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Overview of HSE research on Net Zero safety

National Chemical Emergency Centre (NCEC) Hazmat conference, 21 May 2026

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Overview

- Introduction to HSE
- HSE Areas of Research Interest
- Hydrogen
- Carbon capture utilisation and storage
- Ammonia
- Batteries
- Solar panel fires
- Future research topics

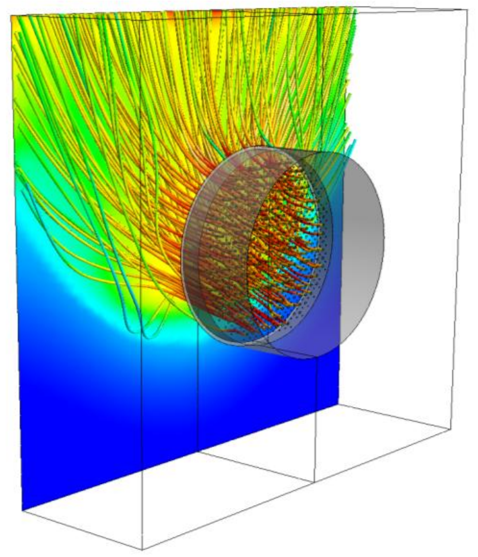
Introduction to the Health and Safety Executive

- HSE is the regulator for workplace health and safety in Great Britain
- Includes onshore/offshore pipelines, chemical/oil/gas infrastructure, offshore platforms etc.
- Activities: evidence gathering, policy development, consultation, regulation, incident investigation, enforcement
- 3,000 total staff (FTE): £310M annual budget, 66% from Government*

- HSE Science and Research Centre, Buxton, UK
- 400 staff, 550-acre test site
- Scientific support to HSE and other Government departments
- “Shared research” or joint-industry projects co-funded by HSE
- Bespoke consultancy on a commercial basis







* https://www.gov.uk/government/publications/the-health-and-safety-executive-annual-report-and-accounts-2024-to-2025

HSE Areas of Research Interest

HSE

Areas of Research Interest

2025

Contents

https://www.hse.gov.uk/research/assets/docs/hse-areas-of-research-interest.pdf

https://ari.org.uk/

HSE Areas of Research Interest

Question 1: How can it be ensured that GB's evolving industrial landscape and the built environment doesn't lead to a higher likelihood of major health and safety incidents?

- What are the significant hazards and risks associated with the deployment and scale-up of new and emerging technologies for Net Zero, such as Carbon Capture Usage and Storage (CCUS) and hydrogen?
- What research is needed to support new industries such as CCUS, hydrogen etc., to ensure that the risks to workers and the public are kept as low as reasonably practicable?
- What are the appropriate controls and mitigations that need to be built into new carbon capture infrastructure?
- How do operational fusion power plants compare in risk profile to more traditional industrial installations?
- How can the integrity and safety of industrial assets be ensured across their lifecycle?

https://www.hse.gov.uk/research/assets/docs/hse-areas-of-research-interest.pdf

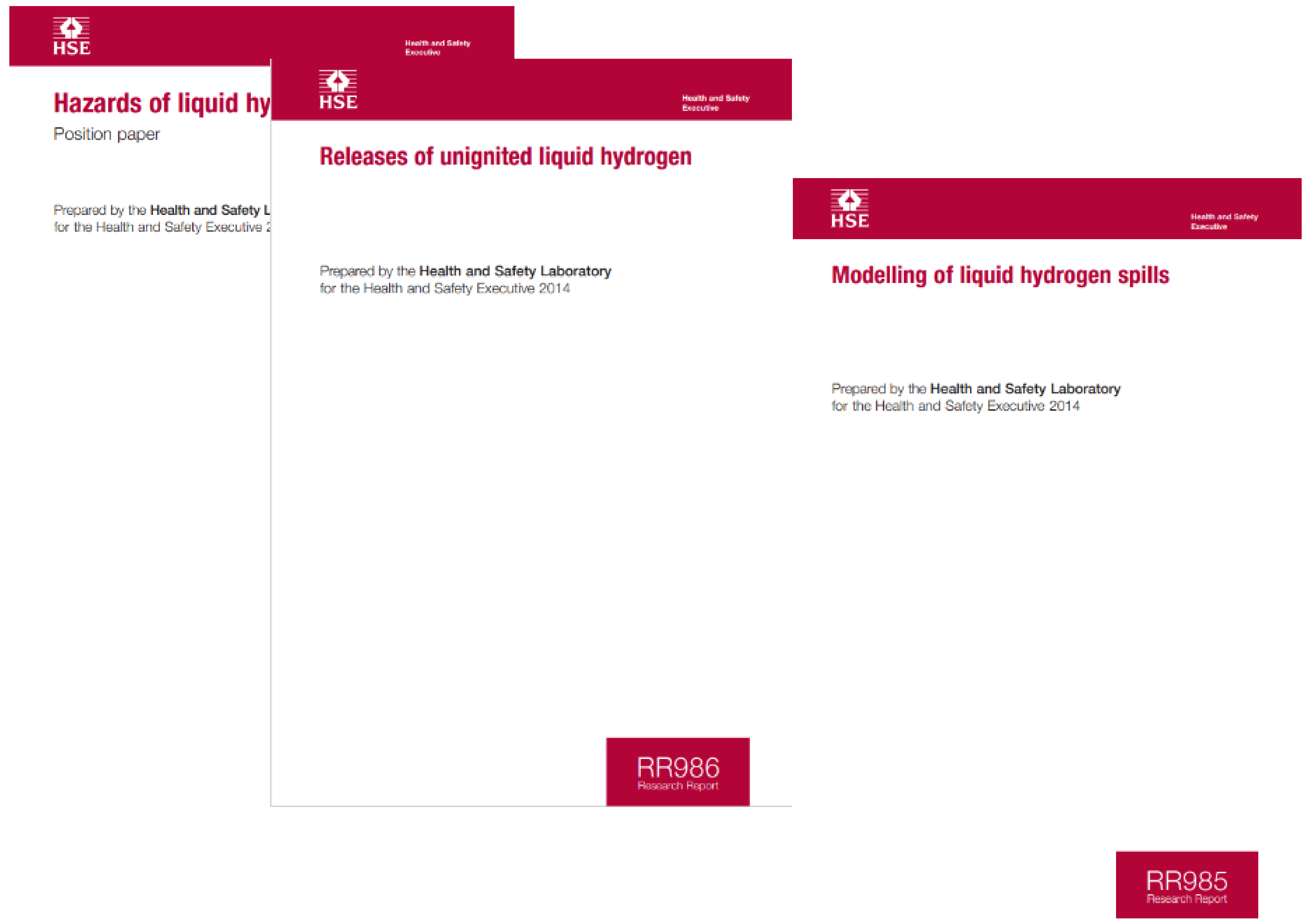
https://ari.org.uk/

Hydrogen

HSE hydrogen safety research

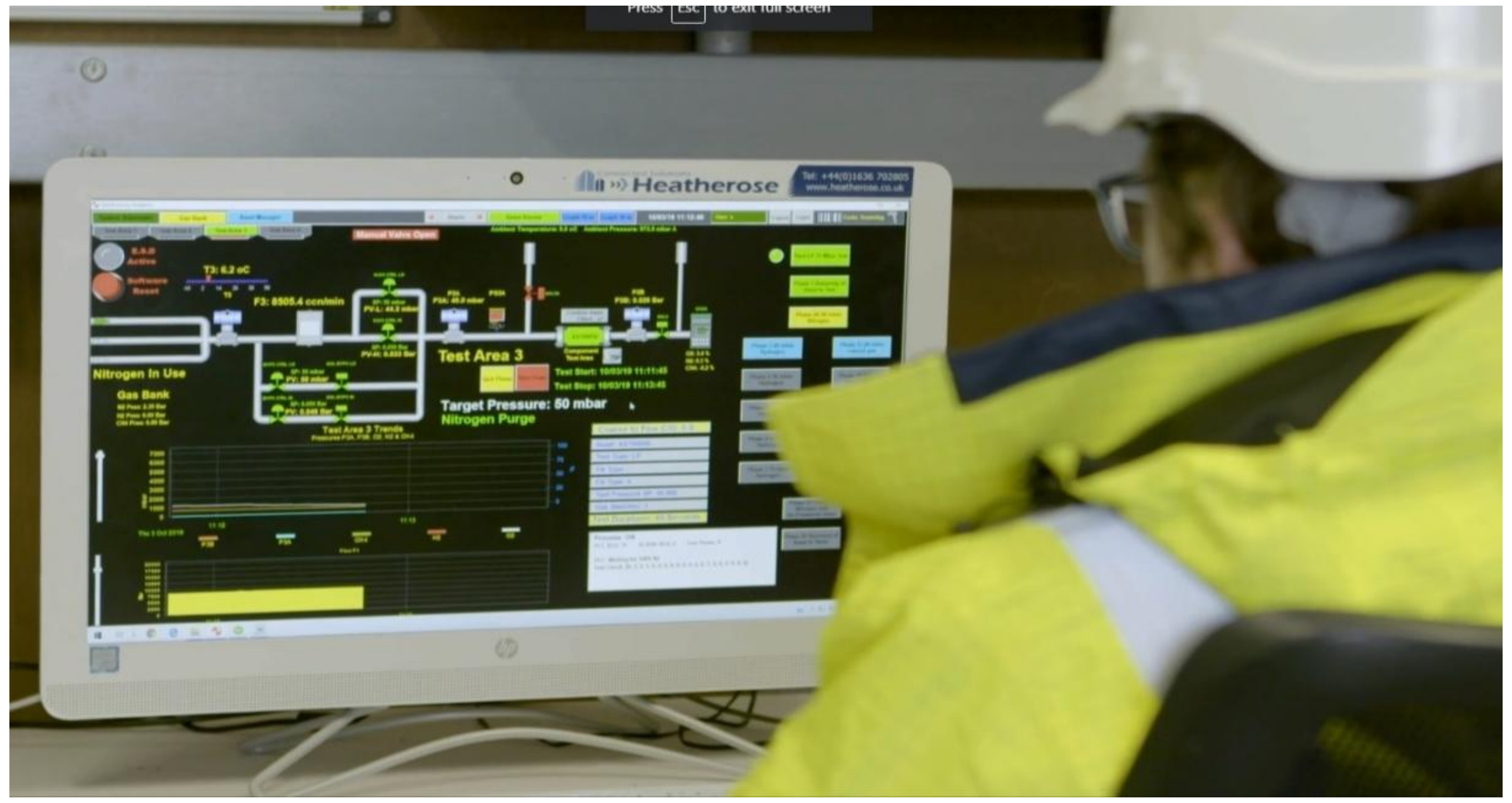
Examples of HSE publications on hydrogen safety

- RR1133 – Maintaining the integrity of process plant susceptible to high temperature hydrogen attack. Part 1: analysis of non-destructive testing techniques
- RR1134 – Maintaining the integrity of process plant susceptible to high temperature hydrogen attack. Part 2: factors affecting carbon steels
- RR1169 – Hydrogen in the natural gas distribution network: Preliminary analysis of gas release and dispersion behaviour
- RR715 – Installation permitting guidance for hydrogen and fuel cell stationary applications: UK version
- RR1047 – Injecting hydrogen into the gas network – a literature search
- RR769 – Hazards of liquid hydrogen: position paper
- RR985 – Modelling of liquid hydrogen spills
- RR986 – Releases of unignited liquid hydrogen
- RR987 – Ignited releases of liquid hydrogen
- RR1159 – Hydrogen research priorities workshop
- RR615 – Spontaneous ignition of hydrogen: Literature review



https://www.hse.gov.uk/research/rrhtm/index.htm

H21 natural gas and hydrogen leak testing facility



Northern Gas Networks | SGN | Cadent Your Gas Network | Wales&West Utilities | RIIO NIC | DNV·GL | HSE

H21 natural gas and hydrogen leak testing facility

Installed in 1870 and didn't leak

Through wall

Hook bolt

Lead yarn in steel

Lead yarn in cast iron

HyTunnel

Pre-normative research for safety of hydrogen driven vehicles and transport through tunnels and similar confined spaces

Aims

- Analyse effectiveness of conventional safety measures for hydrogen incidents
- Develop explosion and fire prevention and mitigation strategies
- Produce experimental data to validate CFD and FE models for consequence analysis
- Develop correlations for quantitative risk assessment
- Harmonise recommendations for intervention strategies and tactics for first responders
- Provide recommendations for inherently safer use of hydrogen vehicles underground

Ulster University · HSE Health & Safety Executive · Technical University of Denmark DTU · KIT Karlsruher Institut für Technologie · ibz · Sapienza Università di Roma · cea · ifa International Fire Academy · Pro-Science · NEN · Universitetet i Sørøst-Norge

- 13 European partners
- Budget: € 2.5m
- Duration: 2019 – 2022

https://hytunnel.net/

Clean Hydrogen Partnership
Co-funded by the European Union
Grant agreement: 826193

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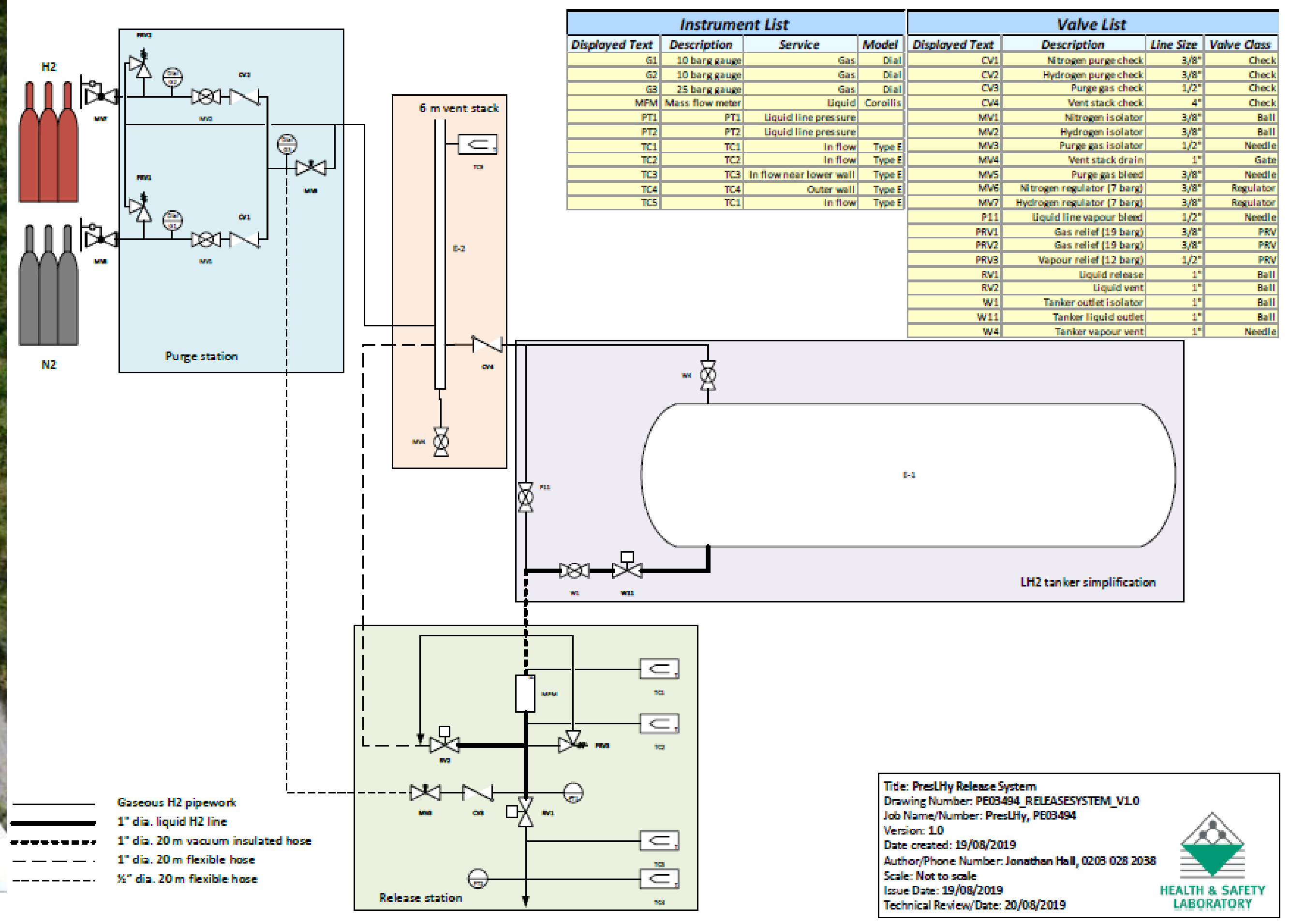
PRESLHY

- Pre-normative research on the safe use of liquid (cryogenic) hydrogen as an energy carrier
- 3-year test programme, 2018 – 2020
- Experiments on source term characterisation, near- and far-field dispersion, fire-fighting measures, explosion overpressures, electrostatic charging and condensed phase assessment
- Flows ranged from 1-5 barg at source with flow rates up to 300 g/s in 1” pipework
- EU FCH JU 2.0 co-funded research and innovation activity (Project ID 779613), €1.9m budget



Karlsruher Institut für Technologie · hySafe · WARWICK · INERIS · Ulster University · Air Liquide · Pro-Science

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PRESLHY

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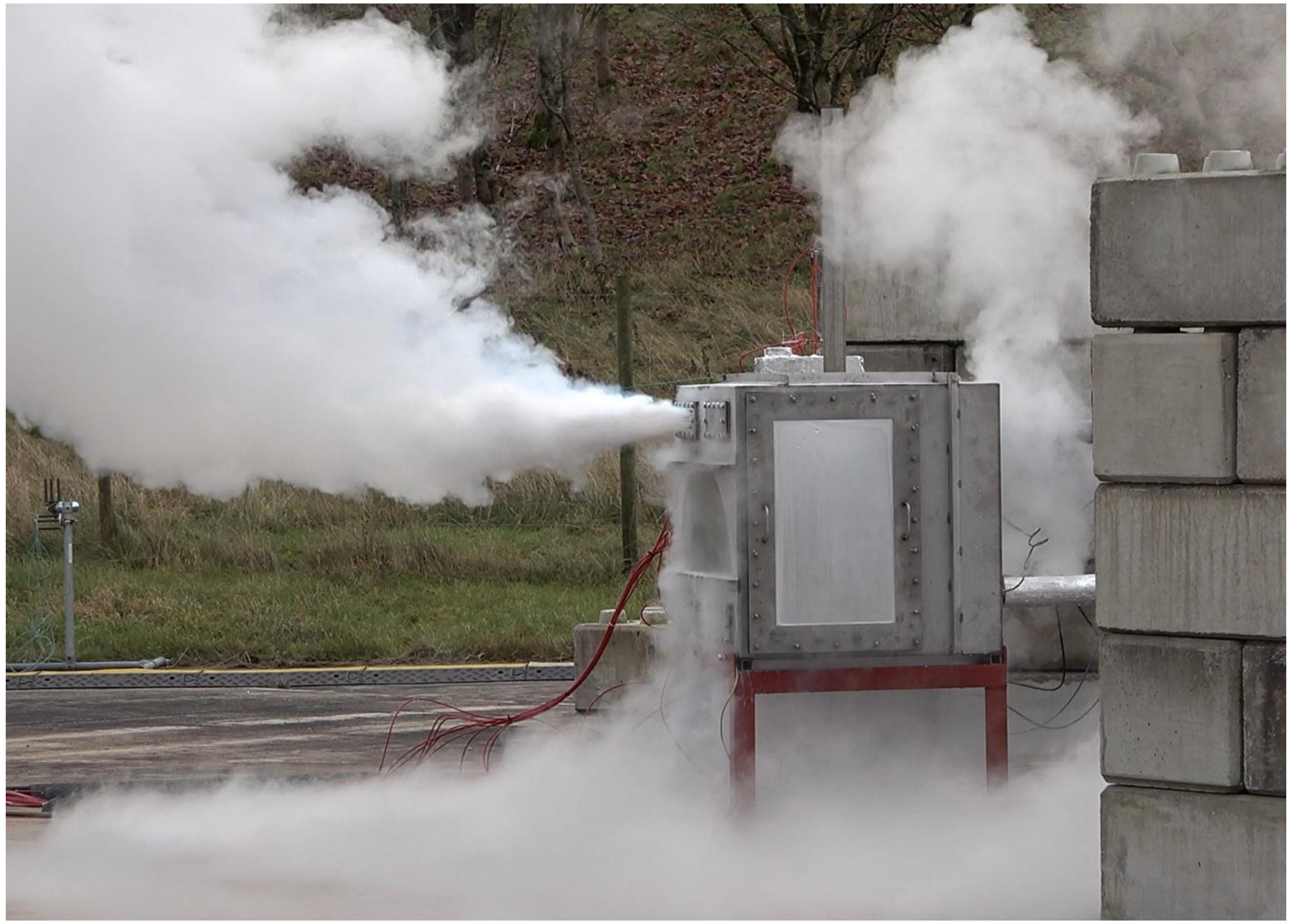
ELVHYS

- Collaborative EU project investigating the safety of LH_2 transfer technologies (2021 – 2026)
- First set of experiments characterised the propensity for air to condense and become oxygen enriched due to LH_2 spill
- Second set of experiments assessed hazards posed by small leaks during liquid hydrogen refuelling operations in connection spaces
  - Examined effect of ventilation on cryogenic leaks
  - Large leaks showed evidence of pressure peaking phenomena with similar maximum pressures to equivalent gaseous leaks



Partners

NTNU Norwegian University of Science and Technology · Ulster University · Alma Mater Studiorum Università di Bologna · DLR · HSE Health & Safety Executive · KIT Karlsruher Institut für Technologie · Air Liquide

https://elvhys.eu/

Co-funded by the European Union · Clean Hydrogen Partnership · UK Research and Innovation

ELVHYS project No. 101101381 is supported by the Clean Hydrogen Partnership and its members. UK participants in Horizon Europe Project ELVHYS are supported by UKRI grant numbers 10063519 (University of Ulster) and 10070592 (Health and Safety Executive).

Co-funded by the European Union
Clean Hydrogen Partnership
Acknowledgements
This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No 101006794. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation programme, Hydrogen Europe and Hydrogen Europe Research

MultHyFuel

- 3-year collaborative project that aimed to develop a strategy for use of hydrogen in multifuel refuelling stations
- Project duration: 2021 – 2025
- HSE assessed hazards posed by 700 barg dispensers to the public and hydrogen equipment
- Scenarios: hose break, hose burst and leak in dispenser
- Efficacy of safety barriers was also assessed

kiwa, Air Liquide creative oxygen, Shell Hydrogen, INERIS maîtriser le risque pour un développement durable, ITM POWER Energy Storage | Clean Fuel, ZSW, snam, ENGIE Lab CRIGEN, Hydrogen Europe

https://multhyfuel.eu/

Zero Emissions Sustainable Transport (ZEST)

- Collaborative project between HSE and Airbus to safely enable liquid hydrogen-fuelled aircraft
- Studied accidental LH_2 spills in confined spaces and open areas
- Results used to create and validate predictive tools
- Vacuum insulated Coriolis mass flow meter used to better define source term
- ZEST received the ‘Shaping the Future’ award at the Aerospace Technology and Innovation Conference 2025

https://press.hse.gov.uk/2025/12/02/hse-contributes-to-award-winning-hydrogen-safety-research-in-aviation-sector/

Zero Emissions Sustainable Transport (ZEST)

- Ignited liquid hydrogen jet impinging onto an aluminium plate
- Flame speed 25 m/s
- Over 1000 °C observed at impingement point
- Plate warped significantly even after short release (90 s)

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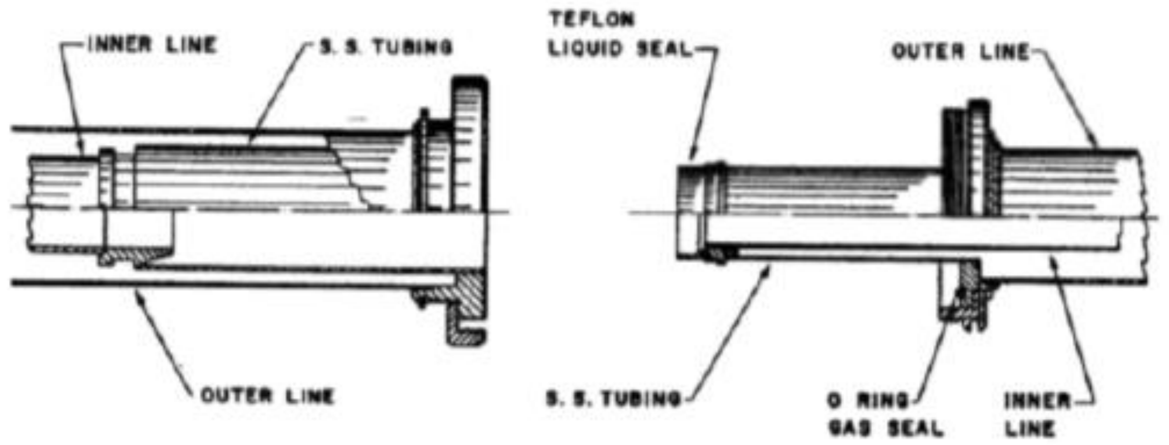
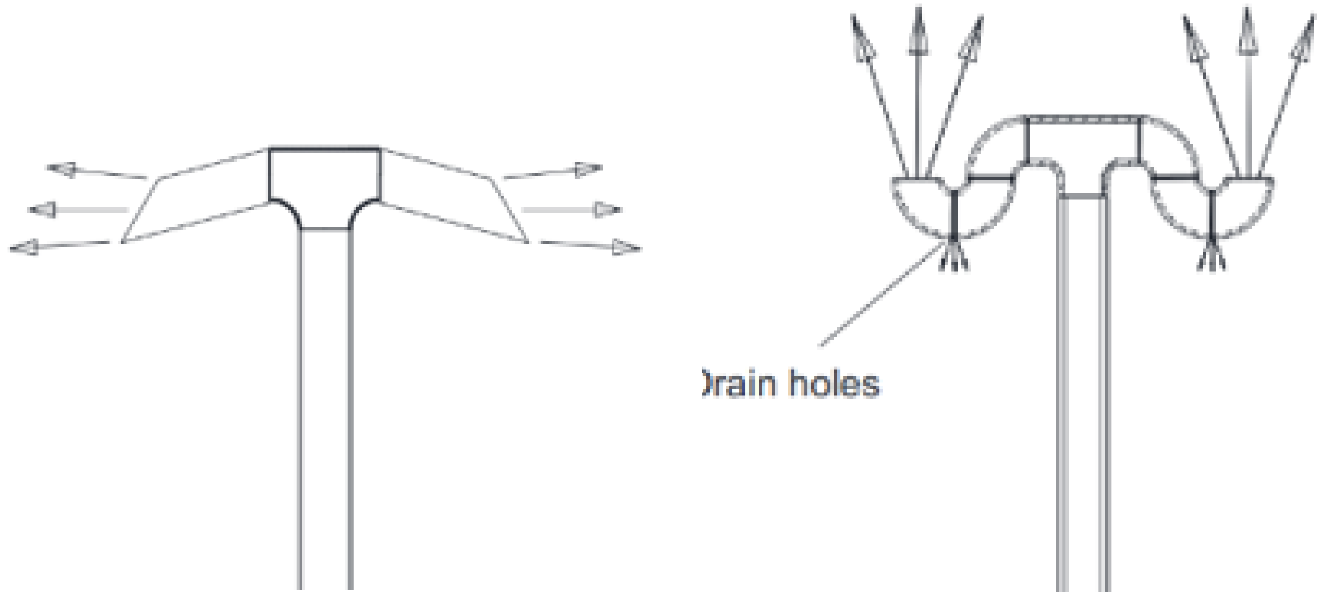
- Couplings and hydrogen venting (CHyVe)
- New internally-funded HSE research project: 2026-2028
- Assessment of leaks from LH_2 transfer connections (bayonets)
  - Aims: to improve guidance and characterise leak sizes
- Investigation of LH_2 venting operations
  - Gaseous and liquid hydrogen venting experiments
  - Measure: flammable gas dispersion distances, noise, jet fire thermal radiation, and delayed explosion overpressure

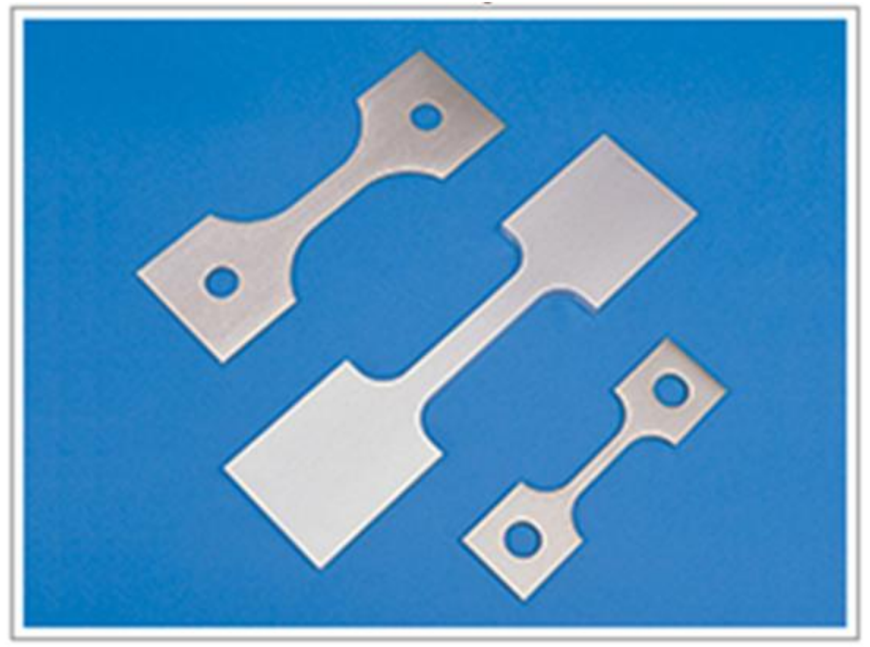


For more information:
CHyVE@hse.gov.uk



HSE hydrogen soaking facility

- Four 47-litre long-term soaking vessels
- 10 bar pressure
- Temperature controlled
- Test media: H_2, CH_4, mixtures
- In-situ material testing capability
  - 5 kN tension, compression, horizontal bending
- Tests ongoing (2026-)



In-situ mini tensile testers

Carbon Capture Utilisation and Storage (CCUS)

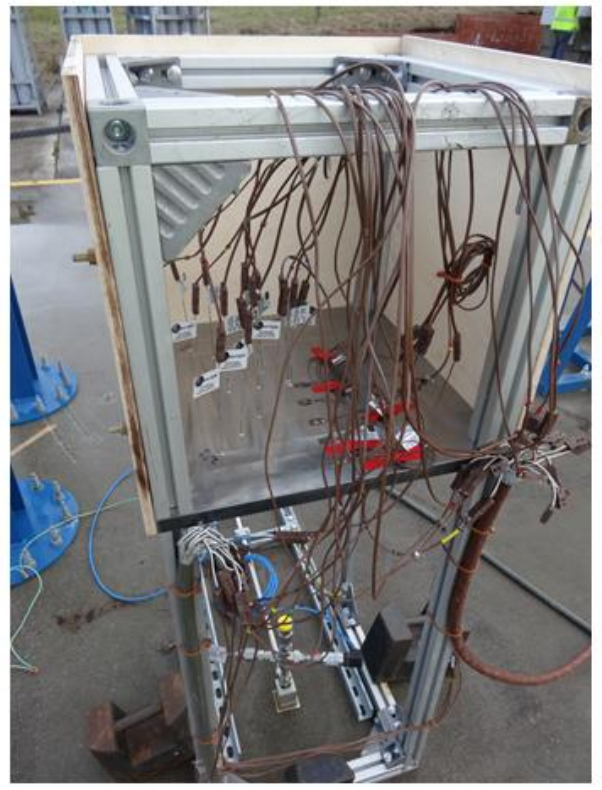
HSE CCUS research project

- Task A1 – Oversight and technical coordination
- Task B1 – Develop internal CCUS training course
- Task B2 – Support to regulatory questions
- Task C1 – Collation of JIPs and international projects
- Task C2 – Steering Board engagement
- Task C3 – Review international lessons learned
- Task D1 – Review of industry models
- Task D2 – Update previous modelling
- Task D3 – Modelling offshore scenarios
- Task D4 – Storage thresholds for CO_2
- Task E1 – Understanding industry design
- Task E2 – Flow assurance and process safety
- Task E3 – Suitability of controls
- Task E4 – Understanding the standards landscape
- Task E5 – Definition of hazard and scenarios
- Task E6 – Mitigations and emergency response
- Task F1 – Materials challenges and interactions
- Task F2 – Fracture control
- Task F3 – Corrosion control
- Task F4 – Non-metallic materials and coatings
- Task F5 – Low temperature excursions
- Task G1 – Review of CO_2 toxic levels and dose
- Task G2 – Amines and health effects from the capture process

Task F5 – Low temperature excursions

- Ongoing internally-funded HSE research to investigate cooling and embrittlement of steel structures exposed to dense-phase CO_2 jets
- Instrumented steel plate
- Beam under three-point bending
- Some tests with engineered defects
- Assessment of thermal protective coatings
- Findings can be shared with third-parties


Site overview


Steel plate with thermocouples (Pre-CO2 release)


Square hollow section (SHS) under bend load (pre-CO2 release)


Nozzle and release system commissioning


Steel plate underside after 200s release


SHS underside after 200s release

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Task G1 – Review of CO_2 toxic levels and dose

- Review HSE's assessment of the dangerous toxic load (SLOT and SLOD) and other published criteria on CO_2 toxicity
- Review criteria for human impairment and possible impact on disorientation and means of escape
- Workshop on CO_2 toxicity held on Monday 8 September 2025 in Bootle (UK), the Hague (Netherlands) and online with presentations from HSE, RIVM (Netherlands), DSB (Norway), Flemish Government (Belgium), Shell and DNV – slides available on request
  - Outcome: HSE SLOT and SLOD are best available criteria for land-use planning applications, to be used in the UK, Netherlands, Belgium and Norway

Table 1. Summary of key data supporting the DTL assessment

% CO_2	Exposure duration	Effects	Reference
27.9	25 sec	Onset of unconsciousness, muscle spasms	Committee on Aviation Toxicology, 1953
17	35 sec	Onset of unconsciousness	Committee on Aviation Toxicology, 1953
10, with 21% O_2	15-22 min, following a 40-90 min exposure to 7%	Restlessness, confusion, progressive listlessness	Brackett et al, 1965
7.5	15 min	Shortness of breath, headache, vertigo, sweating, numbness, increased motor activity, loss of control over limbs due to overactivity, visual colour distortions, loss of balance, irritation and disorientation.	Schaefer, 1963
7, with 21% O_2	40-90 min	Heavy breathing, mild headache, burning of eyes (O_2 concentration maintained at 21%)	Brackett et al, 1965
6	5-8 min	Reversible changes in visual intensity discrimination	Gellhorn, 1936
6	16 min	Increased respiration rate, dyspnoea, headache, sweating	White et al, 1952
6	6-8 min	Minor ECG changes	Okajima and Simonson, 1962
3.5-6	6-10 min	Reversible changes in auditory threshold	Gellhorn and Spiesman, 1934, 1936
5.4	15 min	No clinical signs of symptoms. Flicker fusion frequency decreased indicating some CNS depression	Schaefer, 1963
4	14 days	No adverse effects on neurobehavioural test performance	Storm and Gianetta, 1974
3.9	30 min	Headache during heavy exercise	Menn et al. 1970
3.5	60 min	Increased cerebral blood flow, slight dyspnoea	Patterson et al, 1955
2.8	30 min	Intercostal pain, dyspnoea during heavy exercise	Menn et al, 1970
2.5	60 min or 21 days	Mild headaches, awareness of increased respiratory effort during heavy exercise	Sinclair et al, 1971

Skylark

- **Challenge 1**: Source characteristics from CO_2 pipeline craters - Understanding the interaction between pipeline failure, crater formation, and atmospheric conditions to predict dispersing behaviour in different scenarios.
- **Challenge 2**: Terrain effects on dense clouds - Investigating the influence of slopes, valleys, and complex terrain on the behaviour of dense vapor clouds produced by CO_2 sources.
- **Challenge 3**: Emergency response - Testing equipment, techniques, and procedures used by emergency responders in large CO_2 releases, including search and rescue operations and the impact on internal combustion engines.
- **Challenge 4**: Operational issues (venting) - Studying the outflow rates, vent heights, and hazard distances associated with necessary venting events, ensuring safe dispersion of gas without compromising pipeline integrity.

Example of a large-scale experiment conducted at DNV's Spadeadam facility as part of the COSHER joint industry project

- Timeline: 2025 – 2028
- Four CO_2 pipeline rupture tests conducted to date

https://www.dnv.com/group/joint-industry-projects/skylark-pioneering-excellence-in-co2-pipeline-safety/

Energy Institute CCUS research alignment workshop, July 2025

- Report on workshop to be published in late-Spring 2026

Workshop aims

The workshop aims to bring together stakeholders across the CCUS sector to:

- Develop plans for future CCUS joint health and safety research projects
- Identify shared challenges across the breakout session topics of modelling, impurities, transportation, wells, materials and corrosion, and CO_2 plant and system operations
- Explore collaborative resolutions to these challenges and pinpoint areas for further initiatives/research, including actionable next steps.
- Promote collaboration and networking among CCUS stakeholders.
- Identify potential projects for the EI, HSE or through other routes (e.g. JIPs or academic research) to undertake and determine the expertise and stakeholder input required.

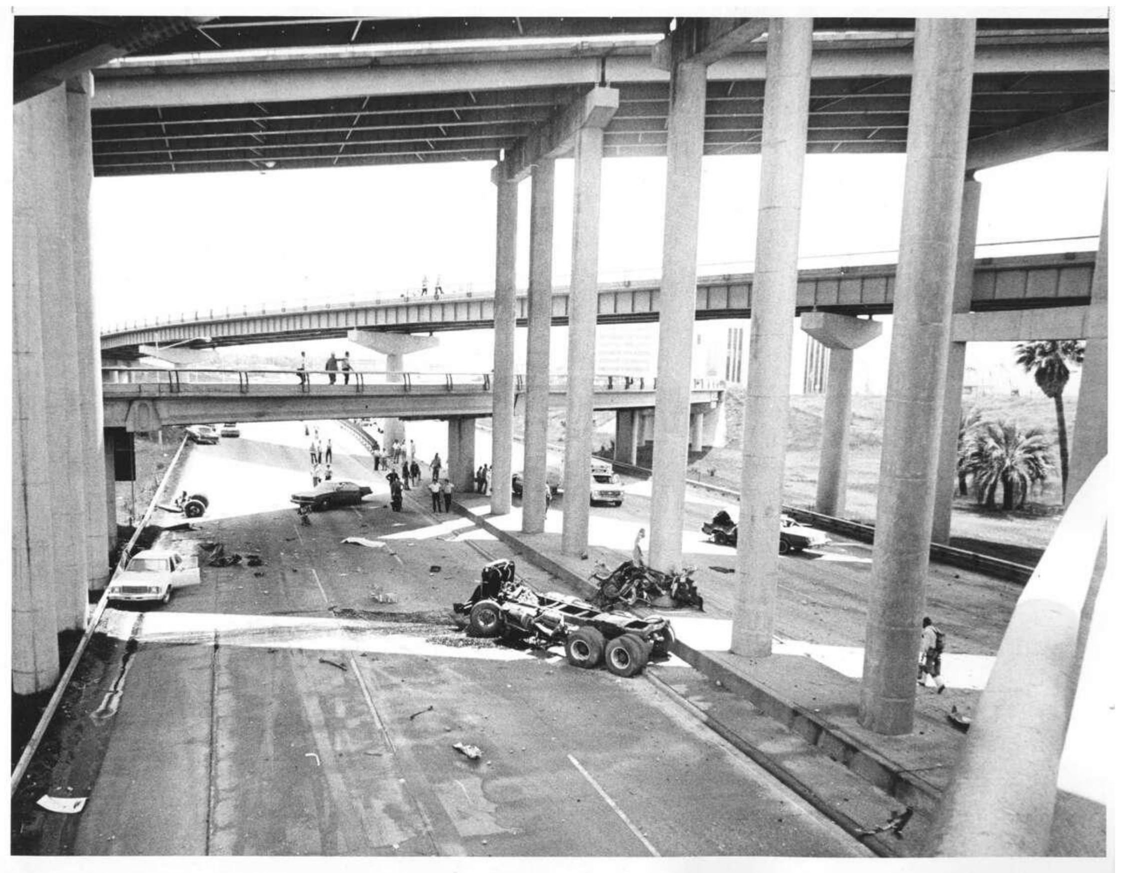
CCUS Joint Industry Projects

- SINTEF
  - Offshore large-scale subsea CO_2 releases
  - CO_2 EPOC: effect of CO_2 on polymeric materials
  - IntoCloud CO_2 venting
- DNV
  - CO_2 CFD simulation software
  - CO_2 offshore injection (from ships)
  - Skylark CO_2 onshore pipelines and venting
  - CO_2SafePipe updating CO_2 pipeline guidance
  - CO_2SafePipePolymers (non-metallic seals and coatings)
  - Materials in CO_2 wells
  - CO-CO_2 cracking in pipelines
  - CO_2MET impurities measurement
  - SubCO_2 Phase 3 subsea CO_2 releases
  - CO_2SpecChain impurities for CCS networks
  - CO_2Jets cryogenic and erosive effects
  - Non-metallic pipelines for transport of CO_2
  - CO_2CleanFlow acid droplet formation and removal
- DNV-SINTEF-HSE-USN
  - CO_2 vessel safety and BLEVEs
- TWI
  - Permeation of CO_2 with impurities through thermosets
  - ENCO$_2$RE corrosion of CO_2 pipelines (Phases I and II)
  - Materials assessment for CO_2 transport (MASCO$_2$T II)
  - Permeation of CO_2 with impurities through thermoplastics
  - MARCO$_2$ corrosion in liquid CO_2 for maritime transport
- Noble
  - Safe drilling and intervention into CO_2 reservoirs
- PRCI
  - CO_2 pipeline dispersion modelling
  - CO_2 toxicity research (led by Exxon)
- NZTC
  - Qualification of SSSV for injection of CO_2
- SafeTec
  - SAFEN- failure rates for CCUS, hydrogen and ammonia
- Wood
  - Guidelines for setting CO_2 specifications (impurities)
  - Corrosion from upset conditions in CO_2 pipelines, and chemical treatment (with Leeds University)

Ammonia

Review of ammonia incidents and information sharing

- Joint talk at FABIG conference in 2024 with Andy Pearson (Star Refrigeration) and Ed Sullivan (Collective Resilience) – slides available on request
- Summarised 17 pressure-liquefied and 6 refrigerated ammonia incidents
- Shared learning from the ammonia refrigeration industry
- Emergency response for ammonia incidents



https://www.houstonchronicle.com/news/houston-texas/houston/article/In-1976-an-ammonia-truck-disaster-claimed-the-12906732.php

Photograph taken by Texas Air Control Board
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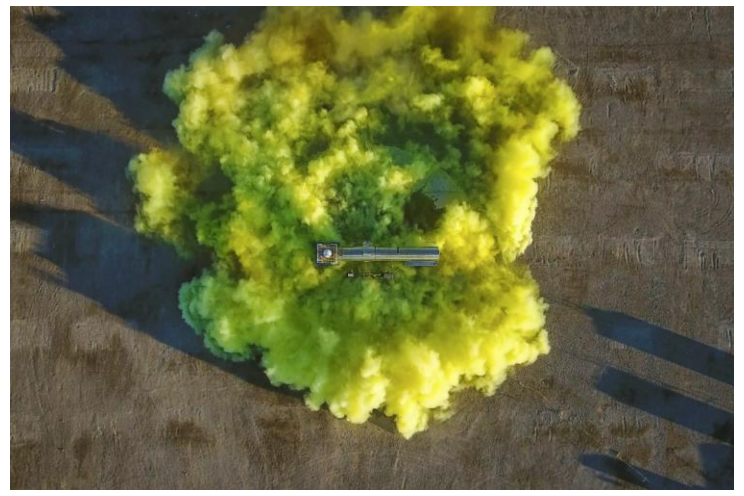
Jack Rabbit III

- Ammonia release experiments (2021-ongoing)
  - Led by US Department of Homeland Security and Department of Defense/War
  - Aims:
    - Conduct large-scale releases of ammonia, similar to Jack Rabbit II chlorine trials
    - Validate dispersion models
    - Improve preparedness of emergency responders
  - HSE co-chairs the Jack Rabbit III Modelling Working Group and has coordinated an international dispersion model inter-comparison exercise (next slide)
  - Recent indoor ammonia release experiments at Battelle Memorial Institute, Columbus, Ohio
  - Updates often shared at GMU conference http://camp.cos.gmu.edu/announcement.html

Images of previous series of Jack Rabbit II chlorine trials conducted in 2015-2016

Images © DHS S&T CSAC and Utah Valley University
https://www.uvu.edu/es/jack-rabbit/

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Contents lists available at ScienceDirect

Atmospheric Environment: X

journal homepage: www.journals.elsevier.com/atmospheric-environment-x

Pressure-liquefied ammonia jet dispersion: Multi-model intercomparison using Desert Tortoise and FLADIS field data

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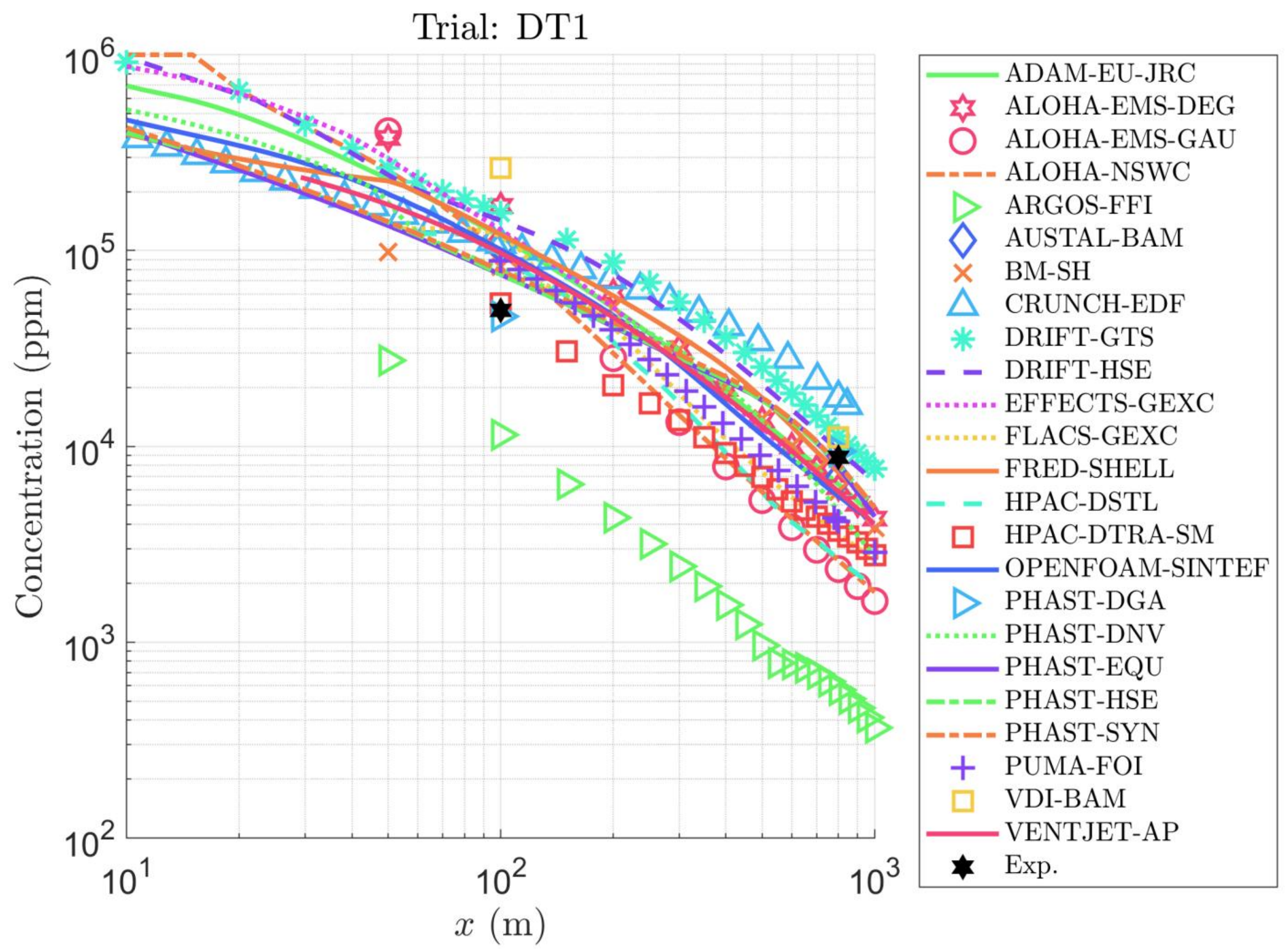
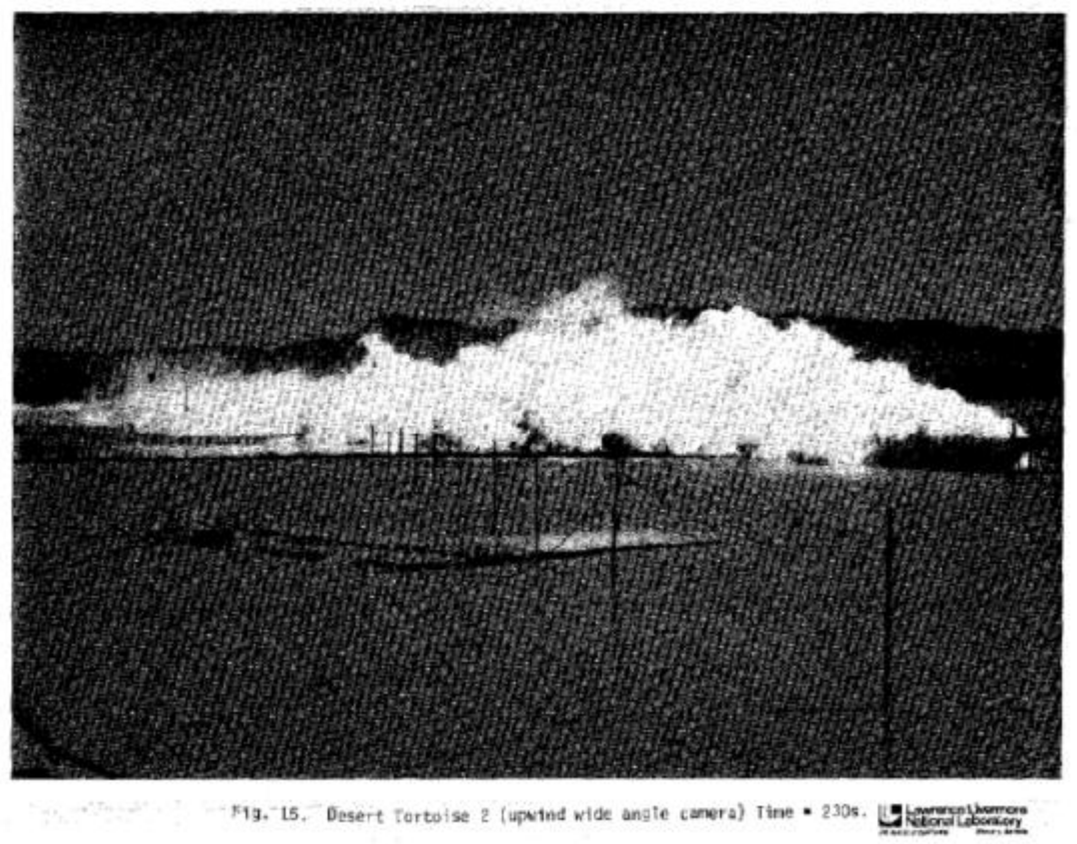
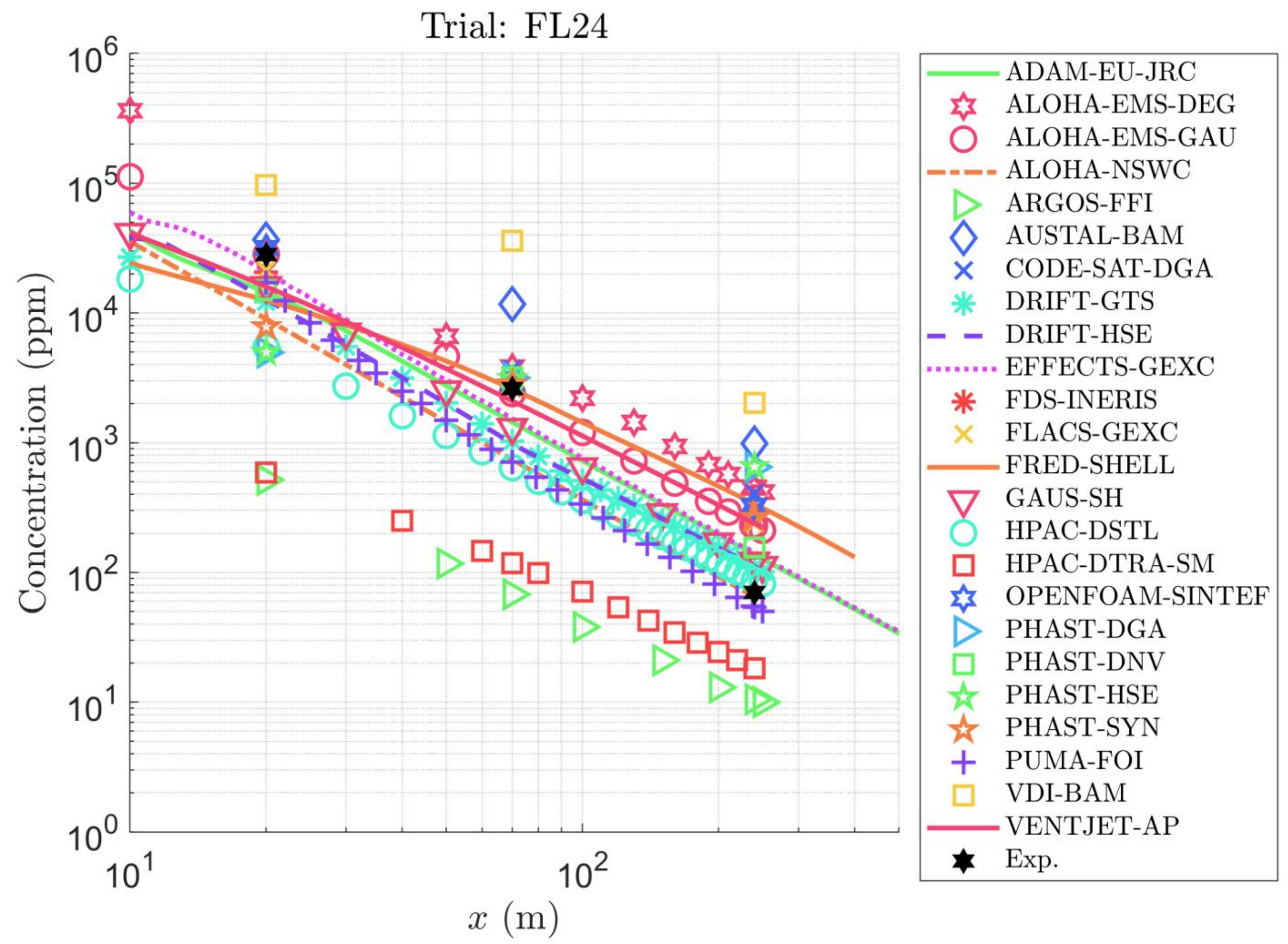




Desert Tortoise ammonia release, Nevada, USA, 1983

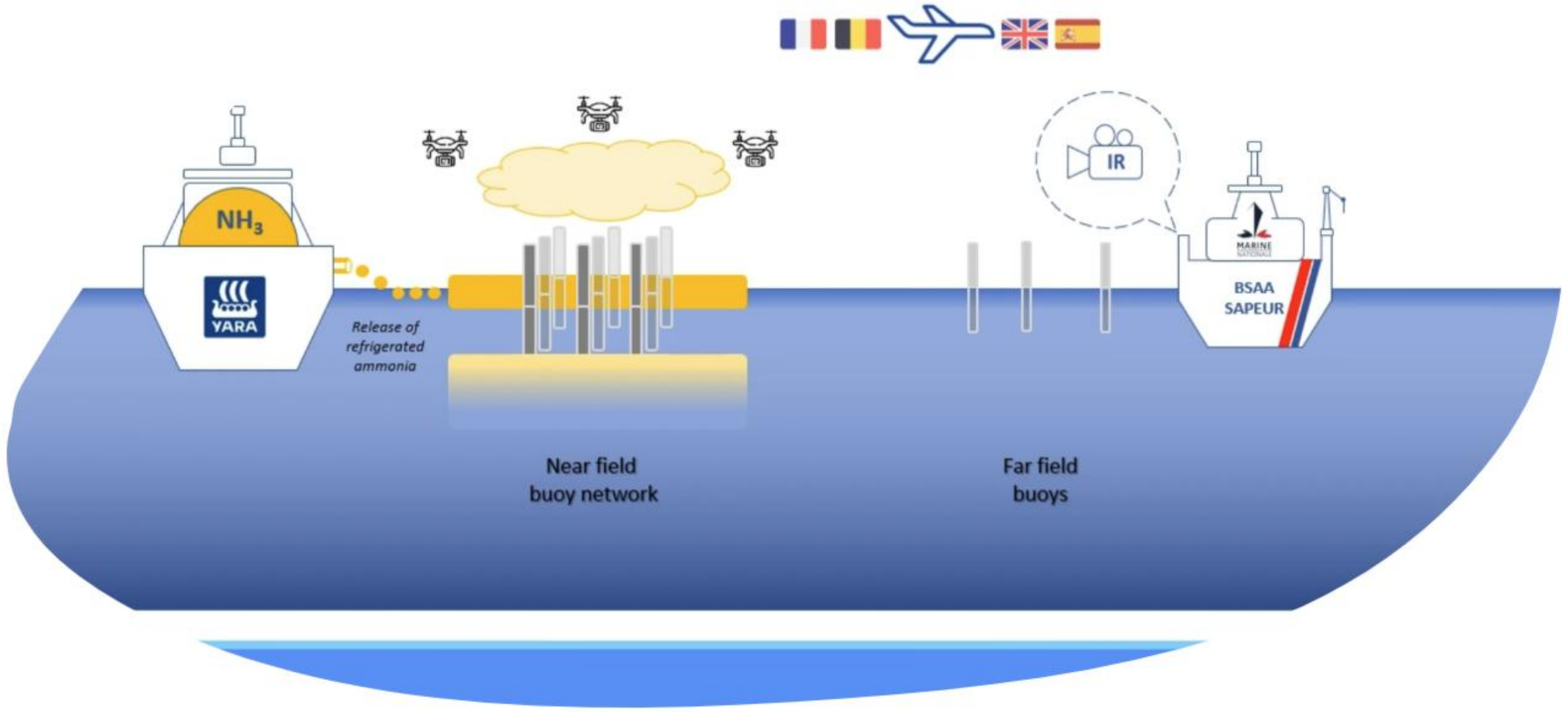


FLADIS ammonia release, Sweden, 1993-1994

https://doi.org/10.1016/j.aeaoa.2025.100389

Ammonia Response in Sea Emergencies (ARISE)

- HSE is partner in the ARISE Joint Industry Project led by INERIS and CEDRE
- Aims:
  - Conduct multi-tonne spills of ammonia at sea
  - Improve understanding of dispersion in water and air
  - Provide dataset for validation of models
  - Develop methodology for risk assessment for marine applications
- Experiments planned for 2026
- Contact: Olivier.Salvi@ineris-developpement.com



ARISE Ammonia Response In Sea Emergencies

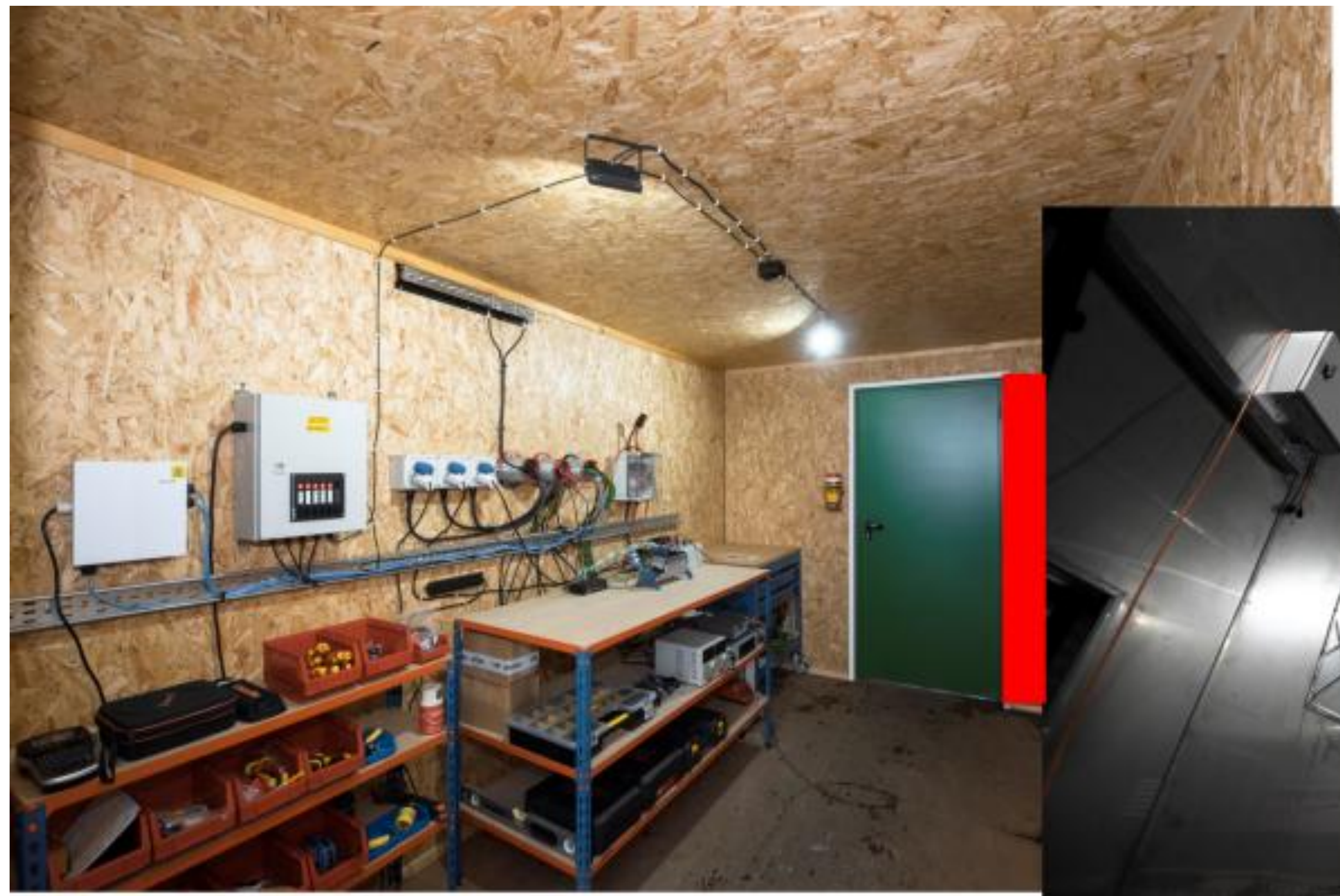
www.arise-partnership.org

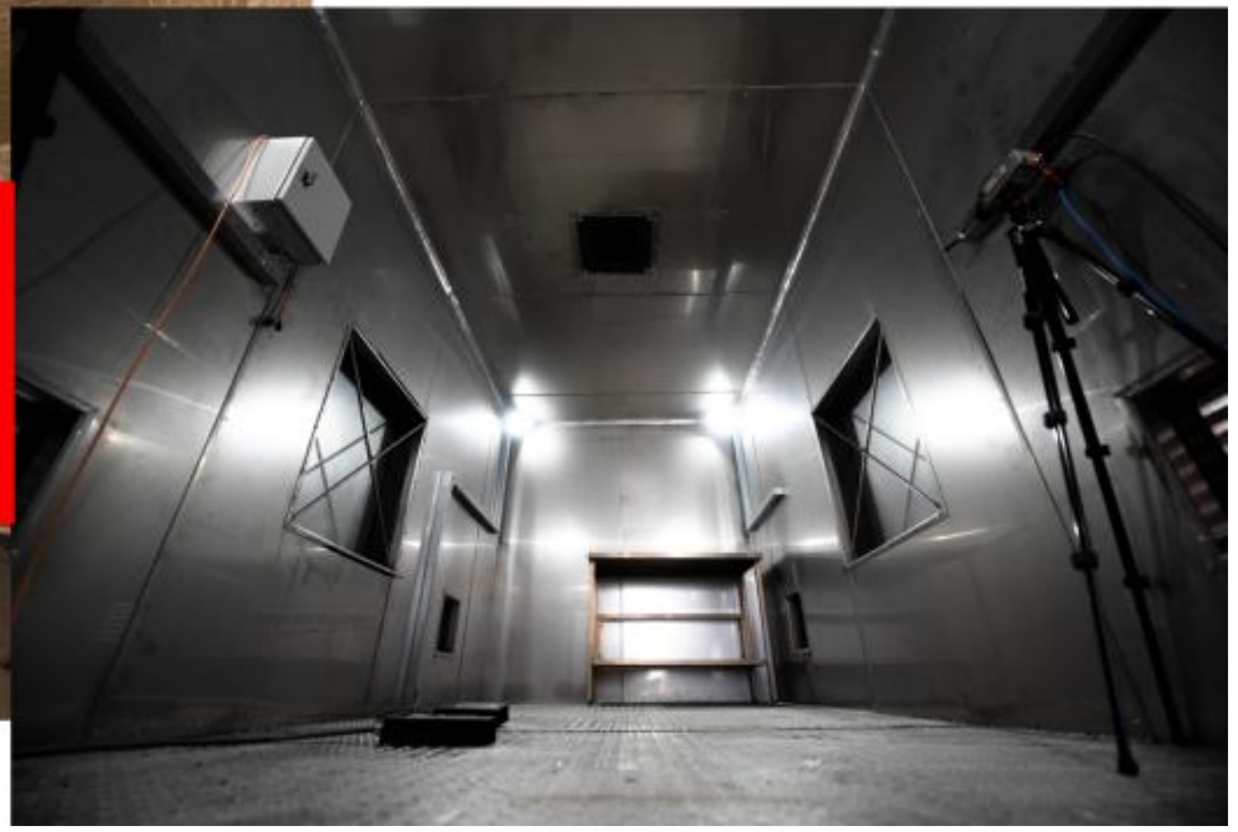
INERIS, Cedre, Yara Clean Ammonia, ONERA, museum Royal Belgian Institute of Natural Sciences, HSE Health and Safety Executive, INERIS Développement, IMT Mines Alès, SINTEF

Batteries

HSE battery abuse testing facilities

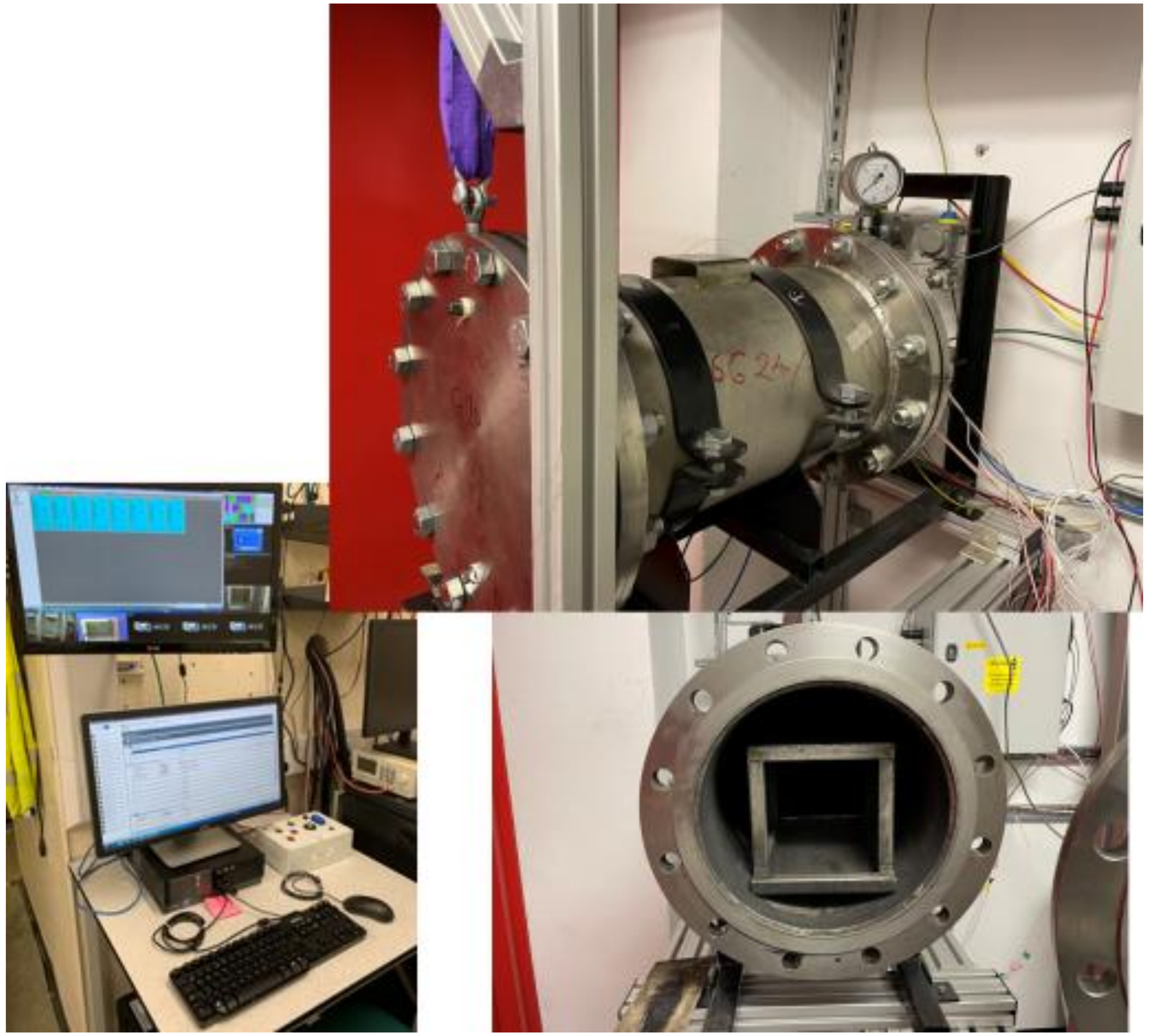
- Significant investment by HSE over last 10 years
- Three abuse test chambers (1 module scale, 1 with potential calorimetric addition)
- Use of outdoor test pads/bunkers
- Range of other facilities and equipment





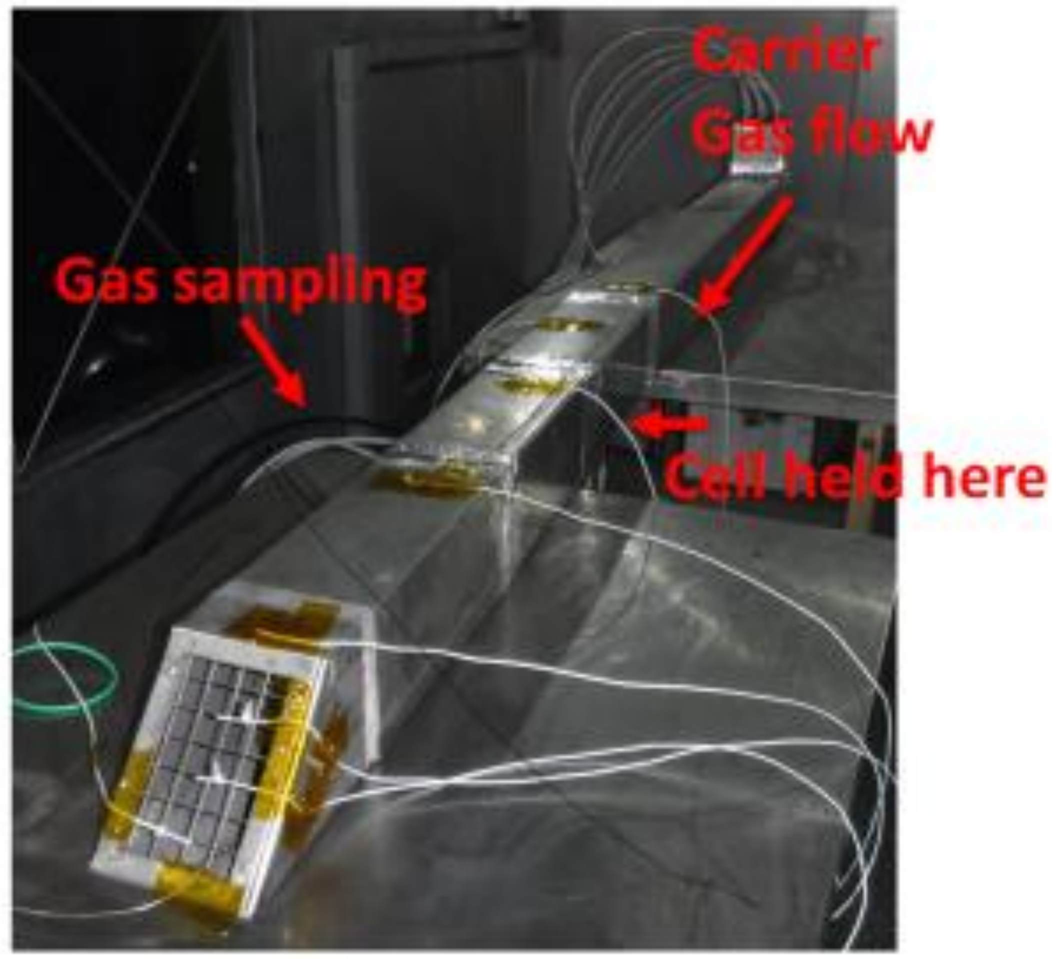
Analysis of gas generated by cells in failure

Total volume and composition



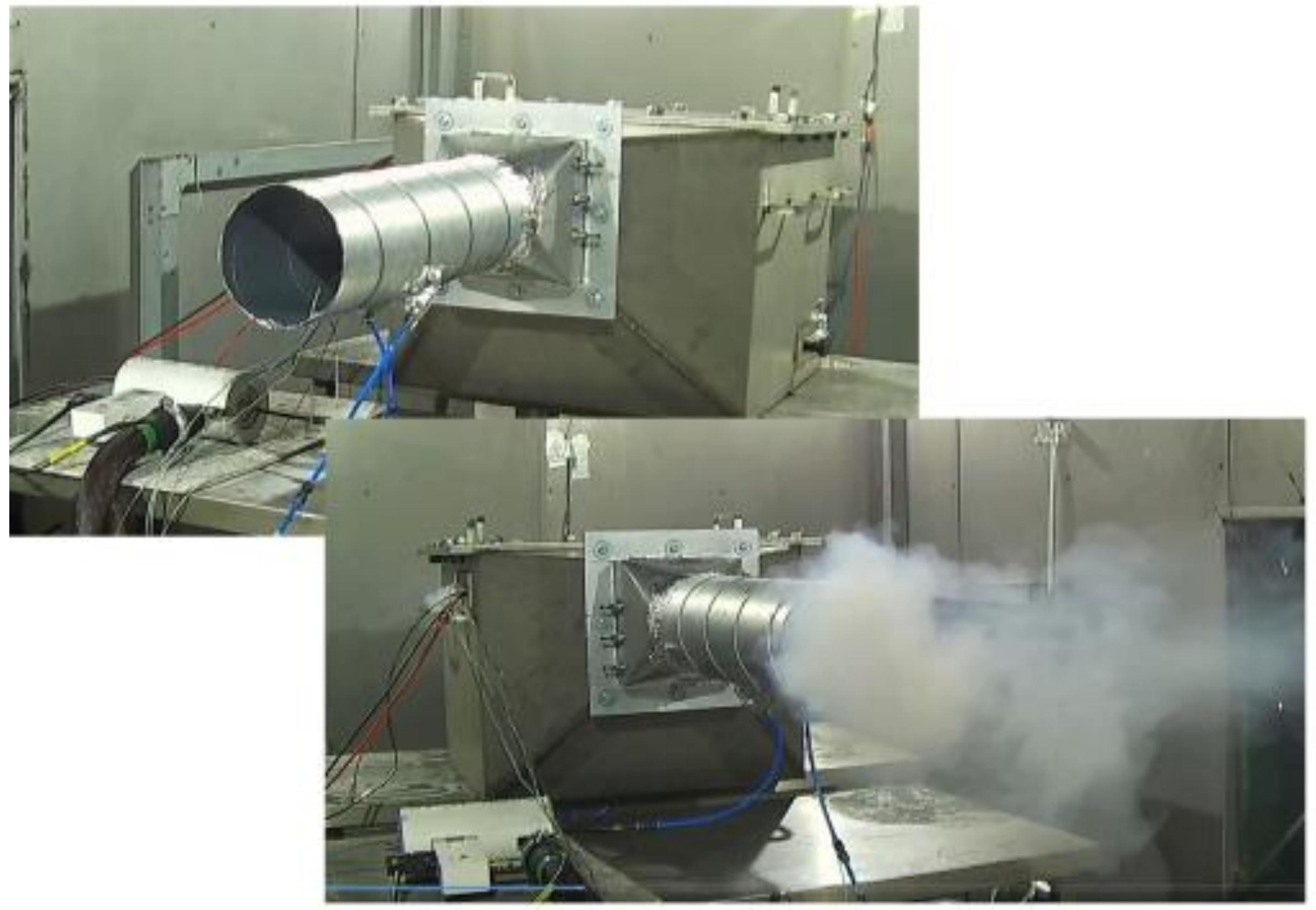
Real time analysis

Small Cells:



Cells held in enclosed part under main ductwork

Bigger Cells:



~ 210 litre volume

56 cylindrical cell battery overcharge

Nail penetration into battery module

Cells as projectiles

Casing has little mass but travels 37 m with average speed of ~62 m/s (139 mph)

https://www.icheme.org/media/17627/hazards-31-paper-43-abbott.pdf

Some recent battery-safety publications

Energy Advances
ROYAL SOCIETY OF CHEMISTRY

PAPER

Check for updates

Cite this: Energy Adv., 2023, 2, 170

Experimental determination of metals generated during the thermal failure of lithium ion batteries†

Jonathan E. H. Buston,* Jason Gill, Rebecca Lisseman, Jackie Morton, Darren Musgrove and Rhiannon C. E. Williams

https://doi.org/10.1039/D2YA00279E

Journal of Power Sources 539 (2022) 231585

Contents lists available at ScienceDirect

Journal of Power Sources

journal homepage: www.elsevier.com/locate/jpowsour

ELSEVIER

Comprehensive gas analysis of a 21700 $Li(Ni_{0.8}Co_{0.1}Mn_{0.1}O_2)$ cell using mass spectrometry

Katie C. Abbott, Jonathan E.H. Buston, Jason Gill, Steven L. Goddard, Daniel Howard*, Gemma Howard, Elliott Read, Rhiannon C.E. Williams

HSE Science and Research Centre, Harpur Hill, Buxton, Derbyshire, SK17 9JN, United Kingdom

https://doi.org/10.1016/j.jpowsour.2022.231585

Journal of Energy Storage 65 (2023) 107293

Contents lists available at ScienceDirect

Journal of Energy Storage

journal homepage: www.elsevier.com/locate/est

ELSEVIER

Research papers

Experimental study of three commercially available 18650 lithium ion batteries using multiple abuse methods

Katie C. Abbott, Jonathan E.H. Buston*, Jason Gill, Steven L. Goddard, Daniel Howard, Gemma E. Howard, Elliott Read, Rhiannon C.E. Williams

HSE Science and Research Centre, Harpur Hill, Buxton, Derbyshire SK17 9JN, United Kingdom

https://doi.org/10.1016/j.est.2023.107293

batteries
MDPI

Article

Comprehensive Study of the Gas Volume and Composition Generated by 5 Ah Nickel Manganese Cobalt Oxide (NMC) Li-Ion Pouch Cells Through Different Failure Mechanisms at Varying States of Charge

Gemma E. Howard*, Katie C. Abbott, Jonathan E. H. Buston, Jason Gill, Steven L. Goddard and Daniel Howard

https://doi.org/10.3390/batteries11050197

RSC Advances
ROYAL SOCIETY OF CHEMISTRY

PAPER
View Article Online

Check for updates

Cite this: RSC Adv., 2025, 15, 5084

Failure gas analysis of lithium–nickel–cobalt–aluminium oxide cells from different manufacturers

Philip A. P. Reeve,* Jonathan E. H. Buston,* Jason Gill, Steven L. Goddard, Gemma E. Howard and Jack W. Mellor

https://doi.org/10.1039/D4RA07884E

Other papers currently submitted relating to
- Gas produced by LFP cells
- Gas produced by a range of other cells,
- Deflagrations caused by LFP cells
- Battery recycling

Solar panel fires

Solar panel fires

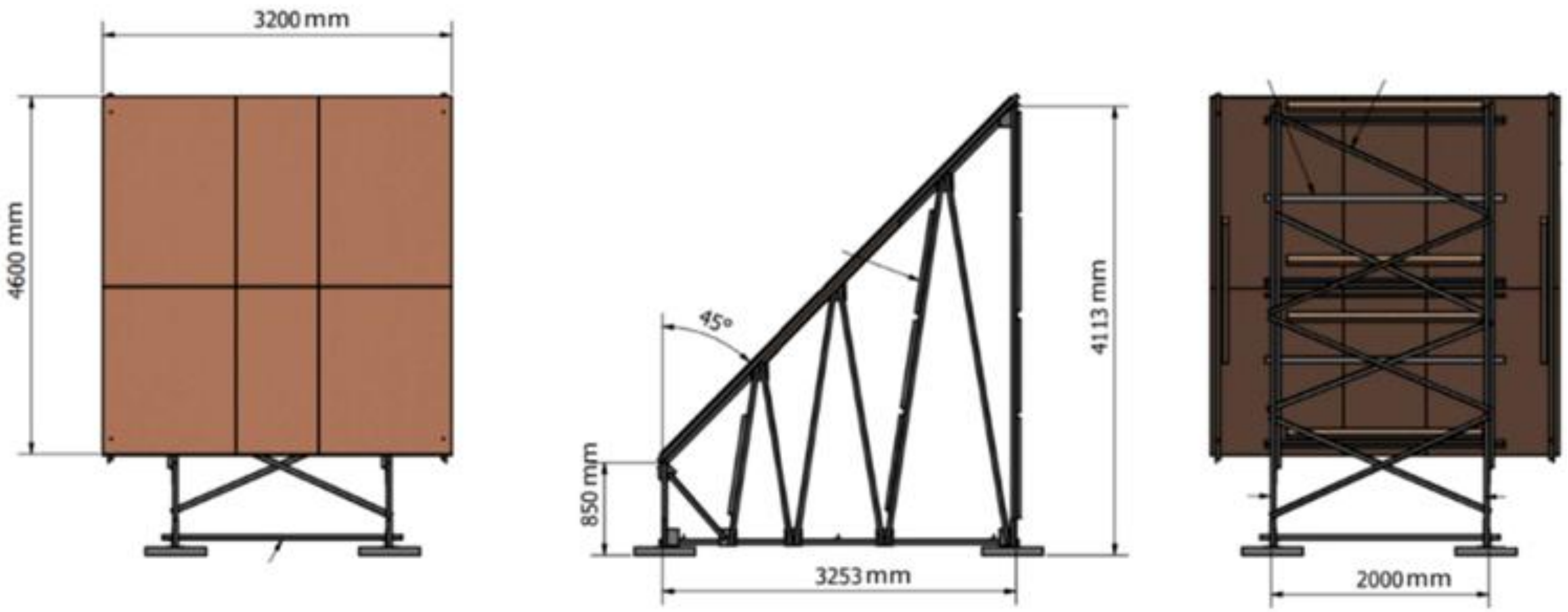
- Background: concerns raised from recent fire incidents involving solar panels
  - Example: Strawberry Fields estate fire in Addlestone, Surrey in 2025
    https://www.thefpa.co.uk/fire-and-risk-management-journal/news/surrey-residents-call-for-housing-association-action-over-solar-panels-

Source: https://www.getsurrey.co.uk/news/live-addlestone-fire-updates-firefighters-31613832

- Aim: to study how photovoltaic (PV) panels affects fire spread over pitched roofs in residential buildings.
- Eleven large-scale experiments carried out at HSE Buxton
- Funded by Building Safety Regulator (BSR)

Solar panel fires

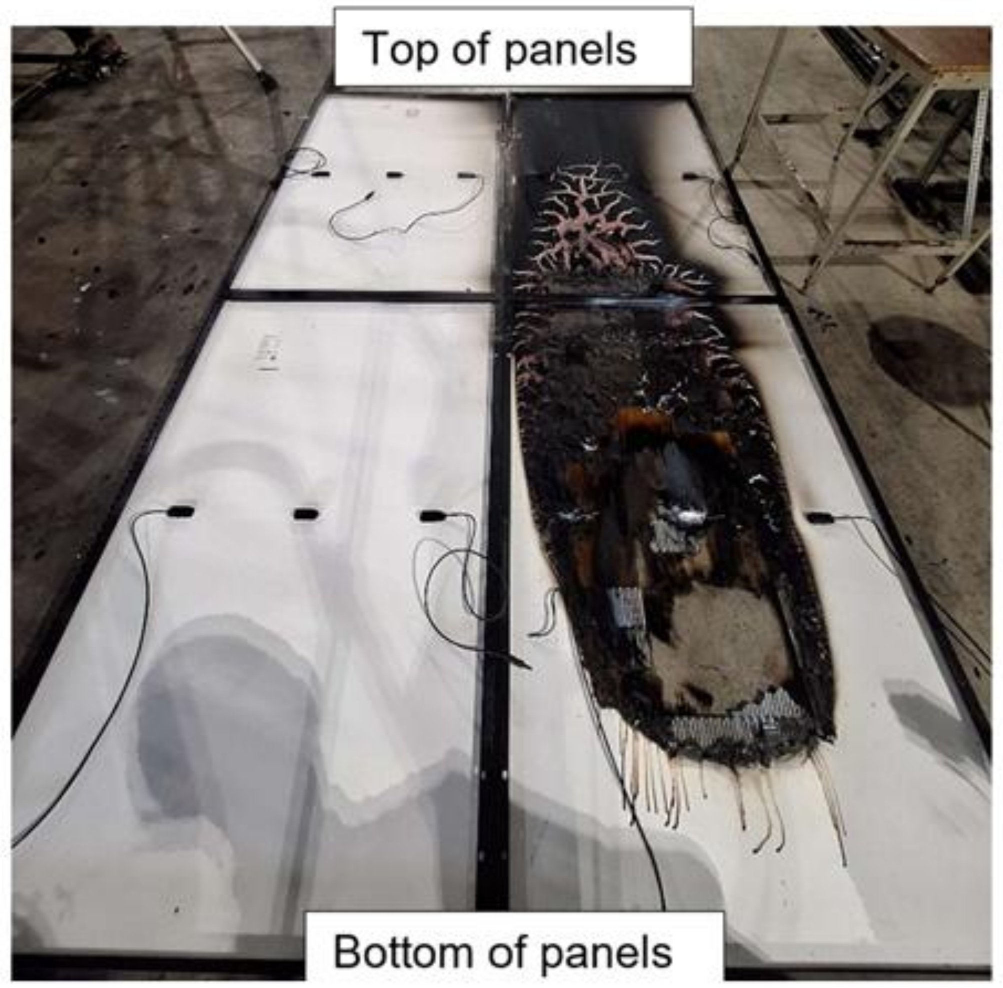
- Configuration: 2 × 2 PV array mounted on a pitched roof with an angle of 45°
- PV panels either integrated into the roof construction or supported above the roof tiles to create a void space under the panels
- Wooden crib replicated a DC-DC connector failure underneath the PV panel



Building Applied Photovoltaic (BAPV) panels

- Interlocking concrete roof tiles
  - Vertical fire spread with plastic-backed PV Class C panels
  - Limited horizontal fire spread
  - Less fire spread with glass-backed PV Class A panels

- Plastic roof tiles
  - System using these roof tiles has achieved a fire classification of BROOF(t4), according to BS EN 13501-5
  - Test with plastic-backed PV Class C panels
  - Almost all of the roof tiles below the solar panels very rapidly became involved in the fire and this greatly increased the fire spread

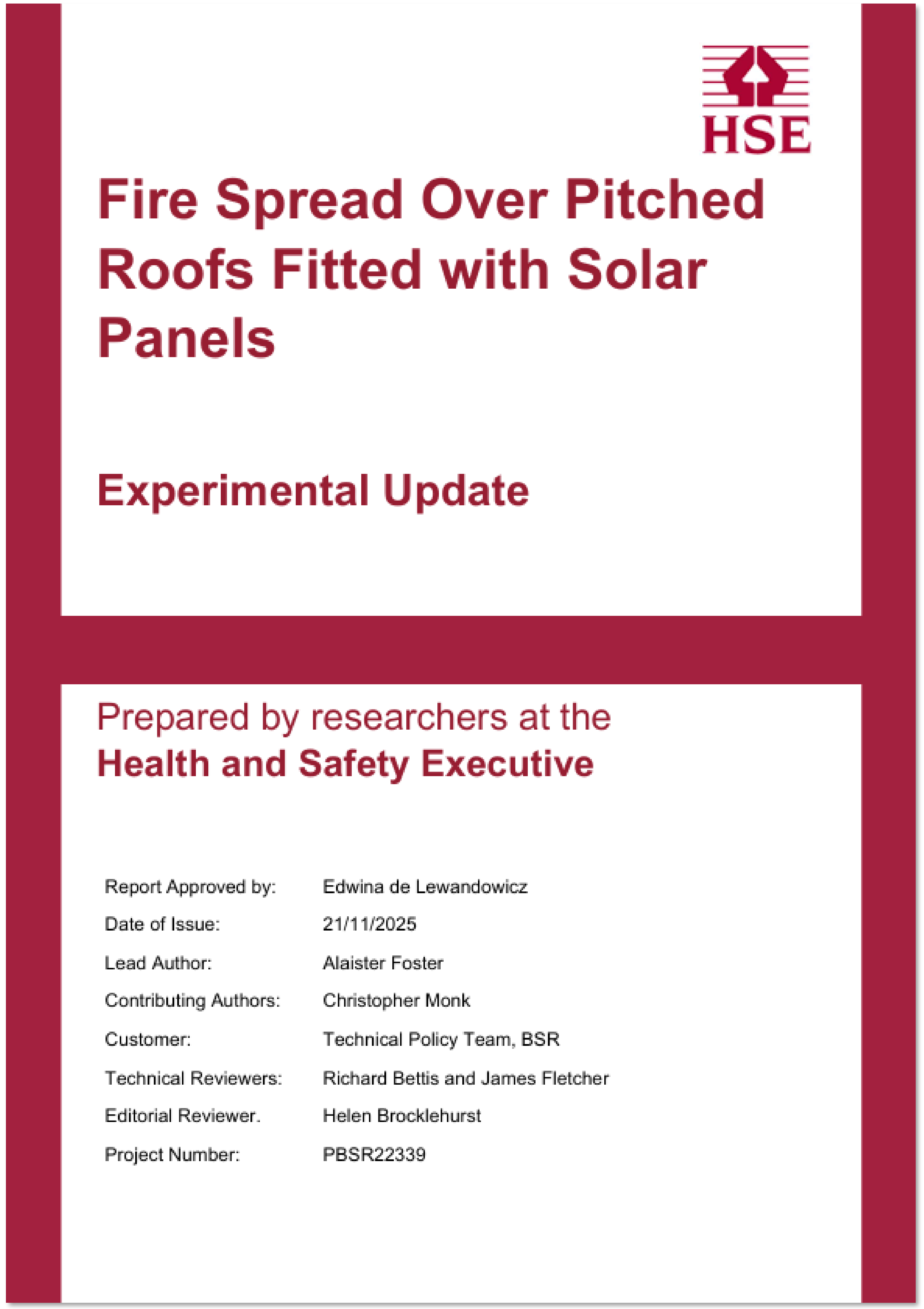


Building Integrated Photovoltaic (BIPV) panels

- Wooden support battens and the plastic trays provided a large fuel source for the fire
- Significant vertical and horizontal flame spread in all of the plastic tray integrated systems, with flames extending above the top of the roof
- Some differences depending on type of integrated system
- Fires were significantly harder to extinguish than above-roof BAPV systems
- Part of the fire was contained in the cavity behind the waterproof layer of the roof, fully sealed by the solar panels and flashing, meaning it was harder to apply water to this area unless the fire had burnt an opening in these materials

Solar panel fires

- Update report provides summary of initial findings
  - https://assets.publishing.service.gov.uk/media/693aeb43c72b0f8ccf33d63e/fire-spread-over-pitched-roofs-fitted-with-solar-panels.pdf
- Data interpretation and validation are not fully complete for all of the tests
- Findings may evolve as the final report is produced
- Contacts:
  - Alaister.Foster@hse.gov.uk
  - Rhodri.Jones@hse.gov.uk



HSE

Fire Spread Over Pitched Roofs Fitted with Solar Panels

Experimental Update

Prepared by researchers at the
Health and Safety Executive

Report Approved by:	Edwina de Lewandowicz
Date of Issue:	21/11/2025
Lead Author:	Alaister Foster
Contributing Authors:	Christopher Monk
Customer:	Technical Policy Team, BSR
Technical Reviewers:	Richard Bettis and James Fletcher
Editorial Reviewer.	Helen Brocklehurst
Project Number:	PBSR22339

Future directions

Future directions

- Reviewing/updating the HSE Areas of Research Interest in late 2026

- Submitting abstract to IChemE Hazards 2026 conference
  - https://www.icheme.org/training-events/hazards-process-safety-conference/
  - Aim to map landscape of safety research on hydrogen and CCUS
  - Summarise recent/ongoing/future joint industry projects
  - Review research prioritisation exercises run by HSE and others
  - Explore opportunities for future collaboration

- If you have any questions about the work presented in these slides, please do not hesitate to get in touch

Sincere thanks to HSE colleagues who have provided material for this presentation:
Adam Bannister, Joshua Royle, Janni Vizma, Wayne Rattigan, Jason Gill and Rhodri Jones

Thank you

Any questions?

simon.gant@hse.gov.uk

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