Vienna is calling

Every two months, Prof. Dr. Thorsten Arnhold, IECEx Chairman 2014-2019, provides an update on developments within the organisation.

In mid-November I was co-host and speaker at a conference in Jena, the well-known industrial and scientific city in the heart of Thuringia, Germany. The topic of the conference was the development and implementation of safety strategies for hydrogen applications.

Because of the one-sided focus of energy supply on renewable energy sources, especially wind and photovoltaics (PV), Germany is more dependent than any other large industrial nation on the rapid development of large storage capacities to balance out the volatile energy supply. Hydrogen as a storage and transport medium plays a crucial role here. At the end of the first day of the conference, the numerous participants were asked to formulate theses on the topic of safety of hydrogen applications in working groups.

One thesis stated: without safety, there can be no acceptance in society. At first glance, this statement makes sense to everyone. In reality, however, things often look different, the best example being nuclear energy. Viewed objectively and statistically proven, nuclear is one of the safest technologies ever. Deaths per terawatt hour (TWh) of energy generated associated 0.01 with nuclear power plants, while 18.4 deaths per TWh associated with oil were recorded. The sad leader in these statistics is lignite with 32.72 deaths per TWh (sources Markandaya & Wilkinson [2007], Sovacool et al [2015]). Nevertheless, there is still a considerably large proportion of the population who view nuclear energy as a high-risk technology and reject it in principle. In Germany, the energy gap created by the complete shutdown of all nuclear power plants is now largely filled by reactivated lignite-fired power plants. I will leave it to the readers to draw their own conclusions based on the numbers above.

Let's also take public transport and traffic for comparison: no one would think of calling this a high-risk technology. Even with the knowledge that around 1.2 million traffic deaths were registered worldwide in 2017, I'll sit relaxed in my car next Sunday to drive the 600km to Vienna, where I will take part in the ISO TC 197 annual conference. The connection between security and social acceptance of a particular technology is not as simple as expected. It occurs not only on a rational level based on concrete numbers and data, but also very much on an emotional level. Emotions, in turn, can be specifically controlled from the outside. For several years now, I have noticed that large parts of politics promise that the state cannot only significantly reduce risks to life, but even completely eliminate them. A particularly striking outgrowth of this movement is the EU "Vision Zero Road Deaths" (https://cinea.ec.europa.eu/publications/eu-road-safety-towards-vision-zero_en).

The truth is that there is no life without risk! All human activity, be it mental or physical work, be it professional or leisure, is associated with risks. All we can do is reduce these risks to a socially acceptable level. This level, which is still associated with a residual risk to life and health, is referred to as safety.

What are the conclusions for the new hydrogen technologies that we are using more and more in public spaces? The increasing contact of people with hydrogen, be it in traffic, for example in hydrogen-powered buses, be it in gas stations, in steelworks or in public buildings in which fuel cells are used to convert energy, makes it necessary to adequately publicise the hazard potential of hydrogen.

All people who are directly or indirectly involved with such new hydrogen systems in public spaces must have sufficient knowledge to behave correctly when dealing with hydrogen. However, in order to keep the acceptance of the technology high, it is necessary to build the necessary respect for the potential dangers without creating panic. What is particularly important here is the consensus among experts regarding the right, effective security strategies. This consensus is generally referred to as state of the art and forms the content of standards.

Personally, I am very happy to be able to contribute my knowledge and experience to this exciting development in the autumn of my professional career after more than 30 years of working with explosion protection in general. I am therefore looking forward to going to my first annual ISO TC 197 conference in Vienna to take part in shaping the necessary standards landscape. In my role as liaison officer between IECEx and the standards organisation for hydrogen technologies, I can also help deepen the good cooperation that has begun, which is about adopting proven elements of the global certification system in the future hydrogen economy. ■