



CSA INTERNATIONAL



CSA LEARNING CENTER

Factory Mutual Research

FM Global Affiliate

INFO

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October 31 & Nov 1, 2002
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1125 Boston Providence
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19331
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CLEVELAND

November 14 & 15, 2002
CSA International Offices
8501 East Pleasant Valley Road
Cleveland, Ohio 44131-5575
Tel: (216) 524-4990

ORLANDO

November 18th & 19, 2002
Hilton Garden Inn Orlando
Airport
7300 Augusta National Drive
Orlando, Florida 32822
Tel: (407) 240-3725

**Additional
Hazardous Locations
seminars planned
for 2003**

IRVINE

February 6 & 7, 2003

HOUSTON

February 10 & 11, 2003

CHICAGO

March 6 & 7, 2003

MILWAUKEE

March 10 & 11, 2003

Design, Installation and Maintenance
of Electrical Equipment in

HAZARDOUS LOCATIONS

A 2-day seminar presented by
Factory Mutual Research and CSA International

**If you design, install or operate electrical equipment
in hazardous locations - this seminar is for you.**

A solid prevention program based on risk management techniques requires that you can identify the hazards that may lead to accidental explosions. Learn to minimize the risk of ignition as you focus on designing and building safer equipment and installations that conform with the applicable regulations and legislated requirements.

YOU WILL LEARN:

- How and why hazardous locations are classified.
- Protection techniques for Classes, Divisions, and Zones in North America and Globally.
- When and how to comply with the ATEX Directive.
- NEC Classifications of combustible dusts, ignitable fibers and flammable gases, liquids, and vapors.
- Which standards meet your certification needs.
- Construction and performance requirements based on the protection techniques.
- Wiring methods and other installation concerns covered by the NEC®.

CSA INTERNATIONAL, FACTORY MUTUAL RESEARCH
AND FM GLOBAL
CUSTOMERS

SAVE UP TO \$100

BY REGISTERING ONE MONTH PRIOR TO THE SEMINAR DATE.

FOR MORE INFORMATION OR TO REGISTER,
CALL

1-800-463-6727

HAZARDOUS LOCATIONS

JOIN US FOR AN INFORMATION-PACKED TWO DAYS

DISCOVER HOW YOU CAN:

- Take steps to reduce accidents and liability.
- Cut costs while taking advantage of the new methods of protection, including the wider choice of equipment available for your installations.
- Identify and meet applicable government regulations.
- Protect your installations using a combustible gas detection system.
- Gain wider accessibility to global markets.
- Tailor your installations to the Zone System of classifications.

**AS A DESIGN ENGINEER OR EQUIPMENT
MANUFACTURER YOU WILL UNDERSTAND HOW TO:**

- Comply with National and International standards in your design and manufacturing process.
- Manufacture and test for all methods of protection.
- Obtain the certification your products need for access to global markets.

**AS AN INSTALLER, MAINTENANCE PERSON OR PLANT
MANAGER, YOU WILL UNDERSTAND HOW TO:**

- Cut costs and improve safety by taking advantage of the new methods of protection.
- Work within the new three Zone System of classification and understand how this changes the type of equipment available to you for installation.
- Eliminate many seals under the new system.
- Use National and International Standards to guide you in the selection of wiring.
- Protect your installations using a combustible gas detection system.

ADDITIONAL BENEFIT TO ATTENDEES...

- Receive a certificate of completion, and Continuing Education Units (CEUs).

Who should attend:

- Engineers
- Consultants
- Contractors
- Regulators
- Manufacturers
- Designers
- Maintenance Personnel

Plus... Anyone responsible for identifying, approving, or purchasing equipment for use in hazardous locations - and Field Engineers and staff who operate equipment in hazardous locations.

About CSA International

CSA International provides testing and certification services for electrical, mechanical, gas and a variety of other products, CSA International is part of the CSA Group, a not-for-profit membership based association serving business, industry, government and consumers.

For more information on CSA International's products and services, including the full listing of available seminars, visit our website at

www.csa-international.org

AGENDA

DAY ONE

- 7:30 **Registration & Continental Breakfast**
- 8:15 **Recent Changes to the NEC**
- 9:15 **Explosion Proof (Flameproof) Enclosures**
- Principles of operation
 - Physical Requirements
 - Testing Requirements
 - Entries - Direct and Indirect
 - Marking and other requirements
- 10:00 **Refreshment Break**
- 10:15 **Intrinsically Safe Equipment**
- Design and Calibration of Testing Devices
 - Use of Ignition Curves
 - Fault Analysis
 - Barriers
 - Entity principles
 - Portable Equipment
- 11:15 **Installation of Intrinsically Safe Equipment**
- Wiring Methods
 - Use of Control Drawings
 - Requirements for Cable Parameters
 - Maintenance
- 12:00 **Lunch**

- 1:00 **Purged and Pressurized Equipment**
- Principles of Operation
 - Blower and Compressed Air Systems
 - Continuous Dilution
 - Pressurized Rooms and Buildings
 - Maintenance
- 1:45 **Increased Safety**
- Principles of Operation
 - Terminations
 - Spacings
 - Enclosure Requirements
 - Insulation Requirements
 - Hybrid Devices
 - Maintenance
- 2:15 **Exclusion of Explosive Mixtures**
- Oil Immersion
 - Powder Filling
 - Encapsulation
- 3:00 **Refreshment Break**
- 3:15 **Division 2 and Zone 2 Equipment**
- Non Sparking Equipment
 - Enclosed-Break Devices
 - Non-incendive Devices
 - Sealed Devices
 - Non-incendive Circuits
 - Restricted Breathing Enclosures
- 4:00 **Dust-ignition-proof Enclosures**
- Principles of Operation
 - Gasketed Enclosures

- Metal to Metal joints
- Dual Rated Equipment
- Temperature Requirements
- Conduit Systems
- Cable systems
- Sealing
- Maintenance

5:00 **End of Day One**

DAY TWO

- 8:00 **Continental Breakfast**
- 8:30 **General Electrical Requirements for Hazardous Locations**
- 9:15 **Installations in Hazardous Locations**
- 10:00 **Refreshment Break**
- 10:15 **Principles of Classification**
- Gases, Dusts and Vapors - how their properties affect classification.
 - Ventilation - the effects on classification
 - Zones and Divisions - the differences
- 11:30 **Application of Classification**
- Who is Responsible for Classification?
 - Classifying for Hazardous Locations
 - Applying the Principles
 - Examples of Classifications

About Factory Mutual Research

Internationally recognized organization, conducting research, writing standards and conducting product approvals to benefit property loss control. Factory Mutual Research provides independent third-party laboratory services used to obtain product certification to internationally recognized standards. Factory Mutual Research approves electrical equipment for use in hazardous locations.

For more information on Factory Mutual Research visit our web site at

www.fmglobal.com/approvals

SPEAKERS

FRANK MCGOWAN

was the Chair of the Instrument Society of America SP12 Committee on standards and recommended practices for electrical equipment used in hazardous locations from 1988 to 2000. He was also the Chair of ISA's SP82 Committee - standards addressing shock and fire hazard requirements for electrical equipment and until recently held the position of U.S. Technical Advisor to IEC SC31A for Flameproof Equipment. He is currently the U.S. Technical Advisor to IEC SC31G for Intrinsically Safe Equipment. Frank has participated as an active member of the NFPA Code Making Panel 14, for many years.

Frank was the Manager of the Instrumentation Section at Factory Mutual Research, which has responsibility for the approval of electrical equipment intended for use in Hazardous (Classified) Locations. Prior to joining Factory Mutual Research, he was Principal Product Safety Engineer at the Foxboro Company.

JOHN BOSSERT

is founder and president of Hazloc Inc., a private consulting firm, and author of the CSA handbook, "**Hazardous Locations: A Guide to the Design, Construction and Installation of Electrical Equipment in Explosive Atmospheres**". With over 35 years of experience, John is former Manager and Certification Officer of the Canadian Explosive Atmospheres Laboratory (CEAL) at Energy, Mines and Resources Canada, and previous to that, he held the position of Senior Engineer in the Hazardous Locations Group of the Certification Division at CSA International.

Currently the Chair of IEC Technical Committee 105 on Fuel Cells and past Chairman of IEC TC 31 and SC 31A, John also serves as the Canadian member on NFPA Panel 14. In addition, he is an active member of almost all committees dealing with Hazardous Locations in IEC and Canada.

- 12:00 **Lunch**
- 1:00 **Gas Detection Equipment**
 - Types of Detectors
 - Testing Procedures
 - Applications
 - Installations
 - Calibration and Maintenance
- 2:00 **CE Marking: The ATEX Directive**
Frank McGowan
 - Comparison of the ATEX to Old Directives
 - Groups I & II Apparatus
 - Group I, M1 & M2
 - Group II, Categories 1, 2 & 3
 - Marking
 - Annex Modules
- 3:00 **Refreshment Break / Q & A**
- 3:15 **Certification Schemes**
Frank McGowan & John Bossert
 - North American Market
 - IEC Ex Scheme
 - Accepted Certification Bodies
- 3:45 **Standards for Hazardous Locations -**
Frank McGowan & John Bossert
 - US, Canadian and IEC Standards
- 4:00 **Effect of New Developments on Future Installations -**
John Bossert
- 5:00 **Seminar Concludes**

What previous attendees have said about the Hazardous Locations seminars

"Good introduction to Hazardous Locations standards and technology. Excellent presentation - thank you!"

Jean Herbert - Woodward Governor

"The seminar material provides the solid foundation for anyone involved in Electrical equipment design and spec. for hazardous locations."

Chris Stratton, I&C Engineer
 Terra Nova Operations, Agra Monenco

"Speaker has a vast knowledge of standards and is able to answer questions on a specific level"

Craig Rideout
 SEA Systems Ltd.

TO REGISTER:

CALL

1-800-463-6727

FAX

the Registration Form with payment to:
CSA Seminar Registration,
216-642-3463
or
416-747-2510

MAIL

a copy of the Registration Form with payment to:
CSA Seminar Registration
8501 East Pleasant Valley Road
Cleveland, Ohio
44131-5575

REGISTER ONLINE

at www.csa-international.org
or www.fmglobal.com

REGISTRATION FEE

\$675* USD per person includes continental
breakfast, lunch and valuable seminar materials.

* minus \$50 if registering by early bird date
(one month prior to seminar date)

* minus \$50 discount for CSA Sustaining Members,
CSA Certification Customers, Factory Mutual
Research customers and/or FM Global customers

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QUESTIONS?

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1-800-463-6727



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training course
on the Design,
Installation and
Maintenance of
Electrical
Equipment in
Hazardous
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MY PAYMENT AMOUNT IS:

2-day fee \$675 USD
minus \$ 50 if registering by early bird date (one month prior to seminar date)
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Total \$ _____

Visit CSA's online store at www.csa-international.org to purchase
*Hazardous Locations: A Guide to the Design, Construction and Installation of Electrical Equipment
in Explosive Atmospheres*
by John Bossert

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