The Proficiency Test Program for ExTLs - a key trust-builder within the IECEx system

Every two months, IECEx Chairman Prof. Dr. Thorsten Arnhold provides an update on developments within his organisation.

One of the most frequently asked question at IECEx conferences and similar events is about the difference between ATEX and IECEx. No worries – I don`t want to give a lecture about this topic now. It is not so obvious but there are many differences. For interested readers I can recommend the IECEx 01A Guide: "An Informative Guide comparing various elements of both IECEx and ATEX" which can be downloaded from the IECEx website under Publications

What I want to highlight in this article is the fact that IECEx is not a law like ATEX, it is an organisation acting worldwide on a voluntary basis. Our Executive Secretary, Chris Agius once said that IECEx is like a franchise system. There is a certain infrastructure and a powerful steering organisation but the day to day business is done by the Certification Bodies (ExCB) and the Test Labs (ExTL). In the IECEx Certified Equipment Program we now have 57 accepted ExCBs plus 5 Applicants and 68 accepted ExTLs plus 5 Applicants forming a global network for testing and certification of explosion protected products. Such a network organisation heavily depends on the competence and quality management of every single member. The overall quality of the test and certification process needs to be be high and uniform, and the results of these processes must be the same or at least comparable regardless if a manufacturer is applying for a certificate in Germany or in Brazil.

In order to ensure this high quality, IECEx started the Proficiency Test Program (PTP) for ExTLs in 2010. The idea behind this is to select a type test as it is defined in a certain IEC - TC 31 standard (IEC 60079 – XX) and to create standardised and calibrated test samples for this test. The samples are than sent to the ExTLs which have to make the type test with their equipment and send the test results to a notified authority. At IECEx, the German PTB is this authority, creating and producing the test samples and evaluating the test results.

In the meantime, the following seven programs have been conducted or are still running:

• Spark Ignition Test for Ex "I"	Test Round 2010
• Flame Transmission for Ex "d"	Test Round 2013
• Temperature Classification general	Test Round 2013
• Electrostatic Charge general	Test Round 2015
• Intrinsic Safety	Test Round 2015
• Explosion Pressure for Ex "d"	Test Round 2017
• Pressurised Enclosure for Ex "p"	est Round 2017

As an illustration of the program, here is a short description of one chapter of the 2017 Test Round:

For the program "Explosion Pressure - Test Round 2017" the general routine procedure is described by the standard "Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"" - IEC 60079-1, Edition 7.0. An essential characteristic for the testing and assessment of the explosion protection is the ability of the enclosure to withstand pressure (clause 15.2.). This is of decisive importance for the design and construction of "d" products. Therefore, the explosion pressure (reference pressure) has been selected as the quantity to be compared in the program "Explosion Pressure - Test Round 2017".

The explosion pressure is determined with the Test Sample "EP" for two different configurations (single chamber and combination of two chambers with orifice), two different ambient temperatures (normal temperature and ambient temperature of -40 °C) and two different explosive mixtures (ethylene & hydrogen) selected according to IEC 60079-1.

On the basis of two configurations of the Test Sample "EP" two explosive mixtures, two ambient temperatures and five ignitions each, a total of 40 explosion tests must be performed by each participant for the program "Explosion Pressure".

After feedback from participating ExTLs, a statistical evaluation of the results is carried out. The participants are than invited to join a workshop in which the results are presented and discussed. An important part of this workshop is training to achieve a common understanding of the best working practice.

The workshop for the Explosion Pressure Program took place in June 2018 at the PTB in Braunschweig, Germany, and 80 participants from international ExTLs joined this event. In the eight years the program has been running, we have seen that the quality of our test has risen from a satisfactory level at the beginning to an excellent level today.

We at IECEx are so convinced of the importance and the trust-building effect of the PTP that we decided at the 2014 IECEx Management Committee Meeting in The Hague to make it obligatory for all ExTLs and applicant ExTLs.

More detailed information about the program can be found in the Operational Document OD 202 ed. 2.0 (2017) which can be downloaded from the IECEx website.

When I wrote this article I was in the final stage of preparations for the 2018 IECEx Management Committee Meeting in Cannes France.

I will report on the outcomes of this, the main IECEx event of the year, in a future edition of Hazardex. ■