

IEM-ILSAS Course: Two-Day Course on Steam Boiler

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The Institution of Engineers, Malaysia (IEM) via its Oil, Gas and Mining Technical Division (OGMTD) and the TNB Training Institute-ILSAS (Institut Latihan Sultan Ahmad Shah) organised a two-day course at ILSAS from 11-12 April 2007 titled 'Course on Steam Boiler – Operations, Trouble-Shootings, Inspection, Maintenance and Repairs'. A total of 25 participants attended the course.

The course was delivered by Engr. Mohd Normarzuki Ya'acob. The course aimed to impart to the participants the following:

1. An understanding for the work related to steam boilers such as boiler safety, legislation and regulations;
2. The commissioning of new boilers, operations, trouble-shooting, inspection, maintenance and repairs; and
3. Introduction to related boiler legislation in Malaysia such as the Factories and Machinery Act 1967 (Act 139), Steam Boiler and Unfired Pressure Vessel 1970.

The course covered the following key aspects:

1. **Factories and Machinery Act 1967 (Act 139)** – Steam Boilers, Certificates of Competency – Examinations, Person-in-charge, Notification, Certificate of Fitness and Inspection;
2. **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 and water-tube boilers and universal pressure boiler (supercritical boiler);
3. **Boiler Operations and Trouble-shootings:** An introduction to operations and trouble-shootings, basic boiler controls, boiler operation

and trouble-shootings, idle boiler (boiler storage), commissioning activities, safety valves, water gauge glasses and steam drum;

4. 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);

5. An Introduction to Combustion:

Combustion theory, products of combustion, flue gas analysis, general considerations regarding safety, general firing practice for boilers, burners (gas and liquid), solid fuels, atomiser for fuel oil, Trial For Ignition Time (TFIT), safety aspects during burner ignition, and soot blowers;

6. 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;

7. Non-Destructive Testing and the Basics of Metallurgy:

Introduction of non-destructive testing, pre-heat treatment, post weld heat treatment, material testing and the fundamentals of metallurgy (ferrous steel); and

8. Steam Boiler Failures:

Types of failures, causes of failures and prevention from failures.

This course is one of a series of 10 courses that was envisaged and organised around the ILSAS and IEM (via OGMTD) collaboration which commenced on 15 January 2007.



Classroom presentation by Engr. Mohd Normarzuki



Explanation of a power boiler or steam generator by Engr. Mohd. Normarzuki



Explanation of a dummy package boiler internals by Engr. Mohd. Normarzuki

The participants were also given a tour around the main plant workshop in ILSAS that showcased typical models of industrial boiler, a dummy package boiler and other auxiliaries such as heaters, pumps and valves. ■