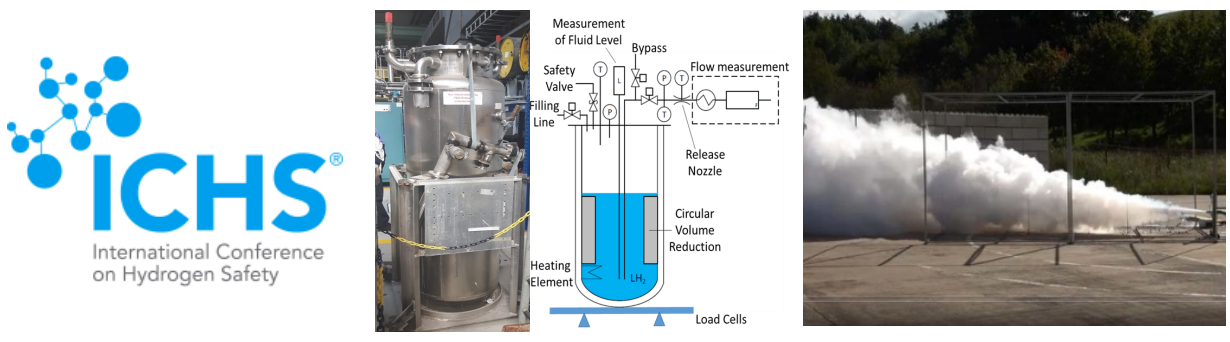
PRESLHY Newsletter

ISSUE 3 JANUARY 2020

Top stories in this newsletter



ICHS 2019 | Progress of KIT experimental campaign | HSL experiments on LH2 releases

Project progress

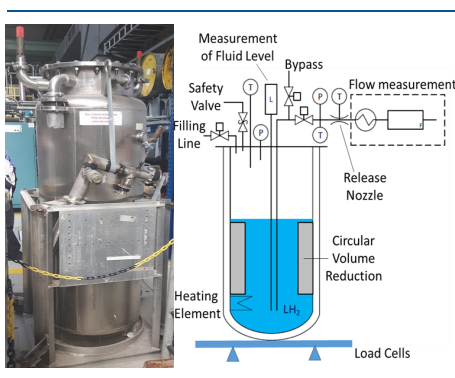
PRESLHY has entered the third year of the project. The consortium had a 4th project meeting at HSL premises (Buxton) on 6-8 November 2019. During this event, PRESLHY partners organized a 4th workshop in collaboration with HySafe to exchange knowledge and expertise on "*CFD and engineering tools for Experiments*". i.e. tools to aid designing, planning, executing or controlling of experiments; interpolating, statistically evaluating and interpreting experimental results. The material associated to this and previous workshops is available in the section events of the project website.

PRESLHY representation at ICHS 2019

The 8th International Conference on Hydrogen Safety took place in Adelaide, Australia, on the 24-26 September 2019. Two sessions were organized on cryogenic, including liquid, hydrogen safety. Five papers associated to PRESLHY were submitted and presented:

⇒ Jordan T., Bernard L., Jallais S., Venetsanos A., Coldrick S., Cirrone D., Status of the pre-normative research project PRESLHY for the safe use of LH2.
⇒ Cirrone D., Makarov D., Molkov V., Cryogenic hydrogen jets: calculation of hazard distances.
⇒ Giannissi S.G., Venetsanos A.G. and Hecht E.S., Numerical predictions of cryogenic hydrogen vertical jets.
⇒ Venetsanos A.G., Giannissi S., Proust C., CFD Validation against large scale liquefied helium release.
⇒ Venetsanos A.G., Choked two-phase flow with account of discharge line effects.

Presentations are available on ICHS 2019 website.



Cryostat facility for LH2 releases

Test facility is ready for the second phase of KIT experimental campaign

KIT has finalized the design and set up of the Cryostat facility for the two-phase hydrogen releases with pressure up to 6 bar. This facility is being used for the experimental investigations on liquid hydrogen pools formation. For safety reason, these tests will be performed in a remote free field location of KIT Campus South. The same location will be used for the experiments on ignition and combustion of cryogenic hydrogen.

The experimental campaign will be completed in May 2020.

HSL successfully completed the experimental series on dispersion of LH2 releases

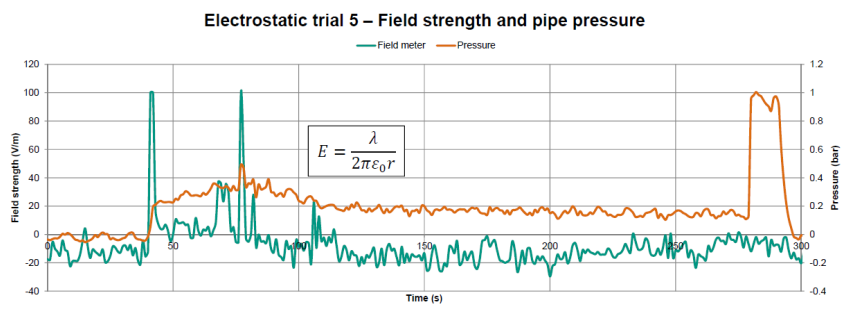
A series of 25 large scale LH2 releases from elevated positions were carried out through ¼", ½" and 1" nozzles with an indicated tanker pressure of 1 or 5 barg and release heights of 0.5 or 1.5 m.
Pipework temperature, pressure and mass flow measurements enabled a characterization of the release and downstream temperature and concentration sensors enabled the analysis of the subsequent dispersion. Near and far field video was captured so an assessment of rainout can also be made across the range of release scenarios. The data and results for the experiments are currently under analysis and will become available on the project Open Data repository.

HSL experiments on dispersion and rainout of large scale LH2 releases

Electrostatic charge in multiphase hydrogen releases

HSL completed a series of 7 experimental tests on the flow of multiphase LH2 releases in electrically isolated steel pipework. Wall current was measured in the isolated pipework and field strength was measured in the dispersing plume. The results showed the possibility of generation of a current in the isolated pipe. Occasional charge spikes were observed in the dispersing plume. It is considered they may have been caused by ice breaking off the nozzle or ejection of the air not yet purged from the pipe.

Two tests were conducted on the rapid phase transition (RPT) for LH2 pools. Sprinkler systems were not seen to lead to RPT, whereas a fire hose deluge increased rapidly the LH2 pool evaporation rate even if not leading to an energetic event.



Electrostatic plume measurements for a 1/4" and 1 bar LH2 release

Best wishes for a Happy New Year from PRESLHY consortium! 2020

Forthcoming events

⇒ CEN/CENELEC TC 6 plenary meeting, Brussels, Belgium (January 2020)
⇒ PRESLHY 5th project meeting and workshop, Athens, Greece (April 2020)

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 779613.

To find more information about our research activities, please visit: www.preslhy.eu
Next edition newsletter: Issue 4, June 2020