

# Powering industry through education



*Powering Business Worldwide*





**Houston, Texas, USA**



**Pittsburgh, Pennsylvania, USA**



**Peachtree City, Georgia, USA**

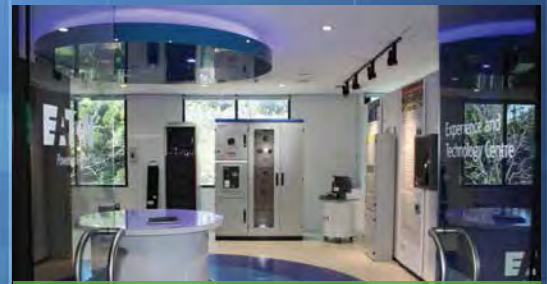


**Raleigh, North Carolina, USA**

Eaton's Experience Centers provide a global education solution with the unique ability to enable customers with hands-on training in multiple application environments, Eaton created first-of-its-kind Experience Centers located across the globe.



**Dammam, Saudi Arabia**



**Mascot, Australia**



**Singapore**



**Seoul, South Korea**



# Powering industry through education

To provide a global education solution with the unique ability to enable customers with hands-on training in multiple application environments, Eaton created first-of-its-kind Experience Centers located across the globe.

Our market-specific demonstrations empower customers to experience products within a solution-based application. With applications that step customers through the power management process from generation all the way down to the receptacle, Eaton Experience Centers focus on “pulling back the curtain” to give customers an opportunity to see the impact of their projects from a broad perspective and dive into operation of products, understanding the design, technology and installation practices of a product within that application.

**The Experience Center in Houston provides a global education solution with the unique ability to give visitors hands-on training in a true application environment.** The facility offers world-class industrial training in an innovative 55,000-square-foot facility representing a manifestation of global trends within the industrial space. In addition to live application installations, the facility features multiple training rooms all designed to help facilitate industry-specific education and hands-on demonstrations of Eaton's entire line of electrical products and solutions from a proven industry leader.

#### Visitors to the Experience Center can:

- Learn through a broad offering of training courses within numerous markets that deliver technical expertise
- Experience hands-on training with over 10,000 products in true application
- Earn CEUs and PDHs through certified training courses
- Participate in professional training by industry-leading organizations in areas such as code and standards, hazardous area safety requirements and industry certifications
- Consult with Eaton product experts to customize training courses specified for your needs
- Test and observe Eaton products live and analyze results
- Create working environment issues that allow you to view Eaton's products in action
- Utilize application environments to verify competencies
- Address knowledge gaps within your organization through training designed for seasoned and new engineers



# From live applications...

## 1. Petrochemical refinery

The downstream application area demonstrates explosion-proof power distribution, life safety solutions and instrumentation within a hazardous classified area. The refinery displays products installed in true application representing both US and international installation practices. The petrochemical refinery provides design build engineers and facility operators an opportunity to enhance competencies while developing a broad understanding of the downstream market.

## 2. Upstream drilling and production rig

The upstream offshore drilling rig is aligned to global industrial and maritime standards demonstrating integrated life safety and communications and process control power distribution equipment. The upstream offshore platform illustrates comprehensive weight and power savings solutions to mitigate downtime, while offering increased safety systems to protect critical assets. This comprehensive and interactive application vignette enables hands-on practices for operators and multitude of engineering disciplines.

## 3. Utility

The utility and power distribution environment, steps visitors through a complete electrical grid, from generation to the meter. The hands-on application develops foundational understanding of a complete electrical infrastructure, from medium voltage switchgear, capacitors, and voltage regulation, to advanced system automation.

## 4. Medium and low voltage industrial power distribution

Constructed to arc-resistant design with enhanced safety options, the medium voltage switchgear showcases vacuum technology and intelligent racking capabilities of power components; while the low voltage switchgear utilizes automatic transfer capabilities with active monitoring and controls. From across the line to intelligent variable frequency drive control, the low voltage and medium voltage motor control centers allow for programming and component level interaction. Specifying engineers can understand construction and operator needs while operators can test competency and explore arc flash safety, space-saving solutions, and communication systems.

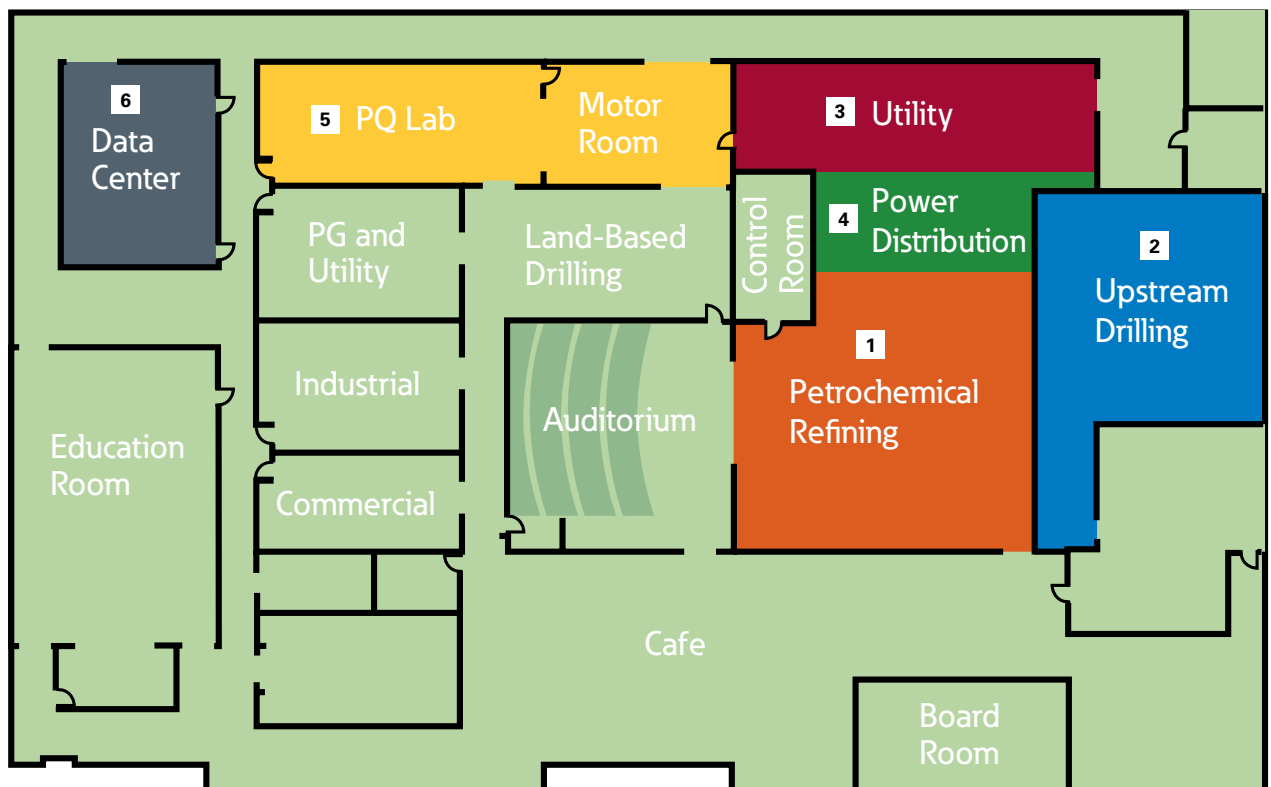
## 5. Power quality lab and motor room

The power quality lab provides live demonstrations for a wide range of power quality solutions through training and testing for both commercial and industrial power systems. Real-time demonstration of surge events, harmonics, sags are captured and displayed utilizing fast transient detection monitoring systems. Industry topics such as basic power and energy fundamentals, bonding and and control systems grounding, power factor, coordination, control systems can be explored and visualized. Visitors can also witness system solutions such as studies, power factor correction units, specialty transformers, active filters, motor and load control.

## 6. Data center

The full-scale data center features hot aisle containment and racking, above and below floor cable management solutions, back-up power, and co-location and secure area construction. It is electrically integrated with the power quality lab, enabling advanced situational testing and demonstration of facility wide power consumption and protection. Typical data center architecture allows commercial and industrial end-users to find layout facility specific solutions for backup power conditioning. The application vignette ranges from three phase commercial UPS with active IGBT rectifier and double conversion construction to ePDUs utilizing plug level monitoring and control capabilities.

The Experience Center in Houston provides a global education solution with the unique ability to give visitors hands-on training in a true application environment.



# ...to real world training



**1. Petrochemical refinery**

#### Downstream codes and standards

Foundational to advance training on the National Electrical Code with a primary focus on electrical, mechanical and hazardous area identifications.

#### Life safety and communications courses

In-depth understand of life safety through electrical safety terminology and methodology, applying principles to any electrical system.

#### Process control and instrumentation

Overview of process control environment including instrumentation, electrical distribution, and remote monitoring within downstream petrochemical applications.

#### Power distribution and protection

Overcurrent protection courses with reference to overcoming code related design issues, industry trends, improving system design and cost saving solutions.



**2. Upstream drilling & production rig**

#### Upstream offshore codes and standards

Development of foundational to advance understanding of international offshore standards with primary focus on electrical distribution systems and hazardous area identifications.

#### Structural supports and infrastructure

Design and application considerations for minimizing project costs, engineering requirements, and weight within upstream and offshore assets.

#### Automation and controls

Foundational to advance training for process control environments, including instrumentation, electrical distribution and remote monitoring.

#### Power distribution and motor controls

In-depth knowledge of power distribution, switchgear, and motor starting within an upstream, offshore asset.



**3. Utility**

#### Power quality

Hands-on exploration of voltage regulation and power factor through transmission systems for utility applications.

#### Substation and power distribution

In-depth training on design, build, and layout development for electrical houses and substations.

#### Medium voltage transformers

Understanding of varying types of transformers, design considerations, protective relays and maintenance procedures.

#### Protective devices and control systems

Overview of power systems analysis and smart grid fundamentals training through energy regulations and technology.

## Over 75 training courses available in these categories



**4. Power distribution**

#### System monitoring and data collection

Courses focused on the methods of metering and predictive diagnostics for switchgear and motor controls.

#### Operational techniques

Hands-on training for operation of components from medium voltage distribution to low voltage equipment.

#### Automation and remote control

Understanding of intelligent power distribution equipment and enhanced safety capabilities with PLC and HMI configurations.

#### Electrical safety

Wide range of courses focused on understanding industry standards in relation to personal protection and safety.



**5. Power quality lab & motor room**

#### Power quality

Fundamentals of the most common power quality issues, including sag, surge, undervoltage, noise, switching transients, and harmonic mitigation.

#### Motor starting fundamentals

Basics of motor starting characteristics and different methods of starting motors, including across the line starting, soft starting, variable frequency drives, motor control centers and systems.

#### Low voltage power distribution

Understanding power distribution and the potential devices feeding various loads utilized in a system.

#### Electrical safety

Stepping through electrical safety terminology and methodology and applying principles to any electrical system.



**6. Data center**

#### Back-up power fundamentals

Overview of redundant systems and energy efficient solutions for three phase and single phase UPS and transfer switches.

#### Effects of voltage variations

Understanding the effects of source power for data center applications, including generator, sags and outages.

#### Architectural and design practices

Hands-on demonstration of cable management practices, including air flow management and area layouts.

#### Monitoring and communications

In-depth training for monitoring and managing building systems from branch circuits down to load balancing and control.

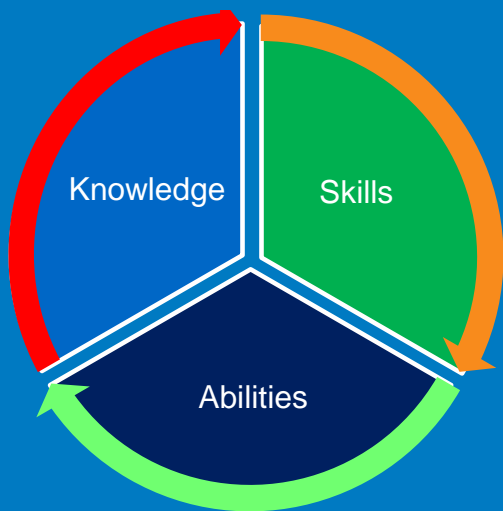
# Industry certifications

Eaton Experience Centers courses and customized training programs can significantly reduce cost and the potential for catastrophic events, ensuring that everyone involved in hazardous-area design, installation, maintenance or management has the required knowledge to ensure compliance and most importantly...**safety**.

## What is CompEx?

CompEx, or competency in explosive atmospheres, is the global solution for validating core competency of employees and contract staff of major users in the oil and gas and industrial markets. It was designed and developed by industry for industry in 1994 to provide a validation ensuring personnel have the knowledge and skills to specify and work within explosive atmospheres.

Each course utilizes comprehensive hands-on sections to validate and test students capabilities.



### ExF NEC & IEC Hazardous Area Foundations

The Ex Foundation courses are suited for anyone involved in the hazardous area industry. The training is designed to provide companies a method to raise hazardous area awareness for their employees. Foundation courses available for IECex, NEC 500, and NEC 505

### NEC 500/API RP 14 F

The NEC500 Ex01-Ex04 combines an underpinning knowledge and practical assessment program, provided for electrical personnel who undertake the physical installation and assembly of new "Ex" equipment, and who perform preventive maintenance and inspections on previously installed equipment. This is very similar to standard EX01-04 program although it additionally covers the NEC 500 Code of Practice for Division 1 and 2 locations.

### NEC 505/API RP 14 FZ

#### Ex01 – Ex04 – NEC Electrical & Instrumentation Assessment

The NEC505 Ex01-Ex04 combines an underpinning knowledge and practical assessment program, provided for electrical personnel who undertake the physical installation and assembly of new "Ex" equipment, and who perform preventive maintenance and inspections on previously installed equipment. This is very similar to standard EX01-04 program although it additionally covers the NEC 505 Code of Practice for Zone 0, 1 and 2 locations.

### Ex 01 – Ex04 – IEC Electrical & Instrumentation Assessment

The Ex01-Ex04 combines an underpinning knowledge and practical assessment program, provided for electrical personnel who undertake the physical installation and assembly of new "Ex" equipment, and who perform preventive maintenance and inspections on previously installed equipment.

### Ex11– Mechanical

Ex11 meets the competency requirements for EN 13463 Parts 1, 5 and 6 for operatives working with mechanical equipment. Since the introduction of ATEX (& DSEAR), users must identify all possible ignition sources that could arise in hazardous areas, including non-electrical (mechanical) items of equipment. The safety measures for non-electrical equipment used in hazardous areas include not only the design of equipment, but also those aspects required for safe selection, installation, maintenance, inspection and repair.

### Ex12 – Design

The Ex12 CompEx course is intended to give an in-depth awareness to the candidate with regard to explosive atmospheres formed by gases, vapors, mists and combustible dusts. It covers the application design and selection of electrical equipment, along with the electrical requirements of IEC 60079-14: Electrical installations design, selection and erection; this includes but is not limited to, the selection of designed equipment, cabling and cable glands, etc. Designed specifically for designers and applications engineers.

### EMT015—Electrical Inspection Fundamentals course

The Electrical Inspection Fundamentals course introduces the student to techniques used in the inspection of electrical equipment installations. The student will be given a familiarization of general inspection concepts and processes necessary to interpret common electrical and classified area drawings. The course includes a practical overview of principles and techniques used in the identification of hazardous areas, appropriate equipment installation and visual inspection methods.

# Need training tailored to your needs?

Eaton's Experience Centers offer a wide range of training courses for industry codes and standards, products and solutions for a variety of markets. Through classroom, hands-on and live application training environments, the Experience Centers provide a global training solution to address knowledge gaps and power industry through education. In addition to our regularly scheduled courses, we offer customized training opportunities designed to fit your specific needs

## Who should visit?

Facility managers

Consultants

Owners

Executives

Distributors

Contractors

Operators

Engineers

Students

The Eaton Experience Center - Houston welcomes more than 10,000 visitors every year from all industries.

- Commercial
- Data center
- Education
- Electric transportation infrastructure
- Electric utility
- Government and military
- Healthcare
- Industrial
- Mining and minerals
- MOEM
- Nuclear
- Oil and gas
- Residential
- Solar
- Wind



# VISIT TODAY!

Contact us about visiting  
Eaton's Experience Center in Houston

**Email:** [eechouston@eaton.com](mailto:eechouston@eaton.com)

**Online:** [www.eaton.com/eechouston](http://www.eaton.com/eechouston)



We look forward to seeing you soon.

The Eaton Experience Center–Houston  
3413 North Sam Houston Pkwy W  
Houston, TX 77086

[Eaton.com/experience](http://Eaton.com/experience)