

# International Workshop On Hydrogen Safety Training for First Responders



European Hydrogen Emergency Response training programme for First Responders  
ENSOSP September 3 – 4 2014



Lieutenant-colonel François LAUMANN *scientific and technical responsible of  
the HyResponse program*

Marc Lopez *Administrative and financial responsible of the HyResponse program*

# Context



## Hydrogen risk



## Societal acceptance



# Context



- Hydrogen technologies and applications are being introduced into the market
- Fire authorities awareness and knowledge regarding these new technologies is low
- Any mishandling of a crashed FCV and hydrogen technologies, inappropriate and counter-measure interventions could affect FCV deployment and generate a negative impact on social acceptance of hydrogen technologies
- Therefore , First Responders must be trained adequately to know how to handle potential incidents to protect public without putting in jeopardy their own life



# HyResponse project



- Coordination and Support Action Project supported by the FCH JU
- Starting date: **12/06/2013**
- Project duration: **3 years**
- FCH JU contribution: **1 857 897 €**
- Project coordinator: **ENSOSP**
- Consortium :



# HyResponse: key objectives



- To develop a comprehensive training for First Responders dealing with all safety aspects of H<sub>2</sub> transport and stationary applications
  - An educational training including hazard and risks from H<sub>2</sub> applications
  - An operational-level training on mock-up real scale transport and stationary installations
  - A virtual reality training exercises reproducing entire accident scenarios
- Organize three pilot sessions to train 50 FR in a face to face mode to test and get feedback regarding the developed training
- Deliver an Emergency Response Guide
- Disseminate and perpetuate FR training to facilitate permitting process and social acceptance of hydrogen-energy technologies



# HyResponse: a European project within an international collaboration



- European Fire Services members of the ACP (Advisory and Consultative Panel)
  - Germany, UK, France, Belgium, Denmark, Italy, Poland, US
- International Association of Fire and Rescue Services
  - 36 countries represented
  - New commission created in 12/2013 “New Technologie and Extrication”
- Discussion with US DOE to join both FR programs

**Any contribution will be disseminated at international level**



# HyResponse project



## Educational training material

- Curriculum development
- Basics of hydrogen safety for First Responders
- Regulations, codes and standards requirements to FCH systems relevant to First Responders, intervention strategies and tactic
- Teaching materials for First Responders intervention strategy and tactic

## Emergency scenarios and first response strategies

- Selection, analysis and description of the HFC applications, their safety concept and safety features
- Development of typical detailed scenarios and evaluation of the associated consequences
- Operational emergency response strategies

## Operational training facility

- Elaboration of multi-level operational training exercises
- Design and technical specifications of the operational hydrogen training facility
- Realisation, installation and commissioning of the operational hydrogen training facility

## Pilot training sessions

- Establishment of a database of First Responders involved in European hydrogen projects
- Implementation of the European First Responder training sessions
- Creation of a European Emergency Response Guide

## Recommendations and dissemination

- HyResponse web-site and online training course
- Development of recommendations for RCS to the international standardization bodies
- Recommendations on future research topics Workshop for First Responders

## Virtual Reality training platform

- Programming of the hydrogen virtual training platforms
- Definition of the 3D Virtual Reality Serious Game exercises
- Hydrogen phenomena input for virtual training exercises





# Methodology



## Emergency scenarios and first response strategies

- Description of the HFC applications, their safety concept and safety features
- Development of typical detailed scenarios and evaluation of the associated consequences
- Operational emergency response strategies





# Methodology

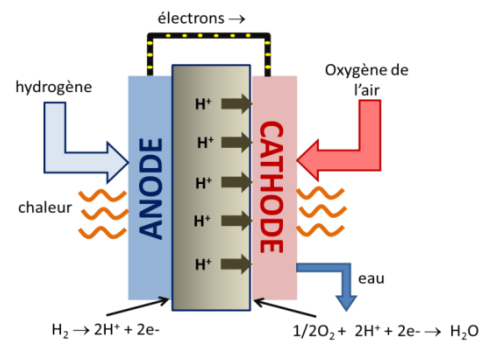
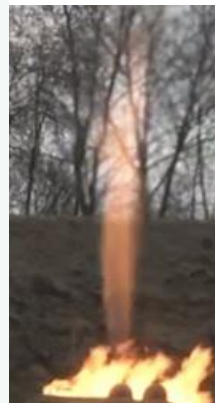


## Educational training material

- Curriculum development
- Basics of hydrogen safety for First Responders
- Regulations, codes and standards requirements to FCH systems relevant to First Responders and intervention strategies
- Teaching materials for First Responders intervention strategy and tactic
- Material available online

### Emergency scenarios and first response strategies

- Selection, analysis and description of the HFC applications, their safety concept and safety features
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# Methodology



## Educational training material

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## Emergency scenarios and first response strategies

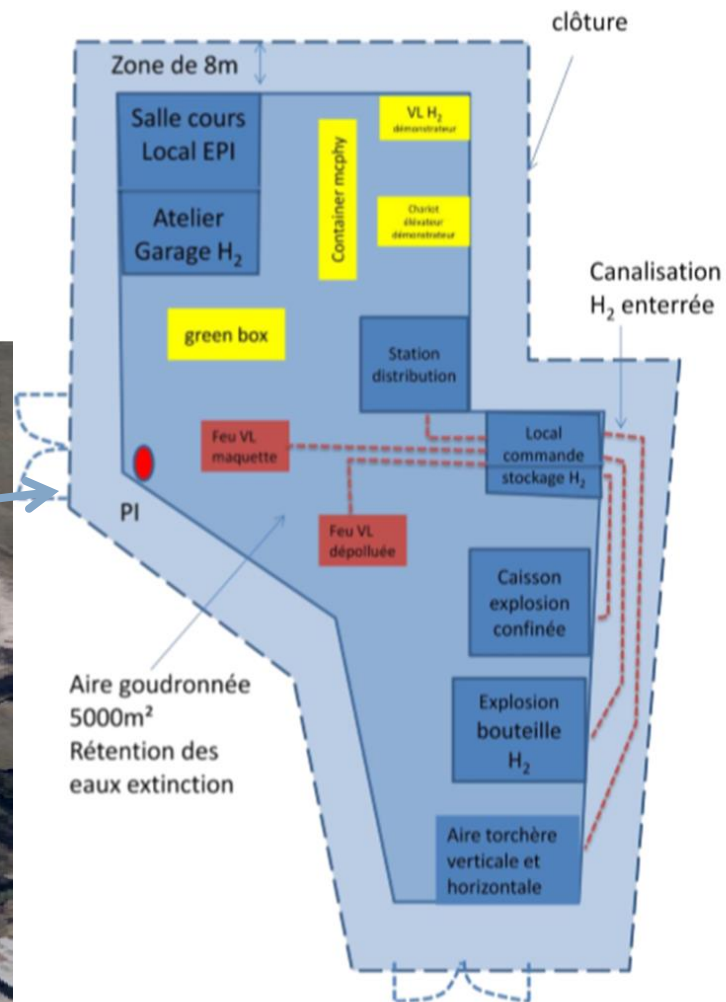
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## Operational training facility

- Elaboration of multi-level operational training exercises
- Build an operational hydrogen training facility



# Operational training facility





# Methodology



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## Operational training facility

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- Realisation, installation and commissioning of the operational hydrogen training facility



## Virtual Reality training platform

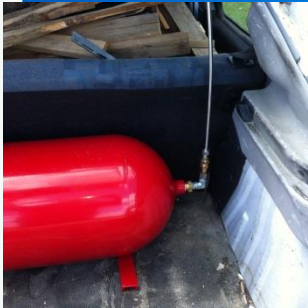
- Creation of the hydrogen VR platform
- Definition of the 3D Virtual Reality Serious Game exercises reproducing entire command chain
- Hydrogen phenomena input for VR exercises



# Methodology



HyResponse



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- Hydrogen phenomena input for virtual training exercises



## Pilot training sessions

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- Implementation of the European First Responder training sessions
- Creation of a European Emergency Response Guide



# Methodology



Home Educational training Operational training VR training Emergency Response Guide Contacts Events Members  
Links

## Welcome to the HyResponse project's website

HyResponse is a 'Coordination and Support Action (CSA)' project supported by EC Fuel Cell and Hydrogen Joint Undertaking and aiming to establish the World's first comprehensive training programme for first responders, i.e. a European Hydrogen Safety Training Platform (EHSTP), to facilitate safer deployment of FCH systems and infrastructure. The core training programme is threefold: educational training, including the state-of-the-art knowledge in hydrogen safety, operational training on mock-up real scale hydrogen and fuel cell installations, and innovative virtual reality training reproducing in detail an entire accident scenario, including influence of first responder's intervention. Three pilot training sessions will be organised during the project. The Emergency Response Guide, explaining details of intervention strategy and tactics, will be developed and included into the pilot training sessions to receive attendees' feedback. The Advisory and Consultative Panel will be established to engage as much as possible European stakeholders and provide highest outreach of the project results. The Panel membership will be open to first responders, site operators, representatives and hydrogen industry, and car manufacturers throughout Europe. A website will stay active for training of new comers after the end of the project. EHSTP will train first responders to deal with all safety aspects for a range of hydrogen applications, including passenger vehicles, buses, forklifts, refuelling stations, backup power, stationary fuel cells for combined production of heat and power, etc.



You will be able to find on this website the deliverables of the HyResponse Project, International Curriculum on hydrogen safety training for First Responders, Emergency Response Guide, links to relevant resources and RCS, information on the HyResponse pilot training sessions, workshop, etc.

Would you have any question on the HyResponse Project or this website, don't hesitate to contact us.

[Home](#)

[Contact Us](#)

[General disclaimer](#)

HyResponse project is a Coordination and Support Action funded by Fuel Cells and Hydrogen Joint Undertaking and supported by the European Commission under the 7th Framework Programme. Project reference: 325348.



## Recommendations & dissemination

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- Recommendations on future research topics  
Workshop for First Responders

[www.hyresponse.eu](http://www.hyresponse.eu)

# HyResponse - Conclusions



- First Responder hydrogen safety educational materials in Europe
- European Hydrogen Training Platform with mock-up real scale transport and hydrogen stationary installations
- Virtual reality platform reproducing entire accident scenarios
- Funding for training 50 European First Responders during 3 training sessions in a face to face mode of one week duration
- European Emergency Response Guide
- Website
- Second International Workshop on Hydrogen Safety Training for First Responders on May 2016





# Thank you for your attention



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