
6. Perform Industrial Boiler Basic Maintenance	<ul style="list-style-type: none"> <li>• Basic Maintenance requirements</li> <li>• Methods of service line Isolations</li> <li>• <i>Boilers</i> internal cleaning</li> <li>• Adjusting loose boiler components and auxiliaries</li> </ul>	<ul style="list-style-type: none"> <li>• Written</li> <li>• Oral</li> <li>• Observation</li> </ul>
7. Generate Industrial Boiler Operations Report	<ul style="list-style-type: none"> <li>• Industrial boiler operations report</li> <li>• Sharing the report</li> </ul>	<ul style="list-style-type: none"> <li>• Written</li> <li>• Oral</li> <li>• Observation</li> </ul>

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