

Boiler & Steam System Fundamentals

A Technical Training Seminar Designed for Those New to Steam Systems

So you're new to boilers and steam systems? Get started off right! This introductory program features a "keep it simple" format and a relaxed pace.

This seminar is intended to serve as "Steam System Boot Camp". It is strongly recommended as a prerequisite to our *Steam Boiler Operation & Maintenance* and *Steam Distribution & Condensate Return Systems* programs. **Boiler & Steam System Fundamentals** prepares the participant with a sound understanding of such concepts as:

- How steam boiler systems work in commercial and industrial facilities
- Basic steam system terminology and "lingo"
- Why steam and condensate behave the way they do in piping systems
- The major influences and measurements of steam system efficiency
- Essential elements of a safe and efficient steam system – What to look for
- Basic concepts of thermodynamics and physics as they apply to steam systems
- Safe practices that are essential in every steam system

Your Place or Ours?

We can bring this training directly to your plant site at a reasonable cost. Or, attend at one of our open-enrollment presentations.

Call **STEAMWORKS** LLC Today at

614-878-3100

or Visit Us On-Line at

WWW.STEAMWORKSLLC.COM

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Seminar Outline

General

Why is steam used in industry?
Typical applications

Basic Systems – The Big Picture

Steam system overview
Feedwater systems
Fuel and draft systems
Steam distribution systems
Condensate receivers and pumps

Heat Principles

Steam tables, BTUs
Sensible heat
Latent heat
Total heat
Temperature-pressure relationship
Specific volume - expansion of steam
Saturated steam
Understanding steam efficiency
Superheated steam

Pressure Principles

Pounds per square inch (psi)
Total Force
Low pressure vs. high pressure systems
Vacuum
Differential pressure

Principles of Fluids

Properties of fluids
Fluid flows
Path of least resistance

Flash Steam

Why it forms
How it affects system operation
How to use it to advantage

Boilers & Steam Generation

Boiler types and styles
Expression of flow rates (lb/hr)
Boiler capacity
Basics of combustion
Boiler burners
Demand (load) of steam equipment
Steam pressure control
Satisfying varying PSI requirements

Steam Distribution

Desirable velocities in piping
Pressure reducing valves
Insulation
Common types
Energy savings vs. cost

Drip legs
Steam traps
Operating principles

Steam Applications

Heat transfer equipment fundamentals
Steam for power
Other applications

Condensate Return

Value of condensate return
Effect on boiler fuel cost
Makeup water
Chemicals, softening
Value of condensate system maintenance

Steam System Safety

Burn protection
Safe system warm-up
Water hammer
Thermal shock
Provision for expansion

Steam System Efficiency

Basic steam system efficiency measurements

What Can You Expect To Take Home From This Seminar?

A solid understanding of steam system basics

- The easy-to-follow format ensures that you'll achieve maximum retention
- Learning in later courses and on the job will be much easier
- Understanding steam system devices (steam traps, heat transfer equipment, etc.) will become more intuitive
- The knowledge needed to operate your steam system safely
- Common safety issues are clearly addressed and correct practices covered
- Elimination of the "black box mysteries" associated with steam systems
- Each component is explained in clear terms
- Complicated topics such as boiler water treatment objectives are made simpler
- A clear path to improved efficiency and money savings
- The major impediments to steam system efficiency are clarified
- Methods of saving energy dollars *starting today* are provided

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