

Course code	LSP301
Course name	NR-13 - Boilers Operation Safety Training - 40h
Duration	40 Hours
Target group	Boiler Operators.
Prerequisites	<ul style="list-style-type: none"> - RG and CPF; - Passport (expatriate); - Proof of Grade School.
Objective	Qualify industrial workers to act as boiler operators.
Contents	<ul style="list-style-type: none"> • Notions of applied physics; • Pressure; • Atmospheric pressure; • Gauge pressure and absolute pressure; • Internal pressure in boilers; • Pressure Units; • Heat transfer; • General notions: what is heat, what is temperature. • Modes of heat transfer; • Specific heat and sensible heat; • Heat transfer at constant temperature; • Thermodynamics; • Concepts Saturated steam and superheated steam; • Fluid Mechanics; • Fundamental Concepts; • Pressure in Flow; • Gas Flow; • Notions of applied chemistry; • Density; • Solubility; • Diffusion of gases and vapors; • Characterization of Acid and Base (Alkali) - Definition of pH; • Basic principles about Corrosion; • General considerations about boilers; • Types of boilers and their uses; • Flamotubular boilers; • Aquatubular boilers; • Electric boilers; • Solid fuel boilers; • Liquid fuel boilers; • Gas boilers; • Boiler accessories; • Boiler control instruments and devices; • Feeding device; • Level display; • Level control system; • Pressure indicators; • Safety devices; • Auxiliary devices; • Valves and piping; • Smoke draft; • Instrumented Safety System; • Boiler operation; • Boiler start and shutdown; • Regulation and control: of temperature; of pressure; of power supply; of the water level; of

pollutants; and combustion.

- Operation failure, causes and control measures.
- Daily inspection guide;
- Operation of a system of several boilers;
- Procedures in emergency situations;
- Boiler water treatment;
- Water impurities and their consequences;
- Feed water treatment;
- Boiler water control;
- Prevention against explosions and other risks;
- General risks of accidents and health risks;
- Explosion risk;
- Study cases;
- Legislation and standardization;
- Regulatory Norm nº 13 (NR-13);
- Boiler B Category;
- Topics of inspection and maintenance of equipment and records.

Total Contact Time: Theory: 40h

Technical Reference: NR-13.

Exam	Multiple choice exam with minimum passing grade of 60%.
	Validity: N/A
