STEAM BOILER OPERATION AND MAINTENANCE COURSE

Training Dates:	As per schedule	**Training Venue:**	Kuala Lumpur, Malaysia.
Basic Fee:	RM3,450.00 + SST per participant (this includes course materials, meals, refreshment and attendance certificate)		

DURATION

21 hours (Three (3) days)

TARGET GROUP

- This course has been designed for the personnel responsible for operation and maintenance of all types of boilers.
- The following personnel should attend the course: Boiler engineers, boiler operators; Mechanical engineers, maintenance engineers; Plant engineers, process engineers; Boiler consultants, boiler contractors; and Plant supervisors, and plant managers

TARGETED INDUSTRY/INDUSTRIES

Oil & Gas, Petrochemicals, Power Plant, Renewal Energy Plant, Co-Generation Plant, Palm Oil Mills and Refineries, Plywood Industries, Hotels and all industries that using steam for heating and mechanical driven.

CERTIFICATION

This course is endorsed by The Board of Engineers, Malaysia (BEM) under the Continuing Professional Development (CPD) program.

COURSE OBJECTIVE

This course has been designed to provide participants with comprehensive knowledge of boiler operation, inspection, repair and maintenance from the Codes & Standards and Legislation in Malaysia (such as the Factories and Machinery Act 139) and the operation and maintenance of power boilers and heating boilers are covered in details.

COURSE OUTCOMES

At the end of the course, the delegates will be able to: -

- Identify the related laws, codes and standards for steam boiler design, installation, fabrication, operation, inspection, repair and maintenance.
- Identify the major hazards that's related to operation and maintaining the boiler and steam systems.
- Operate the steam boilers and steam systems with the safe conditions.
- Describe the boiler commissioning, operations, trouble-shooting, inspections, repairs and maintenance processes.

- Describe key parameters affecting boiler performance and efficiency.
- Describe the principles of thermodynamics of steam boiler and steam systems.
- Describe the uses of steam in process plant and power generation sector.

TRAINING METHODOLOGY

- Lecture
- Classroom discussions
- Short video presentation
- Case study

COURSE CONTENTS

Applicable Codes & Standard and Laws Related to Steam Boilers

- History of Codes and Standards Related to Steam Boilers
- Overview of the OSHA, 1994 and FMA, 1967
- Steam Boiler and Unfired Vessels Regulations,1970,
- Person-In-Charge (Amendment) Regulations, 2014
- Notification, Certificate of Fitness and Inspection Regulations, 1970
- Special Scheme of Inspection (Risk-Based Inspection) Regulations, 2014
- Safety, Health and Welfare Regulations, 1970

Introduction to Steam Boilers

- Definition of steam boilers
- Basic steam process
- Fundamental of heat transfer in steam boilers
- Steam boiler efficiency
- Principle of fire-tube boiler
- Principle of water-tube boiler
- Universal pressure boiler (supercritical boiler).

Steam Boiler Operations and Trouble-shootings

- An Introduction to operations and trouble shootings
- Basic boiler controls
- Boiler operation and trouble-shootings
- Boiler storages
- Commissioning activities
- Safety valves,
- Water gauge glasses
- Boiler drum

Steam Boiler Water Treatments

- Introduction to boiler water treatment
- Objective of boiler water treatment
- Types of boiler water treatments
- Deaerator unit
- Water treatment concerns
- Scale formation

- Boiler water guides (applicable codes and standards)

Combustion Fundamentals

- Combustion theory
- Products of combustion
- Flue gas analysis
- General considerations regarding safety
- General firing practice for boilers
- Burners (gas and liquid)
- Atomizer for fuel oil
- Trial for Ignition Time (TFIT)
- Safety aspects during burner ignition
- Soot blowers

Non-Destructive Testing and Basic of Metallurgy

- Introduction Non-Destructive Testing
- Pre-heat treatment
- Post weld heat treatment
- Material testing
- Fundamental of metallurgy (ferrous steel)

Steam Boiler Maintenance and Repairs

- Introduction to Boiler Maintenance
- Boiler maintenance program
- Repair Procedure: -
  - Summary of boiler tubes repairs,
  - Tubes bending,
  - Method of welding and joints
- Boiler-internals inspection
- Case study of boiler repairs

Steam Boiler Failures

- Types of failures
- Causes of failures
- Prevention from failures

ABOUT THE INSTRUCTOR



Ir. Mohd Normarzuki bin Ya'acob**,** has graduated with Bachelor (Honors) in Mechanical Engineering from the University of Malaya.

He is a registered Professional Engineer with Practicing Certificate (Mechanical) with Board of Engineer, Malaysia (BEM) and a Corporate Member, The Institution of Engineers, Malaysia (IEM). He is a certified First Grade Engineer (Steam Boiler and Internal Combustion Engine) by the Department of Occupational Safety and Health (DOSH).

He had working experiences with several company such as Equator Engineering Sdn Bhd, Tenaga Nasional Berhad, Petronas Gas Berhad (Gas Processing Plant 5/6 and Centralized Utilities Facility), Qatar Petroleum (Head of Short Technical Training) and currently, he is working with Bayubali Engineering Sdn Bhd as a Managing Director.

Throughout his carrier, he has extensive field experiences in steam boiler operation, trouble-shooting, inspection, maintenance and repair. He has also experience in project management, design, selection, specification, installation, maintenance, operation, plant optimization and trouble-shooting of utility facilities in the oil and gas industry.

He is the co-author for "An Introduction to Steam Machinery" book published by University of Malaya Publisher.