# Approved Product News

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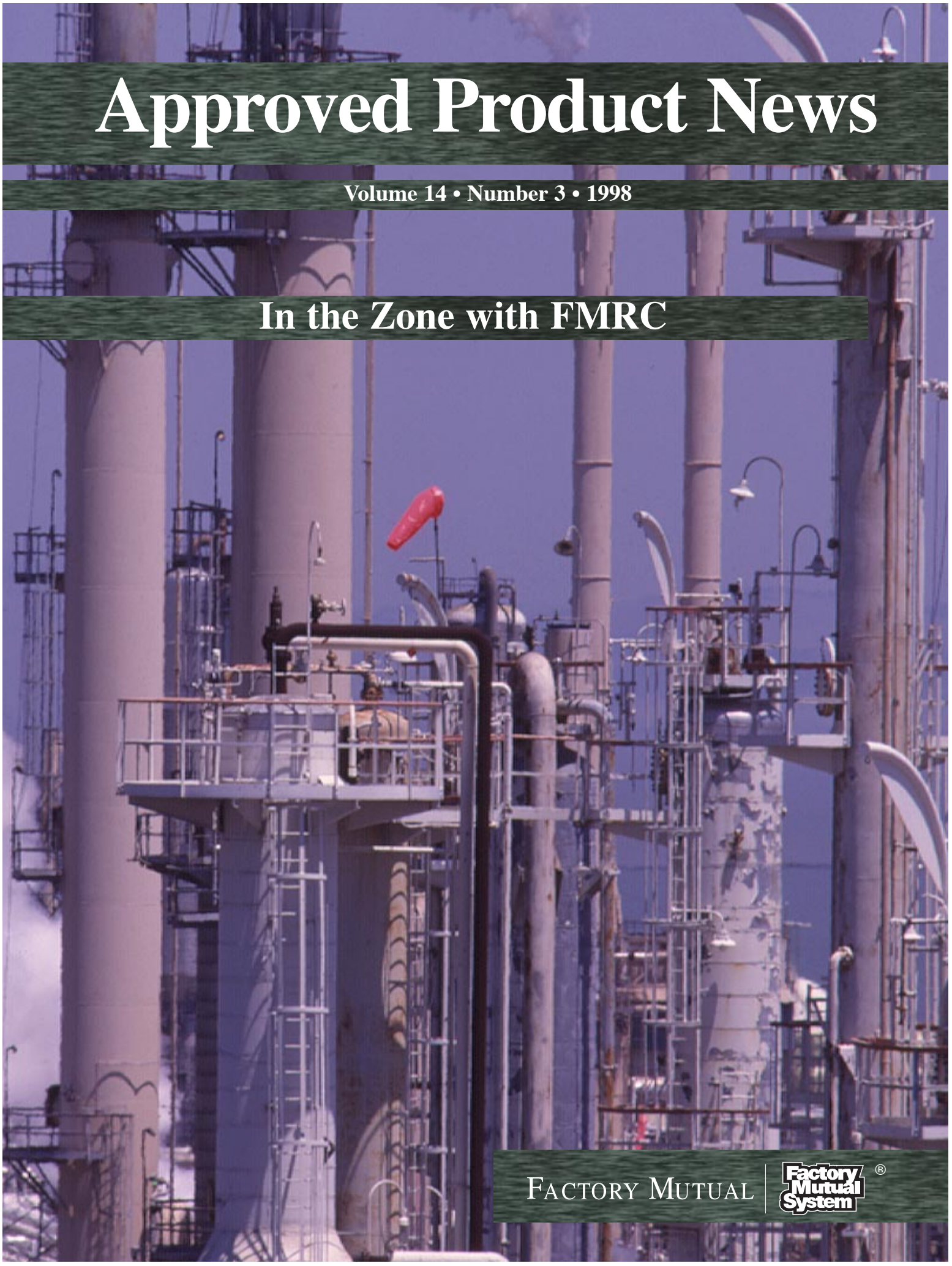
## In the Zone with FMRC



FACTORY MUTUAL | Factory Mutual System®

Approved Product News

Volume 14 • Number 3 • 1998

# In the Zone with FMRC

In this issue:



**On the Cover:** Since the adoption of the zone classification system in the United States, hazardous locations like this refinery in Martinez, Calif., can be reclassified using the zone system.

**Editor:** Amy Costa

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## Zone Classifications Promise More Choices, Lower Costs for Hazardous Location Products

It was an unlikely place for global drama. The 1995 Annual Meeting of the National Fire Protection Association (NFPA) in Denver promised to be like any other–a time to gather with colleagues, attend interesting seminars, eat good food, golf, and vote on the proposed changes and additions that would lead to the 1996 *National Electrical Code*® (*NEC*®).[1]

But something unusual happened at the meeting. On May 25, 1995, the meeting attendees shrugged off 25 years of industry resistance and voted to include Article 505, based on the international zone classification system, in the 1996 *NEC*. Now that may not sound like high drama, but for those in the know, this was big news. The United States had just taken one giant step toward global harmonization.

Especially in petrochemical and other process industries, where flammable and explosive gases, vapors or liquids are prevalent, the introduction of the zone system for hazardous location classification and product certification has the potential to lower equipment costs and provide increased choice in equipment selection. While there may be some short-term disadvantages, says Bill Lawrence, senior engineer in Factory Mutual Research Corporation's (FMRC) Electrical Section, "most major manufacturers are global enterprises that manufacture equipment to meet both North American division and international zone classification requirements. The new market opportunities far outweigh the downside!"

### Article 505 and the *NEC*

Article 505, which was added to the 1996 *NEC*, is based on the International Electrotechnical Commission (IEC) standards number 79-0 through 79-20. Article 500 is the area of the *NEC* where the traditional North American class/division/group system of hazardous area classification has been defined. This article will explore the difference between these two classification systems, but first it may be helpful to describe how the *NEC* is prepared and maintained.

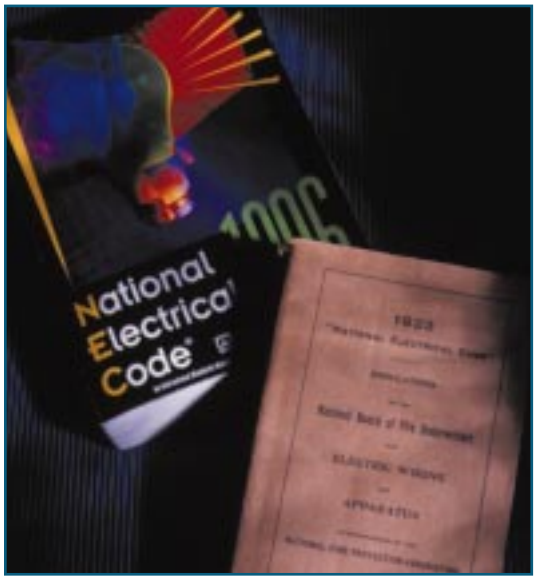
In the nineteenth century, as the United States grew increasingly dependent on electricity, it became apparent that a uniform set of safety standards was needed to help control this new and dangerous utility. The *NEC* was first published in 1897 as the joint effort of a diverse industry group that included architects, engineers, insurance carriers, electrical manufacturers and others. (The *NEC* didn't address equipment for hazardous locations until 1923. A single page on hazardous locations in the 1923 edition of the *NEC* has since grown to nearly 50 pages today.) Since 1911, the *NEC* has been sponsored by the NFPA and since 1920 the *NEC* has been endorsed by the American National Standards Institute (ANSI). Officially, the *NEC* is published as document NFPA 70.

Since 1959, the *NEC* has been updated every three years to keep it current with the latest advances in electrical technology and safety standards. The NFPA's *National Electrical Code* Committee is charged with reviewing and editing the *NEC*. The Committee oversees 20 code making panels

[1] *National Electric Code*® and *NEC*® are registered trademarks of the National Fire Protection Association, Quincy, MA 02269.

comprised of industry representatives, electrical contractors, associations, insurance carriers, testing labs, government agencies and others. Code Making Panel 14 is the panel that oversees the classification of hazardous locations. The 1996 edition was the last major revision. Revisions to be included in the 1999 edition were voted on at the NFPA Annual Meeting last spring and are being incorporated into the final document.

As an accredited ANSI standards developer, the ISA–the international society for measurement and control–works to develop and refine many of the standards referenced in the *NEC*. ISA committee SP12, and its many subcommittees, coordinates and manages all of the standards activities relating to electrical equipment for use in hazardous locations. FMRC's Frank McGowan chairs SP12 and many FMRC engineers serve on various SP12 subcommittees.




*A single page on hazardous locations in the 1923* NEC *has grown to nearly 50 pages today.*[2]

## Zones and Divisions Compared

Until the introduction of the zone system in the 1996 *NEC*, the only area classification system used in the United States was the **class/division/group** scheme. Under this system, hazardous materials are first classified into three classes of flammable materials.

*Liquid natural gas tanks under construction constitute a hazardous location where zone-classified products could be used.*

**Class I** hazards include gases, vapors and liquids that can burn or explode. **Class II** contains combustible dust such as flour, sugar, aluminum or magnesium. **Class III** includes ignitable fibers or "flyings" such as cotton.

Each of these three classes is further subdivided into two **divisions,** with **Division 1** encompassing hazards that are continuously, intermittently or periodically present in the atmosphere. **Division 2** includes hazards that can exist under "unusual" circumstances. In other words, under this scheme, an area classified as Class 1, Division 1 would represent the most hazardous area within that class. This would be an area where hazards exist on a regular basis under normal operating conditions.

The last subdivision within the traditional *NEC* area classification system is **groups.** Seven groups are used to categorize materials by their similar explosive or flammable characteristics. **Groups A, B, C and D** apply to Class I areas only and include flammable gases, vapors and liquids. **Group A** is considered the most volatile and includes only acetylene. **Group B** includes such hazards as gases or vapors of butadiene, hydrogen, ethylene oxide, and other manufactured gases. **Group C** contains atmospheres such as cyclopropane, ethyl ether and hydrogen sulfide. **Group D** contains atmospheres such as gasoline, acetone, alcohol, hexane, naptha, butane and lacquer solvent vapors.

**Groups E, F, and G** are the last three groups and apply only to Class II areas where combustible dusts may be found. There are no groups defined for Class III locations.

*In the **zone** system,* the practice of area classification is refined even further within the Class I area. The IEC divides U.S. Class I areas into three zones: **Zone 0, 1 and 2**–one more than the North American division classifications. The zone classification system,

[2] Reprinted with permission from NFPA 70-1996, the *National Electric Code®*, Copyright© 1995, National Fire Protection Association, Quincy, MA 02269.

with national deviations to meet individual country standards, has been used throughout much of the world for many years. Like the metric system, the zone classification system is a global standard that the United States has been reluctant to adopt.

**Class I, Zone 2** is essentially the equivalent of Class I, Division 2. Zone 2 is an area in which an explosive gas-air mixture is not likely to occur and, if it does occur, will exist only for a short time. Under the zone classification system, Class I, Division 1 is subdivided into Zone 0 and Zone 1. **Zone 0** defines those locations in which an explosive gas-air mixture is present continuously or for long periods during normal operation. An example of this would be the vapor space of a closed, but vented, process vessel or storage tank. By isolating the worst hazards within a Zone 0 classification, designers are free to use less restrictive and less costly systems in the remainder of Division 1 areas defined as **Zone 1.** (See table 1.)

## Separate but Equal?

*NEC* Article 505, the zone classification system, is intended as a parallel classification system to be used as an alternate to the division system. Many division-classified areas can be reclassified to zone-defined areas, but only by a "qualified registered Professional Engineer," according to *NEC* wording. (The 1999 *NEC* [Section 501-1] permits the use of equipment listed for Zone 0, 1 or 2 in a Division 2 location with the same gas.) "In general, a given area cannot be classified under both zone and division systems–it's one or the other," Lawrence explains. "There is going to be a transition period during which we must get used to applying the zone system in areas that were previously classified using division guidelines."

## FMRC's Global Ties Mean Faster, Lower Cost Approvals

FMRC has for years assisted U.S.-based manufacturers in achieving zone classification for products intended for international markets. The 1998 edition of the *FMRC Approval Guide* contains over 300 pages listing Approved hazardous location equipment and devices.

FMRC, in addition to being a Nationally Recognized Testing Laboratory in the United States, maintains interlaboratory agreements with other Certification Bodies throughout the world. These agreements allow testing data used for other national certifications to serve as the starting point for FMRC Approval testing for the U.S. market. *(See list of agreements on page 7.)*

With the inclusion of Article 505 in the *NEC*, a U.S.-based manufacturer that offers zone-classified products for international markets can now market these same products in the United States, often with little or no modification. Test data from international Certification Bodies can be used, in most cases, by FMRC as the basis for Approval testing. This helps reduce time-to-market and Approval test costs.

The zone system of hazardous location classification is still very new for the United States. Demand for zone-classified equipment is growing slowly, but steadily. The promise of reduced product cost and the opening of new markets is appealing to manufacturers and end users alike. "It's a proverbial chicken-and-egg situation," notes Nick Ludlam, FMRC project engineer and chair of the ISA SP12.12 Subcommittee on Apparatus for Division 2 Hazardous Locations. "Without a clear market for a zone-classified product, it's difficult for a manufacturer to justify spending time and money on a zone product. Of course, without zone-classified products available, plant designers can't specify zone products for new plants and retrofits. Despite this initial problem, we are seeing a steady stream of requests for zone listings, primarily for certain large projects."

## Seeing Zones in a New Light

According to Lawrence, as end users and manufacturers begin to see the tangible benefits offered by zone classification, the number of products available for zone use will increase proportionally. An early example of this is a recent Approval granted by FMRC for a zone-classified fluorescent luminaire (lighting system).

"We recently Approved a fluorescent luminaire for use in Zone 1 locations," Lawrence explains. "The immediate use for this zone-classified luminaire is on a large oil project in Alaska. In this case, the alternative to a zone-classified luminaire would have been a Division 1 fixture, which would have cost over US$1,000 each and weighed several hundred pounds. When you have to

**AREA CLASSIFICATION**

| | | Flammable Material Present Continuously | Flammable Material Present Intermittently | Flammable Material Present Abnormally |
|---|---|---|---|---|
| IEC/CENELEC | | Zone 0 (Zone 20 - dust) | Zone 1 (Zone 21 - dust) | Zone 2 (Zone 22 - dust) |
| US | NEC 505 | Zone 0 | Zone 1 | Zone 2 |
| | NEC 500 | Division 1 | | Division 2 |

IEC classification per IEC 79-10.
CENELEC classification per EN 60 079-10
US classification per ANSI/NFPA 70 National Electric Code (NEC) Article 500 or Article 505

*Table 1. Comparison of divisions and zones. By putting the more hazardous conditions of Division 1 into Zone 0, the requirements for Zone 1 are relaxed.*

*Hazardous materials offloading in Switzerland, where zone-classified equipment is already used. (Permitted by Ciba-Geigy Limited, Switzerland.)*

haul hundreds of these things across the Alaskan tundra, not only cost, but weight, becomes a significant cost factor."

The manufacturer of the Approved Zone 1 luminaire, described by Lawrence, used the zone protection principles of "Increased Safety" and "Flameproof" (see sidebar below) to provide proper explosion/flammability protection while achieving reduced weight and cost. Instead of housing the entire light in a heavy explosionproof case, the electrical components within the zone-Approved luminaire are individually protected. For instance, wiring terminals are generously dimensioned and provided with additional spacing to reduce the likelihood of arcing. The luminaire's ballast is housed in its own small flameproof case. The luminaire is housed in a lightweight shatterproof plastic case, providing environmental protection.

"This is also a good example of our interlaboratory agreements at work," Lawrence notes. "This particular luminaire was introduced by a German company in European markets about two years ago, just about the time that zones were included in the *NEC*. At that time, the

## Zoning in on New Types of Protection

In addition to Zone 0, one of the other big differences between the traditional *NEC* area (class/division/group) classification system used in North America and the new IEC zone system introduced in the 1996 *NEC* is in the area of equipment protection methods. There are some new techniques introduced under the zone-based system that will be new to U.S. manufacturers and end users.

These new protection methods will provide U.S. manufacturers with increased flexibility in designing electrical equipment for hazardous locations. Here's a rundown of the four new IEC zone types of protection.

**Increased Safety (Ex e–IEC Explosion Protection designation; AEx is the prefix used in the United States).** Developed in Germany, this protection technique focuses on eliminating the sources of ignition such as sparking, arcing or hot surfaces. According to John Bossert, a noted expert in hazardous location standards, under the Increased Safety concept, a device (e.g., a terminal block or motor) is designed with highly reliable insulation, secure terminal connections, impact-resistant enclosure for environmental protection, overload protection, and extra insulation.[3]

**Intrinsic Safety (Ex ia & ib).** This protection concept, which has been used in a similar form in the United States and Canada division classifications for many years, limits the energy and the power available for igniting flammable gases under normal and fault conditions. This is typically accomplished by means of inserting energy-limiting devices within these circuits. Intrinsically safe (Ex ia) devices are the only devices allowed in Zone 0 areas and are very similar to the traditional 'division' intrinsic safety. The new concept, "ib," used in the less hazardous but more prevalent Zone 1 locations, does not apply as many faults as are applied for "ia" allowing the product to be better fitted to the actual level of risk.

**Powder Filled (Ex q).** Powder filling is a new protection method introduced by the zone system in which an enclosure is made suitable for Zone 1 by filling it with small quartz granules. The quartz acts as a flame arrestor to quench any explosion before it could propagate to a surrounding flammable gas.

**Encapsulation (Ex m).** A form of explosion protection that focuses on isolation and is often referred to as potting, casting or molding. Electrical parts or circuits are encased in epoxy or similar nonconducting material.

Other types of isolation protection included for Zone 1 areas are Pressurization (Ex p), Oil Immersion (Ex o), and Flameproof (Ex d); and for Zone 2 areas: Non-Sparking (Ex nC), Limited Energy (Ex nA), and Restricted Breathing (Ex nR).

[3] John A. Bossert, *Hazardous Locations – Guide for the Design, Testing, Construction and Installation of Equipment in Explosive Atmospheres*, ed. Judy Eaton (Ontario: Canadian Standards Association, 1994), 93-97.

manufacturer began considering other markets for its new luminaire. Because of this large project in Alaska, the manufacturer decided to pursue the U.S. market. We were sent the test data from one of our interlaboratory partners."

"We began our Approval process by first reviewing that test data and determining what we could use and what we might have to repeat," Lawrence says. "We designed a test program that filled in the gaps. This particular manufacturer saved at least 75 percent on testing costs thanks to our interlaboratory agreement with the German test laboratory."

## FMRC is Ready to Assist You

With over 160 years of testing experience and a global reputation, FMRC is uniquely positioned to assist manufacturers in taking advantage of the new zone classification system. Whether you are a manufacturer with a current zone-classified product who would like to enter the U.S. market or a U.S. manufacturer seeking to take advantage of the new zone classification scheme, FMRC can help reduce your time-to-market and your testing costs.

When it comes to hazardous industrial locations, the stakes are high and the dangers real. While it is difficult to completely eliminate the risk of human error in industrial accidents, correctly classified and Approved equipment and devices help to keep workplace hazards in check.

**To Learn More...**

Contact:
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or
Roger Lutfy
Electrical Section Manager
Factory Mutual Research Corporation
(781) 255-4820
email: roger.lutfy@factory-mutual.com

## *How Do They Approve?*

## Results of the Approvals Customer Survey

Upon completion of the Approval process, the Factory Mutual Research Corporation (FMRC) Approvals Division surveys each customer for satisfaction ratings. The response rate more than doubled in the first half of 1998 as compared to the same period in previous years. We would like to thank our customers for this valuable input, which we use to improve the way we do business and provide service to you.

Customers expressed high satisfaction in many areas; and in some the numbers rose from previous years. However, we recognize the need for improvement in a few areas where satisfaction was rated lower. Specifically, we are working on two key areas: building a better billing system, and improving the format and writing time of the Approval report. Here is a synopsis of the results in each area:

1) **Overall satisfaction:** Satisfaction numbers high–83% expressed high or above average satisfaction.

2) **Technical knowledge of engineer:** Satisfaction numbers very high–97% expressed high or above average satisfaction.

3) **Being receptive to customer concerns:** Satisfaction numbers up from previous years–93% expressed high or above average satisfaction.

4a) **Verifying customer requirements:** Satisfaction numbers high–90% expressed high or above average satisfaction.

4b) **Identifying sample requirements:** Satisfaction numbers high–90% expressed high or above average satisfaction.

4c) **Scheduling test dates:** Satisfaction numbers lower than in other areas–only 80% expressed high or above average satisfaction.

4d) **Providing feedback on status of Approval:** Satisfaction numbers lower than in other areas–only 79% expressed high or above average satisfaction.

4e) **Responding to client letters/phone calls:** Satisfaction numbers up from previous years–82% expressed high or above average satisfaction.

5) **Contractual agreement clear:** Satisfaction numbers up from previous years–89% expressed high or above average satisfaction.

6) **Billing clear and understandable:** Satisfaction numbers down–only 59% expressed high or above average satisfaction.

7) **Time:** More rated us "same as" other Approval agencies than in any other category. A small percentage rated us as taking less time than other agencies. The time taken to write the Approval report seems to be the biggest cause of complaints.

8) **Approval report complete and accurate:** Most said "yes"–86%.

9) **Recommend FMRC to others:** 92% of our customers would recommend FMRC to others.

**One thing customers would like to see changed:** Less time for Approval, improved billing information.

**Other comments:** Kudos and thanks for a job well done or the help they gave during the Approval process were received by the following engineers and staff: Robin Napolitan, Bill Lawrence, Ed Laliberte, Andrew Lozinski, Tony Nikolassy, Bob Elliott, Paul Conroy and Len D'Angelo.

# Interlaboratory Agreements:

## Your link to global markets

Take advantage of Factory Mutual Research Corporation's (FMRC) interlaboratory agreements which allow you to have your product tested by FMRC to standards used throughout the world.

The resulting test report will be submitted by FMRC to a participating laboratory of your choice. The report serves as a basis for the designated laboratory's certification.

Upon your request, a participating laboratory may also conduct testing and submit a test report based upon FMRC Approval Standards which become the basis for FMRC Approval.

FMRC participates with testing laboratories on every continent of the world. The number of signed agreements continues to grow; here is a current list of international laboratories with whom FMRC has reciprocal agreements.

| TESTING LAB | TYPE OF EQUIPMENT | | TESTED TO | CONTACT |
|---|---|---|---|---|
| Canadian Standards Association (CSA) CANADA | Intrinsically safe, Ex i<br>Explosion proof<br>Non-incendive<br>Purged and pressurized<br>Encapsulated, Ex m<br>Powder filled, Ex q | Flameproof, Ex d<br>Type n, Ex nA, nC, nR<br>Increased safety, Ex e<br>Pressurized, Ex p<br>Oil immersed, Ex o | CSA standards | Frank McGowan (781) 255-4840 |
| Centro de Pesquisas de Energia Eletrica (CEPEL) BRAZIL | Intrinsically safe, Ex i<br>Flameproof, Ex d<br>Type n, Ex nA, nC, nR<br>Pressurized, Ex p<br>Encapsulated, Ex m<br>Oil immersed, Ex o<br>Powder filled, Ex q | | IEC standards | Frank McGowan (781) 255-4840 |
| Deutsche Montan Technologie (BVS/DMT) GERMANY | Intrinsically safe, EEx i<br>Encapsulated, EEX m<br>Pressurized, EEx p<br>Flameproof, EEx d | Type n, Ex nA, nC, nR<br>Increased safety, EExe | European norms | Frank McGowan (781) 255-4840 |
| Electrical Equipment Certification Service (EECS/BASEEFA/MECS) UNITED KINGDOM | Intrinsically safe, EEx i<br>Flameproof, EEx d<br>Pressurized, EEx p<br>Encapsulated, EEx m<br>Oil immersed, EEx o<br>Powder filled, EEx q | Type n, Ex nA, nC, nR<br>Increased safety, EEx e | European norms | Frank McGowan (781) 255-4840 |
| Institut National de l'Environnement Industriel et des Risques (INERIS) FRANCE | Flameproof, EEx d<br>Pressurized, EEx p<br>Encapsulated, EEx m<br>Oil immersed, EEx o | Type n, Ex nA, nC, nR<br>Increased safety, EEx e<br>Powder filled, EEx q | European standards | Frank McGowan (781) 255-4840 |
| KEMA Registered Quality Nederland BV (KEMA) NETHERLANDS | Flameproof, EEx d<br>Encapsulated, EEx m<br>Pressurized, EEx p<br>Oil immersed, EEx o | Type n, Ex N, nA, nC, nR<br>Increased safety, EEx e<br>Powder filled, EEx q | European norms | Frank McGowan (781) 255-4840 |
| Laboratoire Central des Industries Electriques (LCIE) FRANCE | Flameproof, EEx d<br>Pressurized, EEx p<br>Encapsulated, EEx m<br>Oil immersed, EEx o | Type n, Ex nA, nC, nR<br>Increased safety, EEx e<br>Powder filled, EEx q | European standards | Frank McGowan (781) 255-4840 |
| Le Centre National de Prevention et de Protection (CNPP) FRANCE | Fire and intrusion detection, alarm signaling, manual and automatic extinguishing systems | | Standards acceptable to both labs and/or EN54 | Bob Elliott (781) 255-4832 |
| Londonderry Occupational Safety Centre of WorkCover Authority (LOSC) AUSTRALIA | Flameproof, Ex d<br>Encapsulated, Ex m<br>Oil immersed, Ex o<br>Pressurized, Ex p | Type n, Ex nA, nC, nR<br>Increased safety, Ex e<br>Powder filled, Ex q | Australian standards | Frank McGowan (781) 255-4840 |
| Norges Elektriske Materiellkontroll (NEMKO) NORWAY | Flameproof, EEx d<br>Encapsulated, EEx m<br>Pressurized, EEx p<br>Oil immersed, EEx o | Type n, Ex nA, nC, nR<br>Increased safety, EEx e<br>Powder filled, EEx q | EN 50 014 through 50 020;<br>IEC 79-15 | Frank McGowan (781) 255-4840 |
| Physikalisch-Technische Bundesanstalt (PTB) GERMANY | Flameproof, EEx d<br>Encapsulated, EEx m<br>Pressurized, EEx p<br>Oil immersed, EEx o | Type n, Ex nA, nC, nR<br>Increased safety, EEx e<br>Powder filled, EEx q | European norms | Frank McGowan (781) 255-4840 |
| Safety in Mines Testing and Research Station (SIMTARS) AUSTRALIA | Flameproof, Ex d<br>Encapsulated, Ex m<br>Pressurized, Ex p<br>Oil immersed, Ex o | Type n, Ex nA, nC, nR<br>Increased safety, Ex e<br>Powder filled, Ex q | Australian standards | Frank McGowan (781) 255-4840 |
| Scientific Services Laboratory (SSL) AUSTRALIA | Sprinkler heads, sprinkler alarm valves, sprinkler pipe hangers, sprinkler pipe couplings and fittings, water flow switches, carbon dioxide (low pressure) systems | | Australian standards | Bob Martell (781) 255-4850 |
| Shanghai Institute of Process Automation Instrumentation (NEPSI/SIPAI) CHINA | Flameproof, Ex d<br>Type n, Ex nA, nC, nR<br>Increased safety, Ex e<br>Pressurized, Ex p | | Chinese standards | Frank McGowan (781) 255-4840 |
| Sira Certification Service (SCS) UNITED KINGDOM | Flameproof, EEx d<br>Encapsulated, EEx m<br>Pressurized, EEx p<br>Oil immersed, EEx o | Type n, Ex N, nA, nC, nR<br>Increased safety, EEx e<br>Powder filled, EEx q | European norms | Frank McGowan (781) 255-4840 |
| Swedish National Testing Institute (SP) SWEDEN | Building materials | | UBC 17-5, 14-2<br>ISO 9705<br>room tests | George Smith (781) 255-4870 |
| Verband der Sachversicherer (VdS) GERMANY | Pipe hangers, couplings, right angle gear drives,<br><br>Fire detection and alarm signaling | ESFR sprinklers | European norms<br><br>Standards acceptable to both labs and/or EN54 | Roger Allard (401) 567-0590<br><br>Bob Elliott (781) 255-4832 |
| Quest Engineering Solutions UNITED STATES | Electrical equipment that must comply with specific EMC limits | | FCC Part 15, Subpart J and all standards to conform to EU directives | Tony Nikolassy (781) 255-4819 |
| Underwriters Laboratories, Inc. (UL) UNITED STATES | ISO 9000 co-registration | | ISO 9000 standards | John Hill (781) 255-4972 |
| Vouching Technical Inspection Ltd. (VTI) CHINA | ISO 9000 co-registration | | ISO 9000 standards | John Hill (781) 255-4972 |

## Partner with FMRC for ISO 9000 Registration

Selecting an ISO 9000 REGISTRAR could be the most important business decision you'll ever make. You want a registrar you can trust, one that knows and understands your business. You also want to lower cost and save time.

You will capture these benefits by selecting Factory Mutual Research Corporation (FMRC). Plus, if you already have your products or services Approved by FMRC, you will save more time and money by combining the ISO 9000 audit and a facilities and procedures audit into one visit. In addition, you will be working with an FMRC auditor who is already familiar with your organization and its business.

Having FMRC auditors near your facility is another advantage. The fact is, trained auditors are on staff in several offices throughout North America–which translates into quick response and lower cost.

For an application form or for any question regarding registration, please contact FMRC. You can also opt to have FMRC perform a pre-assessment to determine where your company is in terms of quality processes.

Call: Kristina Palermo (781) 255-4884
or John Hill (781) 255-4972.

Or write:
FMRC Approvals
ISO Registration Department
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062
USA

## Certify Your Safety System with FMRC

Do you have a safety system based on electric, electronic or programmable electronic (E/E/PE) technology? If so, you may be subject to the standards IEC 61508, or ANSI/ISA S84.01.

The level of automation in industrial facilities is rising and unscheduled downtime is expensive. This intensifies the need to keep equipment in operation. Factory Mutual Research Corporation (FMRC) now offers the Reliability Certification Program, which can certify that your safety system provides the functional safety needed to comply with these standards. FMRC is well known for its skills in testing systems for standards compliance. As an independent third party, FMRC can provide the assurance you need.

ANSI/ISA S84.01, "Application of Safety Instrumented Systems for the Process Industries" and IEC 61508, "Functional Safety of E/E/PE Safety Related Systems" are performance-based standards that consider the entire safety life cycle of the industrial process. FMRC participated in the development of these standards and is in an excellent position to provide third-party testing and certification for safety system components and specific industrial applications.

If you have questions about how the Reliability Certification Program can help you, please contact FMRC.

Call Paris Stavrianidis at (781) 255-4983, or write to:

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