HRD CORP CLAIMABLE

MATRIX
QUANTUM

BOILER OPERATION & MAINTENANCE

10 CEP

+

BOILER SAFETY MANAGEMENT

5 CEP

TRAINER

MOHD FAUZI BIN MAT RASID

RM3402 Per Pax
(Inclusive 8% SST)
Non-Member

RM 2916 PER PAX
(INCLUDE 8% SST)
Member

DATE: 25-27 September 2026

Venue:
Dewan Cenderawasih Hentian Gua Musang,
Tingkat 1, SHELL Hentian Gua Musang,
KM 5.5, Jalan Gua Musang-Kuala Lipis,
18300 Gua Musang, Kelantan

SCAN TO REGISTER

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TRAINING OUTLINE

COURSE TITLE : BOILER OPERATION, MAINTENANCE & SAFETY MANAGEMENT

TRAINING PROVIDER : MATRIX QUANTUM SDN BHD

DURATION : 3 Days

SPEAKER : MOHD FAUZI BIN MAT RASID (STEAM ENGINEER GRADE 1 –JKKP 2025/JS01/1590)

TRAINING OUTCOMES

The Boiler Operation & Maintenance course is specially developed to upgrade theoretical and operational skills in handling steam boilers for the current workforce.

Upon Completion of the training program, the participants will be able to:

1. Describe the fundamentals and types of steam boiler
2. Proper operate the boiler with safe manner by using startup & shutdown sequence referring to boiler's maker documents
3. Monitor and control pressure, temperature, and water levels to ensure optimal performance
4. Learn how to maintain accurate records of boiler operation and maintenance
5. Define boiler maintenance philosophy, program and activities.
6. Coordinate and execute Boiler maintenance activities
7. Optimize Daily Boiler House Operations
8. Maximize Early Warnings and Prevent Safety Breaches
9. Mitigate Operational Failures and Analyze Breaches
10. Execute Rapid and Safe Emergency Protocols

MODULE DETAILS

1. **MODULE 1 – BOILER OPERATION & SAFE PRACTICES**

1.1 Fundamentals and overview of a Boiler

a. Principle of steam generation
b. Types of Boiler
   - Firetube
   - Water Tube
   - Combination Boiler

1.2 Boiler Operation Cycles

a. Starting up Procedures
   - Pre-start checklist (water, fuel, auxiliaries & safety device)
   - Start up sequence (Purging, Ignition and Flame, warm up and loading up)
b. Key Operating Parameter to monitor
   - Pressure (steam & Boiler water)
   - Temperature (water, steam & chimney)
   - steam flow
   - Boiler drum water level
c. Critical equipment to monitor
   - Safety valves
   - Burners
   - Feedwater Pumps
   - Instrumentations
d. Shutdown Procedures
   - Shutdown sequence (Depressurization, Flame off and safe cooling)

1.3 Boiler Protection

a. Safety Interlock & Alarms
   - Low water level
   - Flame Failure
b. Overpressure Protection
c. Water Treatment & Chemical Dosing (corrosion & Scale Prevention)

1.4 Boiler preservation

1. Wet lay up
   - Chemical dosing
   - Nitrogen Blanketing
2. Dry lay up
   - Dehumidifier agent

2 MODULE 2 – BOILER MAINTENANCE

2.1 Introduction to Boiler Maintenance

a. Maintenance objectives
b. Importance of Boier Maintenance program
c. Critical boiler parts & maintenance focus
d. Maintenance Philosophy

2.2 Routine maintenance

a. Definition
b. Tasks & Activities (Daily, Weekly, Monthly)
    - Daily
    - Weekly
    - Monthly

2.3 Preventive maintenance

a. Definition
b. Maintenance Schedule & Activities
    - Scheduled Inspection & servicing
    - Cleaning (Soot Blowing, Chemical cleaning)
    - Safety Valve & Low water cut off testing
    - Lubrication of Fan, Pumps and auxiliary drives

2.4 Predictive maintenance

c. Definition
d. Maintenance Activities – Tools and Techniques
    - Ultrasonic Thickness checks (Drum and tube)
    - Eddy current testing (superheater & Economizer tubes)
    - Water Chemistry trend monitoring (Oxygen, TDS, pH, Hardness)

2.5 Corrective maintenance

a. Definition
b. Maintenance Activities
    - Identifying damage & deciding on repair or replacement
    - Tube plugging & retubing activities
    - Refractory patching and firebrick replacement

3 MODULE 3 – BOILER SAFETY MANAGEMENT

3.1 Boiler House Management

a. **Logbook & Shift Management**
    - Effective shift handover procedures to ensure critical information regarding alarms, defects, or mechanical anomalies is never missed.
b. **Housekeeping & Safety Facilities**
    - Ensuring emergency escape routes remain unobstructed, illumination is adequate, and ventilation systems function optimally within the boiler house.

c. **Access Control & Contractor Safety**
    - Managing the safety of maintenance crews during specialized activities such as filter media cleaning, drum internal inspections, or scheduled overhauls.

3.2 Alarm Management

a. **Critical Alarm Classification**
    - Differentiating between normal operational alarms, warning
b. **Alarm Response Procedures**
    - Correct operational actions to take when an alarm is triggered (moving beyond simply pressing the *acknowledge/mute* button).
c. **Alarm Flooding & Bypassing Issues**
    - The hidden dangers of ignoring alarms or bypassing safety interlocks/safety devices without an authorized **Permit to Work (PTW)**.

3.3 Incident/Accident Management

a. **Boiler Incident Classification**
    - Handling operational anomalies such as boiler tube leaks, flame failures, or critical water chemistry deviations.
b. **Simplified Root Cause Analysis (RCA)**
    - How to investigate the breakdown using logbook data or DCS trends to prevent recurring failures.
c. **Reporting & Documentation**
    - Best practices for logging incidents to drive maintenance improvements and fulfill internal reporting requirements

3.4 Emergency Response Plan Management

a. **Emergency Shutdown (ESD) Procedures**
   Step-by-step actions to safely shut down the boiler during critical emergencies
b. **Roles & Responsibilities**
   Clearly defining who controls the boiler operations, who initiates emergency calls, and who authorizes building evacuation.
c. **Emergency Drills & Preparedness**
   The critical importance of conducting regular, periodic emergency drills specifically tailored for the boiler house crew.

TRAINING SCHEDULE

	TIME	DESCRIPTION	REMARK
DAY 1	8.30-8.45	REGISTRATION DAY 1	
	8.45-9.00	INTRODUCTION AND ICE BREAKING	
	9.00-10.30	MODULE 1	
	10.30-11.00	TEA BREAK	
	11.00-12.30	MODULE 1	
	12.30-14.00	LUNCH AND ZOHOR PRAYER BREAK	
	14.00-15.30	MODULE 1	
	15.30-15.45	TEA BREAK	
	15.45-17.00	MODULE 1	
	17.00	ADJOURN DAY 1	
DAY 2	8.30-8.45	RECAP OF PREVIOUS DAY LESSONS	
	8.45-9.00	MODULE 2	
	9.00-10.30	MODULE 2	
	10.30-11.00	TEA BREAK	
	11.00-12.30	MODULE 2	
	12.30-14.00	LUNCH AND ZOHOR PRAYER BREAK	
	14.00-15.30	MODULE 2	
	15.30-15.45	TEA BREAK	
	15.45-17.00	MODULE 2	
DAY 3	8.30-8.45	RECAP OF PREVIOUS DAY LESSONS	
	8.45-9.00	MODULE 3	
	9.00-10.30	MODULE 3	
	10.30-11.00	TEA BREAK	
	11.00-12.30	MODULE 3	
	12.30-14.00	LUNCH AND ZOHOR PRAYER BREAK	
	14.00-15.30	MODULE 3	
	15.30-15.45	TEA BREAK	
	15.45-17.00	MODULE 3	

	17.00	END OF COURSE	