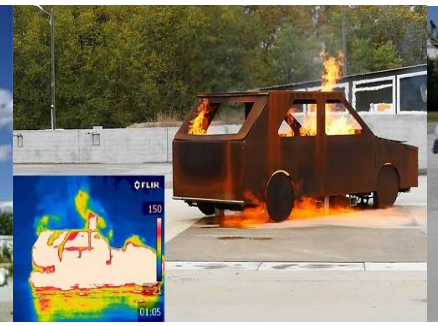
HyResponder

Dr Donatella Cirrone on behalf of the HyResponder partners

Rome, Italy, 20th June 2024







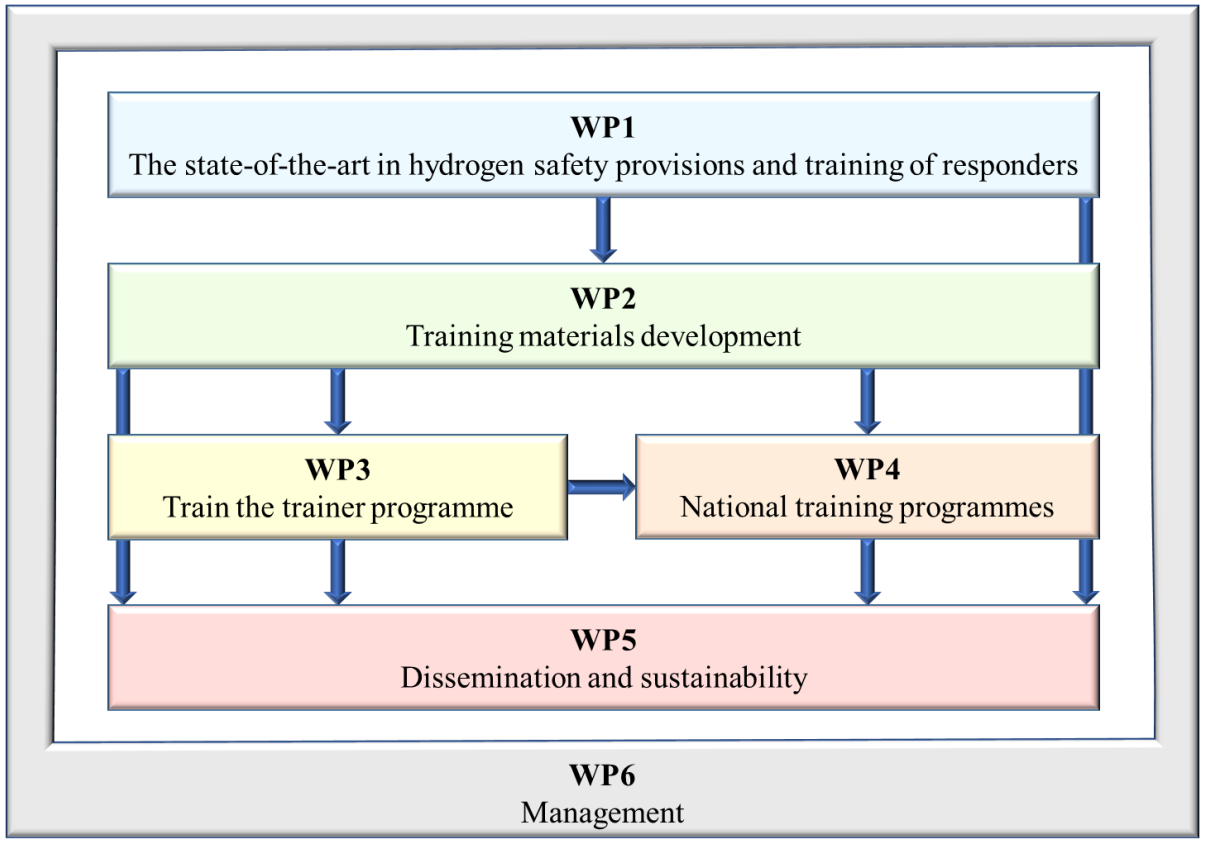
Project Overview

- European Hydrogen Train the Trainer Programme for Responders
- 40 months project: 1/01/2020 -31/05/23
- Total project budget: €1M
- Ulster coordinator
- Partners: 16 partners from 10 countries
- Fire and Rescue Services and Associations, Academia, Industry, Virtual Reality experts

Project Summary

HyResponder aim and work plan

- Develop and implement a **sustainable** train the trainer programme in hydrogen safety for responders throughout Europe
- Supporting the commercialisation of FCH technologies by informing the participation of responders in the initial permitting process, improving resilience and preparedness through enhanced emergency planning, and ensuring appropriate accident management and recovery



Project objectives

- Develop updated, **operational**, **virtual reality**, and **educational training** for trainers of responders to reflect the state-of-the-art in hydrogen safety.
- Establish a Pan-European Network of Responder Trainers
- Train trainers from at least **10 European Countries** in hydrogen safety
- Make teaching materials available in **8 languages**
- Support trainers to deliver regional workshops in **10 countries**
- Ensure **sustainability** of the training programme through the availability of translated materials on an **educational platform**
- Update the **European Emergency Response Guide**
- Establish an International Forum of Responders

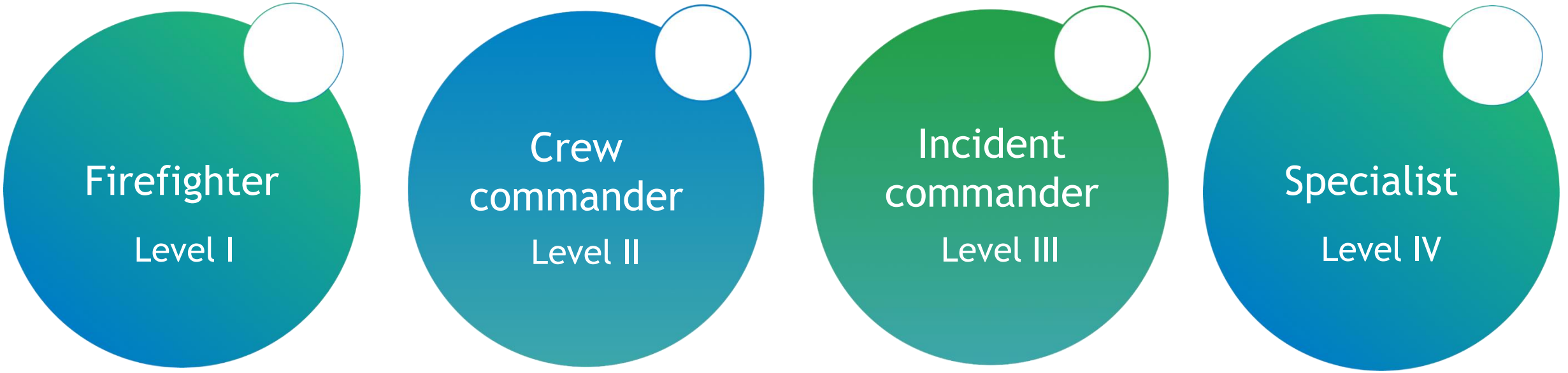
Extended training package for trainers

Outcome of HyResponder

- **Threefold** approach with all elements represented on HyResponder **e-Platform**
  1. Operational training
     - Unique hand-on training facility at ENSOSP, France
     - Extended within HyResponder to include cryogenic spills
  2. Educational training
     - Lectures revised, stratified, trialed, and translated
  3. Virtual Reality training (extended)
     - Scenarios extended to include LH2
- Training is underpinned by the revised **European emergency response guide**
- Details on the HyResponder e-Platform

Stratification of training materials

Responder led identification of **four** learning levels across Europe aligned to EQF



- Framework used as a basis to stratify the Lectures into up to 4 levels by responders
- Presentations at level 4
- Goal of developing a standardised training package and gaining recognition of the training

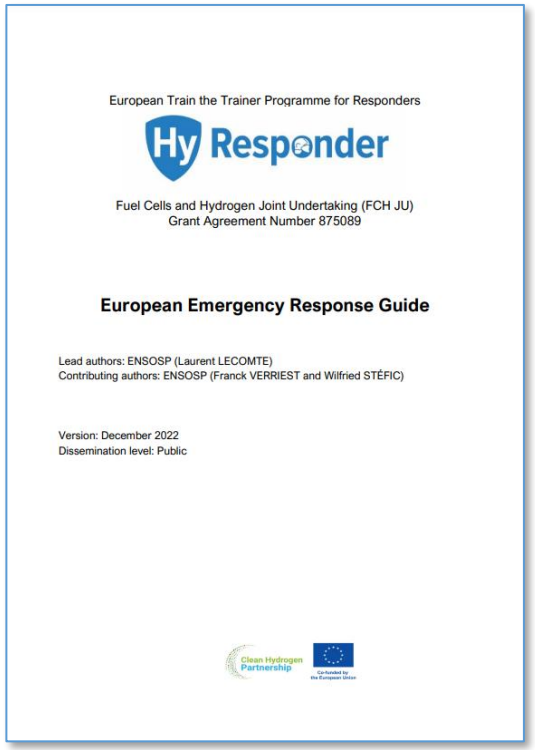
Training sequences

- Digital resources were developed due to the pandemic
- Operational training is supported by practical sequences with videos and exercise cards underpinned by the EERG
- Partners ENSOSP and CRISE were instrumental in this activity
- Examples are accident scenarios related to:
  - Fuel cell equipment
  - Triggered hydrogen releases
  - FCH vehicle fire
  - Liquid hydrogen
  - Hydrogen transport
  - Storage tank
  - Explosion in fuel cell container

Revised EERG

Living document

- HyResponse European Emergency Response Guide updated
- Guide intended to be used by emergency response personnel, both by front-liners and commanders
- Revisions include events related to LH2
- Multiple contributions from the wide consultation


European Train the Trainer Programme for Responders

Hy Responder

Fuel Cells and Hydrogen Joint Undertaking (FCH JU)
Grant Agreement Number 875089

European Emergency Response Guide

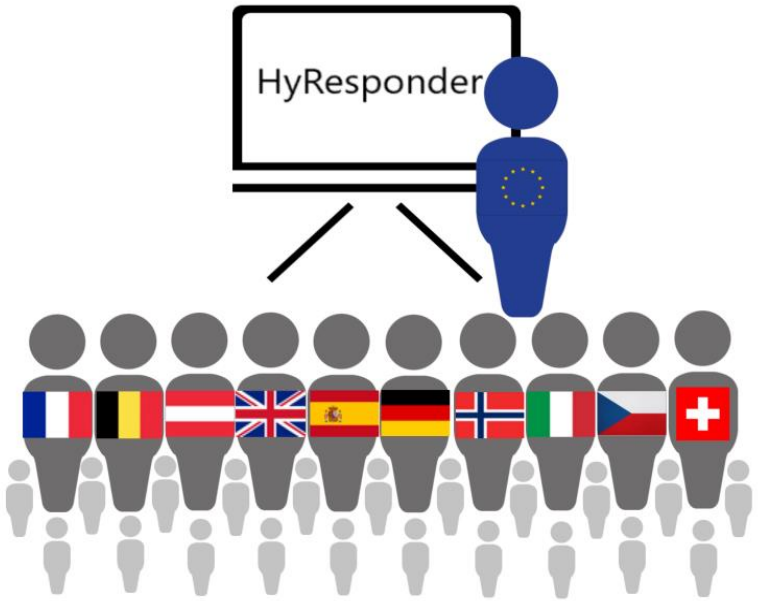
Lead authors: ENSOSP (Laurent LECOMTE)
Contributing authors: ENSOSP (Franck VERRIEST and Wilfried STÉFIC)

Version: December 2022
Dissemination level: Public

- https://hyresponder.eu/e-platform/european-emergency-response-guide/

Train the trainer (National leads)

- Virtual training for trainers from 10 partner countries plus SAB June 2021
- Face to face operational and virtual reality training June 2022 at ENSOSP, France
- Unique approach to manage online delivery “training sequences”
- National training was undertaken in 10 countries
- Materials are available in 8 languages including Italian
- Plan in place for a standard module but no “one-size fits all”



National training activities

- Training through 11 main activities in 10 countries
- Trainers introduced the **translated** training
  Czech, Dutch, English, French, German, Italian, Norwegian, & Spanish
- Approach is different from country to country to align to needs e.g.
- **In all regions a plan is in place for beyond the project**

Country	Austria	Norway	Italy
Training lead	Landes Feuerwehrverschule Tirol	University of South Eastern Norway	Università degli Studi di Roma "La Sapienza
Language	German	Norwegian	Italian
Format	Two online courses basic knowledge and specialist	Hybrid	Face to face with small operational facility
Impact to date	Over 200 responders enrolled in the basic course	in person and online workshops delivered	Firefighters from across Italy trained
Next steps	800 participants by the end of 2023	Follow up training	National working group established

National training examples

Hva skjer etter HyResponder workshop?

H2Konstabel kommer hjem til dere

Som en norsk videreføring av HyResponder har Norges Forskningsråd finansiert videreførings-prosjektets H2Konstabel.

H2Konstabel vil oppsøke kommunale brann og redningsetater som ønsker en innføring i hydrogensikkerhet og en presentasjon av opplæringsmateriell for å begynne eget arbeid med hydrogensikkerhet. Besøket varer en dag og prosjektet dekker materiell, bevertning, reise og opphold (for instruktørene). Deres lokale etat må stille med lokaler og deltagere.

Ønsker du å motta H2Konstabel? Påmelding starter etter Norsk Hydrogen-sikkerhets workshop og sendes per epost.

Kontaktinfo og spørsmål

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NORSK HYDROGEN-SIKKERHETS WORKSHOP

Hy Responder

USN Universitetet i Sørøst-Norge

MINISTERO DELL'INTERNO

Hy Responder

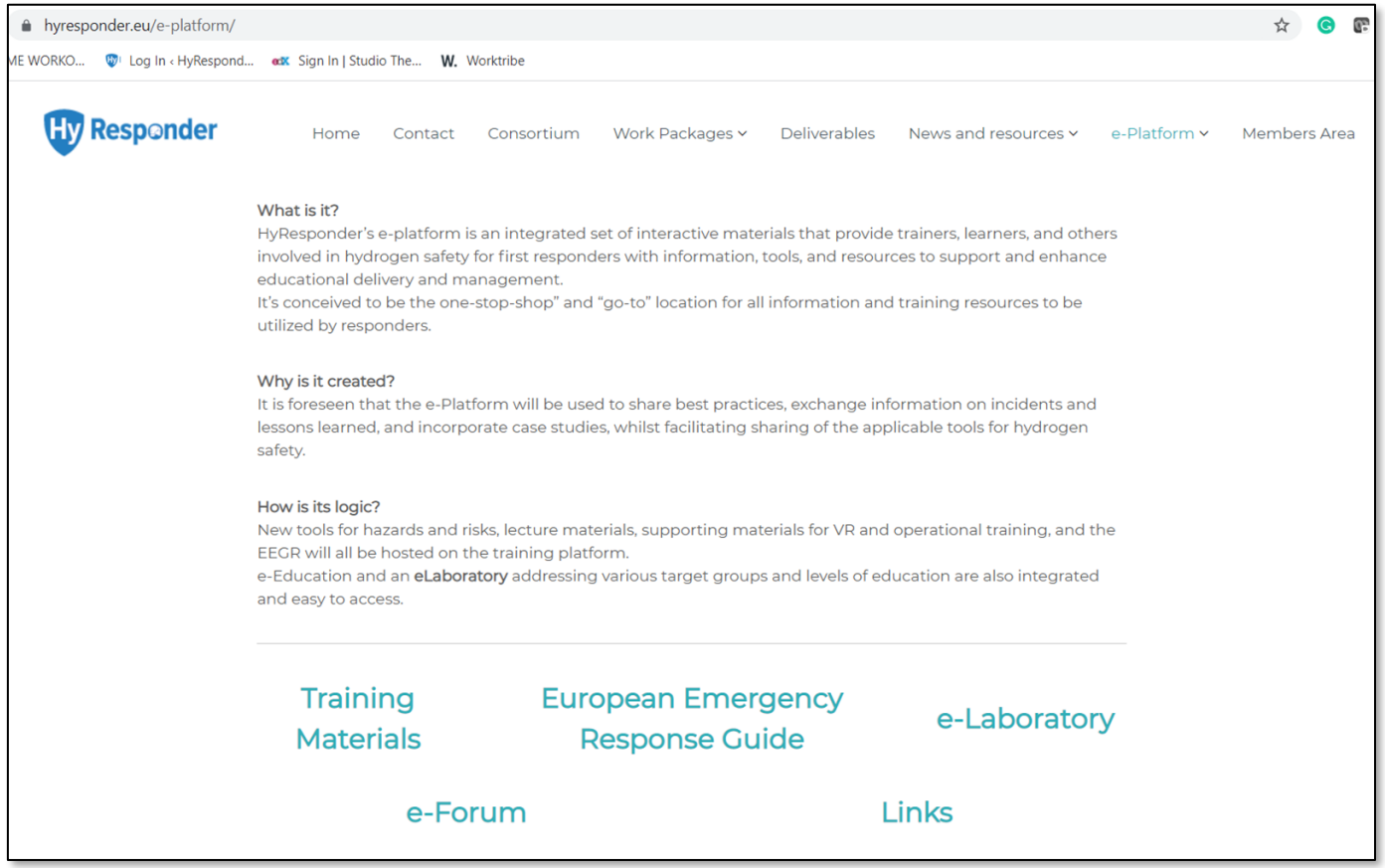
Agenda 15 novembre 2022

- **Ore 09:00 – 09:20: saluto ai partecipanti e introduzione ai lavori**
  Stefano Marsella, Direttore Centrale per la Prevenzione e la Sicurezza Tecnica
  Michele Mazzaro, CNVVF – Vicario Direttore Centrale per la Prevenzione e la Sicurezza Tecnica
- **Ore 09:20 – 09:40: presentazione del Progetto Europeo «HyResponder» – HySAFER Centre Ulster University**
  Sile Brennan, HySAFER Centre – Ulster University
- **Ore 09:40 – 09:50: presentazione del Progetto Europeo «HyResponder» – DICMA Sapienza**
  Paola Russo, DICMA Sapienza
- **Ore 09:50 – 10:30: introduzione alle tecnologie dell'idrogeno e proprietà rilevanti per la sicurezza**
  Donatella Cirrone, Ulster University
- **Ore 10:30 – 10:45: pausa caffé**
- **Ore 10:45 – 11:15: presentazione piattaforma e scenari ENSOSP**
  Laurent Lecomte, Franck Verriest, ENSOSP
- **Ore 11:15 – 12:00: scenari di incidente e conseguenze: dispe**
  Donatella Cirrone, Ulster University
- **Ore 12:00 – 12:40: casi pratici**
  Jacopo Moretti, CNVVF
- **Ore 12:40 – 13:00: stato dell'arte dell'attività svolta dal CNV**
  Michele Mazzaro, CNVVF – Vicario Direttore Centrale per la Prev
- **Ore 13:00 – 14:00: pausa pranzo**
- **Ore 14:00 – 15:00: introduzione alle attività pratiche**
  Francesco Pilo, CNVVF – illustrazione prove pratiche di jet fire da
  HYPER – illustrazione elettrolizzatore
  TENARIS – illustrazione serbatoi in composito
  GKN – illustrazione stoccaggi tramite idruri
- **Ore 15:00 – 17:30: attività pratiche ed illustrazioni componer**
- **Ore 17:30 – 18:00: debriefing conclusivo**

HyResponder e-Platform

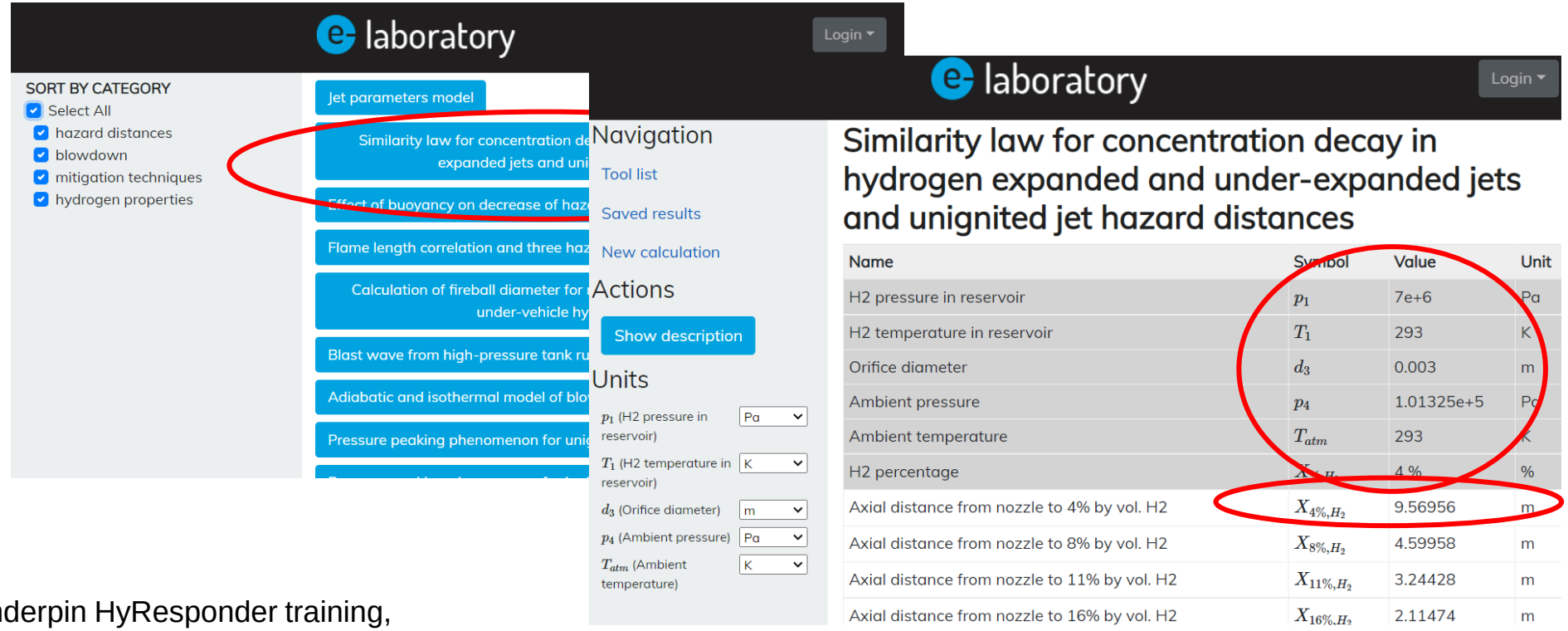
- Materials for trainers beyond HyResponder
- Stratified lectures
- Training sequences with videos
- Online tools
- EERG
- Translated materials

https://hyresponder.eu/e-platform



e-laboratory

e-Laboratory



Used to underpin HyResponder training, many applications, access is free
https://elab.hysafer.ulster.ac.uk/

Training framework

- The International Association of Fire and Rescue Services, CTIF, has led development of a framework for recognition of firefighter level training.
- Aim is to enable the **wide diversity** of emergency first responders that exist, to seek and secure **localised arrangements** to develop and promote acceptable practice standards **using the HyResponder training outcomes**.
- Programme aligns to the European Qualification Framework at Level 2
- The programme covers the equivalent to 20 hours of guided study and practice
- Full details on the Framework will be available on the HyResponder website and can already be accessed through CTIF
- The Framework is intended to be **flexible** and to complement and support local training arrangements.

Training framework

https://ctif.org/commissions-and-groups/hyresponder-european-hydrogen-train-trainer-programme-responders

Impact of HyResponder

- e-Platform available to facilitate access to information
- Unique operational training platform available at ENSOSP – sharing expertise
- Online training sequences available to support local training
- Training delivered in different formats to over 1250 individuals across 10 countries
- Plans to extend the reach to > 22,000 responders across Europe by 2028.
- Roadmap for standard training package with a defined module at firefighter level
- Stratified training materials available to freely access online across 4 levels
- Translated materials online and freely available in 8 languages
- Online tools to support training available to all stakeholders
- Revised EERG available for use globally
- Plans for each region beyond the project

Hy Responder

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No 875089. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation program, Hydrogen Europe and Hydrogen Europe Research.

Clean Hydrogen Partnership

Co-funded by the European Union

Ulster University

ENSOSP

cea

ibz

Bomberos Zaragoza – Escuela de Bomberos

DLR Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center

Institute of Networked Energy Systems

CTIF

Fire Service College

ifa International Fire Academy

Hasičský záchranný sbor České republiky

ISN

Crise Crisis Simulation Engineering

Landes-Feuerwehrverband Tirol

Air Liquide creative oxygen

Sapienza Università di Roma



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