



The concept of risk-based selection of equipment for hazardous areas, such as oil rigs, is not new.

## ENHANCING SAFETY – THE ATEX DIRECTIVE AND THE ETCI

Kieran Fallon Chartered Engineer, FIEI provides an update on the ATEX Worker Safety Directive which has now been in force for more than six years. He also looks at the work of the Electro-Technical Council of Ireland (ETCI) including its revision of the national rules for electrical installations in potentially explosive atmospheres (ET 105:2001)

**T**he ATEX Worker Safety Directive has now been in force for over six years and fully applicable to existing workplaces since 2006. The directive, 1999/92/EC, which is implemented into Irish law through the Safety, Health & Welfare at Work (General Application) Regulations 2007, requires:

- production and maintenance of an explosion protection document and hazardous area classification;
- control of ignition sources;
- training; and,
- signage.

CE marking, familiar to many, has applied to products for use within potentially explosive atmospheres for a similar period of time. This directive, 94/9/EC, which is transposed into Irish law by S.I. No. 83 of 1999, prohibits the sale, or putting into service of, equipment in hazardous areas unless it complies with ATEX and is CE marked. Generally, to meet the requirements of the directive, products are designed and manufactured in conformance with a range of harmonised CENELEC standards. Harmonised standards are standards which are aligned with the directive, lists of which are published and if complied with, the equipment manufacturer may presume conformance with the directive.

### Sources of standards

There are three main sources of standards for electrical equipment: national standards, European standards, generated by the European Committee for Electrotechnical Standardisation (CENELEC), and international standards from the International Electrotechnical Commission (IEC). For the most part, national standards for products have been replaced by common European standards identified with the reference EN. These EN standards are then adopted by national organisations, in Ireland's case the National Standards Authority of Ireland (NSAI), as a national standard. Installation standards have tended to remain as national standards which may be different in each country. CENELEC, in recent years, have tended to follow IEC standards and adopt the IEC standard rather than generate separate CENELEC standards. A system of co-operation is in place between the two organisations. The result is that international (IEC) and European standards are nearly identical.

The Electro-Technical Council of Ireland ([www.etcie.ie](http://www.etcie.ie)), through Technical Committee TC6, is responsible for equipment and installations within potentially explosive atmospheres. The committee is actively involved in the generation and review of international standards associated

with ATEX certified equipment and potentially explosive atmospheres. The work of TC6 includes reviewing and voting on international (IEC TC31) and European (CENELEC TC31) standards. Standards are generally subject to a maintenance cycle which requires that they be reviewed on a regular basis. In addition, equipment standards for dusts and gases, which were separate documents, have generally been incorporated into single publications under the IEC/EN60079 series and a material group for dusts (Group III) is progressively being introduced into the standards.

### Revision of ET105

Currently the ETCI TC6 Committee, via a small Cork-based task group, is revising ET105:2001, the national rules for electrical installations in potentially explosive atmospheres. The new ET105 installation rules will incorporate elements of ET202:2001 and ET209:2003 (*Guide to the selection of electrical apparatus for use in potentially explosive atmospheres, and Recommended maintenance and inspection routine*, respectively) together with requirements of the ATEX Directives and will be aligned with the international IEC installation requirements (IEC60079-14).

The revised ET105 will also include details of the explosion protection levels (EPLs) which are now incorporated into all IEC and CENELEC hazardous area equipment standards. These EPLs introduce a risk-based approach to the selection of equipment for hazardous areas. EPLs are designated as M for mining, G for gas, D for dust, and followed by a letter (a, b, or c), which indicates whether the equipment provides either very high, high, or enhanced levels of protection against ignition of an explosive atmosphere.

The concept of risk-based selection of equipment for hazardous areas is not new and is included in the ATEX directives using the term 'Categories' (although using a risk assessment as the basis of a decision to select Category 3 equipment for a Zone 1 area is not permitted under ATEX). Indeed even before ATEX, risk-based selection was exercised either through manipulation of zones, or minimum requirements in the selection of equipment above that which was required for a particular zone. Even the EPL designations are not new, but instead use familiar abbreviations for the three levels. The intrinsically safe system of protection methodology (EEx-ia & EEx-ib) and, more recently, encapsulation (EEx-ma & EEx-mb) use the concept of designating 'a' and 'b' to indicate installation in different zones (Category 1, Zone 0 and Category 2, Zone 1 respectively). The M, G and D designations used in the latest EPL standards are also familiar to the industry from their use in the ATEX Directive. The introduction of explosion protection levels could be considered as a transfer of the ATEX category concept to the international standards. CENELEC publications consider explosion protection levels and ATEX categories to be the same. CENELEC standards state, with reference to EPLs 'Wherever there is a reference to an EPL in the text, it should be equated with the corresponding ATEX Category'.

### Invaluable tool

Although questioned at the time of their introduction, the ATEX categories have become invaluable tools in the selection of equipment for hazardous areas. Use of either the ATEX category, or the explosion protection level, is becoming essential as equipment is provided with more complex combinations of protection concepts. The ATEX category

allows an understandable and unambiguous method of selection of equipment. The proposed EPLs should perform a similar function but with international rather than just European application.

### Dusts

Since the application of the ATEX directive, protection of explosive dust atmospheres from ignition sources has become more formalised. The ATEX directive introduced the concept of a separate and dedicated category for equipment intended for dust atmospheres and a requirement to identify these items with 'D'. The IEC standards have introduced an additional material group, Group III for dusts, thus IEC and CENELEC material groups are now:

- I: mining;
- II: gases and vapours; and
- III: dusts, fibres and flyers.

The material group III for dusts is further broken into three sub-groups as follows:

- IIIA: combustible fibres and flyers;
- IIIB: combustible dusts; and
- IIIC: combustible conductive dusts.

As with the EPLs, there is no mention of Group III within the ATEX directives, an issue which will have to be resolved over time.

### International committee meeting

As part of the ETCI TC6 Committee's contribution to the international standardisation endeavour, the ETCI, in close cooperation with NSAI ([www.n Sai.ie](http://www.n Sai.ie)) will host the international committee meetings of IEC TC31 and CEN TC305. These are the committees who are responsible at an international level and European level for the development and maintenance of standards associated with potentially explosive atmospheres. The meetings will take place October 29 and 30, 2009, in the Engineers Ireland conference facilities at 22 Clyde Road, Dublin 4 ([www.engineersireland.ie](http://www.engineersireland.ie)). Training continues to be an important part of the ETCI remit and members of TC6 have developed and presented a number of sessions of the ETCI 'Foundation Course in Hazardous Areas'. The next course has not been scheduled as yet, but is expected to take place mid-2010.

Publication of revised ET105 is due towards the end of this year or early 2010, and any specific comments on the existing ET 105, ET 202 or ET 209 would be welcome. ☐



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