

REGISTRATION

To attend this seminar, please contact the ITT HVAC/Plumbing Representative in your area. They will have the scheduled dates for all seminars and will make all the arrangements for you. As a continuing service to the HVAC industry, these seminars are offered free of charge. A certificate indicating CEU credit is awarded upon completion of this seminar.

CONFIRMATION

Confirmation of acceptance will be sent from the ITT HVAC/Plumbing Representative.

LITTLE RED SCHOOLHOUSE

ITT Training Center
8200 N. Austin Avenue
Morton Grove, IL 60053
Direct: (847) 983-5816 • FAX: (847) 966-9377
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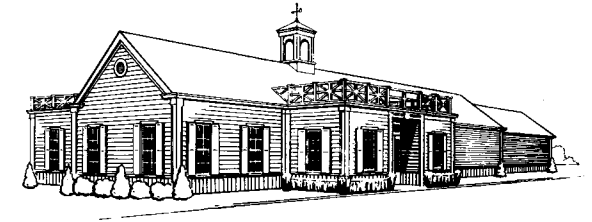
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**Design
&
Application
Seminar**



PROGRAM

MONDAY Introduction and Orientation

Pump Fundamentals

- Centrifugal Pump Operation
- Pump Curves
- NPSH & Cavitation

Hydronic Systems

- Open & Closed System
- System Curves

B&G System Syzer®

- Each student receives a System Syzer®

TUESDAY Pump Selection

- Manual
- Computer Aided

Impeller Trim Problem

System Control

- Valve Types
- Valve Sizing
- Effect of Piping Design

System Balance

- Variables that Effect Hydronic Balance
- Introduction to the Balance Problem
- Each student receives a Circuit Setter slide rule

Primary-Secondary Pumping

- Theory
- Example problem

Introduction to Variable Speed Pumping

WEDNESDAY Plant Tour

V/S Demonstration

System Balance Problem

Air Management

- System Pressurization
- Air Separation
- Compression Tank Sizing

Cooling Tower Systems

Continuing Education Units (CEU)

- Students who complete the seminar will receive 1.7 CEU

Expected Learning Outcomes

- Employ pump selection principles
- Use the System Syzer in advanced calculations
- Identify the importance of control valve sizing in hydronic systems design
- Recognize the importance of proportional balance
- Compute flow requirements in primary-secondary systems for energy savings
- Recognize the components of system pressure and apply the fundamentals of tank sizing

GENERAL INFORMATION

Out of town students attending the Design & Application Seminar can receive a significant discount on rooms at a local hotel.

Hotel requirements must be entered on the web page at least one week in advance.

Reservations are made by the Schoolhouse.

Students are responsible for all charges at the hotel including:

Room Rental	Laundry Service
Valet Service	Telephone Calls
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The Schoolhouse will furnish noon meals at the Bell & Gossett cafeteria for the entire class.

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**Operation
&
Maintenance
of Steam Systems
Seminar**



**McDonnell
& Miller**

PROGRAM

MONDAY

Basic Steam and Condensate Cycle

- Development of Low Pressure Steam Heating Systems
- Features of Higher Pressure Systems
- System Components, Terms and Definitions

Steam Boilers – Maintaining Pressure and Water Level

- Low Water Cut-offs, Feeders, Pumps Controls
- Description – Operation
- Installation – Troubleshooting

TUESDAY

Steam and Condensate Piping Problems

Pressure and Temperature Regulators

- Description and Operation of Commonly Used Valves
- Valve Installation and Troubleshooting

Steam Heating Devices

- Operation & Maintenance to Avoid Problems

Steam Traps

- Description and Operation of Traps

WEDNESDAY Plant Tour

Steam Trap Application and Installation

Pump Fundamentals

- Condensate Pumps Operation and Installation
- Condensate Coolers and Flash Tanks
- Boiler Feed Equipment and Operation
- Pumping Equipment Troubleshooting

Summary

Continuing Education Units (CEU)

- Students who complete the seminar will receive 1.7 CEU

Expected Learning Outcomes

- Increase the reliability of common boiler controls through routine observations and periodic tests
- Describe typical system component interactions
- Improve troubleshooting ability
- Avoid common mistakes in system operation

GENERAL INFORMATION

Out of town students attending the Steam System Operation & Maintenance Seminar can receive a significant discount on rooms at a local hotel.

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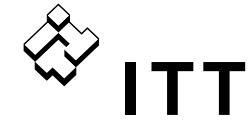
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**Large Chilled
Water
System Design
Seminar**



PROGRAM

MONDAY Background and Definitions

The Load

- Control Valve Selection
- Coil Selection

The Production Loop

- Sources
- Chillers
- Thermal Storage

System Design Alternatives

- Constant Volume Distribution
- Variable Volume Distribution
- Parallel Pumping

TUESDAY System Design Alternatives (cont.)

- Variable Speed/Variable Volume Pumping
- Primary/Secondary/Tertiary
- Primary/Secondary Zone Pumping

Variable Speed Pumping Equipment

Differential Pressure Sensor Location

WEDNESDAY Plant Tour

Variable Speed Pumping Demonstration

Air Management

Design for System Balance

Comparison of Alternate Pumping Methods

Continuing Education Units (CEU)

- Students who complete the seminar will receive 1.7 CEU

Expected Learning Outcomes

- Identify and evaluate pumping alternatives for the secondary loop
- Apply ESP Plus to compute pump annual operating costs
- Discuss the impact of proper sensor selection and location
- Describe the benefits of good hydronic balance in large systems
- Compare the economics of alternative pumping methods

GENERAL INFORMATION

Out of town students attending the Large Chilled Water System Design Seminar can receive a significant discount on rooms at a local hotel.

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**Service
&
Maintenance
Seminar**



PROGRAM

MONDAY

Introduction to Hydronic Systems

- Design Basics
- Piping Layouts
- Components

Centrifugal Pumps

- Operation
- Pump Curves

Pump Installation

Pump Alignment

TUESDAY

Routine Pump Service

- Seal Replacement
- Bearing Inspection
- End Suction Pumps
- Double Suction Pumps
- Inline Pumps

Seal Selection Basics

System Troubleshooting

- Using Pressure Gauges and Pump Curves
- Practical Problems

WEDNESDAY

Plant Tour

Variable Speed Systems

System Pressurization & Compression Tank Problems

System Troubleshooting

Continuing Education Units (CEU)

- Students who complete the seminar will receive 1.7 CEU

Expected Learning Outcomes

- Discuss the major limits on seal performance
- Recognize the need for correct piping at the pump
- Apply recommended trouble shooting tables
- Measure and apply pump gauge readings to solve typical system problems
- Recognize the need for routine pump service procedures

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Out of town students attending the Service & Maintenance Seminar can receive a significant discount on rooms at a local hotel.

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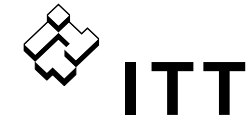
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**Steam
System
Design
Seminar**



PROGRAM

MONDAY

Basic Steam and Condensate Cycle

- Overview of Steam System Operation
- System Characteristics, Components, Terms and Definitions

Steam Generation – Boiler Types and Features

- Pressure Control
- Water Level Control

Piping-Factors Influencing Steam and Condensate Flow

- Piping System Problems

TUESDAY

Pressure and Temperature Regulators

- Principles of Valve Operation
- Design of Valve Installations

Steam Heat Exchangers

- Factors Influencing Unit Selections, Operation and Efficiency
- Avoiding Mechanical and Corrosion Damage

Steam Traps – Operating Principles

- Trap Selection and Sizing

WEDNESDAY Plant Tour

Steam Trap Application and Installation

Steam System Pumping Equipment – Pumping Fundamentals

- Condensate Transfer-Open and Closed Systems
- Boiler Feed System-Receivers, Pumps, and Control Alternatives
- Water Treatment

Final Problem

- Laptop Application

Continuing Education Units (CEU)

- Students who complete the seminar will receive 1.7 CEU

Expected Learning Outcomes

- Discuss the development of modern steam system components, design ideas, and terminology
- Discuss common boiler controls and boiler operating principles
- Size steam and condensate piping using nomograms or software
- Use ESP Plus to size pressure and temperature regulators
- Recognize how to avoid the damage mechanisms typically at work in steam heat exchangers
- Apply steam traps to solve system problems
- Describe the basics of condensate pumping equipment applications

GENERAL INFORMATION

Out of town students attending the Steam System Design Seminar can receive a significant discount on rooms at a local hotel.

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**Modern Hydronics
Basic Seminar**



PROGRAM

MONDAY **Introduction to Hydronics; Principles and Definitions**

Rules of Thumb for the Non-Engineer Installer

Designing a Series Loop System

Air Management

- System pressurization
- Air separation
- Compression tanks
- Installation and service topics

Designing a System Using Bell & Gossett Monoflo® Fittings

TUESDAY **The Bell & Gossett System Syzer®**

Designing Radiant Panel Systems

Hydronic Zone Control With Primary-Secondary Pumping

Circulator Service

WEDNESDAY **Plant Tour**

Designing a Two Pipe System

Typical Hydronic System Controls

Continuing Education Units (CEU)

- Students who complete the seminar will receive 1.7 CEU

Expected Learning Outcomes

- Discuss the advantages of properly designed hydronic systems
- Describe how to size boilers, pumps, piping, compression tanks and hydronic specialties for hydronic systems
- Apply rules of thumb to design simple systems
- Use the Bell & Gossett System Syzer to complete typical calculations

GENERAL INFORMATION

Out of town students attending the Modern Hydronics Basic Course can receive a significant discount on rooms at a local hotel.

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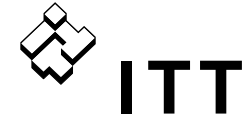
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**Modern Hydronics
Advanced Seminar**



PROGRAM

MONDAY **Introduction to Hydronics**

Centrifugal Pumps and Pump Curves

Intermediate Hydronic Systems Design Topics

The Bell & Gossett System Syzer®

TUESDAY **Pump Selection for Intermediate Sized Systems Using ESP Plus**

Using Pumps in Parallel and Series

Topics in Primary-Secondary Pumping

Designing a Dual Temperature System for Cooling or Heating

Introduction to Cooling Tower Pumping

WEDNESDAY **Plant Tour**

Introduction to Hydronic Systems Balance

Special Problems in Hydronic Design

- Converting a gravity flow system to forced circulation
- Converting a low-pressure steam system to forced circulation

Troubleshooting Common Hydronic System Problems

Continuing Education Units (CEU)

- Students who complete the seminar will receive 1.7 CEU

Expected Learning Outcomes

- Discuss the advantages of properly designed hydronic systems
- Use the Bell & Gossett System Syzer to design more complicated systems
- Recognize when standard design techniques may lead to poor design decisions
- Discuss the differences between conventional design and conversion applications
- Apply the basics of primary-secondary pumping to simple zoned systems

GENERAL INFORMATION

Out of town students attending the Modern Hydronics Advanced Seminar can receive a significant discount on rooms at a local hotel.

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