OPERATE INDUSTRIAL STEAM TURBINE

UNIT CODE: ENG/CU/IPO/CR/02/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Operate Industrial Steam Turbine

DURATION OF UNIT: 100 hours

UNIT DESCRIPTION

This unit describes competencies required to operate industrial steam turbine. It involves apply industrial steam turbine safety procedures, identifying industrial steam turbine parts, starting-up industrial steam turbine operations, running and monitoring industrial steam turbines, shutting down industrial steam turbines, performing industrial steam turbine basic maintenance and generating industrial steam turbine operation report

Summary of Learning Outcomes

1. Apply Industrial Steam Turbine Safety Procedures
2. Identify Industrial Steam Turbine Parts
3. Start-Up Industrial Steam Turbine Operations
4. Run and Monitor Industrial Steam Turbines
5. Shut down steam turbine
6. Perform Industrial Steam Turbine Basic Maintenance
7. Generate Industrial Steam Turbine Operation Report

Learning Outcomes, Specific Learning Outcomes and Content

Learning Outcomes	Content	Suggested Assessment Methods

1. Apply Industrial Steam Turbine Safety Procedures	• Identify personal safety gear
	  ○ Helmet
	  ○ Eye protection
	  ○ Ear protection (muffs or plugs)
	  ○ Working protective gloves
	  ○ Safety boots
	  ○ Working protective clothing
	• Observe Occupational Health and Safety Act
	  ○ Personal safety equipment
	  ○ Responsibility of the employee
	  ○ Responsibility of the employer
	  ○ Work area safety
	  ○ Work area hazards
	  ○ Accident reporting procedure
		• Written
		• Oral
		• Observation

2. Identify Industrial Steam Turbine Parts	• Identify different type of Steam Turbines
	  ○ Impulse turbine
	  ○ Reaction turbine
	• Identify components of Steam Turbine
	  ○ Turbine casing
	  ○ Turbine rotor
	  ○ Disc type rotor
	  ○ Drum type rotor
	  ○ Turbine blades
	  ○ Nozzles
	  ○ Diaphragm (Stationary blades)
	  ○ Blade fastenings
	  ○ Shrouds
	  ○ Turbine barring devices
	  ○ Turbine bearings
	  ○ Radial bearings
	  ○ Thrust bearings
	  ○ Turbine seals
		• Written
		• Oral
		• Observation

Learning Outcomes	Content	Suggested Assessment Methods
	○ Shaft seals ○ Blade seals ○ Turbine couplings ○ Governors ○ Lubrication systems ○ Cooling systems ○ Strainers (cooling) ○ Auxiliary plants ○ Steam boiler ○ Steam condenser ○ Electric generator	
	• Obtain and interpret work instructions ○ Source of work instructions: ○ Steam turbine SOP ○ manufacturer's specifications and guidelines for steam turbine operations ○ task risk assessment forms other operational details ○ other operational details • Obtain and apply safety requirements for steam turbine operation ○ Requirements for personal protective clothing and equipment ○ Requirements for working at heights • Inspect equipment and work place ○ Systems functionality ○ Documents review ○ Pre-start up checks	• Written • Oral • Observation
3. Start-Up Industrial Steam Turbine Operations	• Identify types of Steam Turbine start up ○ Cold state start up ○ Warm state start up ○ Hot state start up • Apply steam turbine start-up SOP ○ Steam turbine start-up procedure ○ Condition for applying different start up method • Record Keeping ○ Operating log books ○ Records of faults	• Written • Oral • Observation

Learning Outcomes	Content	Suggested Assessment Methods
	○ Daily check charts ○ Workplace record ○ Operational Manuals	
4. Run and Monitor Industrial Steam Turbines	• Turbine synchronization • User demand • Manufacturers' specifications • Check for abnormal operation ○ Visual check ○ Audio checks ○ Smell ○ Temperature ○ Vibrations	• Written • Oral • Observation
5. Shut Down Industrial Steam Turbine	• Apply shut down procedure ○ Unload the auxiliary ○ Methods and procedures for shutdown operation of turbine and auxiliary ○ Manufacturers' instructions and procedures ○ Housekeeping	• Written • Oral • Observation
6. Perform Industrial Steam Turbine Basic Maintenance	• Servicing of Water Strainers (online and standby) • Adherence to Maintenance schedule • Fixing Tube / pipe leaks • Fixing Oil leaks • Change Over of Various Auxiliary Systems	• Written assessment • Observation • Oral
7. Generate Industrial Steam Turbine Operation Report.	• Report writing procedure • Maintenance scheduling • Updates and storage of maintenance records	• Written assessment • Observation • Oral