CAN/CSA C22.2 NO. 60079-0:2015 ALIGNS CANADIAN AND IEC 60079 SERIES REQUIREMENTS FOR "EX" PROTECTION

The CAN/CSA C22.2 No. 60079-0 standard, which is the Canadian adoption of IEC 60079-0:2011, has been updated to align requirements with the current edition of the IEC 60079 series. The revised standard reduces or eliminates ambiguity and is consistent with the text and requirements of IEC 60079 series editions published since the last update. Officially known as CAN/CSA-C22.2 No. 60079-0:15 – Explosive atmospheres – Part 0:

Equipment – General requirements (IEC 60079-0:2011, MOD), the standard specifies the general requirements for construction, testing and marking of electrical equipment and components intended for use in explosive atmospheres. Evaluation and conformance to this standard is mandatory to obtain "Ex" marking for equipment that will be installed in Canadian hazardous locations classified under the Zone system.

MARKING REQUIREMENTS AFFECTED
Notable in this update is the elimination of the past requirement for specific mandatory additional marking. That requirement was removed because the 2015 version of the Canadian Electrical Code (CEC) includes enhanced recognition of markings and area classifications. CAN/CSA-C22.2 No.60079-0:2015 does allow optional Class and Divisions markings in addition to "Ex" marking, in line with provisions of the CEC. However, when optional markings are incorporated, instructions and appropriate warnings must be clearly communicated to installers and other users to eliminate potential confusion and resulting unsafe situations.

Other major changes in the requirements include:

- Clarification of the test to determine the capacitance of accessible metal parts and reduction of the acceptable capacitance levels based on updated information published in the horizontal IEC TS 60079-32-1 standard.
- Addition to requirements for ventilating fans.
- Clarification of requirements for testing of arc-quenching on plugs and sockets. Updated test conditions include specified voltage, current and safety factors, where applicable.
• Incorporation of additional information on cell voltages, including a slight increase in some cell voltages. While this is a minor change for most protection concepts, it is a major change for equipment employing a type of protection that relies on energy limitation under the "Intrinsic Safety Protection" requirements of IEC 60079-11.
• Removal of the "charging test" because it had been found to be unrepeatable. CAN/CSA-C22.2 No.60079-0:2015 references the IEC TS 60079-32-1 standard as a source of further testing guidance.

CAN/CSA-C22.2 No.60079-0:2015 specifies requirements directly related to explosion risks. However, some ignition sources – including adiabatic compression, shock waves, exothermic chemical reaction, self-ignition of dust, naked flames and hot gases/liquids – are not addressed by the standard.

PROTECTING LIVES AND PROPERTY IN HAZARDOUS LOCATIONS

Hazardous locations exist in a wide range of industries, all of which must take important hazloc safety requirements into consideration in their day-to-day operations. In this article series, we are exploring three important facets of maintaining safety in hazardous locations: Equipment Certification; Personnel Certification; and Equipment Inspection, Repair and Maintenance.

In Part 1 of our series, we discussed the importance of equipment certification to confirm that products meet the requirements of applicable standards. Now in Part 2, we’ll discuss how personnel certification programs can help assure uniform understanding and compliance with safety requirements among staff working in hazardous locations.

CERTIFY PERSONNEL FOR SAFE JOB PERFORMANCE

Workplace accidents can lead to serious injuries and fatalities, particularly when inexperienced workers are not adequately trained in safety or competent to perform the duties of the job. Nowhere is this more apparent than in the oil and gas industry, which includes some of the most hazardous workplace conditions found anywhere.

Booming shale exploration and production activity has increased demand for oilfield workers to such an extent, new recruits may be less skilled than members of the historical workforce. Oil and gas growth in "non-traditional" locations such Nova Scotia, New Brunswick and Newfoundland adds to the challenge, as the historical knowledge and experience found in long-time producing areas such as Alberta and Texas does not exist among the local candidate pool in these "newer" oil regions.

While equipment designers and manufacturers invest significant time and resources in the certification of products used in hazardous areas, less attention may be paid to the knowledge and capability of the individuals tasked with sourcing, installing and maintaining that equipment in the field. The safety provided by certified products can quickly be undermined by improper product selection, installation or maintenance performed by unknowledgeable staff.

In some jurisdictions, personnel certification is legally required, but in many others, operators must take the initiative to increase staff knowledge and competence, including
pursuing personnel certification.
Larger companies often have comprehensive training programs in place. However, industry growth and outsourcing in industries such as oil and gas has led to a boom in small service companies, which often do not have established health and safety programs or the resources internally to provide them.

Furthering the challenge of personnel safety knowledge and competence are the unrecognized needs in industries that are often overlooked as being hazardous, such as food and beverage production and grain processing. In some cases, operators of small businesses are unaware that their locations are considered hazardous and are uninformed of the rigorous safety requirements associated with them.

IECEX PERSONNEL COMPETENCE CERTIFICATION
Stakeholders should aim to assure that their own workers, and supplier and contractor personnel, are knowledgeable and capable. The best way to assure this is with the participation and certification of staff involved in hazardous areas to schemes such as the IECEx Personnel Competence program. Independent, third-party personnel competence schemes assure that all participants demonstrate uniform knowledge and ability of the required skills.

Utilization of a scheme such as IECEx Personnel Competence provides companies who outsource elements of their business with a consistent and measurable method of assuring subcontractors and other external providers have skill sets consistent with their own. This provides important protection against safety incidents and associated liability by helping to close the risk management loop.

Coming up in June, Part 3:
Maintain Equipment Integrity for Lasting Safety
The need for knowledgeable and competent staff extends past initial equipment commissioning to equipment life cycle services including inspection, repair and maintenance activities. In the upcoming June issue of The Bulletin, we'll discuss the importance of bringing older equipment up-to-date with current safety requirements. We'll also describe why personnel certification programs should be extended to upgrade the safety knowledge and competence of all workers who may be called on to perform critical services in the aftermarket.

To view part 1 of this 3-part series, click here.

PROPER INTERPRETATION IS ESSENTIAL TO MEET IEC 60079-11 INTRINSIC SAFETY REQUIREMENTS FOR DOWNLOADING AND BATTERY CHARGING PORTS

Meeting Intrinsic Safety “i” requirements for mobile equipment used in hazardous locations requires understanding of the gray areas in the standard and the ability to correctly interpret the requirements to properly assess equipment safety.
Of particular concern to product designers is IEC 60079-11:2011 clause 6.2.5 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety “i”, because advancements
This standard defines the requirements for downloading and battery charging ports found on mobile equipment intended to be used in a hazardous location, but which may be charged or otherwise accessed via plugs, chargers, USBs, card readers, and other connections outside of the hazardous environment.

Clause 6.2.5 is intended to help assure that the intrinsic safety of equipment used in hazardous locations is not compromised when the equipment is connected to an accessory that has not also been rated as intrinsically safe. The standard also defines circumstances when such an accessory must comply with intrinsic safety requirements.

**WHY INTERPRETATION IS REQUIRED**

When it was published, IEC 600079-11:2011 clause 6.2.5 represented a clarification to existing requirements for downloading and battery charging ports. Previously it was common practice to specify maximum charging parameters and leave responsibility for compliance to the equipment end user.

While the need to protect the intrinsic safety of laptops and other mobile equipment during use both inside and outside of a hazardous location is clear, measures required to achieve that goal under the current standard can be ambiguous. Following are some examples of questions that can arise during product design, testing and certification, the answers to which may not be specifically addressed by the standard:

- What safety factor should be applied to diodes, fuses and other components in a battery charging circuit? How do we assess if they will perform as safety components inside as well as outside of the hazardous environment?
- What if safety components designed to protect the intrinsic safety of an apparatus during operations performed outside of the hazardous location reside in an accessory device and not in the intrinsically safe apparatus?
- Does the voltage rating of accessories used only in non-hazardous areas make a difference in assessment of the intrinsic safety of an apparatus used in a hazardous environment?
- How about the voltage rating of the apparatus' charging or downloading port? What bearing does it have on whether accessory devices must meet intrinsic safety requirements?
- What are the intrinsic safety requirements for internal components when an Ex d flameproof external enclosure is in place during normal operation but the enclosure may be opened for service such as battery replacement?

These are just a few examples of requirements that may not be clearly defined in the standard. They illustrate the importance of working with a knowledgeable testing and certification organization with in-depth understanding of the requirements and the technical issues surrounding them.

CSA Group's in-depth standards knowledge and product testing and certification experience equips us with a clear understanding of the issues involved and the ability to interpret the intrinsic safety requirements properly and effectively. The hazardous location specialists at CSA Group are available to support designers in interpreting and applying IEC 600079-11:2011 clause 6.2.5 to assure intrinsic safety requirements for mobile equipment are met.
ISO 9001:2015: WHAT YOU NEED TO KNOW TO UPDATE TODAY

The International Organization for Standardization (ISO) has published an update to ISO 9001, its leading quality management requirement standard, in September of 2015. This new version replaces the previous ISO 9001:2008 edition, and companies will have until September 2018 to update their certifications and ensure their quality management systems comply with this standard.

KEY DIFFERENCES
Every five years, ISO reviews its standards to determine if they should be revised based on the state of the current marketplace. Revisions are made in order to keep standards up to date with the new challenges and expectations that companies face since the last updates were made. ISO 9001:2015 was created to address the latest industry trends and keep the standards relevant to organizations today.

Compared to ISO 9001:2008, the biggest change to 9001:2015 is its new structure. It now follows the same High-Level Structure as other ISO management system standards, making navigating easier for companies operating multiple management systems.

The new version puts more emphasis on risk-based thinking than the 2008 version did. This approach combines performance with the existing focus on process and uses the Plan-Do-Check-Act cycle at all organizational levels.

USER BENEFITS
Manufacturers often choose to obtain ISO 9001 certification to add credibility in the eyes of potential customers or to meet contractual requirements and access new markets. This standard proves that a company is operating efficiently and offering consistent products and services, instills confidence in the company's procedures, and demonstrates that its employees are suitably trained to serve customers and meet all expectations.

This new version was designed for compatibility and easy integration with other management systems including ISO 14001. In addition to this, there are other benefits of 9001:2015 that will allow organizations to keep up performance in an increasingly globalized industry. These benefits include:

- Elevation of the importance of leadership engagement
- A more structured way to address organizational risks and opportunities
- Simplified language and a similar structure and terms compared to other management system standards, which increases the ease of use for organizations using multiple systems
- More effectively addresses the complexities of supply chain management
- User-friendly experience for service and knowledge-based organizations including those related to environment, health and safety, or business continuity

Organizations already using ISO 9001 should consider transitioning to 9001:2015 as soon as possible to more quickly receive the benefits of the updated version.
CSA GROUP IS HERE TO HELP

CSA Group is able to offer hazardous locations manufacturers combined certifications of ISO 9001, ATEX QAN and IECEx QAR, saving you time and money by conducting these audits simultaneously using the same auditor. We can also help companies switch from an existing Registrar to update their existing ISO 9001 or 14001 certifications by the 2018 deadline. As a leader in ISO certification, CSA Group offers cross-sector training and has more than 40 years of quality management experience helping companies achieve their quality and risk management objectives.

GAS DETECTORS: IEC 60079-29-1

Since it was published in 2007, the first edition of the IEC 60079-29-1 explosive atmospheres standard has detailed internationally recognized performance requirements for detectors of flammable gases or vapor concentrations with air. In 2016, the IEC TC31 technical committee is expected to complete development of the second edition of the standard. However, details of any changes and modifications – and the anticipated effective date for compliance – have not yet been publically announced. First edition requirements will remain in effect until the second edition is published and adopted in national jurisdictions.

Known formally as IEC 60079-29-1 (Edition 1, August 2007): Explosive atmospheres – Part 29-1: Gas detectors, this standard specifies the general requirements for construction, testing and performance of portable, transportable and fixed apparatus for detecting and measuring flammable gas or vapor concentrations with air. The standard applies to detectors providing an indication, alarm or other warning of a potential explosion hazard. In some cases, the apparatus may initiate automatic or manual protective action(s).

The first edition of IEC 60079-29-1 (Edition 1, August 2007) was a technical revision that canceled and replaced the first edition of the IEC 61779-1 to IEC 61779-5:1998 series of standards, condensing the requirements into a single, consistent standard. At the same time, the requirements were modified to reflect ongoing industry developments, including the expanded use of software, communications and other new technologies that impact the safety and performance of detection devices.

KEY REQUIREMENTS

Key changes from the IEC 61779-1 to IEC 61779-5:1998 series included:

- Modifications to the requirements for alarm and output functions, to ensure alarm devices cannot be adjustable outside their measuring range and to include requirements for de-activation of alarm devices.
- Addition of requirements for software-controlled apparatus, for improved evaluation of software. The added software requirements were based on the guiding principles and requirements of standard EN 50271.
- Additions of the requirement for communications options, to ensure maximum transaction rates are applied during testing.
- Modifications to air velocity testing, to include testing at 3 m/s and 6 m/s.
- Additions of requirements for stand-alone gas detection apparatus for use with separate control units, to allow separate evaluation of detection apparatus with an industry-recognized output signal.

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The IEC 60079-29-1 standard has been adopted internationally with national deviations. In Europe the EN 60079-29-1 standard mirrors the requirements of IEC 60079-29-1. It is recognized under the ATEX directive and is published in the Official Journal. In the U.S., IEC 60079-29-1 Edition 1 has been adopted with deviations under standard ANSI/ISA-60079-29-1 (12.13.01)-2013. Canada has adopted IEC 60079-29-1 Edition 1 with deviations under standard under CAN/CSA-C22.2 No. 60079-29-1:12.

FUTURE UPDATES
CSA Group will provide updates on changes and modifications to the current standard as the second edition is finalized, requirements are published, and terms of national adoptions (and any applicable deviations) are announced.