National Technology Transfer, Inc.

Training America's Workforce

Seminar Catalog 2003

***Learn by doing* with**

HANDS-ON TECHNICAL TRAINING SEMINARS

- Electrical & Electronics • National Electrical Code
- Fluid Power • Compliance/Business Systems
- HVAC • Mechanical/Industrial Systems
- Communications

A Letter from the President

Dear Colleague:

The world's technical infrastructure is changing faster today than ever before. And every technical innovation brings accompanying changes in codes, regulations, maintenance guidelines, safety requirements and more. Keeping your staff up-to-date with these changes is a constant challenge; failing to do so can represent an enormous risk—in terms of efficiency, profitability, safety and even legal liability.

The question is not, *whether* you need a consistent, integrated employee training program—if you're going to compete, ongoing training is essential. The real question is: *how* will you implement your training program? *What is the most effective, cost-efficient, nondisruptive way to plan and conduct the ongoing training your personnel need?*

At NTT, we've been supplying mission-critical training for companies like yours for almost 20 years. But, the physical implementation of these training programs is only part of the equation. Our training consultants are among the most experienced in the industry at helping you construct customized programs designed to address both your company's individual goals and its unique logistical demands.

As you look through this catalog, the value of NTT's seminar material will become obvious. What this catalog cannot show, however, is just how far NTT consultants will go to customize both content and logistics to suit your specific objectives. NTT's senior consulting team has been trained to work with you to develop the type of training your personnel needs, and to administer it *where and when* it's most convenient for your business.

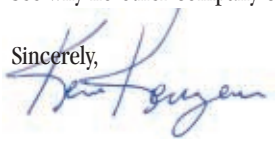
Your customized plan may include a series of on-site seminars—or a block of public training vouchers. Depending on your needs, the program may even contain seminars in which the content is tailor-made to address very specific knowledge gaps unique to your industry.

Whether you're interested in cross-training, advanced trade-specific training or specific knowledge-gap training, your team will acquire only the most current information available. Our instructors bring more practical knowledge, field experience and enthusiasm than any in the industry. ***And, the NTT training staff has access to more custom-designed, "Hands-On" training equipment than any training team...anywhere***! This combination of expertise, enthusiasm and equipment means your team gets the latest information...affordably...understandably...and conveniently.

The SEMINAR SELECTOR located on the facing page will allow you to get the details on seminars that will suit your needs. You may find the job function that most closely describes your particular role at the top of the chart. Follow the column down to each check mark and then across to find the seminar title and page number where a more complete description can be found. You may also choose your seminar by category (listed in the left-hand column of the chart).

Take a moment right now to read through the SEMINAR SELECTOR and then review some of the seminar descriptions inside. You'll see why no other company can meet your technical training needs like NTT!

Sincerely,



Kevin Keegan

NTT Training Seminars...

- are taught by some of the most experienced professionals in the industry, with multimedia presentations, field examples, photos, and more, designed to keep your team engaged and interested...
- offer rapid learning of essential concepts and lessons to maximize every hour of training...
- feature "Hands-On" *learn by doing* sessions, employing the most modern and extensive array of custom-designed training machinery available anywhere...
- include no commercial affiliation, so your training is provided without sales bias toward products and/or service companies...
- provide continuing education units (CEUs) and the corresponding certificates, or in some cases, *actual college credits which may even be applied to an Associate's Degree in Applied Technology!*
- are attended by *tens of thousands of people every year*!
- are ideal for cross-training, refreshing skills, or up-training in both multiskilled and trade environments.

Call 1-800-922-2820 or Visit www.nttinc.com
to learn more about improving efficiency company-wide with the **NTT Training Seminars.**

NTT SEMINAR SELECTOR

Use this handy selector to find the seminars that will help you achieve your specific corporate or personal objectives.

	Multi-craft Maintenance	Mechanical Trades/Sprvsrs.	Trainers/Educators	Instrument Technicians	Sales Personnel	Mobile Equip. Repair	Electrical Tradespeople	Engineers	Hydraulic Service	PAGE
National Electrical Code®										
2002 National Electrical Code®	✔		✔	✔			✔	✔		8
NEC® Updates	✔		✔	✔			✔	✔		8
Electrical Standards/Offshore Hazardous Locations	✔		✔				✔	✔		9
Grounding & Bonding	✔		✔	✔			✔	✔		9
National Electrical Code®/Grounding & Bonding	✔		✔	✔			✔	✔		10
Maintaining Building Electrical Systems	✔		✔				✔	✔		10
Electrical & Electronics										
AC & DC Variable Speed Drive Technology	✔	✔	✔	✔				✔		11
Understanding Programmable Logic Controllers	✔	✔		✔			✔	✔	✔	11
Basics Of Industrial Electricity	✔	✔	✔	✔	✔	✔	✔	✔	✔	12
Data Cabling	✔	✔	✔			✔	✔	✔		12
Industrial Electronics	✔		✔	✔	✔		✔	✔		13
Electrical Print Reading	✔		✔			✔	✔	✔	✔	13
Instrumentation & Process Control	✔	✔	✔	✔	✔		✔	✔		14
Tuning DDC/Process Control Loops	✔		✔	✔			✔	✔		14
Understanding & Troubleshooting Electric Motors	✔			✔			✔	✔		15
Troubleshooting Electrical Control Circuits	✔			✔			✔	✔		15
HVAC										
Boilers	✔	✔						✔		16
Air Conditioning & Refrigeration	✔	✔	✔		✔			✔		17
Chillers	✔					✔		✔		18
HVAC Technology										19
Fundamentals of Pneumatic Comfort Controls	✔	✔						✔		19
Fluid Power										
Hydraulic Training	✔	✔	✔		✔	✔			✔	20
Vacuum Technology Training										20
Electro-Pneumatic Training	✔	✔	✔		✔		✔	✔		21
Applied Hydraulics & Troubleshooting	✔	✔	✔		✔	✔		✔	✔	21
Compliance/Business Systems										
Electrical Safety	✔	✔	✔	✔	✔		✔	✔	✔	22
High Voltage Electrical Safety	✔	✔				✔	✔	✔		23
Electrical Safety/High Voltage Electrical Safety	✔	✔	✔	✔	✔	✔	✔	✔	✔	23
Maintenance Management	✔	✔	✔							24
Life Safety Code® (NFPA 101)		✔	✔					✔		24
National Fire Alarm Code® (NFPA 72)	✔	✔					✔	✔		25
Uniform Plumbing Code™	✔				✔			✔		25
International Plumbing Code®	✔				✔			✔		26
Cross-Connection Control & Backflow Prevention	✔							✔		26
Lockout/Tagout	✔	✔	✔	✔			✔	✔	✔	26
OSHA 10 or 30 Hour Safety Cards	✔	✔	✔		✔	✔	✔	✔	✔	27
NFPA 70E 2002 Edition										27
Confined Space Entry	✔	✔	✔				✔	✔	✔	28
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Mechanical/Industrial Systems										
Shaft Alignment	✔	✔				✔		✔	✔	29
Centrifugal Pumps	✔	✔				✔		✔	✔	29
Mechanical Drives	✔	✔			✔	✔		✔	✔	30
Fundamentals of Hoisting & Rigging										30
Welding	✔	✔	✔			✔				31
Pipefitting	✔	✔				✔			✔	31
Communications										
Fiber Optic Training	✔					✔	✔	✔		32
Telephony and Communications			✔		✔		✔	✔		32

The key to a safe, cost-efficient work environment is Training! Personnel become more valuable, while companies spend less to produce more!

Learn By Doing...

with NTT's unique combination of "Hands-On" instruction and exclusive training equipment. There's no better way to retain new skills than *learning by doing!*

Cross-Training

makes Electrical Tradesmen, Maintenance Mechanics, Educators, Mobile Equipment Repair Mechanics, Trade Supervisors, Sales Personnel and Industrial Trainers safer and more versatile.

Advanced Trade-Specific Training

makes Instrument Technicians, Electrical Tradesmen, Engineers and Hydraulic Service Technicians more proficient and more valuable.

More "Hands-On" Training

Customized "Hands-On" Training Equipment

NTT offers "Hands-On" seminars that reinforce training concepts with the practical activity of "doing." Our instructors use more customized equipment, for "Hands-On," real-world experience training, than you'll find with any other technical training institution in the industry.

"Tell me, and I'll try to remember...*show me* and I'll never forget!"

Michael McVey, Philadelphia, PA

The Most Experienced Instructors

The Most Highly-Qualified Instructors in the Industry

NTT instructors average more than 25 years of field experience. They deliver concepts via personal "Hands-On" instruction, (or through lecture-based seminars, depending on the subject material)—*in small classes*—so you'll get the one-on-one attention needed to ensure a firm grasp of all material.

Guaranteed Results

100% Unconditional Money-Back Guarantee

If you feel that you did not receive the value you expected from any NTT seminar, your enrollment fee will be returned.

NTT

Call 1-800-922-2820 Now to Enroll

or visit www.nttinc.com

Public Seminars

Convenient Locations Near You—

NTT offers an extensive list of locations nationwide, so you can find a convenient time, location and seminar subject to suit your schedule. Each public seminar has a limited class size and many include a complete array of "Hands-On" equipment so you can be assured of a quality learning experience every time...wherever and whenever you attend.

Register Now with Our No-Risk Registration Policy—

Even if your schedule is not a sure thing, you can register now risk-free. Should your schedule change, you can move to a different seminar, a different location, and/or a different date up until 24 hours prior to the seminar. *That means you can enroll with complete confidence, months in advance, to ensure that your space is reserved!*

Upcoming Seminar Schedule Enclosed—ENROLL NOW—While Space Remains!

A schedule of upcoming seminars is located in the center of this catalog, so you can register for the subject, location and date of your choice. Select the seminars your team needs to improve its performance and call **1-800-922-2820** or visit **www.nttinc.com** right now so you can be assured that you won't miss out!

On-Site Seminars

Call Us...We'll Come to You

NTT's on-site seminars allow you to train individual workgroups or your entire staff without ever leaving your facility. We'll bring all the expertise and "hands-on" training equipment needed. You eliminate the travel, expenses and downtime of off-site training, and you keep your workforce close to home in case of an emergency. We'll even accommodate your 24/7 work schedule, and your remote locations.

Customize Your Training Material to Meet Your Unique Needs

NTT's on-site seminars allow you to focus on specific issues within a given subject to get the maximum value from the training you receive. We'll even do an assessment of your operation to help you customize your on-site seminars to meet your unique objectives.

Find All the Most Popular Subjects–and Then Some

NTT offers every seminar listed in the pages to follow for on-site training. In addition, we can design custom classes to meet your unique training requirements. Call customer service at 1-800-922-2820 to discuss your individual needs.

Get Substantial Cost Savings

Depending on the number of individuals you need to train, NTT's on-site seminars allow you to save on enrollment costs. Combine these savings with the money saved on travel and expenses and it's easy to see why many companies have instituted on-site programs using NTT's on-site training year after year. And best of all, you control the schedule. You get your training when, where, and how you need it.

Judge Us by the Company We Keep

General Motors, Coors, International Paper, General Public Utilities, White House, US Navy, US Army, US Coast Guard, Ford Motor Company, DuPont, Lockheed Martin, Johnson & Johnson, NASA, Boeing, Verizon, Intel and more. For references call 1-800-922-2820.

NCA Accredited Tuition Reimbursement Programs with College Credits

You May Be Able to Transfer College Credits To, or From, Red Rocks Community College

Red Rocks Community College and NTT extension Campus have partnered to offer college credits for selected courses. You may be able to earn the Applied Technology Associates Degree, and you may even qualify for Tuition Assistance as well. We can take enrollments and conduct these seminars in your area. You pay only for the attendees you send. Call 1-800-354-7324 for details.

The Most Experienced Program Managers Leading Over 100 Qualified Instructors!

NTT instructors average more than 25 years of field experience. They deliver concepts via personal "Hands-On" instruction, (or through lecture-based seminars, depending on the subject material)—in small classes—so you'll get the one-on-one attention needed to ensure a firm grasp of all material.

Gary B. Xavier

- 20 years of industry experience
- Training Services Manager
- Stationary Engineering, Monroe C. College
- Licensed Building Code Officer (New York)
- Licensed Applicator-Cooling Towers (NY)
- Licensed Applicator-Cooling Towers (PA)
- Licensed Water Plant Operator (NY)
- President, HVAC Waterside Services, Inc. Boiler and chiller waterside services
- HVAC/R Instructor, Program Chairman, Finger Lakes Community College and Wayne-Finger Lakes BOCES

Kim A. Hathaway

- 20 years of industry experience
- NTT Boilers and Mechanical Drives Program Manager
- 10 years experience as Equipment Engineer in semiconductor industry
- 15 years experience in Boiler service, installation and sales

Randy Barnett

- 29 years of industry experience
- NTT/PTA Program Manager for Electrical Seminars
- Published author on Industrial Electrical Maintenance
- Certified Electrical Inspector, International Association of Electrical Inspectors
- Instructional Systems Development (ISD)
- INPO Journeyman Electrician
- Over 4 years experience managing electrical training programs
- B.S. Business Administration; US Navy—Electrical and Nuclear Power Submarine Service

"I began attending NTT seminars for the simple reason that I wanted to better myself. A lot of things are changing out there and I wanted to be prepared for life after Rocky Flats. It doesn't take a brain surgeon to figure out that the better trained you are, the better the work you're going to get.

NTT has been great, I haven't been to a single seminar yet where I left disappointed. And I can't say that for some of the other training companies I've worked with. I had started out by taking a course with another company in the Denver area. The trainers were basically reading right out of a book. They weren't bringing a thing to the table.

The Instructors at NTT have an amazing amount of field experience. They bring a lot of personal examples and on-the-job insight. These guys are really excited about the classes they teach. They love it, and it comes across to the class.

The thing that really sets NTT apart is the amount of "hands-on" training they provide. They have these full-scale, custom-made training simulators. You actually get to try out the skills you learn. It's like gaining instant experience.

After the first class I attended I went back and got NTT classes on the list for reimbursement. I've been to at least eight seminars so far, and I'm scheduled for another one in a couple of months. I wouldn't go anywhere else."

Steven Weber
Maintenance Technician
Rocky Flats Facility

Comments From Satisfied Students

Thank you for your patience and professional attitude in setting up the "OSHA ELECTRICAL SAFETY (1910.331-. 335)" on-site training. The training was presented as advertised, in a clear and concise manner.

You should commend Mr. Larry Lenhardt (the instructor) on his outstanding presentation. His knowledge and 35-plus years of experience with electrical safety were instrumental in converting non-believers into passionate followers of our safety procedures. His insight in satisfying our needs, and his cooperative nature are what set NTT apart from other training. I look forward to doing business with you again. Please feel free to include my name as a potential reference for your company.

Don Babbitt
Vogel Lab, Engineering Supervisor
Eaton Navy Controls Division
Cutler Hammer Products

I just want to take a moment to thank you and your organization for the fine training that was recently conducted for our plant's craftsmen in regards to electrical hazard safety training.

Your instructor was knowledgeable and related well with our group. I particularly appreciated his flexibility in the scheduling of the classes to fit the requirements of our plant. It can be difficult in a small facility like ours to accomplish training for all of our crafts and still not negatively impact operations.

I have received comments from our Engineering group, the electrical group and our machinist in regards to the quality of the training. Several of our machinists commented that they felt they would be more cautious in the future when working around electrical hazards.

Thanks again.

Scott Russ
Plant Superintendent
ALCOA Louisville Laminating

Joe Tedesco

- 39 years of industry experience
- Lead Instructor, National Electrical Code
- Former NEC committee member
- Licensed Master Electrician
- Certified IAEI and ICBO Inspector
- Member, IAEI and NFPA

Armin Hunzinger

- 30 years of industry experience
- Program Manager, Fluid Power
- Mechanical Engineering Degree Ing.grad (Germany)
- Project Engineer Mobile Equipment
- De Beers Diamond Mines, Namibia South West Africa
- Technical Manager Fluid Power and PLC Products Festo Corp, New York
- Division Manager Didactic, Seminars & Training Products, Festo Corp
- Consultant Engineer and Owner
- Plinex Inc. Puerto Rico
- Systems Engineer, Gantry Robots and Transfer Lines, Grob Systems, Bluffton, Ohio
- Member, International Fluid Power Society

Vernon Miller

- 25 years of industry experience
- Program Manager, Instrumentation and Process Control
- 8 years as a Process Control Engineer with international experience
- 8 years experience as an Electrical & Instrument Supervisor
- Certified in Radiation Safety

Rob Dombek

- 14 years of industry experience - Automotive, food process, water purification, glass manufacturing, semiconductor, and packaging
- Program Manager, PLC and Automation Seminars
- Electrical Engineering Degree - Penn-State University
- 5 years experience as Engineering Manager
- 5 years experience as Chief Electrical Controls Engineer
- 4 years experience as Field Service/Installation/System-Startup Engineer

Give Your Team a Solid NEC® Foundation—Protect Yourself from Harm...Your Clients & Workers from Fire, & Your Company from Potential Liability & Fines!

2002 National Electrical Code®

Continuing Education Units: *For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.*

This educational 3-day program is designed to clarify the requirements of the National Electrical Code® and to provide basic instructions on the newest edition. When your team knows the most current Code requirements, they will save money, keep costly system incompatibilities from holding up the job, and more importantly, will provide a greater degree of protection. We will discuss rules to minimize the risk of electricity as a source of electric shock and as an ignition source of fires and explosions. **Plus:** you'll receive the 2002 NEC® Electrical Systems Manual and a copy of the 2002 National Electrical Code®.

NOTICE!

According to the revised Article 100, the definition of a "qualified person" has been substantially altered within the 2002 National Electrical Code®. This change, along with many others, could have an important effect on your business. Don't miss this opportunity to acquire the 2002 NEC® training your team needs!

You will learn about:

- **The purpose and scope of the NEC® and the implications for your company**
- **Major changes and new material in the 2002 NEC®**
- **How to select and size conductors for different applications, physical environments, and layouts**
- **When and where ground-fault protection equipment is required by the NEC®**
- **The grounding requirements for building services**
- **The requirements for installation and maintenance of electrical systems in hazardous (classified) locations**

Keep Up with More Than 400 Code Changes New for 2002—Changes in the Code Can Cost You & Your Company Significant Time & Money!

NEC® Updates (On-Site Only)

Continuing Education Units: *For this seminar, you may receive up to .7 CEUs. Personalized CEU Certificate provided.*

This concentrated 1-day seminar provides a review of the latest changes made to the National Electrical Code®, including the rules and articles new in 2002. It is designed to clarify and explain the changes to the requirements of the NEC®. This seminar does not focus on the code in its entirety as does the 2002 National Electrical Code® seminar above, but only on those elements that have been changed. By keeping on top of the latest changes, you'll keep your competitive edge in the marketplace. When your team knows the changes in the code, you and your company can save significant time and money. **Plus**: you'll also receive the *IAEI 2002 Analysis of Code Changes* and a copy of the *2002 National Electrical Code®*.

You will learn:

- **The purpose and scope of the NEC® changes and what the implications are for you and your company**
- **The most significant changes to the 2002 NEC®**
- **How the selection and sizing of conductors for different applications, physical environments and layouts have been affected**
- **When and where ground-fault protection is required by the updated NEC®**
- **How the grounding requirements have changed for building services**
- **2002 NEC IAEI 2000 Analysis of Code Changes**

Adopt Safe Installation and Operation Procedures for Offshore Hazardous Locations—
Identify Hazardous Zones; Learn Codes, Standards, and Certification Requirements!

Electrical Standards for Offshore Hazardous Locations (On-Site Only)

Continuing Education Units: *For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.*

This 3-day seminar will enable you to identify both hazardous zones, and the proper equipment for each hazardous zone. You'll learn basic design and installation requirements, codes, standards, certification and marking. By acquiring a broad knowledge of protective systems and safety measures specific to marine petroleum-related environments, your personnel will be better equipped to reduce on-the-job risk. This seminar covers environments classified as "Hazardous Atmospheres" under the IEC Standards and the USA National Electric Code® (NFPA 70). With US National Electric Code recognizing the class/division and zone classification methods plus multiple regulatory agencies with jurisdiction over specific pieces of equipment, "minimum standards" will be defined and globalized with "best practices" recommendations for each topic covered. This seminar is excellent for Offshore Electricians, Electronic Technicians and Maintenance Supervisors. It is also strongly recommended for OIMs, Rig Managers and Global Purchasing Personnel, Electrical Inspectors, QA/QC Personnel, manufacturers integrating hazardous area electrical equipment, and engineers who specify equipment for hazardous area applications.

You will learn:

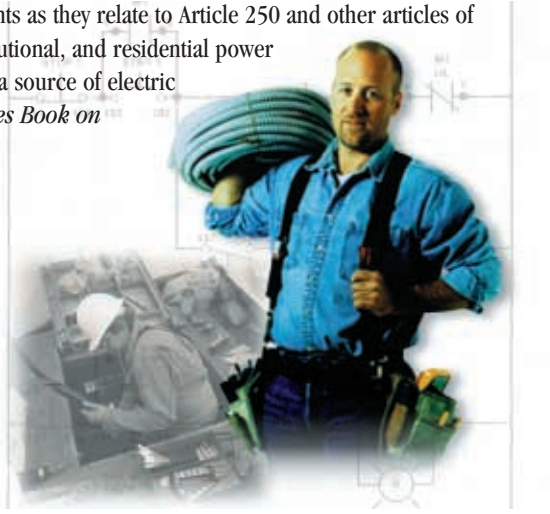
- **Basic installation requirements**
- **Hazardous location identification**
- **Design issues**
- **Codes, standards, certification and marketing**
- **Other protective schemes**
- **Wiring methods**
- **Grounding and bonding**
- **Maintenance**

Major Changes in the 2002 NEC® for Grounding & Bonding—
Learn the New Requirements & How to Avoid Grounding Problems!

Grounding & Bonding of Building Electrical Systems

Continuing Education Units: *For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.*

This 2-day seminar will clarify and refine your grasp of grounding. It presents the subject via state-of-the-art multimedia presentations in order to greatly enhance your ability to understand and retain the material. Your instructor's lifetime of experience in this field allow him to provide the real-world examples of code violations, complete with pictures! You will learn about grounding requirements as they relate to Article 250 and other articles of the 2002 NEC®. Installation, testing and inspection procedures for industrial, commercial, institutional, and residential power systems will also be discussed. Finally, you will cover rules to minimize the risk of electricity as a source of electric shock, and as an ignition source of fires and explosions. **Plus:** you'll also receive the *IAEI Soares Book on Grounding* and a copy of the *2002 National Electrical Code®*.



You will learn:

- **The NEC® requirements for grounding**
- **The purpose of grounding and bonding**
- **Grounded and ungrounded electrical systems**
- **How grounding conductors are properly identified**
- **How to differentiate between neutral and grounded conductors**
- **Methods for grounding electrical systems**
- **Clearing ground faults and short circuits**

Partial Agenda:

• Fundamentals of Grounding and Bonding • To Ground or not to Ground • Grounding of Electrical Systems • Service Equipment and Main Bonding Jumpers • Grounding Electrodes and an Electrode System • Grounding Electrode Conductors • Bonding Enclosures and Equipment • Equipment Grounding Conductors • Enclosure and Equipment Grounding • Clearing Ground Faults and Short Circuits • Tables and Example • Much More

Special **Combination Seminar** Provides a Complete Solution at a Savings!
Get In-Depth Training on Both the 2002 NEC® and Grounding & Bonding!

National Electrical Code 2002 and Grounding & Bonding

MONEY SAVING • TIME SAVING COMBINATION SEMINAR

Continuing Education Units: *For this seminar, you may receive up to 3.5 CEUs. Personalized CEU Certificate provided.*

This 5-day combination class delivers critical electrical code information on both the NEC and Grounding and Bonding in one comprehensive 1-week seminar. That means you and your entire team can attend one seminar and get all the information you need, saving time and money in the process. First, you'll get a basic understanding of the 2002 National Electrical Code, complete with the latest major changes. Next, you'll learn about the latest requirements for grounding and bonding, including how to avoid grounding problems.

In the NEC 2002 you will learn:

- **Many of the changes and new material in the National Electrical Code**
- **How to select and size conductors for different applications**
- **Grounding requirements for building services**
- **When and where ground-fault protection of equipment is required**
- **Rules for installation of electrical systems in hazardous (classified) locations**
- **Plus much more**

In the Grounding & Bonding you will learn:

- **The National Electrical Code requirements for grounding**
- **The purpose of grounding and bonding**
- **Grounded and ungrounded electrical systems**
- **Ground-fault circuit-interrupter protection**
- **Methods for grounding electrical systems**
- **Plus much more**

PLUS:
Receive the NEC® Code Book and IAEI Soares Book on Grounding FREE!

Learn to Design, Modify and Maintain Building and Facility Electrical Systems.
Save Time and Money by Expanding Your On-Site Capabilities!

Maintaining Building Electrical Systems (On-Site Only)

Continuing Education Units: *For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.*

This 2-day seminar can provide great economic returns for Building Managers and Supervisors, and Facility Maintenance Personnel by dramatically decreasing their reliance upon outside resources. Electrical issues can be addressed without outside expense or costly delays. Apprentices, Electricians and Engineers will use this seminar to enhance their general electrical knowledge with specific skills relating to buildings and facilities using building electrical wiring below 600 volts. Day 1 features a mock building floor plan which illustrates how various building electrical components work and how systems are designed. During Day 2, participants will size conduit and wire for various power and lighting loads from areas of the mock plant including offices, support services, production, shipping and receiving departments. The simulation includes panels, transformers, overcurrent protection, and branch circuits by NEC® standards.

You will learn how to:

- **Work with building electrical wiring below 600 volts**
- **Select conduit and wire according to the NEC®**
- **Wire a fire alarm system for fail-safe operation**
- **Size overcurrent protection for distribution, panelboards, and branch circuits**
- **Wire 3-way and 4-way switch circuits**
- **Wire generators for automatic transfer operation**
- **Set an automatic generator to start and stop**
- **Size transformers and their overcurrent protection**

Visit www.nttinc.com Now to Enroll

Learn to Select, Operate and Maintain Electrically-Driven Rotating Equipment—
Reduce Costly Downtime & Keep Your Equipment Running!

AC & DC Variable Speed Drive Technology (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

The purpose of this 3-day seminar is to thoroughly examine this exciting technology: how it works; where it may be effectively applied; various types of VSDs; operations, maintenance, troubleshooting considerations; potential benefits; and applications. *AC & DC Variable Speed Drive Technology* is ideal training for Electricians, Maintenance Mechanics, Service Technicians, Plant Engineers and HVAC Specialists who want to improve their knowledge base, expand their job capabilities, and increase their earning potential.

Rotating equipment consumes 50% of the total electrical energy generated in this country. Current estimates indicate that centrifugal or flow related applications alone, such as we have with pumps, fans, blowers, and compressors, consume as much as 65% of this total.

Variable speed drive technology offers a cost-effective method to match driver speed to load demands and represents a state-of-the-art opportunity to reduce operating costs and improve overall productivity.

You will learn about:

- **Operation**
- **Set-up**
- **Troubleshooting**
- **Maintenance**

HANDS-ON

Learn by doing!

Control Your Own Destiny— Learn PLCs from a Single 3-Day Seminar—

Understanding Programmable Logic Controllers

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

During this 3-day session you will spend approximately 50% of the time working on an actual programmable controller. You will learn about programming, connecting input/output devices, solving (elementary and then more complex) problems, and troubleshooting. Approximately 50% of the time will be spent in lecture sessions, learning the theory, the details, and the various approaches to PLC application and control.

You will learn:

- **What the advantages of programmable controllers are over electromechanical relay systems**
- **How PLCs are programmed and what types of programming can be used**
- **What causes most PLC problems**
- **How to specify hardware and choose suppliers**
- **How to plan for installation of a PLC system**
- **What the future holds and how to plan for it now**
- **How to troubleshoot PLC and field device malfunctions**

HANDS-ON

Learn by doing!

Learn the Nature & Applications of Industrial Electricity—
Cross-train Nonelectrical Tradespeople!

Basics of Industrial Electricity

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

This comprehensive 3-day seminar has been designed to teach your non-electrical personnel the basic nature of electricity in the workplace. All theory is explained in simple, easy-to-understand terms without complex mathematical equations. Each key concept is reinforced with practical "Hands-On" exercises and demonstrations through which students get a firsthand feel for real-world applications. Attendees will gain valuable experience using electricity in an industrial setting and understanding its function in an electrical circuit. Electrical safety issues are also covered. This seminar is not recommended for experienced electricians or electrical engineers.

You will learn:

Fundamentals **of Basic Electricity in Industry**

- **Electricity in simple terms**
- **Effective use of the multimeter and what measurements really mean**
- **Electrical safety**
- **AC & DC voltage and current**
- **Transformer operation**
- **Generator action and principles**
- **Troubleshooting electrical circuits and much more**

Application **of Basic Electricity in Industry**

- **Electrical terminology**
- **Motor operation, AC and DC**
- **Relay operation**
- **Timers, contactors, and motor starters**

HANDS-ON

Learn by doing!

Learn to Install, Splice, Terminate, Troubleshoot & Test Structured Cabling Systems—

Data Cabling (On-Site and Accredited Tuition Reimbursement Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

During this 3-day session, you'll gain a thorough understanding of the theory and methods of structured cabling. You will also examine and compare structured cabling standards and installation requirements for the various types and categories of copper cable, as well as fiber optic cables. Termination, splicing, testing and certification are also covered. After completing this seminar, you'll understand construction, troubleshooting, repair, and more, while gaining "Hands-On" experience with a variety of specialized hand tools.

You will learn:

- **Theory and methods of structured cabling—plus standards for various types and categories of copper and fiber optic cables**
- **Termination, splicing, testing and certification of a variety of systems**
- **Construction, troubleshooting, repair**
- **"Hands-On" competency with various specialized test equipment**

Learn to Install, Maintain, Spec & Buy Electronic Control Equipment—
Get the Big Picture You Need to Perform and/or Manage More Effectively!

Industrial Electronics (On-Site and Accredited Tuition Reimbursement Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

During this 3-day session, you'll spend about 40% of your time actually working on real circuits and components. You'll gain a broad exposure to the field of Industrial Electronics in general, and specific exposure to the latest in maintenance and troubleshooting methodology. If you work in an area of engineering, maintenance, operations or management that deals directly or indirectly with electronic controls, this seminar will provide the background you need to do your job more effectively. This seminar will deliver a thorough understanding of installing, programming, maintaining, buying, and/or specifying electronic control equipment.

HANDS-ON

You will learn to troubleshoot circuits & components for:

- **AC/DC drives**
- **Programmable logic controllers**
- **Solid-state machine controls**
- **Alarm systems**
- **Intercom systems**
- **Sensors**
- **Transmitters**

Partial Agenda:

- Basic Concepts (Atomic Structure; Conductors; Insulators; Semiconductors; Voltage; Current; Resistance; Power; Units; Abbreviations; Direct Current; Alternating Current)
- Circuit Laws (Ohm's Law; Kirchoff's Voltage Law; Grounds, more)
- Digital Integrated Circuits (Switch Logic; Diode Logic; Binary Logic; Digital IC Families; TTL; CMOS)
- Discrete Components (Resistors; Inductors; Capacitors; Transformers; Diodes; Bridge Rectifiers; NPN Transistors; PNP Transistors; JFETS; MOSFETS; IGBTS; SCRS; TRIACS; UJTS; DIACS)

Take the Mystery Out of Reading Electrical Blueprints, Diagrams & Schematics.
Learn To Interpret Architectural Electrical Drawings with this Intensive 1-Day Seminar!

Electrical Print Reading (On-Site Only) HANDS-ON

Continuing Education Units: For this seminar, you may receive up to .7 CEUs. Personalized CEU Certificate provided.

This 1-day seminar is critical for anyone involved in the design, construction or maintenance of electrical systems. Whether you are an apprentice electrician, a facilities maintenance technician or supervisor, a construction supervisor, or even a purchasing agent this seminar provides the skills you'll need to interpret electrical drawings properly. The session includes a lecture component where you will discuss the types and purposes of electrical prints. You'll also review photos of electrical devices and equipment along with their ANSI symbols and ratings so you can apply them in the field. During the "practical exercises" segment of the seminar you'll walk through a typical electrical construction project, interpreting the various diagrams and schedules. You will examine prints for errors and NEC® compliance in voltage drop, conductor sizing, conductor fill and more. You'll even design and sketch simple electrical systems and circuits.

You will learn how to:

- **Read and interpret architectural electrical drawings, known as Construction Blueprints**
- **Identify real equipment with schematic symbols**
- **Understand and apply electrical specifications**
- **Employ the applications and ratings of electrical devices and components**
- **Identify National Electrical Code® (NEC®) requirements for electrical systems**
- **Examine basic electrical concepts such as voltage drop, conductor fill, short-circuit analysis, kVA ratings, service calculations, and more**

Training Process Control Personnel Can Save You Time & Money—Become More Efficient at Troubleshooting & Calibrating Process Control Equipment!

Introduction to Instrumentation & Process Control

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

During this 3-day session, you'll spend approximately 40% of the time actually working with various instrument controllers. Seminars are segmented into small groups, so you get plenty of firsthand instruction learning to program, connect input/output devices, solve elementary and then more complex problems, and troubleshoot. With the recent industry trend toward downsizing, adding this ability to your multi-skill set will make you more valuable and increase job security at the same time.

HANDS-ON

You will learn:

- **How to troubleshoot process controls including sensors, transmitters, controllers, and final elements**
- **How the various instruments measure temperature, pressure, flowrate, level and position, pH, weight and density**
- **What the differences are between open and closed loop controls, feedback and feed forward controls, PLC, DCS and stand-alone controllers**
- **How analog signals are produced, processed and protected from noise**
- **What Proportional, PI, and PID control strategies are**
- **What causes errors in instruments, and how to minimize and troubleshoot them**
- **How to calibrate transmitters and tune controllers**

Partial Agenda:

- Instrumentation Principles and Applications in Process Control (Definition of Process Control & Process Concepts; Comprehensive Introduction to the Terminology and Techniques of Process; Measurement and Control; Primary Elements; Flow, Pressure, Temperature, Analytic, Weight; Types of Control & Characteristics; Feedback and Feed Forward Loops; Open Loop and Closed Loop; Nonlinear Sensors and Final Elements; Types of Instruments & Calibration Devices; "Hands-On" Exposure to Instruments and Calibration Devices)
- Pressure, Flow, Temperature, Analytical, Digital Meters, Handheld Calibrators (Instrument Installation; Wiring, Tubing, Mounting Restrictions, Instrument to Process Interfacing; Discussion of Voltage, Current, and Pressure Analog Signals; and more.

Optimizing Your Process Requires Proper Setting & Tuning of DDC or Control Loops— Learn to Use the Latest Methods!

Tuning DDC/Process Control Loops

HANDS-ON

(On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

During this 2-day seminar, participants will become familiar with basic control terminology and definitions. They will understand the process characteristics that become the basis for tuning the DDC or process controller. With the use of computer simulation, each participant will tune control loops to gain the experience for efficient control loop tuning.

You will learn:

- **Common process characteristics**
- **Different tuning methods**
- **What proportional band, integral and derivative do in a 3-mode or DDC controller**
- **How to tune DDC controllers for accurate control**
- **How to obtain control for savings in dollars and quality**
- **Much more**

Get the Basics of Electrical Motor Operation, Maintenance and Troubleshooting —
Maintain the Performance of the Electric Motors You Work Around Every Day!

Understanding & Troubleshooting Electric Motors

(On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

This 3-day seminar is presented using the latest technological equipment. Instruction techniques include demonstrations with participant interaction, as well as "Hands-On" lab exercises. You'll cover everything from basic operational theory, to the actual operation of various types of AC and DC motors. Each participant will work with live electrical circuits. Because this is an entry-level seminar, no prior electrical experience is required.

You will learn:

- **How electric motors operate**
- **What types of AC and DC motors are commonly used**
- **Identification and construction of motors**
- **How to connect a multiple speed motor for operation**
- **How to connect a dual voltage motor for operation**
- **Motor nameplate information and how it is used**
- **Duties and training needed by motor maintenance personnel**
- **How to cross-train nonelectrical maintenance personnel**
- **How to operate a motor for forward or reverse operation**
- **Motor braking methods**
- **NEC® requirements for motor installation**
- **How to use test equipment to check motor operation**
- **Troubleshooting and maintenance procedures for motors**

Learn to Wire, Operate and Troubleshoot a Circuit Before Noon, Day 1—
Sharpen Your Skills Through Our Hands-On Training Techniques!

Troubleshooting Electrical Control Circuits

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

During this 3-day session, you will spend a minimum of 50% of the time actually working at a troubleshooting station with circuits that are identical in every respect to motor control circuits in your plant. There is no lengthy discussion of electron theory, magnetism, or any other basic subject in this seminar. It is devoted almost exclusively to teaching "Hands-On" troubleshooting, using the simple circuit and gradually becoming more complex. You will leave with only the material you need, and NTT's "Hands-On" instruction makes it easier to retain your new skills far into the future.

You will learn:

- **Practical, useful troubleshooting techniques that can be put into immediate use in the plant**
- **Techniques to simplify and speed up the task of locating faults**
- **How to eliminate the guesswork about circuit conditions**
- **About common circuits for controlling pumps, air compressors, hydraulic systems, heating & air conditioning systems, etc.**

Partial Agenda:

• Electrical Schematics • Mapping Control Circuits – Ladder Diagrams • Logical Circuits • Basic Electrical Principles • Transformers • Disconnecting Devices & Symbology • Control Elements, Switches, & Symbology • Supplementary Contact Symbols & Terms • Manual Switches – Functionality & Symbology • Automatic Switches • Troubleshooting Techniques •Much More

Safe Efficient Operation of Commercial & Industrial Boilers—A Competitive Edge for Operators, Facilities Managers, Technicians & Engineers!

Boilers: An Operator's Workshop

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

Starting at the introductory level, with a discussion of boiler components, language and key operating criteria, this intensive, practical 3-day seminar incorporates 16 "Hands-On" training stations to enhance and reinforce the understanding of the critical set-up and operating features of this equipment. The seminar concludes with a summary discussion of the essential operating features followed by a thorough presentation regarding preventive maintenance tips and practical troubleshooting considerations.

You will learn:

- **Boiler construction features and essential components**
- **Flame safeguard and burner component details**
- **How to read wiring and programmer diagrams**
- **How boilers, burners, and programmers integrate**
- **Common failure modes and what to do to prevent them**
- **Preventive maintenance considerations and how to establish a proper PM program**
- **Advanced troubleshooting and problem solving skills**

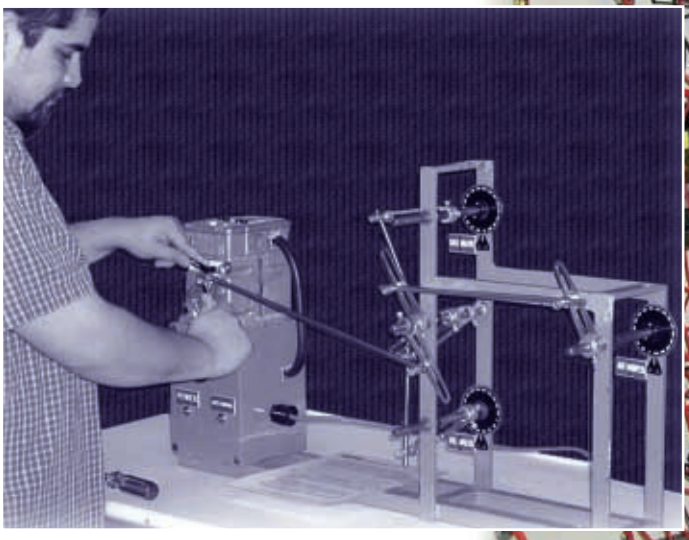
Learn by doing!
HANDS-ON

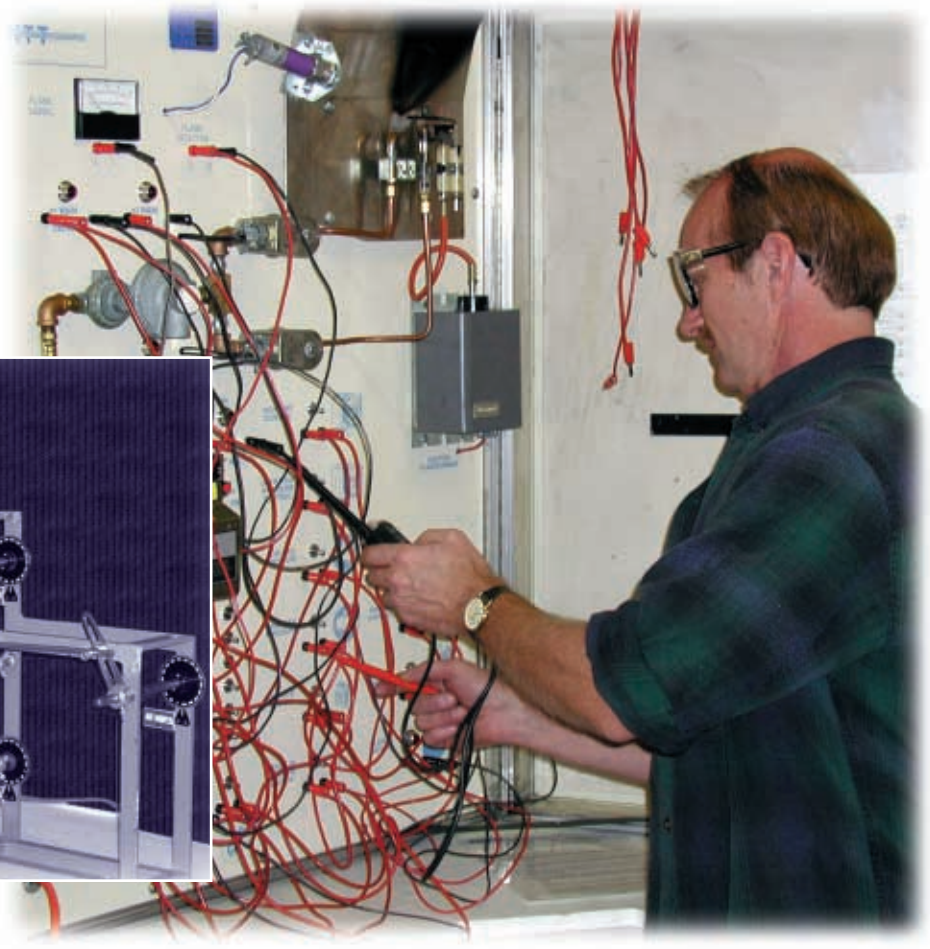
Agenda:

• Introduction & Overview • Operator Responsibilities • Boiler Basics • Boiler Types & Construction • Codes & Standards • Operating & Safety • Controls • Flame Safeguard • "Hands-On" Session Flame Safeguard Simulation (4-hour workshop) • "Hands-On" Session Jackshaft Modulation Simulator (4-hour workshop) • Schematic Wiring Diagrams • Fuels • Combustion Systems • Combustion Theory & Tuning • Water Treatment • Plant Operations • Maintenance & Repairs • Efficiency • Emissions • Much More

Who should attend:

This *operator-oriented* program has been designed to directly address the needs of those who have responsibility for the operation, safety and maintenance, as well as the economics associated with commercial and industrial boilers, including: Operators; Installation, Service and Maintenance Technicians; Supervisors; Building Engineers; Facilities and Property Managers





Get the Basics of Servicing & Troubleshooting Air Conditioning & Refrigeration—

Air Conditioning & Refrigeration

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

This intensive 3-day seminar provides thorough training on the basics of air conditioning and refrigeration. *Air Conditioning & Refrigeration* covers the practical application of air conditioning and refrigeration in domestic, commercial, and heat pump applications. It also provides an understanding of servicing and troubleshooting techniques. **Plus:** FREE **EPA certification** testing, and HVAC Excellence Technician's Certificate testing are offered as well! You'll profit from the ability to demonstrate certification of your training achievements and level of expertise!

You will learn:

- **The principles of air conditioning and refrigeration**
- **Maintenance/repair of air-conditioning and refrigeration equipment**
- **Fundamentals of electrical and mechanical troubleshooting**
- **The provisions of the Clean Air Act Amendments (Section 608)**
- **The principles of the basic refrigeration cycle, using cooling principles to work on a vapor-compression refrigeration system**
- **How to use instrumentation and test equipment to maintain, and troubleshoot air-conditioning/refrigeration equipment**
- **Fundamentals of electricity for air conditioning/refrigeration applications, including reading symbols & diagrams**
- **The safe handling of refrigerants, refrigerant classification and applications, and much, much more**

Agenda:

• Air Conditioning & Refrigeration Overview • Tools & Test Equipment • Refrigerants & Refrigerant Oils • Air-Conditioning & Refrigeration Compressors • Air-Conditioning & Refrigeration Evaporators • Metering Devices • Air-Conditioning & Refrigeration Condensers • Air-Conditioning & Refrigeration Piping & Accessories • Heat Pump Theory & Components • Fundamentals of Electricity as Applied to Air-Conditioning & Refrigeration and much more

Who should attend:

Anyone who deals with refrigeration or air conditioning on a regular basis, including: Maintenance Technicians, Service Technicians, Building Managers, Apprentice HVAC Technicians, Personnel interested in acquiring new skills.

The seminar is also perfect for those who require refresher training, or want to expand their capabilities through multiskilling.

Learn by doing!

HANDS-ON

FREE EPA Certification Exam Included!

Learn the Latest Techniques for Optimizing Your Chilled Water System—
Detailed Enough for HVAC Techs...Broad Enough for Building Superintendents!

Chillers: Operation & Maintenance Of Chilled Water Systems

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

Whether you maintain and service HVAC systems, chillers, or cooling towers, or oversee all the functions of a facility, it is imperative that the water-cooling system operates at maximum efficiency. This 3-day seminar will provide you with the skills and experience necessary to keep your system functioning at optimum performance. You'll also get up-to-date information on the latest technology so you will understand all of the available options for maintaining your system at peak performance.

Learn by doing!

HANDS-ON

You will learn about:

- **Different types of chillers**
- **Compression and absorption machines**
- **Cooling towers: operation and maintenance**
- **Chilled water system operation**
- **Water quality standards and treatment for chilled water and towers**
- **Glycol (antifreeze) systems**
- **Establish more effective operation, troubleshooting, and maintenance practices**
- **Gain increased understanding of chiller design**
- **Improve your interface with chiller maintenance service companies**
- **Prevent catastrophic failures by establishing more effective monitoring:**
  1. **Know how to monitor your system**
  2. **Know what to look for**
  3. **Recognize early signs of trouble**
- **Avoid water treatment problems:**
  1. **Discover how to spot trouble early**
  2. **Find out how to select the best water treatment program and vendor for your needs**

Agenda:

• Chiller Types: Construction & Operation, Compression vs. Absorption (Refrigerants used; Compressors; Purge units) • Condensers (Air cooled; Water cooled) • Chilled Water System (Pumps; Temperatures; Flow rates; Water chemistry; Terminal units; Glycol fluids) • Condenser Water System (Pumps; Temperatures; Flow rates) • Cooling Towers: Types, Design, & Operation (Flow rates; Heat transfer; Maintenance; Water chemistry) • Heat Exchangers • Thermal Ice Storage

FREE EPA Certification Exam Included!

Expand Your Knowledge of HVAC Troubleshooting & Repair In 5 Intense Days—
Building Maintenance Personnel Gain Expertise On the Widest Range of Units!

HVAC Technology (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 3.5 CEUs. Personalized CEU Certificate provided.

This intensive 5-day, hands-on program provides training for new service technicians, building mechanics, and maintenance personnel; as well as offering an excellent refresher for experienced personnel. This HVAC program expands our 3-day "hands-on" Air Conditioning and Refrigeration seminar by adding training on heating systems, including forced air furnaces and rooftop packaged systems, air movement and balance, fans, filters, pilot burner systems and flame safeguard devices. This seminar can be customized in our on-site program to provide cross-training specific to the units your team works with every day.

HANDS-ON

You will learn about:

- **The fundamental principles of heating and air conditioning**
- **Operation and maintenance of heating and air conditioning systems**
- **Mechanical and electrical troubleshooting procedures and practices**
- **Refrigerant theory, including up-to-date information on new refrigerants**
- **Service practices that save time and money on the job site**
- **Use of refrigeration service equipment, including recovery machines, vacuum pumps, and electronic scales**
- **How to troubleshoot flame safeguard devices, including thermocouples and flame rods**
- **Reading schematic diagrams of installation and control wiring for heating and cooling systems**

Expand Your Troubleshooting Skill Set —

Fundamentals of Pneumatic Comfort Controls

(On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

This 3-day seminar provides a thorough treatment of devices commonly utilized in Comfort Control Systems including theory and basic operation of pneumatic thermostats, receiver-controllers, relays, dampers, valves and pneumatic actuators. It also covers calibration and maintenance.

You will learn:

- **Pneumatic control systems**
- **Pneumatic system components**
- **Pneumatic stat applications**
- **Single input receiver controllers**
- **Dual input receiver controls**
- **How to read control drawings**
- **The basics of direct digital control**
- **Theory and basic operation of component devices used in pneumatic temperature control systems**
- **The language or standard terminology of this technology**
- **Proper calibration technique for thermostats and receiver-controller systems**
- **How to determine proper dual input controller settings and much more**

Learn by doing!
HANDS-ON

Partial Agenda:

• Fundamentals of Air Conditioning • The Pneumatic Supply System • Pressure Regulators • Thermostats • Final Control Assemblies
• Relay and Switches • Receiver-Controller Systems • Automatic Control Systems • Basics of Direct Digital Control

Learn the Basics of Hydraulics & System Troubleshooting—

Hydraulic Training

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

Whatever your fluid power applications, this 3-day seminar will increase your knowledge of basic hydraulics, make you a better troubleshooter, and lower maintenance costs. 15 complete training stations, and *"Hands-On" lab groups of 3 people or less*, give you valuable personal instruction.

HANDS-ON

You will learn:

- **Basic hydraulic components, how they work, and their function in a hydraulic circuit**
- **How to reduce downtime**
- **How to read hydraulic schematics**
- **Basic skills needed to be an effective hydraulic troubleshooter**
- **To work safely with hydraulic systems components**
- **To make minor repairs by understanding the operation of various components**
- **To implement a preventive maintenance program to reduce premature system failure, and much more**

Partial Agenda:

• Principles & Laws • Pumps • Principles of Operation • Pressure Controls • Flow Controls • Directional Controls• Cylinders • Hydraulic Motors • Fluids • Auxiliary Devices • Pipe / Tubing / Hose • Transmission Lines/Fittings • Velocity and Sizing • Basic Circuits • Electro-Hydraulics • Troubleshooting

Vacuum Technology Powers Everything from Packaging to Printing, Electronics to Automation. Learn To Improve Systems Efficiency and Keep Them Up & Running!

Vacuum Technology Training (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to .7 CEUs. Personalized CEU Certificate provided.

This 1-day seminar provides the practical understanding of vacuum technology you and/or your staff need to design, install, maintain, troubleshoot, buy or specify vacuum equipment better. New vacuum technologies are being created to enable greater levels of automation in a wide variety of industries. At the same time, existing vacuum applications are being replaced by more efficient vacuum technologies. If your operation is going to run at peak efficiency, you'll need to cross-train your staff on the latest technical developments in the field. The *Vacuum Technology Training* seminar provides the updated knowledge you'll need to improve efficiency and reduce costly downtime. The *Vacuum Technology Training* text, a lab workbook, and a vacuum data book are all handy for future reference which are included with your seminar.

Should You Attend?

Whether you're an engineer, a maintenance employee or a manager, if you work around vacuum components, you need to attend this seminar. Vacuum technology is being used in an ever-increasing number of automated industries including: electronics, cleaning and polishing, food processing, materials handling, medical labs, packaging, plastics, pharmaceuticals, printing, woodworking and much more. Don't be left behind!

You will learn:

- **What vacuum is**
- **How vacuum is generated**
- **Where and how vacuum is used**
- **Where the various applications of vacuum are used**
- **How the different applications of vacuum affect cost and efficiency**
- **The advantages and differences between air-driven and mechanical vacuum pumps**

Install, Maintain & Troubleshoot Pneumatic & Electro-Pneumatic Automation Systems—

Electropneumatic Training

(On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

This powerful 3-day interactive training program will introduce you to the real world of pneumatic and electro-pneumatic control and power transmission. You will learn the full scope of compressed air production, preparation, and distribution. Through "Hands-On" learning, you will learn to apply simple gas laws, reading of symbols, and understanding of component technologies.

You will learn:

- **About all basic components of a pneumatic system, how they work, and their function within the system**
- **How to read pneumatic and electro-pneumatic schematics**
- **To develop the basic skills needed to be an effective pneumatic system troubleshooter**
- **To work safely with pneumatic system components**
- **To make repairs and implement preventive maintenance programs to reduce premature system failure, and more**

Learn by doing!

Learn Advanced Skills to Repair, Maintain and Troubleshoot Hydraulic Automation Systems!

Applied Hydraulics & Troubleshooting

(On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

Upgrade your skills in this 3-day, advanced hydraulics & troubleshooting seminar. If you're responsible for the ongoing operation of a fluid-power system, or if you manage or train workers who are, this seminar can show you what you need to know to keep systems up and running.

You will learn:

- **How to reduce downtime**
- **The symptoms and causes of hydraulic component failures**
- **To combine physical principles, component technologies, symbols, and circuit diagrams with problems such as cavitation, aeration, erratic pressure, loss of pressure or flow, etc.**
- **How to predict failure in a system**
- **To practice efficient start-up procedures, fluid maintenance, and predictive maintenance**
- **To apply theoretical knowledge by connecting and troubleshooting 19 lab simulations on state-of-the-art training stations**

Gain Electrical Safety Information Based on *OSHA Electrical Safety-Related Work Practices* Standard 29CFR 1910.331 Through 1910.335

Electrical Safety Requirements & Procedures

Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

This 2-day seminar will provide required training for employees bound by Table S-4 of the rule, and optional training for management personnel who need to evaluate their company's safety program, and the training needs of the organization's employees effectively. Table S-4 requires this training for: • Anyone working on or near energized equipment • Electrical and Electronic Engineers • Electronic Equipment Assemblers and Technicians • Electricians • Industrial Machine Operators • Material Handling Equipment Operators • Mechanics and Repairers • Maintenance/Facility Supervisors • Painters • Riggers and Roustabouts • Stationary Engineers • Welders

You will learn:

- **How to identify and control hazards**
- **Training requirements**
- **Proper use of personal protective equipment**
- **Emergency response techniques**
- **Up-to-date "best practices" in industry**

Agenda:

• Introduction to OSHA • Conducting Electrical Inspections • Hazards of Electricity • Training Requirements • Working on Energized Circuits or Parts, Lockout/Tagout • Electrical Work Practices • Personal Protective Equipment • Personal Protective Grounding • Maintenance of Electrical Equipment • Switching and Clearing Procedures • Clearance Distances • Electrical Hazards in Limited Spaces • Portable Electrical Equipment • Test Equipment

NEWLY REVISED & UPDATED

NFP 70E Requirements Included!

The Best Approach Is A Proactive Approach!

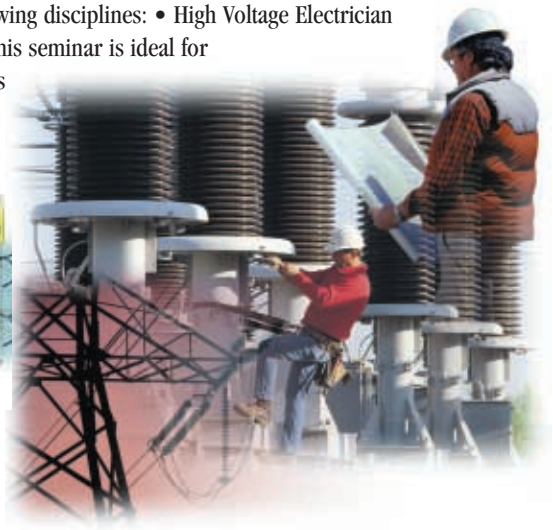
In the year 2000, 493 people died from contact with electric current according to the Bureau of Labor Statistics and a multiple of that many people have been seriously burned. The damage in human terms is incalculable. The damage done to the companies involved was disastrous. Clearly, a proactive approach to safety education is the best approach. In fact, it is estimated that a proactive model may be 6 to 10 times more cost-efficient than the reactive one.

Provide Safety Information for OSHA
Electrical Safety-Related Work Practices 29 CFR 1910.269—
Protect Yourself, Your Employees, and Your Company!

High Voltage Electrical Safety OSHA Requirements 29 CFR 1910.269

Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

This 2-day seminar will provide safety training for any employees working in the following disciplines: • High Voltage Electrician • Substation Mechanic • Line Foreman • System Operator • Apprentice • Lineman. This seminar is ideal for management, training, and compliance personnel so they may evaluate their company's safety program and identify the specific training needs of their employees. It covers • Inspection • Switching-connection and disconnection • Maintenance of lines and equipment • Testing and fault locating • Streetlight relamping



You will learn:

- **Your responsibilities according to OSHA**
- **How to define a "qualified" person**
- **OSHA training requirements**
- **Concepts of minimum-approach distances**
- **How to accomplish equipotential zone groundings**
- **The simplest, most effective way to create a safe work environment**
- **Proper use of personal protective equipment**

Special **Combination Seminar** Provides a Complete Solution at a Savings!
Get In-Depth Training On Both Electrical & High Voltage Electrical Safety!

Electrical Safety Requirements and Procedures and High Voltage Electrical Safety

MONEY SAVING • TIME SAVING
COMBINATION SEMINAR

Continuing Education Units: *For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.*

This 3-day combination seminar helps you meet mandatory training requirements with a single, comprehensive seminar. As you probably know, all qualified employees performing operations or maintenance work, or who have access to electric power generation, transmission and distribution installations must be trained according to OSHA standards. With this convenient combo seminar you'll to get the training you need to reduce liability exposure and dramatically improve on-the-job safety.—plus, you can do it at a substantial savings in both time and money as compared to taking these seminars individually!

In the Low Voltage seminar you will:

- **Identify and control electrical hazards**
- **Select and properly use appropriate personal protective equipment**
- **Understand OSHA's "Qualified Worker" requirements**
- **Explain the new NFPA 70E arc-flash requirements**
- **Properly apply OSHA's electrical safe work practices**
- **Plus much more**

In the High Voltage seminar you will:

- **Develop and apply proper High Voltage switching procedures**
- **Understand "Equipotential Grounding" and its application on the job**
- **Understand the OSHA clearance procedure requirements**
- **Explain the OSHA training requirements for High Voltage workers**
- **Understand how to safely work in High Voltage substations**
- **Plus much more**

Includes NFPA 70E Review!

Develop an Efficient, Proactive Maintenance Program—Reduce Downtime!

Maintenance Management (On-Site Only)

Continuing Education Units: For this seminar you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

In this practical, 2-day seminar, you will learn how to implement a maintenance program or improve an existing program. In the end, you will know how to reduce unscheduled overtime, excessive material costs, and the number of breakdown repairs—improving overall productivity.

You will learn:

- **How to develop, implement, and/or improve your maintenance program**
- **How to manage maintenance inventories to be most cost-effective**
- **How to evaluate current and future needs in your maintenance system**
- **How to schedule repairs and plan for emergency repairs**
- **How to manage job reporting and documentation throughout the job cycle, and much more**
- **How to effectively use maintenance management software**

Partial Agenda:

- Establish the Right Plan for Your Company
- The Preventive Maintenance Program
- Procedures
- Preventive, Predictive, and Unscheduled Maintenance
- Implementing Preventive Maintenance Systems
- Evaluating Maintenance Contribution to Productivity
- Repair Management

Arm People in Building-Related Fields With the Tools to Protect Human Life—Complying with the Code Saves Lives!

Life Safety Code® NFPA 101 Training (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

The *Life Safety Code* addresses new and existing buildings with specific requirements that directly influence the safety of people. Intended to preserve human life, observance of the Code also offers many other benefits, including protection of property and equipment. This 3-day seminar is a must for Building Inspectors, Building Managers, Facility Engineers, Safety Inspectors, Code Enforcers, Engineers, Architects, Building Owners and Insurers, Building Product Manufacturers including Fire Suppression and Alarm Systems, and anyone in a building-related field.

You will learn:

- **Intent and interpretation of the Code**
- **Key provisions impacting your facility**
- **Proper use of the Life Safety Code® manual**
- **How to calculate occupant load and egress capacity**
- **How to analyze Code compliance, and much more**

Partial Agenda:

- Fundamental Requirements
- Definitions
- Classification of Occupancy & Hazard of Contents
- Means of Egress
- Features of Fire Protection
- Building Service & Fire Protection Equipment

Learn to Troubleshoot Fire-Detection Systems—

Apply the Standards & Components to Achieve Maximum Safety & Compliance!

National Fire Alarm Code™ (NFPA 72)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

This 3-day seminar is ideal for Facility Managers and Engineers, Management Personnel, Electricians, System Installers, Plant Engineers, and anyone else who is required to competently design, implement and/or maintain fire-detection systems for maximum safety and compliance.

Revised for New Code Cycle!

You will learn:

- **How to determine which NFPA 72 chapter is applicable for a particular situation**
- **Which NFPA standard(s) require fire alarm systems to be installed**
- **How to identify various components of a typical fire alarm system**
- **To understand the differences in requirements in NFPA 72, ADA (ADAAG), and UFAS documents**
- **How to identify a 2-wire or 4-wire system**
- **How to lay out a fire alarm system using basic components**
- **How to determine proper system installation points and techniques**

HANDS-ON Learn by doing!

Learn the Latest Requirements for Installing & Inspecting Plumbing Systems—

Assure Your Compliance with Codes & Avoid Costly Reinstallations

Uniform Plumbing Code™ (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

This 2-day seminar will provide the very latest standards for installing and inspecting plumbing systems, materials, fittings, sizing of drainage pipes, venting, water distribution, septic tanks, and more.

You will learn:

- **All the most recent Code changes**
- **Regulations for plumbing materials**
- **Location requirements for sewers**
- **Prohibited fittings and practices for water heaters, sewer drainage and venting, water distribution, and gas pipe sizing**
- **Testing techniques for air, water and mercury**
- **Proper applications for private sewers, disposal systems, septic tanks, leach fields, storm drainage, and more**

Understand & Apply the International Plumbing Code®—

International Plumbing Code®

Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

Written by the Southern Building Code Conference International (SBCCI), Building Officials Code Administrators (BOCA), and International Conference of Building Officials (ICBO), the International Plumbing Code® establishes the standards for the protection of public health, safety, and welfare through the proper installation and inspection of plumbing systems. This 2-day seminar will address and illustrate the general regulations and practices for plumbing materials, required sewers, location of sewers, prohibited fittings and practices to include water heaters, sewer drainage, water distribution, and gas pipe sizing. Testing is addressed regarding air, water, and mercury techniques.

You will learn:

- **Plumbing fixtures explained, including prohibited fixtures**
- **Protection of piping, including materials and structures**
- **Support requirements, excavations, and open trenches**
- **Sizing of sewer drainage systems and sewer venting systems**
- **Gas line distribution systems, pipes and supports**
- **Illustrated water heater installations including clearance, protection from drainage and vent terminations**
- **Traps, trap seats, floor drain traps, and prohibited traps all explained, and much more**

Ensure the Safety of Your Drinking Water—

Learn by doing!
HANDS-ON

Cross-Connection Control & Backflow Prevention (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

The health concerns surrounding cross-connection control have been apparent for some time. Sickness, disease, and even death have been attributed to faulty plumbing hardware and practices. This 2-day seminar will arm Plumbers, Pipefitters, Contractors, Maintenance Personnel, Inspectors and Designers with the knowledge and awareness for good cross-connection control practices and procedures.

You will learn:

- **Plumbing hazards—what to look for**
- **Back pressure and back siphonage theory**
- **Test procedures**
- **Health issues and cross-connection**
- **Backflow prevention assemblies and methods**
- **Administrative controls, ordinance provisions, and more**

This Seminar Presents OSHA's Basic "Hazardous Energy Control" Program & More!
Provide Engineering & Administrative Controls (Lockout/Tagout) for Your Staff.

Lockout/Tagout Requirements & Procedures (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to .7 CEUs. Personalized CEU Certificate provided.

This seminar discusses the types and magnitude of hazardous energy sources, the three control methods for protecting employees from harm, engineering controls (machine guards) as well as the administrative controls (lockout/tagout) used to protect employees from injury due to the inadvertent release of hazardous levels of energy. *Lockout/Tagout* provides an in-depth look at the regulatory standard addressing lockout/tagout. This seminar is designed to meet and exceed the safety training requirements defined in the OSHA Control of Hazardous Energy standard paragraph 29 CFR 1910.147 and the lockout/tagout procedures of 29 CFR 1910.333 Selection of Work Practices.

You will learn:

- **Required LOTO program elements**
- **How to develop a lockout/tagout equipment checklist**
- **How to develop a written program**
- **Proper selection and use of lockout/tagout devices**
- **Tagout procedures and additional precautions**
- **Lockout procedures and more**

Learn How to Design and Implement Employee-Protection Programs—
Avoid OSHA Violations & Penalties...Reduce Insurance Costs

OSHA 10 or 30-Hour Training (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to 2.8 CEUs. Personalized CEU Certificate provided.

This 2- or 4-day seminar will provide the information necessary to inform and train employees properly, and to design and implement employee-protection programs.

You will learn:

- **How to become recognized by the U.S. Department of Labor as having been trained by an OSHA authorized trainer**
- **The most violated of OSHA's rules**
- **How to create a safer working environment**
- **Tips on how to avoid OSHA citations**
- **How to solve your own voluntary-compliance problems**
- **How to positively influence employee's attitudes about safety**
- **How to reduce insurance costs**

Partial Agenda:

• Introduction to OSHA (Overview of the OSHA Act, including citations and penalties, plus tips on how to avoid them) • Subpart D (Walking-working surfaces) • Subpart E (Means of egress) • Subpart G (Hearing conservation) • Subpart H (Hazardous materials) • Subpart I (Personal protective equipment) • Subpart J (Section 146: Permit—required confined spaces) • Subpart K (Section 147: Lockout/tagout) • Subpart L (Fire protection) • Subpart N (Materials handling and storage) • Subpart O (Machinery and machine guarding) • Subpart Q (Welding, cutting, and brazing) • Subpart S (Electrical) • Subpart Z (Section 1030: Bloodborne pathogens) • Inspection and Documentation (How to do a complete facility inspection and documenting results against an OSHA inspection) • Much more

Protect Your Employees from On-the-Job Electrical Hazards—
Make Sure Your Team Understands the Latest Safe Work Practices With...

NFPA 70E 2002 Edition (On-Site Only)

Electrical Safety Requirements for Employee Workplaces

Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

This 2-day seminar is a must for: Electricians, Electrical and Electronic Engineers, Maintenance Workers, Maintenance Facility Supervisors, and anyone with an exposure to electricity on the job. From the specific safety guidelines of the code, to the latest safety design requirements for utilization systems, this seminar arms your workers with the essential knowledge they need for both personal safety and compliance. The session includes: • Introduction to the NFPA 70E • Application of 70E • General requirements for electrical installations • Wiring design & protection • Wiring methods & components • Specific purpose equipment • Hazardous (Classified) locations • Special systems • Electric safe work practices • Training requirements for Qualified Persons • Personal protective equipment • Specific safety related work practices • Lockout/Tagout • Approach boundaries • General Maintenance requirements.

You will learn:

- **Essential design requirements for utilization systems**
- **The latest Safe Work Practices**
- **Training requirements**
- **Proper use of Personal Protective Equipment, including Flame Resistant Clothing**
- **General Maintenance requirements**

NTT On-Site Seminars

By scheduling NTT seminars at your location, you save on enrollment costs, travel and expenses and more. Just as important, your most valuable employees remain available in the event of an emergency. Call your NTT Representative to learn more!

Learn to Develop and Implement an Effective Confined Space Program—
Avoid OSHA Violations & Penalties

Confined Space Entry (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to .7 CEUs. Personalized CEU Certificate provided.

This 1-day seminar will provide you with up-to-date practical training that contains the information needed to develop and establish an effective confined space program, and minimize your chances of being cited for violations of this standard.

Each year approximately 1.6 million general industry workers enter confined spaces (e.g. boilers, tank cars, storage compartments, manholes, vaults, etc.). Approximately 13,000 of these workers are injured, 5,000 seriously and more than 60 die. In addition, OSHA has concluded that where multiple deaths occur, the majority of the victims in each event died trying to rescue the original entrant from a confined space. These so called "rescuers" accounted for more than 60 percent of confined space fatalities. This indicates that untrained or poorly trained rescuers make up an especially important "group at risk."

You will learn:

- **The definition of a confined space**
- **The hazards associated with confined spaces**
- **How to identify Permit-Required spaces**
- **Labeling requirements**
- **How to set up and use an entry permit**
- **Training requirements**
- **Alternative entry procedure**
- **Emergency response requirements**

THE OSHA REGULATION

29 CFR Part 1910.146 mandates that employers:

- **Identify all permit-required spaces at their facility**
- **Prevent unauthorized entry into confined spaces**
- **Develop a program to protect and train workers**

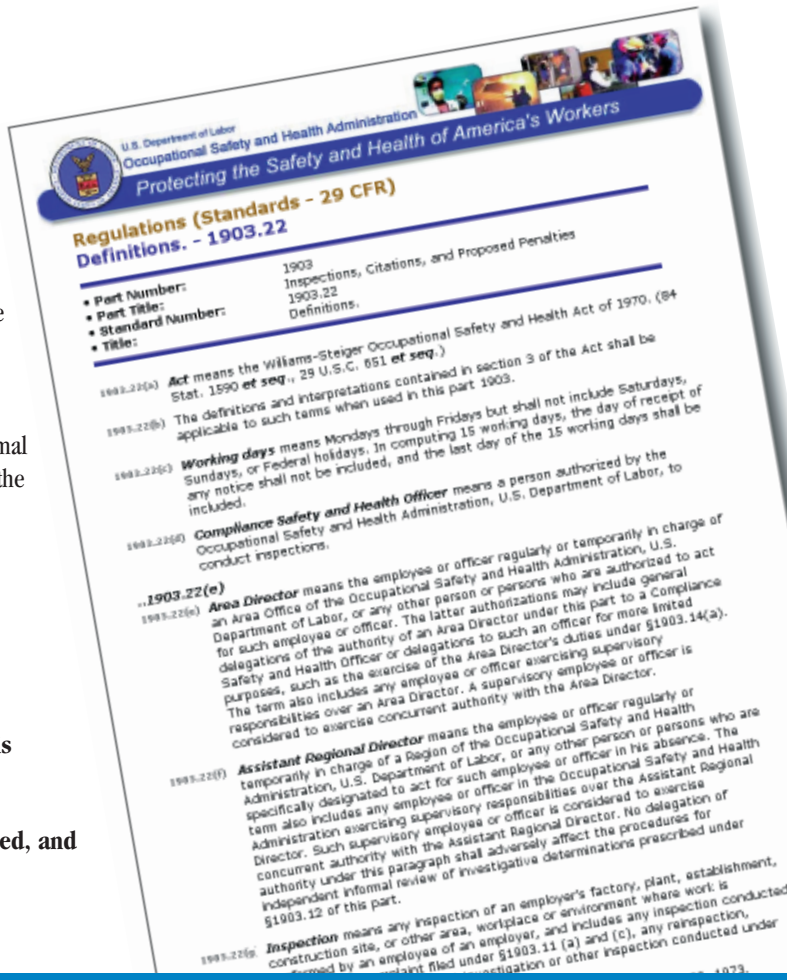
HAZCOM Remains One of the Most Cited OSHA Regulations—
Avoid OSHA Violations & Penalties!

Hazard Communications

(On-Site Only)

Continuing Education Units: For this seminar, you may receive up to .7 CEUs. Personalized CEU Certificate provided.

With a seven-fold increase in OSHA's penalty structure for violations, and a much greater emphasis on willful and multiple violations of one standard, *your company cannot afford to be out of compliance*. If you are covered by OSHA or one of the state-administered OSHA programs, then you are required to have a HazCom program if your employees are exposed to any chemicals in the workplace under normal or emergency circumstances. This 1-day seminar will give your team the knowledge to avoid HazCom OSHA violations and the fines and/or penalties that could result.



You will learn:

- **How to develop, implement and monitor an effective HAZCOM program**
- **OSHA training requirements**
- **What "OSHA's" definition of a hazardous chemical actually is**
- **Labeling requirements for employers**
- **Proper interpretation of MSDS**
- **OSHA's penalties for noncompliance, how to avoid being cited, and much more**

Learn the Full Range of Alignment Methods—
Keep Equipment Running Longer & More Efficiently!

Shaft Alignment Procedures & Techniques (On-Site Only)

HANDS-ON

Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

This intensive 2-day "Hands-On" seminar will provide you with the working knowledge to achieve alignment on two-shaft systems (e.g. motor and pump) and will emphasize the overall alignment process. You'll learn to accurately align any type of machinery in a variety of ways. Since there are advantages and disadvantages to each system, you'll receive instruction on each method, where each is best applied, as well as an understanding of the various techniques for measuring and correcting misalignment.

You will learn about:

- **The importance of alignment**
- **How to align two pieces of rotating machinery**
- **How to correct soft foot**
- **How to check runout**
- **Symptoms of misaligned rotating machinery**
- **How to recognize and correct piping induced stress problems**
- **Tools and techniques to control lateral movement of machinery**

Troubleshoot & Maintain Centrifugal Pumps—
Learn How to Stop Pump Problems Before They Occur!

Centrifugal Pumps

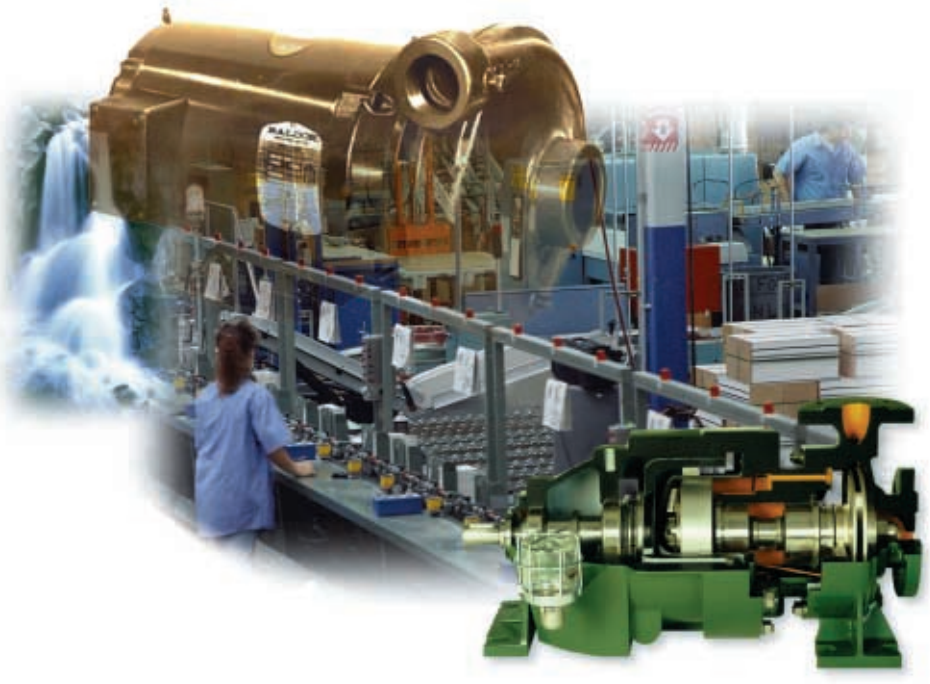
Continuing Education Units: For this seminar, you may receive up to 1.4 CEUs. Personalized CEU Certificate provided.

This intensive 2-day seminar is valuable for workers from a variety of disciplines. *Consulting Engineers* will learn the inside information on why and how pumps are designed. Design Engineers will learn more about the total picture of designing pumps than they could in 20 years of experience. *Plant and Maintenance Personnel* will learn why pumps work and what causes pump problems.

You will learn:

Day 1:

- **How pumps perform useful work**
- **How to read pump curves**
- **How specific speed governs pump designs**
- **What suction specific speed is**
- **The real design differences between major pump types**
- **How to read pump curves and understand the real importance of system curves**
- **What recirculation is**
- **How important shaft deflection is**
- **How to calculate energy costs for your pumps**



Day 2:

- **Exactly what makes up a pump's total discharge head requirement**
- **The difference between closed and open pumping systems**
- **Pump terminology**
- **How to properly install pumps**
- **How to care for bearings**
- **How to troubleshoot mechanical seal failures**
- **How to start up a new pump**
- **What causes wear**
- **How to deal with air entrainment**

Learn to Properly Install & Maintain Mechanical Drives—
Increase Operating Efficiency, Reduce Unscheduled Downtime, & Lost Production!

Mechanical Drives

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

This intensive 3-day seminar has been designed to thoroughly examine all of the common mechanical drives including belts, chains and gears. You'll also learn the role of proper lubrication; bearings; proper alignment and fastening techniques; troubleshooting; the spotting of the symptoms of failure; and selection of the appropriate remedy. The Mechanical Drives seminar offers an excellent cross-training opportunity for Plant and Process Engineers, Maintenance Mechanics and Supervisors, Machinery Designers and Field Service Personnel.

You will learn about:

- **Proper installation and maintenance methods**
- **How to determine proper tensions**
- **Correct alignment procedures**
- **The importance of proper lubrication methods**
- **Bearing selection**
- **How to spot symptoms of failure**
- **How to select the appropriate remedy**

HANDS-ON

Learn the Science of Hoisting & Rigging. Gain the Skills to Transport Materials Safely, Protecting Yourself, the People Around You & the Materials You Handle.

Fundamentals of Industrial Hoisting & Rigging
(On-Site Only)

Continuing Education Units: For this seminar you may receive up to .7 CEUs. Personalized CEU Certificate provided.

This 1-day seminar can be customized to suit the specific needs of your team. Depending on the materials your team transports, you can focus on the pertinent aspects of rigging safety, calculating the weight of the load, common hitch types, common sling types, ropes, locating the load's center of gravity, gaining a mechanical advantage, and more. By cross-training your team with this essential information, you'll create a safer, more efficient operation which may ultimately qualify your company for lower insurance premiums via improvements in its safety record. By arming your employees with hoisting and rigging knowledge you may also face less OSHA and MSHA scrutiny as well! Whether you work in mining, electrical facilities maintenance, railroads, construction, the military, the forest service, a fire department, lumber mill, or even in rope rescue, the practical knowledge gained by attending Industrial Hoisting & Rigging will deliver a tangible improvement in on-the-job performance. **Plus:** get a copy of the I*ndustrial Hoisting and Rigging* text, and Newberry's 128-page *Handbook for Riggers*—two great reference resources for future use!

You will learn:

- **Rigging safety**
- **Proper load weights**
- **Load balancing**
- **Lifting odd shapes**
- **Rigging hardware**
- **Sling materials**
- **Hitches**
- **Different ropes**
- **Environmental factors**
- **Safe crane usage**
- **Alternative lifting devices and more**

Master the Complete Range of Welding Practices and Procedures—
Increase Your Proficiency...Broaden Your Capabilities!

Welding Practices & Procedures

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

This intensive 3-day seminar provides a one-of-a-kind opportunity for welding operators, technicians and supervisors to learn more about the maintenance process. The focus is on applied metallurgy, welding process applications, and related safety. This comprehensive seminar is ideal for improving the skills and on-the-job expertise of a wide range of personnel including: inexperienced welding operators, experienced welding operators in management positions, and anyone else working in a plant or equipment maintenance position where welding repairs are required.

You will learn about:

- **Shielded metal arc welding**
- **Gas metal arc and flux cored arc welding**
- **Gas tungsten arc welding**
- **Oxy-acetylene welding, flame cutting and gouging**
- **Air carbon-arc gouging**
- **Plasma arc cutting and gouging**
- **Welding and cutting safety (meets OSHA standards)**
- **Troubleshooting weld defects**
- **Controlling weld quality**
- **Understanding metals**
- **Repair welding principles**
- **Repair welding procedures**
- **Equipment preventive maintenance**

Understand the Terminology and Installation Techniques Involved With Pipefitting—

Pipefitting Installation & Maintenance (On-Site Only)

Continuing Education Units: For this seminar, you may receive up to .7 CEUs. Personalized CEU Certificate provided.

Piping systems carry vital fluids to plant machinery: heating, cooling, lubrication, etc. This 1-day seminar will provide training on the proper care, installation, and maintenance that will improve the life of machinery and the piping system. You'll learn about the latest developments in the industry with regard to tools and techniques as well. You'll get the skills you need to decrease downtime; increase productivity, and add money to your bottom line.

You will learn:

- **National and international standards**
- **Expansion joints**
- **Piping diagram symbols**
- **Valve installation and maintenance**
- **Gasket materials**
- **Threaded pipe joining compounds**
- **Calculating offsets**
- **Piping supports and hangers**
- **Advantages and disadvantages of plastic piping**
- **What's new in the industry**

Maintain Your Own Fiber Optic Network—

Learn the Skills to Minimize Network Downtime!

Fiber Optic Training (On-Site and Accredited Tuition Reimbursement Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.

HANDS-ON

This powerful 3-day seminar is designed for you to take control of your communications optic networks. The objectives are accomplished by using state-of-the-art test equipment and a "Hands-On" approach that makes retaining material far easier than with any other method.

You will learn:

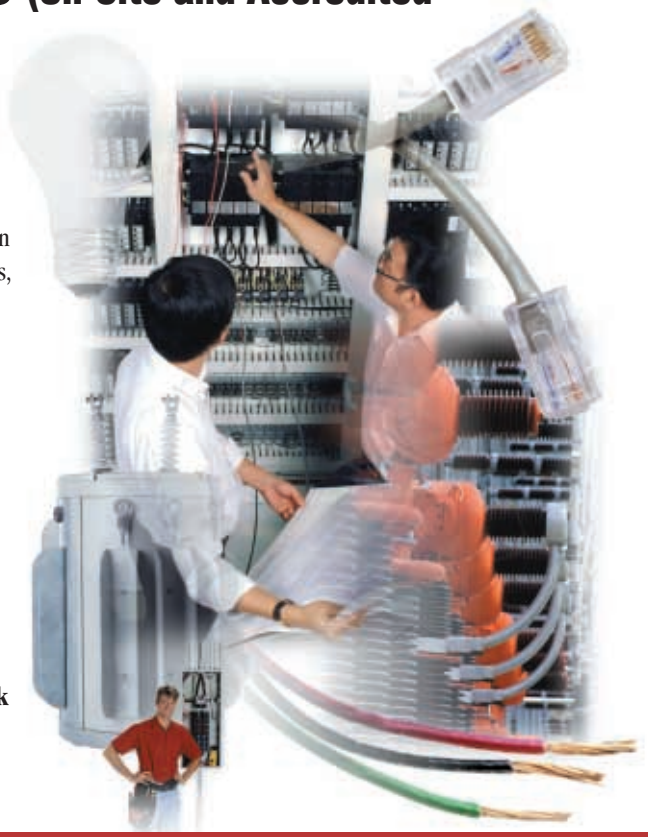
- **Techniques for terminating and splicing fiber**
- **Testing and troubleshooting**
- **Installation techniques**
- **To install, test, and certify fiber optic networks correctly**
- **The ins-and-outs of design considerations and specification requirements**
- **Test equipment: OTDRs, power meters/light sources, microscopes and continuity testers**
- **Budget/loss analysis techniques for fiber optic circuits**
- **Time and money saving installation tips**

Learn About Analog & Digital Telecom Systems—

Understand How to Spec & Monitor Contract Services!

Telephony & Communications (On-Site and Accredited Tuition Reimbursement Only)

Continuing Education Units: For this seminar, you may receive up to 2.1 CEUs. Personalized CEU Certificate provided.



This intensive 3-day seminar includes an introduction to analog and digital concepts, networks, business communications systems, signaling and switching. It has been designed for individuals new to the telecommunications industry or in positions requiring a basic knowledge of voice and data communications systems, networks and terminology; or those who need to understand current networking alternatives and the impact on business decisions and opportunities.

You will learn:

- **Electrical principles of the telephone network**
- **The loop: its components and characteristics**
- **Principles of analog transmission**
- **Principles of digital transmission**
- **Network architecture**
- **Transmission systems and mediums**
- **Central office functions**
- **Radio and wireless communications**
- **How to apply the latest communications technologies to your network**
- **How to evaluate and eliminate common problems with technologies, system setup and component interoperability**
- **How to analyze future telecommunications innovations**

NTT Expansion Campus of Red Rocks Community College—

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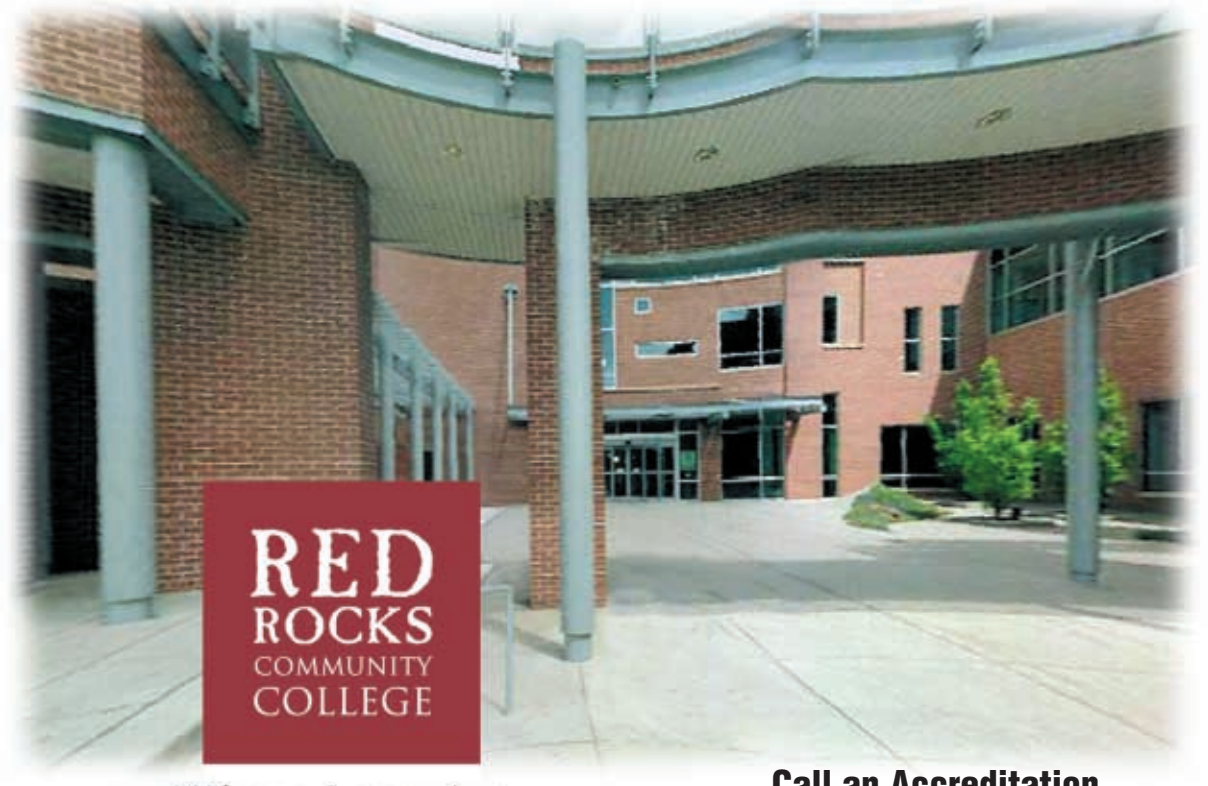
Complete Selected Courses and

Earn an Associates Degree in Applied Technology!

Earn College Credits

Red Rocks Community College and NTT Extension Campus have partnered to offer college credits for selected courses. Unlike programs offering *recommendations* for credit through ACE (like those programs offered by most other technical training companies), Red Rocks Community College/NTT Extension Campus courses earn you *college credits* you can use to earn an ***Associates Degree in Applied Technology***.

When enrolling for an accredited course, NTT will provide your Red Rocks Community College registration form in the classroom. You will be automatically enrolled in Red Rocks Community College. Since you will be officially enrolled in the college, you may be able to transfer credits from any Red Rocks Community College/NTT Extension Campus accredited course to another qualifying degree program. Likewise, college credits you have already earned elsewhere may be eligible for transfer to the Red Rocks Community College degree program. In order to earn the Applied Technology Associates Degree, students must take a minimum of 15 credit hours through Red Rocks Community College/NTT Extension Campus and complete all requirements of the degree program. In addition, you may qualify for Tuition Assistance. Call today to find out about this exciting offer.



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Call an Accreditation Account Manager at

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to find out more information.

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Make address corrections below as required.

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SEMINAR REGISTRATION

(See seminar schedule located at the center of this catalog for pricing, locations, dates and times.)

☐ **Public Seminar:** Title	Location	Date	# of Enrollees	Fee
Phone (_____)_____ Best time to call _____:_____ ☐ am ☐ pm				**Total $**

ENROLLEE NAMES

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☐ Invoice Company: PO Number_____ Attention: _____

☐ Credit Card: ☐ Visa ☐ American Express ☐ MasterCard

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☐ This confirms a telephone registration. Transaction Number _____

☐ Check is enclosed for $_____

Fees are payable **In Advance**. Please make checks payable to: National Technology Transfer, Inc. A company purchase order will reserve space(s) in the seminar until two weeks prior to class.

Terms and Conditions

Registration Policy:

Not sure of your schedule? Don't let that stop you from reserving your space. **Register Now!** If your schedule changes, you may move to a different seminar or send a substitute at no charge. Cancellations received up to one calendar week before the seminar are refundable, minus the $50 registration fee. After that, seminar fees are not refundable, but can be credited to a future seminar. If you must cancel, be sure to request a cancellation number. The $50 registration fee will be retained for all cancellations and no-shows.

Continuing Education Units (CEUs):

Continuing Education Units may be recognized by your professional board. Contact your board to find out what is required, or, call our State/Board Certification Administrator at 1-800-363-7758 ext. 257 if you have any questions on approved seminars.

SEMINAR INFORMATION REQUEST

☐ **On-Site** ☐ **Accredited Training (Name):** _____

Mail this form with payment to: National Technology Transfer, Inc., P.O. Box 4558, Englewood, CO 80155-4558

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NTT

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If you feel that you did not receive the value you expected from any NTT seminar, your enrollment fee will be returned. No strings attached.

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