Vysus Group

Capability

Supporting the Energy Transition: the move to hydrogen

The rate of technology development in the energy sector, driven by pressures to mitigate climate change, is creating new opportunities. The decline in cost of electricity from renewables has opened the prospect of large-scale production of hydrogen by electrolysis. At the same time, there is a renewed focus on carbon capture as an enabler for early adoption of hydrogen at scale.

How we can help

Risk Management Consulting helps engineering and operating companies assess and manage major hazards risk along the length of the hydrogen supply chain.

We have skills and experience relevant to the transition to net zero:

Production
- Green hydrogen production (electrolysers)
- Blue hydrogen production (Steam Methane Reforming)
- Carbon Capture and Storage (CCS)

Storage
- Compressed hydrogen gas and liquefied hydrogen
- Alternative storage media such as ammonia and methanol
- Cavity storage

Transportation
- Pipelines
- Vehicles
- Shipping

Use
- Marine bunkering
- Hydrogen filling stations
- Fuel cells

Together with supporting services including carbon accounting.

Our expertise is in the management of risk through the asset lifecycle within the high-level categories of “people; procedures; equipment”

Experience List for the last 2 years

We have particualr expertise in the application of Computational Fluid Dynamics (CFD) to hydrogen releases and have delivered the following projects.

Client	Project name	Year	Description
Trøndelag Fylkeskommune	Participant development contract catamarans	2018	Consequence modelling
Equinor	Hydrogen in gas turbines at Åsgard B	2019	Consequence modelling
Norsk H2 AS	QRA Jelsa hydrogen production facility	2019	CM + QRA
Trønderenergi	Advisory - Hydrogen Installation Byneset	2020	Advisory
Boliden Odda AS	Hydrogen & gas explosion	2019	Consequence modelling
Sjøfartsdirektoratet	Workshop on Hydrogen safety	2019	Consequence modelling
Gasnor ASA	LH2 Bunkering in Bergen	2019	Consequence modelling
SINTEF AS/ Jernbanedirektoratet	Hydrogen train	2019	Consequence modelling
NEL Hydrogen A/S	Hydrogen filling station accident investigation	2019	Accident Investigation
Havyard Group AS	Havila Kystruten – Hydrogen safety assessment	2020	Consequence modelling
ASKO AS	Hydrogen filling station risk assessment	2020	Consequence modelling
NEL Hydrogen A/S	Hydrogen CFD Risk Assessment Test Site	2019	Consequence modelling
Hynion AS	HAZOP on Hydrogen filling station	2019	HAZOP
NEL Hydrogen A/S	Hydrogen risk refuelling station	2020	Consequence modelling
NEL Hydrogen A/S	Hydrogen module panel assessment	2020	Consequence modelling
Kongsberg kommunale eiendom KF	Risk assessment of Hydrogen facility	2020	Consequence modelling
Ocean Hyway Cluster	Infrastruktur for hydrogen og ammoniakk	2020	Guideline
FMC Kongsberg Subsea AS	Design Review workshop	2020	Consequence modelling
Royal Van Lent Shipyard B.V.	Hydrogen fuel system	2020	Advisory Services Hydrogen System Design and Risk
Equinor	Hydrogen in gas turbines	2020	Consequence modelling

What we do

Our expertise is in the management of risk through the asset lifecycle within the high-level categories of “people; procedures; equipment”.

People

Most systems fail because of shortcomings in the performance of people, rather than equipment - human behaviour is key. In order to deliver and maintain required levels of asset security, availability, reliability and safety, the human contribution to system performance has to be considered and managed throughout the asset lifecycle. We focus on helping organisations to:

- Integrate requirements for human performance into the design of equipment and procedures so that operators can perform tasks consistently and reliably;
- Ensure individuals are competent and capable of delivering the requirements of their roles;
- Build the organisational structure and culture needed to support reliable and safe operation.

Procedures

An effective HSSE management system will not only ensure risks to employees and to the public are properly identified and controlled, but can also enhance business performance by driving the process of continual improvement and risk reduction. We can advise on relevant standards and regulations and how these affect an organisation, and we can help:

- Develop and implement management systems, including the policy, organisational structure, safety and security responsibilities, and supporting processes and procedures including those for emergency response;
- Define and set safety, security and risk targets and other key performance indicators for safety and security;
- Validate the safety of organisational changes and changes to safety management systems;
- Audit, monitor and review the performance of safety management systems.

Equipment

We work with operations and engineering organisations to help understand HSE and asset hazards, and to manage HSE and asset risks across the system lifecycle from concept stage through to decommissioning. We facilitate specialist studies where demonstrable independent leadership or expertise is needed and are familiar with industry standard tools and approaches including:

- Hazard and Operability and Hazard Identification Studies (HAZOP, HAZID);
- Fire & explosion and gas dispersion modelling using Computational Fluir Dyanamics (CFD) and other tools;
- Risk Assessment, including facility Quantitative Risk Assessment (QRA);
- Identification of risk reduction measures and cost-benefit analysis in support of ALARP demonstration;
- Failure Modes & Effects and Criticality Analysis (FMECA);
- Safety integrity level (SIL) assessment in accordance with requirements of IEC61508;
- RAMS (Reliability, Availability, Maintainability and Safety studies).

We are also experienced in preparing safety cases and safety reports to meet regulatory requirements.

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Get in touch

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