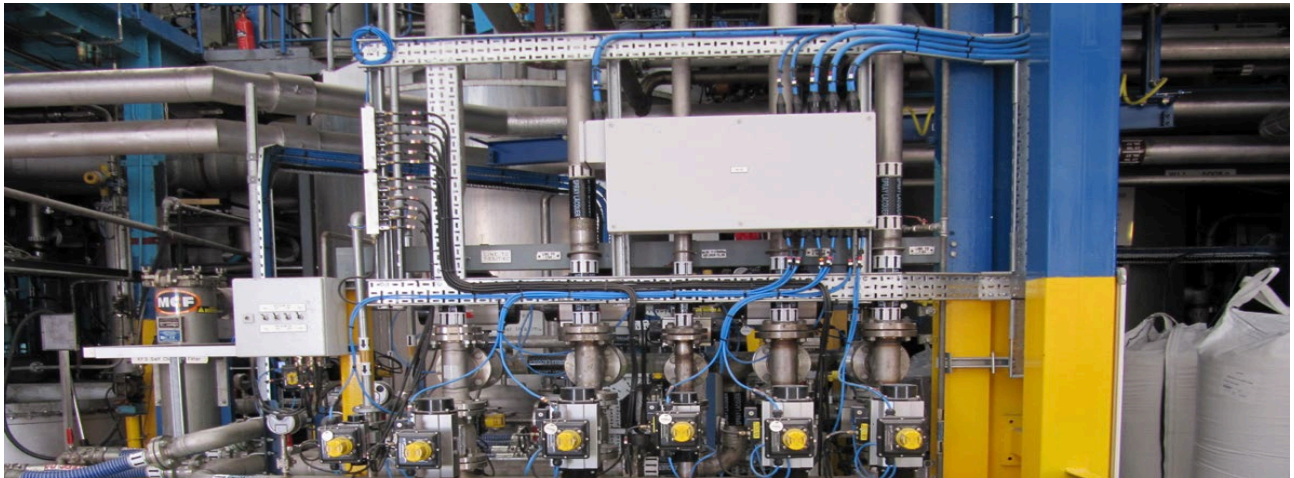


Selection, Installation, Inspection, and Maintenance of Electrical Equipment in Hazardous Areas (IEC & NEC, 4 days course)



Learning objective:

This course aims to give fundamental knowledge to those who require the selection and installation of electrical equipment suitably for hazardous classified areas. It also covers applicable knowledge for operators, inspectors, and maintenance service of the explosion-protected equipment and their installations for safety purposes in such an environment. The IEC 60079-14 recommended that the design of the installation, the selection of equipment, and the erection for explosive atmospheres shall be carried out only by persons whose training has included instruction on various types of protection and installation practices, relevant rules and regulations, and on the general principles of area classification. Appropriate continuing education or training shall be undertaken by personnel on a regular basis.

The course is conducted with reference to IEC 60079-10/ -14/ -17 and various parts of IEC 60079 standards for specific types of protection, ATEX Directive, IECEx Scheme, and also NEC 500 (NFPA 70) in addition.

Target Audience:

Electrical and instrument tradesmen, technicians, and engineers of all disciplines and similarly qualified personnel who work with electrical equipment for potentially explosive environments or hazardous areas.

Pre-requisite:

A good understanding of electrical installations at the tradesman level is required. Moreover, having some basic knowledge of hazardous areas is supported

Course outline:

Day 1

- Introduction and course objective
- Pre-course exam (30 min)
- Regulation and guidance for working safely with hazardous areas
- Properties of flammable materials
- Basic of Hazardous Areas Classification (HAC) acc. to IEC/EN 60079-10 (for operative)
- Group and temperature classes
- Sources of ignition
- Ex-equipment and Reference standards
- Equipment category & Equipment Protection Level (EPL)
- IP - Ingress Protection
- Overview of ATEX Directive and IECEx Scheme
- Certification process and certificates of equipment
- Equipment marking
- Overview for Ex-equipment for main types (d, e, n, p, i, t) and others



Day 2

- IEC 60079-14: Electrical installations design, selection, and erection
- Scope and general requirement
- Documentation, Initial inspection, Conformity of equipment
- Knowledge, skills, and competencies of personnel as required by IEC/EN 60079-14
- Selection of equipment
- Protection from dangerous sparking
- Electrical protection, Switch-off, Electrical isolation
- Cables and wiring systems
- Cable entry systems and blanking elements
- Additional requirement for protection types d, e, n, p, i
- Cable glanding (videos)

Day 3 (for NEC 500)

- Hazardous (Classified) Locations acc. to NEC 500 (NFPA 70): Classes/ Divisions
- Groups and Temperature classes
- Hazardous (Classified) Locations comparison: Class Division v.s. Zone
- NEMA rating
- Protection techniques acc. to NEC
- Electrical installations and wiring in hazardous locations acc. to NEC 500
- Test and certification authority NRTL: UL, FM, CSA,...
- Equipment label and marking

Day 4

- IEC 60079-17: Electrical installations inspection and maintenance
- Scope and general requirement
- Documentation
- Knowledge, skills, and competencies as required by IEC/EN 60079-17
- Safe work procedure guidance
- Types and Grades of inspections
- Periodic inspection, Continuous supervision by skilled personnel
- Maintenance requirements
- Isolation of equipment
- Inspection schedule
- Repair and overhaul equipment
- Qualifications of personnel
- IECEx CoPC (Certificate of Personnel Competence) under IECEx scheme 05
- Wrap-up & conclusion
- Post-course exam (1.5 hours)

*Remark: A practical exercise for cable gland assembling, installation, or inspection of equipment installation can be arranged upon prior discussion. The pre-setting equipment shall be needed.

Methodologies:

A classroom presentation, video, discussion, question & answer, and tests (multi-choices and written answers) are applied to ensure the learner's understanding.

Theory session:	75%
Quiz & exercise:	15%
Examination:	10%
Class size:	8 to 12 pax. is recommended for effective participation (max. 20 pax)
Duration:	9:00 - 16:30 hrs., 4 days (daily attendance check)
Lunch/ break:	12:00 - 13:00 hrs., 2- coffee breaks each day

Training language: Thai or English
 Training material: English (hard copy only)
 Certificate: Certificate of Attendance issued by the JTE_x, upon fulfilling the training criteria

Option: If required, a Certification of Attendance issued by TÜV Rheinland is the option with additional fee.

Remark: A training certificate is not for qualification and does not guarantee personnel competence. However, it will be provided upon completion of the course, once 100% attendance and passing the post-course exam, in order for the attendee to record his/her professional development. A refresher training in the next 3-5 years is recommended.

Instructor/ Trainer:

Mr. Jumpol Thojun has graduated with a Bachelor of Electrical Engineering (EE), a Master of Engineering Management (EM), and a Master of Business Administration (MBA). He holds a professional engineer license from the Council of Engineers - Thailand, and internationally certified personnel competencies for working with Ex-equip. and explosive atmospheres i.e. IECEx CoPC (9 units) from Baseefa-UK, and CompEx from JTL-UK. With over 29 years of experience in electrical engineering, Ex-equipment manufacturing, testing, and certification for ATEX-IECEx, QMS audit for ISO 9001, and ISO/IEC 80079-34, he has been authorized by TÜV Rheinland Industrie Service GmbH as an auditor, trainer, examiner, and expert for ATEX-IECEx Explosion protection services. Mr. Jumpol is stationed in Bangkok for servicing through the AP region.

Personnel Competence Certification:

To ensure a suitable knowledge, skills, and experience of your people for each duty in hazardous areas, the IECEx Certificate of Personnel Competence (CoPC) provides an internationally recognized scheme of competence for certification of personnel associated with the design, installation, inspection, operation and maintenance services for E&I equipment and system in hazardous areas. The CoPC certificates are available online on the IECEx website (www.iecex-certs.com) for searching. TÜV Rheinland Industrie Service GmbH is an IECEx Recognized Training Provider (RTP) and an IECEx Certification Body (ExCB) for this scheme. The CoPC examination by TÜV Rheinland is normally arranged in Germany, however, now this is able to extend locally for applicants in Asia Pacific countries (subject to a minimum pax each).

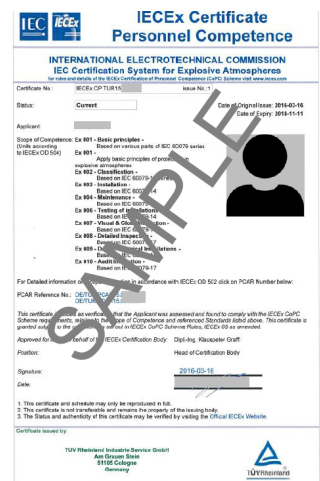
Units of personnel competence under IECEx CoPC scheme:

- Ex 000 - Basic knowledge and awareness to enter a site that includes a classified hazardous area
- Ex 001 - Principles of protection in explosive atmospheres knowledge
- Ex 002 - Perform classification of hazardous areas
- Ex 003 - Install explosion-protected equipment and wiring systems
- Ex 004 - Maintain equipment in explosive atmospheres
- Ex 005 - Overhaul and repair explosion-protected equipment
- Ex 006 - Test electrical installations in or associated with explosive atmospheres
- Ex 007 - Perform visual and close inspection of electrical installations in or associated with explosive atmospheres
- Ex 008 - Perform detailed inspection of electrical installations in or associated with explosive atmospheres
- Ex 009 - Design electrical installations in or associated with explosive atmospheres
- Ex 010 - Perform audit inspection of electrical installations in or associated with explosive atmospheres

For more information: www.iecex.com

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 Email: contact@jtexengineering.com; jumpol.thojun@tuv.net



CoPC Certificate (Sample)



ID Card (Sample)