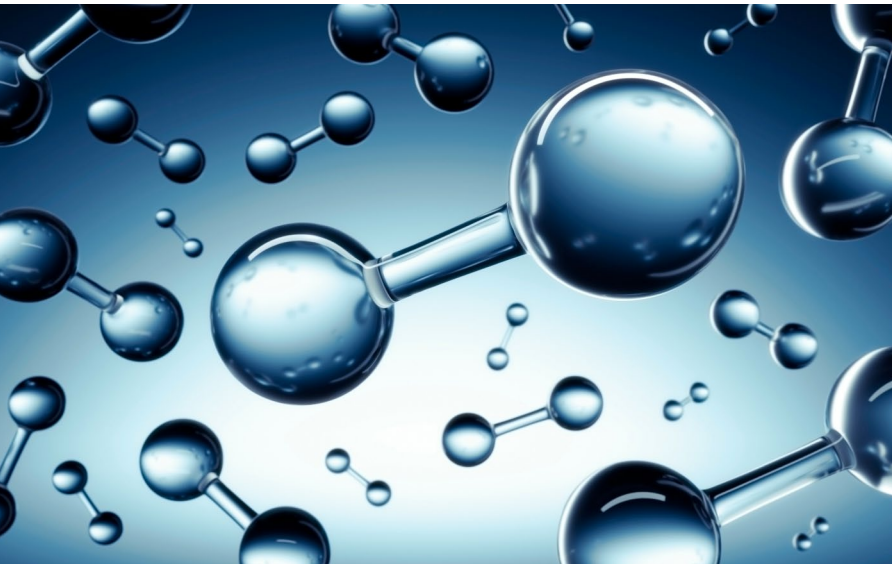


Process safety and hydrogen

Vital to achieve carbon neutrality



Transitioning to a low carbon future must be safe as well as sustainable, so that we protect our planet and ultimately our people.

With the urgent need to address the global climate challenges of the future, there is an invigorated drive towards reaching carbon neutrality throughout industry, with the development of new technology and the expanded deployment of existing technologies to reduce, capture and ultimately eliminate carbon emissions.

Hydrogen's many potential uses, directly as a carbon-free fuel or to store and transport renewable energy, are about to make hydrogen invaluable in lowering man-made CO₂ emissions. However, understanding the risks involved with using and storing hydrogen and ensuring the necessary steps are taken to control and mitigate the hazards is vital for enabling the use of hydrogen as an alternative fuel source. There are various methods and tools to identify, analyze and reduce the risks:

Hazard identification

To reduce emissions and push towards carbon neutrality both new plants and upgrades to existing plants are required. With both of these come new hazards which need to be defined and understood and hazard identification is often the first step in this process.

Safety reports

Whether it is applying the latest regulations to new carbon capture sites or updating safety reports in light of the use of hydrogen, the energy transition will have a significant impact on how regulations are applied to sites. As carbon capture, hydrogen and renewable energy become more widespread, the regulation around these areas is likely to expand and the focus of Competent Authority (CA) on these areas will only increase. Keeping ahead of the changing regulations and best practice is a key part of the move towards a carbon neutral future.

Process Safety Management (PSM)

Managing process safety is vital for safe and sustainable operations. The energy transition will require substantial changes to sites, and if history is anything to go by, most major hazardous events are either directly caused by, or made worse by poorly managed changes to processes and systems. Properly identifying, understanding and assessing changes, such as the replacement of natural gas with hydrogen, is of critical importance, and having robust PSM systems in place makes this a much more reliable and efficient endeavour.



How ABB can help

ABB offers a wide range of support in all aspects of process safety, supporting the full lifecycle of sites from cradle to grave. ABB is able to offer a tailored approach to PSM from providing a full partnership to assistance with specific problems or projects.

Why ABB?

- ABB can bring an independent and objective assessment of process safety with pragmatic and achievable recommendations
- Process safety specialists with extensive experience can provide robust advice and draw from best practice identified through a vast field of work, including hydrogen applications and renewable energy facilities
- Depth of knowledge across various disciplines allows for assistance with all parts of the safety lifecycle
- History of successful delivery

ABB has a strong heritage in process safety, with a long history of successful and quality delivery throughout the UK and beyond.

ABB safety consultants bring a broad range of experience across many different sites and sectors, both in process safety and in operations, alongside a deep knowledge pool. All of this ensures that while the technology or process may be novel, the potential hazards will be well understood.

ABB's experience in hydrogen

ABB has a significant history of applying process safety to hydrogen and renewable sites, including:

- Delivery of hazard studies on hydrogen reformers
- Delivery of Process Hazard Reviews (PHRs) for gas storage cavities
- Risk assessments for hydrogen pipeline
- Occupied Building Risk Assessments (OBRA) and consequence modelling at hydrogen plant
- Woodchip / biofuel; HAZOP of conveying system transporting biomass, hazard studies and DSEAR risk assessments, design review of biomass facility
- Hazard studies, LOPAs, safety cases and human factors work on electrolyzers
- Conversion of equipment to burn high hydrogen fuel
- Delivery of hazard study on EV battery production facility

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