



Australia and IECEx – January 2008

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Introduction

Australia, a founding member country of the International IECEx Scheme, has committed not only to adopting the IEC hazardous areas standards and embracing IECEx Certification, but also to ensuring that IECEx Certificates are recognized by their National Standard [AS/NZS 2381 Part 1] for installations in hazardous areas.

As an active member country of the IECEx Australia continues their involvement in support of the vision through providing the convenorship of a relatively new IECEx Working Group, WG12, for Competency of Personnel Certification in the field of explosion protection. This coupled with Australia holding the chairmanship of IEC Technical Committee TC 31, as well as, other key leadership roles, further demonstrates Australia's commitment to embrace international Ex Standards and the IECEx Scheme.

The work of both IEC TC 31 and IECEx are of prime importance to Australia given their large and diverse industries concerned with explosion protection, which includes oil and gas (on shore and off shore), mining,

particularly coal mining, chemical processing, grain handling, sugar and related industries, plus other dust related industries such as wood chipping etc.

While petroleum and chemical industries account for major installations in hazardous areas worldwide, industries where combustible dusts are present are also a significant market for explosion protected equipment in Australia, due to the dry and very hot climate so often encountered here.

Much of the changes to requirements in Australia over the years have been driven by the regulators, and the 'proof of compliance' has been strengthened in legislation and regulations to satisfy the changes that have occurred. In fact the legislation in all States of Australia references the installation standard AS/NZS 2381 Part 1 requiring that all products in hazardous areas must have a certificate that is System 5 with testing and quality verified by a third party. Current IECEx and Australian schemes meet these requirements but very few other schemes can provide evidence of the same level of integrity.

History

The development of Australian Standards covering the field of explosion protection commenced in the late 1950's and were very much based on the early British Standards. Over time it was found that the conditions in Australia required some 'alternate thinking' based primarily on the local environment and industries. These standards slowly became unique to Australia. The mix of requirements was also influenced by the number of North American installations undertaken during the rapid development of the infrastructure system for the oil & gas industries during the 1960s and 1970s. Additional standards were developed for specific areas, particularly those related to the underground coal mining industry.

From the beginning, use of explosion protected equipment in Australia has been divided into two separate areas,

- › equipment for use in coal mines,
- › equipment for use in areas other than coal mines.

While this situation continues today, there is a greater synergy between the two. Standards Australia, the body recognized as the peak standards body for Australia, facilitates the development and maintenance of Australian Standards. Standards Australia was originally formed in 1922 and also serves as the Australian National Committee to the IEC (International Electrotechnical Commission). Standards published are available for from Standards Australia at <http://www.standards.org.au>.

Background

Standards Australia has established Technical Committees to prepare and maintain Australian Standards covering the use of electrical equipment in hazardous areas. These committees are:

- › EL014 – Electrical Equipment in Hazardous Areas and a number of sub-committees that effectively mirror the work of IEC TC31
- › MS011 – Classification of Hazardous Areas
- › EL023 – Electrical Equipment in Coal Mines
- › P012 – Ex Competencies

As part of the previous closer economic relations agreement between Australia and New Zealand, these committees have been constituted as joint Australian/New Zealand committees, to prepare and publish joint Australian/New Zealand standards. The majority of hazardous area standards are the same, however, due to differences in the legislation and regulations in the 2 countries some minor variations do exist. In addition,

Standards Australia has established management committees to oversee the operation of the accepted Ex Certification Schemes:

- › P008 – ANZEx Certification Scheme Management
- › ET006 – Australian mirror committee to IEC CAB with specialist sub-committee ET006-01 as a mirror Ex Management Committee.

While Committee P008 is a joint Australian/New Zealand committee, Committee ET006-01 remains an Australian committee as both Australia and New Zealand retain their own sovereignty in their membership of IEC.

Since 1991, both Australia and New Zealand have been actively participating in the IEC Technical Committee TC31. This work has enabled a streamlined approach to adopting IEC Standards, where possible without national variations.

The focus for this work has been in the area of explosion protection technique standards, noting that slight variations in classification, installation and repair and overhaul standards between Australia/New Zealand and the IEC mean that further work is required. →

Reasons behind the move for alignment between Australian/New Zealand and IEC Standards

There are numerous compelling arguments for alignment between national and international standards. These are best summed up by the following extract from a presentation given in 1995:

By aligning the requirements of Australian and New Zealand Standards to the International Electrotechnology Commission (IEC) Standards the following benefits are gained:

- › a true global market for all products
- › volume production giving far greater economies of scale
- › open exchange of technology
- › exchange of product

A single requirement worldwide will be established.

Australia and New Zealand do not always align on current requirements. The situation on dust classifications... is an example of different approaches to the same situation. In this part of the world we should ensure that we do not create a position where we cannot send products outside our own markets.

IEC Standards now either adopted or accepted for use in Australia include:

- › IEC 60079 Series
- › IEC 61241 Series

There is a great deal of work currently underway within Committee IEC TC 31 and one should periodically check this to keep up to date.

There are a number of other standards that contribute to the safe use of electrical equipment in hazardous areas, such as AS 1939 – degrees of protection provided by enclosures for electrical equipment (IP Code), IEC 60529.

Standards Australia HandBook HB13 explains, in a concise fashion, the various explosion protection techniques, permitted in Australia, as well as, providing information relating to area classification, equipment selection, and certification.

Another major area of standardization in the field of explosion protection in Australia has been the area of repair and overhaul, with Australian/New Zealand Standard AS/NZS 3800 being developed as the set of minimum requirements for repair and overhaul workshops. There are a number of workshops that hold certification to AS/NZS 3800 throughout Australia.

Introduction of the 2nd Edition of IEC 60079-19 means that the Australian Committee is now focused on integrating IEC 60079-19 into their national standards base.

Certification/approval of explosion protected electrical equipment in Australia

There are various authorities in Australia and New Zealand concerned with the safety of electrical installations in hazardous areas. These include the electrical regulatory authorities, department of mines, department of labour and industry, and the insurance industry.

The authorities' need for appropriate standards are catered for through their membership in committees such as joint Standards Australia/Standards New Zealand Committees EL014, Electrical Equipment in Hazardous Areas, and EL023, Electrical Equipment in Coal Mines, which prepare standards that take into account the special conditions and risks that exist in hazardous areas. However, some forty years ago it seemed necessary for these authorities to participate in a national certification scheme.



Australian Ex-approval

From the early 1960s Standards Australia operated an approval based scheme based on type testing of samples, referred to in later years as the AUSEx scheme, which operated under the direction of the Standards Australia P003 committee and comprised representatives from state electrical and mining regulatory authorities.

This committee was responsible for considering applications for certificates and for authorizing the issue of Certificates of Compliance or Statements of Opinion. It also advised regulatory authorities and industry on matters relating to the application of Australian Standards to electrical equipment for use in hazardous areas. Under this scheme the committee met 5 or 6 times a year to consider applications, generally using test reports and, in most instances, samples to come to a decision.

Australian Ex-certification

The next phase of the scheme was introduced on 1 July 1993 when MP 69:1993 superseded MP 42:1990, and implemented a new program for the Australian Ex Certification Scheme, managed by the new Ex Certification Management Committee P008 and administered by Quality Assurance Services (QAS).

This phase of the scheme, known as the AUS Ex Scheme, served the Australian industry well, but Australia's participation in the new international IECEx Scheme meant that a review of the scheme was required, to ensure that this scheme could

continue to cater to the needs of industry. Therefore, a review of the operational procedures was conducted with the aim of accommodating Australian and New Zealand participation in the IECEx Scheme, as well as, aligning with international practice for conformity assessment.

Until 2002, the scheme operated as an ISO Type 1 (Type test) Scheme that required a type test and an undertaking from the manufacturer to only produce products according to the original certified specification. Also introduced was a 'validity' period on the certificate of 10 years. This applied to the manufacture of the equipment and was intended as a substitute until manufacturers introduced a quality program. While it has served the industry well, the ever changing industrial and commercial climate with company acquisitions, takeovers, mergers and collaborations highlights the limitations of type test certification without having a quality program.

Another major reason for the review was the ongoing publication of joint Australian/

New Zealand Standards, of IEC Standards, as well as, the acceptance of other relevant IEC Standards in the field of hazardous areas/explosive atmospheres. This created the need to incorporate all these adopted and accepted standards in the scheme.

Such difficulties have led many overseas approval and certification agencies to include assessment of manufacturer's Quality Management Systems (incorporating the relevant product quality plans) as a mandatory requirement of certification.

Based on this set of circumstances Committee P008 has endorsed the inclusion of the ANZEx Quality Management System Requirements as a mandatory aspect of the ANZEx Scheme and commenced the phase out of the AUSEx Scheme.

The scheme in operation today is known as the ANZEx Scheme operating under the direction of Standards Australia Committee P008, which has been modelled to fully align with the IECEx Scheme and requires:

- › type testing of samples
- › an initial factory assessment and audit
- › on-going surveillance auditing of the manufacturer.



The ANZEx Scheme also caters for 'one-off' items by way of a 'Restricted Type Test Certificate', which apply only to the item(s) submitted for testing and assessment, and identifies each item by serial number or other means.

Further information regarding the Australian certification schemes can be found at www.anzex.com.au.

Australian certification bodies

Under the Australian Ex Scheme, the following bodies are accepted for issuing ANZEx certificates. All three bodies are also accepted under the IECEX Scheme for issuing IECEX Certificates of Conformity for equipment, with SIMTARS also accepted under the IECEX Certified Service Facility Program to issue IECEX Certificates to repair workshops for explosion protected equipment in compliance with IEC 60079-19.

- › TestSafe Australia
919 Londonderry Road
Londonderry NSW
- › The Safety In Mines Test and Research Station (SIMTARS)
2 Smith Street
Redbank QLD
- › International Test and Certification Services (ITACS)
4–6 Second Street
Bowden SA

IECEX Certificates – Australian acceptance

As a foundation member to the IECEX Scheme, coupled with modelling its own national scheme (ANZEx) on IECEX, Australia placed itself in an excellent position to make full use of the IECEX Scheme and its services by way of

- › acceptance of IECEX Certificates – acceptance of products covered by an IECEX Certificate of Conformity, for the Group II (non mining) industries
- › acceptance of ExTRs and QARs – Use of IECEX Testing and Quality Audit Reporting done by any of the IECEX Bodies, to be used for the issuing of an ANZEx certificate (known as the fast track)

For the mining industry, Group I, IECEX Certificates of Conformity, issued by any IECEX Certification body have been accepted into the NSW Mining Regulations while for Queensland, the IECEX Certificate must be issued by an Australian IECEX Certification Body. A situation that is expected to change.

Australia's decision to accept IECEX Certificates of Conformity for direct market access to Group II industries was seen as a logical extension to the full adoption and acceptance of IEC Standards in this field. A move further facilitated by Australia's involvement in the various IECEX Working Groups and the close cooperation and dialogue among the various stakeholders in the field of explosion protection, e.g. manufacturers, regulators, end users and certification bodies.

While identifying many advantages in full acceptance of IECEX Certificates of Conformity, such as:

- › greater choice of products and components
- › greater choice of certification providers
- › faster access to new and emerging technology
- › significant cost savings to manufacturers and industries
- › the hidden benefits that networking at an international provide, e.g. knowledge transfer



Perhaps the greatest difficulty or most negative aspect has been accepting that Australia must maintain its active involvement, like all IECEx members, to ensure that their interests are served.

In the early days, manufacturers did raise concerns at the apparent additional cost to achieve IECEx Certification with its much more rigorous reporting requirements, e.g. formalized ExTRs and QARs, than normally encountered by processing local ANZEx certification alone. Also of concern was the introduction of 'false' IEC Ex Certificates, primarily from Europe, that were discovered in the Australian market. This was behind the Australian push for the immediate introduction of the full certificate as at that time only ExTRs were being issued. There is also an ongoing battle. Fortunately this was only became evident.

Repair and overhaul certification

Repair and overhaul of explosion protected equipment has been covered in Australia Joint Australian/New Zealand Standard AS/NZS 3800, with certification of repair workshops to this standard handled by individual certification bodies. Currently there is no national scheme, other than the accreditation system of bodies offered by the JAS-ANZ accreditation body.

With the introduction of the new IECEx Certified Service Facilities Program for repair and overhaul in late 2007, Australia is set to make use of this new IECEx service offering with SIMTARS of Queensland, the first Australian Certification Body to gain acceptance as an IECEx Certification Body for this new program. To date SIMTARS has already issued its first certification to a repair and overhaul workshop in the South East Asian region.

Australia along with the UK, Norway, The Netherlands, and Singapore are all countries with certification bodies that have achieved acceptance as IECEx Certifiers for the new Certified Service Facilities Program.

Competencies

The need for competent people to do work in the field of explosion protection, whether installation of explosion protected equipment or repair and overhaul, is obvious. Australia, like many other countries, operates competency training and certification at national levels. The current work of IECEx Working Group on Personnel Certification is being embraced by Australia, whom along with other countries, see the benefit and need for a single structured system, operating worldwide, to independently assess and assure the level of competence of personnel. This work is seen as a logical extension to both of the IECEx existing Programs:

- › Certified Equipment Program
- › Certified Service Facilities Program

The worldwide acceptance of the IEC Standards and structures for design, production, installation, and their use inclusive maintenance, repair and overhaul of electrical equipment for use in hazardous areas ensure considerable advantages for manufacturers and users, and keeps costs to a minimum while preserving the necessary level of safety.