Competency in the Field of Explosion Protection

The need for competence in the field of explosion protection has been highlighted by the ATEX Directive for the Protection of Workers in Potentially Explosive Atmospheres. The Standards used in the application of the Directive (and the IEC ‘global’ Standards) provide guidance as to the level and type of training and competency required for workers in hazardous environments. The knowledge, skills and competencies of persons are referred to in the standards IEC/EN60079-14 Selection and Installation, IEC/EN 60079-17 Inspection and Maintenance and IEC/EN 60079-19 Repair and Overhaul.

About the Standards

Great emphasis is put on the necessity to verify the training, experience and skills of people who may have an effect on the compliance of an initial installation, maintaining the safety of an existing installations and repairing failed equipment from an installation. This is re-enforced with a requirement for ‘competence’ in the field of explosive atmospheres.

The Standard now identifies the various roles that require training and the level of training required.

Management and Design Personnel (Responsible Persons) functions now have specified training requirements in addition to clarifications on the type of training for equipment installers inspectors, maintainers, repairers and overhaul personnel (referred to as ‘operatives’). Historically, it has predominantly been the ‘hands on’ installers who were directed to receive appropriate training, but the requirements now consider all of the personnel who may have an influence in the final integrity of the plant installation as part of the training mandate.

Enforcement

The guidance provides a specification for both providers of installation services and buyers of installation services. It is likely that the competence levels will be written in to many companies' specification contracts for verification of competence. Evidence of competence could be requested (by an end client or by the regulatory authorities) for the de the people who built the plant and the people involved in the management process. Contracting companies who are involved with Hazardous Area plant will have needed installation qualifications for there electrical installation engineers, but now - in addition they be asked for their Designers and Managers (Responsible People) training and competence records.
Mandated knowledge and skill requirements

General
Competencies shall apply to each of the explosion protection techniques for which the person is involved. For example, it is possible for a person to be competent in the field of selection and erection of Ex’d’ equipment only and not be fully competent in the selection and erection of Ex’i’ instrumentation or Ex’e’ motors. In such cases, the person’s management shall define this in their documentation system.

Responsible Persons

Responsible persons who are responsible for the ‘processes’ involved in the design, selection and erection inspection and maintenance or Repair and Overhaul of explosion protected equipment shall possess, at least, the following:

- General understanding of relevant electrical engineering;
- Understanding and ability to read and assess engineering drawings;
- Practical understanding of explosion protection principles and techniques;
- Working knowledge and understanding of relevant standards in explosion protection;
- Basic knowledge of quality assurance, including the principles of auditing, documentation, Traceability of measurement and instrument calibration.

Such persons must confine their involvement to the management of Operatives conducting selection and erection inspection and maintenance or Repair and Overhaul duties and not engage themselves directly in the work without ensuring their practical skills at least meet the requirements given in this document. Responsible Persons are required to be able to demonstrate their competency. Typical staff that may require this training include Project Managers, Maintenance Managers, Procurement Managers, Quality Assurance and Contract Managers.

Operatives

Operatives are considered to be people who are involved in the selection, installation and inspection and maintenance and repair and Overhaul of equipment. Operatives required training under the old Standard/system for installation, but the new standards greatly emphases the need for an assessment of the competency. This necessitates theoretical and practical assessments and evaluations such as the Baseefa Competency scheme’ where applicants are assessed on the theoretical and practical knowledge as necessary.

Operatives shall possess, to the extent necessary to perform their tasks, the following:

- Understanding of the general principles of explosion protection;
- Understanding of the general principles of types of protection and marking;
- Understanding of those aspects of equipment design which affect the protection concept;
- Understanding of content of certificates and relevant parts of IEC/EN 60079-14;
- General understanding of inspection and maintenance requirements of IEC/EN 60079-17;
- Familiarity with the particular techniques to be employed in the selection and erection of equipment referred to in IEC/EN 60079-14; 17 or 19 as appropriate
- Understanding of the additional importance of permit to work systems and safe isolation in relation to explosion protection
Operatives shall be able to demonstrate their competency and provide evidence of attaining the knowledge and skill requirements specified above relevant to the types of protection and/or types of equipment involved. They shall also be able to demonstrate their competency with documentary evidence in the:

- Use and availability of documentation;
- Production of job reports to the user;
- Practical skills necessary for the preparation and installation of relevant concepts of protection;
- Use and production of installation records.

Designers (design and selection)

The requirements for personnel involved in the process of designing plant in potentially explosive atmospheres (including equipment that may be located in the safe area but have functionality involved in the safe explosion prevention or mitigation) are new and should be given serious consideration. The requirements will obviously be applicable to companies who design plant (new plant or modifications) but are equally applicable to project engineering companies or manufacturers who may provide rigs, skids or assemblies that may or may not utilise certified hazardous area equipment.

Designers shall possess, to the extent necessary to perform their tasks, the following:

- Detailed knowledge of the general principles of explosion protection;
- Detailed knowledge of the general principles of types of protection and marking;
- Detailed knowledge of those aspects of equipment design which affect the protection concept;
- Detailed knowledge of content of certificates and relevant parts of 60079-14;
- Understanding of practical skills for the preparation and installation of relevant concepts of protection;
- Detailed knowledge of the additional importance of Permit to Work systems and safe isolation in relation to Explosion Protection;
- Detailed knowledge of the particular techniques to be employed in the selection and erection of equipment referred to in IEC/EN 60079-14;
- A general understanding of Inspection and Maintenance requirements of IEC/EN 60079-17;
- A general understanding of Inspection and Maintenance requirements of IEC/EN 60079-19

Designers shall be able to demonstrate their competency and provide evidence of attaining the knowledge and skill requirements above, relevant to the types of protection and/or types of equipment involved. They shall also be able to demonstrate their competency with documentary evidence in the:
• Production of documentation;
• Production of Designers certificates to the user;
• Practical skills necessary for the preparation and compilation of relevant design details for the concepts of protection and systems involved;
• Update and production of installation records as specified in 60079-14.
• Update and production of inspection and maintenance records as specified in 60079-17
• Update and production Repair and overhaul records as specified in 60079-19.

Assessment of training and competence

The new Standards state that the competency of Responsible Persons, Operatives shall be verified and attributed, at intervals relevant to national regulations or standards or user requirements, on the basis of sufficient evidence that the person:

• Has the necessary skills required for the scope of work;
• Can act competently across the specified range of activities; and
• Has the relevant knowledge and understanding underpinning competency.

A verification of ‘practical skills’ is necessary for people involved in the preparation and installation inspection maintenance and repair and overhaul of equipment.

Verified and attributed Competence translates to having training records for all staff that demonstrate that the training provided covers the scope specified by the standard and was provided by a competent training authority.

Bodies offer training for responsible persons and operative’s people and are a possible source of appropriate training. Internal company training and competence records may be used to demonstrate compliance if the internal training provider and competence assessor can be demonstrated as competent and suitable expertise and knowledge. The mechanism for ensuring that the training provided is in line with current Standards and practices should also be recorded. The frequency of re-training (updating) is not currently specified but is likely with the up coming IEC Ex Scheme to require a 3 year assessment.

Individual companies should be aware of the changes to legislation and standards that are applicable to them and should determine if additional training is required. The company’s quality system should address this, together with the management and verification of training records and a mechanism to ensure that only appropriately trained (competent) people are allocated tasks that may impact on a hazardous area installation. There have been many significant changes in the standards that introduce new protection concepts, new equipment selection methodologies and new equipment groupings (for example IIIA, IIIB and IIIC for dust).

It is important to assure that any Responsible Persons and Operatives maintain their competency as standards move on. This maybe supplemented with a mechanism for updating the people involved where such changes occur, or having more frequent refresher training. To ensure personnel who obtained verified competency remain competent