



FCH 2 JU HyTunnel-CS project (826193)
Pre-normative research for safety of hydrogen driven vehicles and
transport through tunnels and similar confined spaces

International virtual workshop of first responders
5-6 October 2020
Updated 5th October 2020
Preliminary agenda

The International workshop will address several topics, including but not limited to the analysis of current procedures of fire services for incidents with hydrogen in underground systems. In this context, the following questions will be included into discussion, to gain consistent understanding of possibilities and limitations of intervention:

- What are the specific conditions for intervention in underground transportation systems?
- How do first responder get all relevant information needed?
- What are the possible actions taken by fire-fighters?
- Why is ventilation a very important factor?
- Who is responsible for which measures of response?
- What behavior by persons involved must be taken into consideration?
- Which issues need further research?

The possible tactics and techniques for intervention will be presented and discussed, e.g. the benefits and risks of ventilation in tunnels, car parks, etc. The focus will be on how the outcomes of HyTunnel-CS research can aid the development and optimization of the fire services intervention strategies, tactics, procedures, technical equipment, training, etc. Scenarios for tactic sessions have been developed by Alexander Dyck (DLR), Gerhard Schöpf (LFT) and Christian Brauner (IFA).

Workshop goals	
Day 1	<ul style="list-style-type: none">– Overview of projects HyTunnel-CS and HyResponder;– Share knowledge on interventions in underground transport systems in general.
Day 2	<ul style="list-style-type: none">– Interactive discussion of appropriate tactics for response to Hy-incidents in tunnels and similar confined spaces;– Exchange of views on education and training for Hy-Response in tunnels and similar confined spaces;– Identify questions that need further scientific clarification;– Synchronization with partner activities.

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We are therefore pleased to inform you that participation in the virtual workshop is free of charge.



FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

Workshop agenda



All times are British Summer Time

BST	Day 1	
13:00-13:15	Welcome to the workshop Goals, procedures and organization of the workshop; rules for video conference	U. Kummer, IFA
13:15-14:30	Introduction to FCH 2 JU HyTunnel-CS project Pre-normative research contribution to hy-accident response - Similarity law and exclusion of flammable cloud formation - Effect of tunnel slope on hydrogen dispersion in an accident - Correlation of blast wave attenuation in a tunnel - Safety technology to prevent hydrogen tank rupture - Concluding remarks and questions	D. Makarov, UU D. Makarov, UU A. Venetsanos, NCSR W. Dery, UU S. Kashkarov, UU D. Makarov, UU
14:30-15:00	Design of underground transport systems and its impact on first responders Presentations and discussion: types of design and ventilation systems; varieties and dimensions	U. Kummer, IFA
15:00-15:20	<i>Break</i>	
15:20-15:45	Underground transport systems and confined spaces: hazards Presentation and discussion: extremely large fire compartments > long emergency routes > great depth of penetration; smoke, heat, structural collapse; hazard of explosion	C. Brauner, IFA
15:45-16:15	Underground transport systems and confined spaces: tactics Presentation and discussion: extinguish to rescue and the two-sided attack; reconnaissance – firefighting – search and rescue; tactical ventilation.	C. Pessel, IFA
16:15-16:30	Framework for education Different countries, different tasks, different expectations on curricula, intensity and time budgets for education and training	C. Brauner, IFA
16:30-17:00	<i>Break</i>	
17:00-17:30	Vehicle Identification Numbers (VIN) Presentation and discussion: to respond you need to know what you are dealing with. The VIN could tell you all you need to know.	T. Van Esbroek, SPFI
17:30-18:30	HyResponder project - Overview and current status of FCH 2 JU HyResponder project - Virtual reality for training - HyResponder remote events	S. Brennan, UU L. Lecomte, ENSOSP E. Maranne, CRISE
18:30-19:00	Final discussion and closure of Day 1	D. Makarov, UU

BST	Day 2	
09:30-09:45	Introduction: rules for tabletop exercises	C. Brauner, C. Pessel, IFA
09:45-11:15	Tunnel scenarios One tube, single tube, different types of ventilation	
11:15-11:45	<i>Break</i>	
11:45-13:00	Car park scenarios Single car garage; parking garage, underground parking garage	
13:00-13:20	Example for a political recommendation for law makers and regulatory authorities	G. Schöpf, LFT
13:20-13:35	<i>Break</i>	
13:35-14:00	Concluding discussion Define consent and dissent as well as questions to be answered	C. Brauner, IFA
14:00-14:30	HyTunnel-CS project next steps Recommendations to assist intervention strategies and tactics	D. Makarov, UU