IECEx Requirements and Certification – Building Safety Awareness and Confidence in the Hazardous Areas

by Dr Siow Chun Lim, Grad. IEM

Dr Siow Chun Lim, Grad. IEM is currently the Associate Editor of Journal of Engineering Science and Technology and is also an active reviewer for several conferences and journals.

The seminar on "IECEx Requirements and Certification- Building Safety Awareness and Confidence in the Hazardous Areas" was successfully organized by the Electrical Engineering Technical Division, The Institution of Engineers Malaysia on 19th September 2016 at Wisma IEM. A total of six speakers gave presentations with the ultimate aim of creating awareness on IECEx.

The seminar started off with a joint presentation by Mrs Marina Mahdar and Ir. Quah Ewe Hoch on brief introduction to Ex equipment and IEC 60079 series. A standard is defined as a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. Standards are drafted by a group of experts in the identified field which typically comprise of representatives from the institutions of higher learning, professional bodies, government agencies, manufacturer and trade association, consumer associations, research organisations and industries. An Ex area, which can be known by "Hazardous Locations" or "Explosive Atmospheres" relate to areas where flammable liquids, vapours, gases or combustible dusts are likely to occur in quantities sufficient to create an explosion. Hence, an Ex equipment is nothing but an equipment installed in such area. Common Ex areas include petrol stations, oil refineries, chemical processing plants, printing industries as well as hospital operating theatres. Ex protection is done by preventing at least 1 of the 3 parts of the fire triangle namely oxygen, fuel or heat.

According to IEC 60079, Ex area can be classified into 3 zones namely Zone 0 (always hazardous during normal operation), Zone 1 (occasionally hazardous during normal operation) and Zone 2 (not normally hazardous). Various protection design such as flameproof protection, pressurized equipment protection, powder filling protection, oil immersion protection, increased safety protection, non-sparking protection, encapsulation protection, intrinsic safety protection, optical radiation and dust protection are defined in IEC 60079.

The seminar continued with Ir. Halim bin Hafiz presenting an overview on IECEx and the current standing of Malaysia with regards to the advancement of IECEx. According to Ir. Halim, there are 3 types of certification under IECEx namely:

1. IECEx 02: Equipment Certification Programme covering equipment for use in explosive atmospheres.

2. IECEx 03: Certified Service Facilities Programme example covering repair and overhaul of Ex equipment

3. IECEx 05: Scheme for Certification of Personnel Competencies (Ex CoPC) for Explosive Atmospheres

The status of certification compliance PETRONAS installation are as follows:

1. Fully complied to IECEx 02

2. IECEx 03: PETRONAS only allows any repair or overhaul of Ex equipment to be executed by Ex Certified Service Facility

3. IECEx 05: The requirement of Ex CoPC was already included in consultant and fabrication tender document

Ir. Halim concluded his presentation by saying that in addition to the Ex Requirement for new products and Ex Repair Workshops, PETRONAS has adopted the IECEX CoPC in their service contracts. He also briefly introduced INSTEP which is providing Ex Trainings that are aligned to the IECEx CoPC requirement and has been internationally recognized by Ex Training Provider (Ex RTP) and SIRIM QAS International Sdn Bhd, which is one of the IECEx CoPC Certifying Body and for Ex Service Facilities IECEx-03 Part5, Repair and Overhaul.

Then, the fourth speaker, Ms. Wan Fariza shared the IECEx certification requirements on CoPC and Service Facilities. Ms. Wan Fariza represented SIRIM. IECEx CoPC is the first international scheme aimed at providing personnel with a worldwide recognition covering areas of design, selection, installation, maintenance, inspection, audit, overhaul and repair of Ex equipment. It basically exemplifies that the certificate holder is capable of working in the Ex industry safely, conducting work on Ex equipment and ensuring that the Ex equipment is operating safely in accordance with its protection techniques.

The fifth speaker was Mr. Johan Kamaruzzaman, an expert in delivering process safety and technical services to the oil and gas industry. He shared a list of acronyms which bears great significance to the process safety industry as shown in Table 1.

Acronym	Definition
HAZID	Hazards Identification Study
HAZOP	Hazards and Operability Study
SIL	Safety Integrity Level
QRA	Quantitative Risk Assessment
FERA	Fire, Explosion & Radiation Analysis
EERA	Escape, Evacuation & Rescue Analysis
ESSA	Emergency System Survivability Analysis
CFD	Computational Fluid Dynamics
SGIA	Smoke Gas Ingress Analysis
SCE	Safety Critical Element/ Equipment
PS	Performance Standards

Mr. Johan recommended that the hazard and risk reduction priorities should be as follows:

1. Prevention or elimination of the hazards or impact

2. Substitution of hazards

3. Provision of engineering control and administrative control

4. Provision of mitigation measures

The final speaker of the day was Ir. Abdul Manan bin Ismail who is a principal instructor of INSTEP Petronas. INSTEP's objective is to prepare participants with knowledge and skills in line with IECEx OD504 and IEC 60079 standards.

The seminar concluded with Ir. Faridon presenting a token of appreciation to all 6 speakers on behalf of Electrical Engineering Technical Division, IEM.

Group photo of all participants and speakers at the end of the seminar