



Content
Community
Connection

United States
The Electricity Forum Inc.
742 Pre Emption Road
Geneva, NY 14456
Tel 289-387-1025

Canada
The Electricity Forum
1885 Clements Rd, Unit 218
Pickering, ON L1W3V4
Tel 905-686-1040
Fax 905-686-1078
Toll Free 855-824-6131

Electrical Grounding For Oil and Gas Applications

[View Course Details](#)

COURSE DATES AND TIMES

The Oil & Gas sector relies on the efficient transportation, handling, and processing of many hazardous and highly flammable chemical products. These operations generate hazardous levels of static electricity. The first line of defence for catastrophic ignition and explosions is proper grounding & static control measures.

Grounding is defined as electrical equipment connected directly to earth, or to some conducting body that serves in place of the earth, such as the steel frame of an oil drilling platform. Proper grounding is essential for safely and reliably operating electrical systems. Improper grounding methodology can lead to disastrous results from both an operational and a safety standpoint.

There are many different categories and types of grounding principles. This course covers proper grounding techniques for medium- and high-voltage systems, as well as low-voltage Instrument and Control Systems (IACS), which have been proven safe and reliable in process control facilities.

The increased use of electrical and electronic equipment introduces the risk of electromagnetic interference (EMI) problems to operations and performance.

As systems are added, they all contribute and could become susceptible to an intense electromagnetic environment (EME).

Controlling Static Hazards is the key to preventing combustible cloud explosions.

After Attending, You Will Have a Better Understanding of:

- Classification Of Various Oil & Gas Grounding Standards. Codes And Rules
- How to Comply with Oil & Gas Specifications
- How to Comply with Canadian Oil & Gas Safety and Health Administration Specifications

- Oil & Gas Emergency Power Systems
- Petrochemical Storage Tanks Grounding
- Vessels Grounding
- Data Highway grounds
- Logic Manager Grounds
- Cabinet Ground Connections
- Explosion Protection grounding
- Floating, Semi-submersible & Sea Floor Structures Grounding
- Cathodic Protection
- External & Internal Lightning Protection
- Field Transmitter Grounding
- Grounding for Static Electricity Protection

WHO SHOULD ATTEND

- Oil & Gas Electrical Engineers and Engineering Technicians
- Offshore Oil Installation Engineers & Technicians
- SCADA System Engineers/Technicians
- Oil & Gas project Engineers and Supervisors
- Oil & Gas design electrical Engineers
- Oil & Gas Engineers responsible for the engineering, design, construction, installation, inspection, operation, or maintenance of electrical grounding systems in Oil & Gas applications
- Oil Platforms Engineers/Technicians

STUDENTS RECEIVE

- Electrical Grounding for Oil and Gas Applications Course Certificate
- 1.2 Continuing Education Unit (CEU) Credits (12 Professional Development Hours)
- 100-Page Digital Electrical Grounding Handbook - Value \$20 (details below)
- A FREE Magazine Subscription (Value \$25)
- \$100 Coupon toward any future Electricity Forum event (restrictions apply)
- Course materials in PDF Format

COURSE OUTLINE

Electrical Grounding For Oil and Gas Applications Course Outline

DAY ONE

SESSION 1: ELECTRICAL GROUNDING – SCOPE

- Definitions
- Applications
- Grounding methods
- Ground Faults
- Why Ground Circuits and Systems
- Grounding Systems

SESSION 2: CLASSIFICATION OF VARIOUS GROUNDING STANDARDS. CODES AND RULES

- API (American Petroleum Institute)
- ASTM (American Society for Testing and Materials), AASHTO,
- AGA (American Gas Association),
- AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
- ANSI/IEEE
- ANSI, ASCE, ASHRAE, ASME, ASSE/SAFETY, ASTM, AWS (optional), AWWA, CTI, DNV, GPA, ICC, IEEE, IESNA, ISA, MSS, NACE, NEMA, NFPA, PFI, SAE, SSPC and UL

SESSION 3: ELECTRICAL GROUNDING ELECTRODE SYSTEM

- Grounding Theory
- Parameters, Measurements, and Calculations
- Types of grounds: Dirty Ground/Clean Ground
- Connecting IACS to the ground bed
- Star Point Ground, single point connection
- How not to ground
- Electrical Grounding and Corrosion
- Installation and Protection
- Sizing the Grounding Electrode Conductor

SESSION 4: CIRCUIT GROUNDING

- Sources of electrical power
- Grounded Conductor
- Direct-Current Systems
- Alternating-Current System
- Solidly Grounding System
- Resistance Grounding
- MCC's-Motors grounding
- Rigging Shore Power
- External source through shore power cables

SESSION 5: EQUIPMENT BONDING & GROUNDING

- Major Requirements:
- Identification of the Bonding Conductor
- Bonding/Grounding and Electric Shock
- Equipment cabinets and hardware items
- Ground returns & machine grounding
- Pipelines containing gases or flammable liquids
- Grounding of arc welding & cutting machines
- Storage Tank's grounding
- Overall Petrochemical plant's proper grounding

SESSION 6: EMERGENCY POWER SYSTEMS

- Proper grounding of emergency power systems (generators)
- Three-Pole emergency generator grounding
- Four-Pole emergency generator grounding.
- Main Bonding Jumper
- Portable generators
- Vehicle-Mounted Generators

DAY TWO

SESSION 7: STATIC HAZARDS

- The hidden dangers in hazardous areas
- Static discharge ignition of combustible atmospheres.
- Static in liquids
- Electrostatic charging of hoses
- Static grounding protection guidelines for tank trucks
- Road tanker filling & emptying
- Mobile grounding for vehicles
- Railroad filling & emptying
- Mixing & blending
- Plastic drums and containers in hazardous areas
- Vehicle-mounted static grounding verification systems.
- Vehicle refueling

SESSION 8: LIGHTNING PROTECTION FOR OIL INSTALLATIONS

- Electrical Grounding & Lightning
- Characteristics of Protection Systems
- Electrogeometric & Rolling Sphere Concept
- NAVFAC Design Guides

- Ordnance Facilities Protection
- Storage and Handling Facilities Above Ground
- Earth-Covered Magazines
- Cranes on Piers and Wharves
- Marshalling Yards (Truck and Railroad)
- Explosives safety requirements
- Transient Overvoltage Protector Grounding
- Gas Tubes Metal Oxide Varistors Silicon Avalanche Diodes

SESSION 9: ELECTRONIC EQUIPMENT GROUNDING

- Introduction and Definitions
- Computer and Electronic Equipment Grounding
- Telecommunication Rooms and Closets
- Data Processing Equipment
- Grounding Electronic Security Equipment Grounding

SESSION 10: TELECOMMUNICATIONS GROUNDING IN PETROCHEMICAL PLANTS

- Grounding Subsystems
- Exterior Ground Ring
- Interior Ground Ring –
- Field transmitter grounding
- Techniques for floating transmitters
- Single-point grounding system
- Equipment & Cabinet grounding

SESSION 11: EMI ON ELECTRONIC CIRCUITS

- Susceptibility - Immunity
- Cable Shielding and Grounding
- Losses by Absorption and reflection
- Grounding Low- and High-Frequency Shielding
- Grounding High-frequency Shielding
- Coaxial Cables
- Superficial Resistivity
- Resonance and Skin Effect

SESSION 12: TWO CASE HISTORIES:

- Electrical Grounding in Petrochemical Plants

Review of expectations
Questions and Answers

COURSE SCHEDULE

Both days:

Start: 10:00 a.m. ET

Finish: 4:30 p.m. ET

Contact us Today for a FREE quotation to deliver this course at your company's location.

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