



**MATRIX  
QUANTUM**



RM 1,998 Per  
Pax (Inclusive  
8% SST)

**Non-  
Member**

RM 1,782 PER  
PAX (INCLUSIVE  
8% SST)

**Member**

# BOILER

**Kluang**

# OPERATION & MAINTENANCE

**MOHD FAUZI BIN MAT  
RASID**

## DATE:

### 17 - 18 SEPTEMBER

HRD Corp Claimable Courses  
(Skim Bantuan Latihan Khas)

Training Program Number: 10001589077

## VENUE:

**MERDEKA HOTEL  
KLUANG 30, JALAN  
MENGKIBOL, 86000  
KLUANG,  
MALAYSIA**



- ✓ Operate Boilers The Correct Way
- ✓ Perform Routine Maintenance Checks

- ✓ Identify Key Boiler Terminology
- ✓ Differentiate Fundamental Construction of Boilers

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**MATRIX QUANTUM SDN. BHD.** 202201044306 (1490003-X)

Lot 180, Jalan 1A, Kampung Baru Subang,

40150 Shah Alam, Selangor Darul Ehsan.

Tel: 03-58926806

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## **TRAINING SCHEDULE & OUTLINE**

<b>Course Title</b>	<b>Boiler Operation &amp; Maintenance</b>
<b>Training Provider</b>	<b>Matrix Quantum Sdn Bhd</b>
<b>Duration</b>	<b>2 Days</b>
<b>Speaker</b>	<b>Mohd Fauzi bin Mat Rasid – Boiler Engineer Grade (JKKP 2025/JS01/1590)</b>

### **Training Outcomes:**

Upon completion of this training, participants will be equipped to immediately implement best practices and:

- 1) State the basic purpose and operating principles of industrial steam boilers
- 2) Differentiate the fundamental construction of steam boilers.
- 3) Identify key boiler terminology used in daily logging and documentation
- 4) Execute a safe, controlled boiler start-up and normal shutdown procedure
- 5) Accurately monitor and log critical operating parameters on a shift basis.
- 6) Describe the function of the main control loops
- 7) Explain the operating principle of all major safety and protection devices
- 8) Immediately respond to and reset common safety trip alarms
- 9) Demonstrate the proper testing procedure for the Low Water Alarm & Cut-Off device
- 10) Perform routine daily and weekly Preventive Maintenance checks on boiler systems.
- 11) Identify early signs of mechanical failure
- 12) Execute minor maintenance tasks like cleaning the flame scanner and checking pump gland seals
- 13) Prepare a boiler safely and thoroughly for internal inspection by statutory authorities
- 14) Implement the correct Wet or Dry Lay-up procedure based on the planned shutdown duration.
- 15) Understand the legal requirements for operating logbooks and mandatory inspection intervals.



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	<b>TIME</b>	<b>DESCRIPTION</b>	<b>REMARK</b>
<b>DAY 1</b>	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 2	
	12.30-14.00	LUNCH AND ZOHOR PRAYER BREAK	
	14.00-15.30	MODULE 3	
	15.30-15.45	TEA BREAK	
	15.45-17.15	MODULE 4	
	17.15	ADJOURN DAY 1	
<b>DAY 2</b>	8.30-8.45	REGISTRATION DAY 2	
	8.45-9.00	RECAP OF PREVIOUS DAY LESSONS	
	9.00-10.30	MODULE 5	
	10.30-11.00	TEA BREAK	
	11.00-12.30	MODULE 5	
	12.30-14.00	LUNCH AND ZOHOR PRAYER BREAK	
	14.00-15.30	MODULE 6	
	15.30-15.45	TEA BREAK	
	15.45-17.15	MODULE 6	
	17.15	END OF COURSE	



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## **MODULE OUTLINE DETAILS**

### **1. MODULE 1 – INTRODUCTION TO STEAM BOILER**

#### **A. Core Function**

Why boilers are essential

#### **B. Types Steam Boiler**

Distinguish between Firetube and Watertube

#### **C. Terminology**

Understanding key terms

#### **D. The Boiler Cycle**

Tracing the flow of water, steam, air, and fuel.

### **2. MODULE 2 – STEAM BOILER OPERATION**

#### **A. Pre-Start Checks**

The critical importance of the daily checklist (water, fuel, air).

#### **B. Start-Up Procedure**

Step-by-step sequence including the crucial pre-purge cycle.

#### **C. Parameter Monitoring**

Identifying and logging key operational data (Pressure, Temperature, Stack Temp, Water Level).

#### **D. Load Changes**

Managing modulation control and response to steam demand.

#### **E. Normal Shutdown:** The controlled procedure for taking the boiler safely offline.

### **3. MODULE 3 – STEAM BOILER PROTECTION**

#### **A. Safety Interlocks:** Understanding the "if/then" logic of all safety trips.

#### **B. Low Water Alarm & Cut-Off (LWCO):** Detailed explanation of primary and secondary

#### **C. Pressure Relief:** The function of the ASME/Statutory Safety Valve (set point, lifting, testing).

#### **D. Flame Failure Protection:** How the UV scanner/photocell works and the resulting safety trip.

#### **E. Responding to Alarms:** Immediate actions for high-priority alarms (e.g., low water).



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#### **4. MODULE 4 – STEAM BOILER ESSENTIAL PREVENTIVE MAINTENANCE**

##### **A. Routine System Checks**

Daily/Weekly physical checks (pump leaks, noise, vibration).

##### **B. Gauges & Glass**

Cleaning the gauge glass and performing blowdown for accurate level reading.

##### **C. Combustion System PM**

Checking and cleaning the burner scanner/photocell and inspecting ignition components.

##### **D. Soot Blowing & Cleaning**

The importance of maintaining clean heat transfer surfaces for efficiency.

##### **E. Lubrication:** Simple checks on fans, pumps, and motors.

#### **5. MODULE 5 – STEAM BOILER INSPECTION & LAY UP**

##### **A. Shutdown Preparation**

Steps for cooling, draining, and opening the boiler for inspection.

##### **B. Internal/External Inspection**

What to look for (pitting, scale, tube corrosion) and assisting the inspector.

##### **C. Lay-up Procedures**

Detailed steps for preserving the boiler during short-term (Wet Lay-up) and long-term (Dry Lay-up).

##### **D. Statutory Compliance**

Understanding the required log books, daily signatures, and the role of the national inspection body.

#### **6. MODULE 6 – BOILER WATER TREATMENT & CHEMICAL MANAGEMENT**

##### **A. The Problem**

The "Big 4" issues: Scale, Corrosion, Carryover, and Caustic Gouging.

##### **B. Routine Testing**

Step-by-step procedure for testing (Hardness, TDS, pH) and interpretation of results.

##### **C. Blowdown Strategy**

Controlling TDS via manual and continuous blowdown to prevent scale and carryover.

##### **D. Chemical Dosing**

Safe handling of chemicals, maintenance of dosing pumps, and checking injection points.

##### **E. Feedwater Quality**

Softener function (regeneration) and deaerator basics.