Requirements for the safe operation of hydrogen test systems

Stefan Zickler, TÜV SÜD Industrie Service GmbH

The assessment of material and component properties in hydrogen atmosphere requires test systems, which can simulate realistic operational conditions. Due to high pressure and the presence of flammable gases hazards by pressure and explosion are created. For safe operation of tests systems, suitable protection measures have to be taken, which eliminate these hazards.
The requirements for these measures are defined by the hazardous potential of the system. Guidelines for the selection and implementation of these measures can be found in regulations, for example the technical Guidelines for the Handling of Hazardous Materials (TRGS).
The present lecture will demonstrate possible safety strategies for the operation of test systems requiring supervision in areas exposed to explosion hazards. The procedure for determination of reliability criterias will be demonstrated exemplary.