FUEL CELLS AND HYDROGEN JOINT UNDERTAKING

EHSP

ICHS 2021

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24 september 2021

INTERNATIONAL CONFERENCE ON HYDROGEN SAFETY 2021

“Safe Hydrogen for Net Zero”

Edinburgh on 21-24 September 2021

EHSP: European Hydrogen Safety Panel

Background

European Hydrogen Safety Panel (EHSP)

A brief timeline

- In 2006 and 2009 NoE HySafe was suggesting an activity for **sharing lessons learned and hydrogen safety experience across project boundaries** and to **maintain this expertise eventually even beyond program terms.**
- In 2014 the International Association for Hydrogen Safety HySafe proposed the installation of a safety panel to the Executive Director and Governing Board of the FCH JU.
- After several discussions about formal aspects, terms of reference, vision, mission, mandates, etc. the European Hydrogen Safety Panel was launched by the FCH 2 JU in 2017.

Kick-off meeting 2018

Vision // Strategic Role

European Hydrogen Safety Panel (EHSP)

Reflecting the FCH 2 JU vision

- Hydrogen plays a key role in the Energy System constituting a **safe** and sustainable Energy Carrier.

- Hydrogen is an enabler of the Energy Transition towards a decarbonized system.

EHSP ROLE: to provide within FCH-JU **independent safety expertise**, **objective information**, **education and training** in different forms for various groups of stakeholders and support the anticipated upscaling of hydrogen energy application.

Mission, Objectives and Corresponding Activities

European Hydrogen Safety Panel (EHSP)

The EHSP assist the FCH 2 JU both at programme and **at project level**

- in **assuring that hydrogen safety is adequately managed**, and
- to **promote and disseminate hydrogen safety culture**

Activities structured in
4 Task Forces

TF1
Project level

TF2
Program level

TF3
Data Collection

TF4
Public Outreach

Scope of Activities

European Hydrogen Safety Panel (EHSP)

The EHSP assist the FCH 2 JU both at programme and at project level .
Activities are grouped in the 4 pillars and organised in Task Forces (TF)

TF1 Support at Project level

- Coordination of a package of measures to avoid any accident by integrating safety learning, expertise and planning into FCH2 JU funded project.
- e.g. Safety plans review, in-situ reviews, courses, data collection/ monitoring …

TF2 Support at Programme level

- answering urgent questions, short introductions to hydrogen safety
- provision of specific guidelines (collecting inputs from projects)
- …

TF3 Data collection and assessment

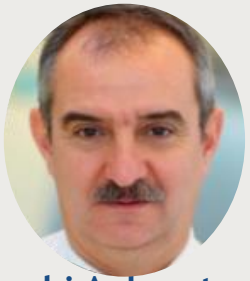
- Support to HIAD - Hydrogen Incidents and Accidents Database
- Analysis of existing events, derive lessons learned and provide recommendations, collaboration with similar activities of the US DoE and EIGA…

TF4 Public Outreach

- Development of a comprehensive outreach, education and training programme for the safety component of FCH2 JU projects
- Newsletter and website, containing the lessons learned and links

Current EHSP Members – the Pool of Experts

European Hydrogen Safety Panel (EHSP)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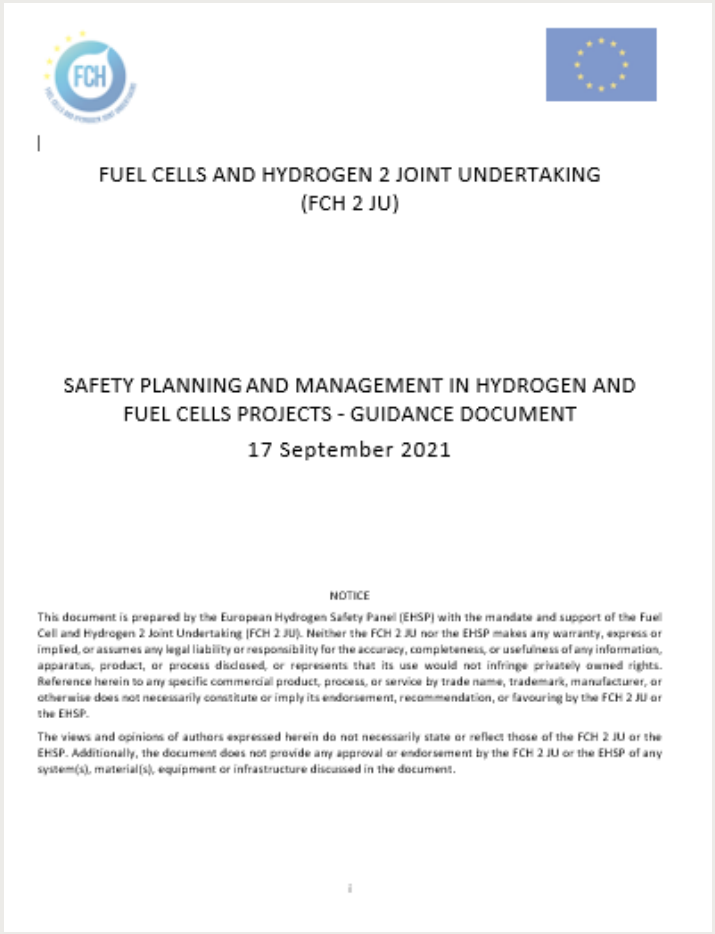
For more information see Members of the EHSP : https://www.fch.europa.eu/page/european-hydrogen-safety-panel

Outcomes: Safety Planning Guidance Document

Products and Services of the EHSP

SAFETY PLANNING AND MANAGEMENT IN HYDROGEN AND FUEL CELLS PROJECTS - GUIDANCE DOCUMENT



FUEL CELLS AND HYDROGEN 2 JOINT UNDERTAKING
(FCH 2 JU)

SAFETY PLANNING AND MANAGEMENT IN HYDROGEN AND FUEL CELLS PROJECTS - GUIDANCE DOCUMENT

17 September 2021

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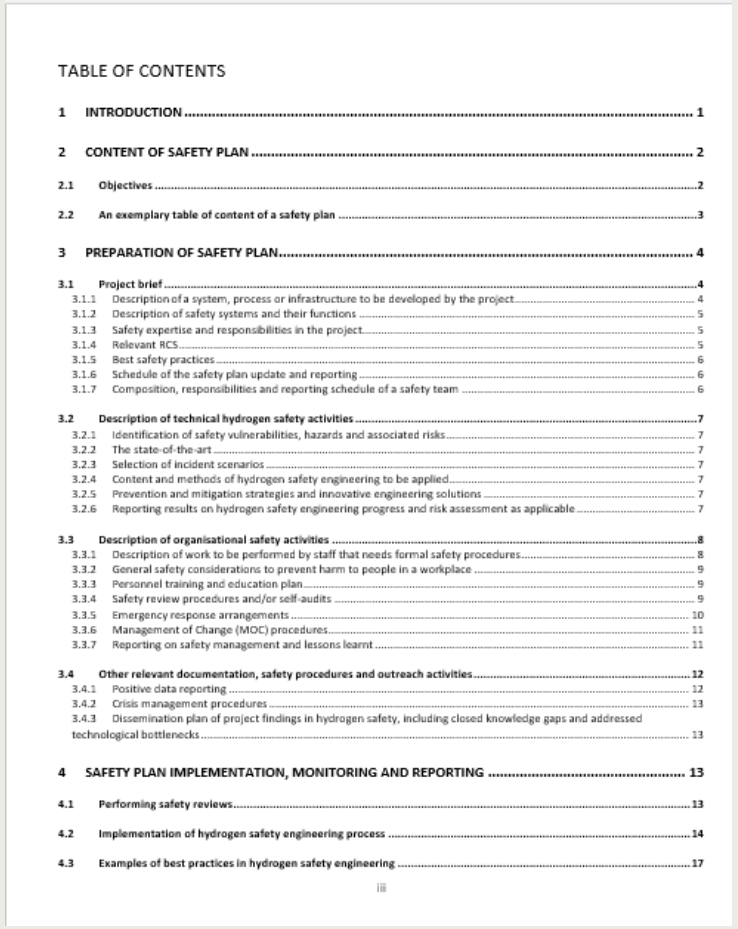

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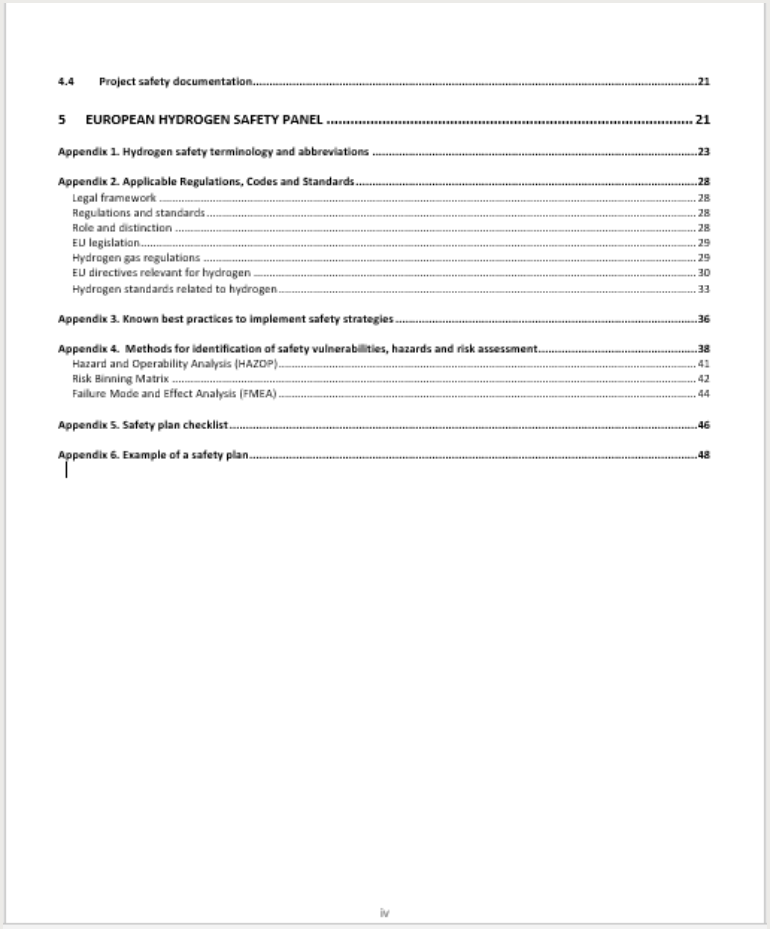


https://www.fch.europa.eu/page/european-hydrogen-safety-panel

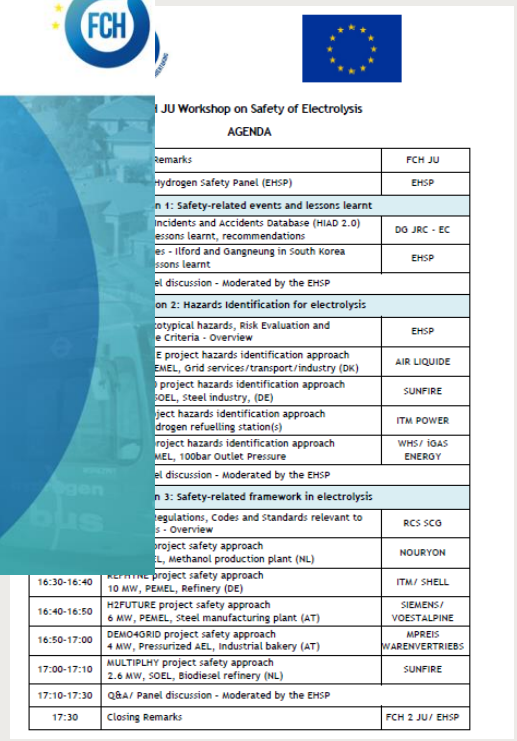
Outcomes: Workshops

Products and Services of the EHSP

Safety of Electrolysis //

Safe Storage of Hydrogen // Safety at the Hydrogen Laboratory

2020



JU Workshop on Safety of Electrolysis

AGENDA

	Remarks	FCH JU
	Hydrogen Safety Panel (EHSP)	EHSP
	n 1: Safety-related events and lessons learnt	
	Incidents and Accidents Database (HIAD 2.0) essons learnt, recommendations	DG JRC - EC
	es - Ilford and Gangneung in South Korea ssons learnt	EHSP
	el discussion - Moderated by the EHSP	
	on 2: Hazards Identification for electrolysis	
	otypical hazards, Risk Evaluation and e Criteria - Overview	EHSP
	E project hazards identification approach EMEL, Grid services/transport/industry (DK)	AIR LIQUIDE
	project hazards identification approach OEL, Steel industry, (DE)	SUNFIRE
	ject hazards identification approach drogen refuelling station(s)	ITM POWER
	roject hazards identification approach MEL, 100bar Outlet Pressure	WHS/ IGAS ENERGY
	el discussion - Moderated by the EHSP	
	n 3: Safety-related framework in electrolysis	
	egulations, Codes and Standards relevant to s - Overview	RCS SCG
	project safety approach L, Methanol production plant (NL)	NOURYON
16:30-16:40	project safety approach 10 MW, PEMEL, Refinery (DE)	ITM/ SHELL
16:40-16:50	H2FUTURE project safety approach 6 MW, PEMEL, Steel manufacturing plant (AT)	SIEMENS/ VOESTALPINE
16:50-17:00	DEMO4GRID project safety approach 4 MW, Pressurized AEL, Industrial bakery (AT)	MPREIS WARENVERTRIEBS
17:00-17:10	MULTIPLHY project safety approach 2.6 MW, SOEL, Biodiesel refinery (NL)	SUNFIRE
17:10-17:30	Q&A/ Panel discussion - Moderated by the EHSP	
17:30	Closing Remarks	FCH 2 JU/ EHSP

2021

ONLINE WORKSHOP

Safety at the hydrogen laboratory

Sharing best practices for safe layout and operation of laboratories with a significant inventory of hydrogen

An online webinar organised by the European Hydrogen Safety Panel (EHSP) and the Fuel Cells and Hydrogen 2 Joint Undertaking (FCH 2 JU), in cooperation with ...

https://www.fch.europa.eu/page/european-hydrogen-safety-panel

Outcomes: Assessment and lessons learnt from HIAD 2.0

Products and Services of the EHSP

FUEL CELLS and HYDROGEN 2 JOINT UNDERTAKING
(FCH 2 JU)

Statistics, lessons learnt and recommendations from analysis of HIAD 2.0 – Hydrogen Incidents and Accidents Database

20 October 2020

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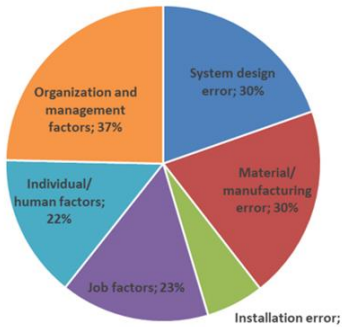


Figure 9: Causes of hydrogen incidents (multiple causes per event considered).

Table 1: HIAD 2.0 events classified by consequence and operation mode

Total number events	Number events by consequence			
	Explosions	Jet fires	Unignited hydrogen release	No hydrogen release
424	238	117	55	14
	Number events by operational mode			
	Normal operation	Outside normal operation	Unclear	
	299	113	12	

Table 2: HIAD 2.0 events classified by industry sector

Sector	Number of events by sector
Chemical/ Petrochemical industry	259
Hydrogen transport and distribution	43
Nuclear power plant	23
Laboratory / R&D	15
Power generation	13
Hydrogen production	10
Aerospace	5
Entertainment	3
Hydrogen-powered vehicle	2
Stationary fuel cell	0
Other/Unknown	
Other	34
Total	461

Finally, Table 3 lists the number of events according to causes. It should be noted that some events had multiple causes.

Table 3: HIAD 2.0 events classified by causes

Cause	Number of events by causes
System design error	126
Material/ manufacturing error	127
Installation error	38
Job factors	98
Individual/ human factors	94
Organization and management factors	158

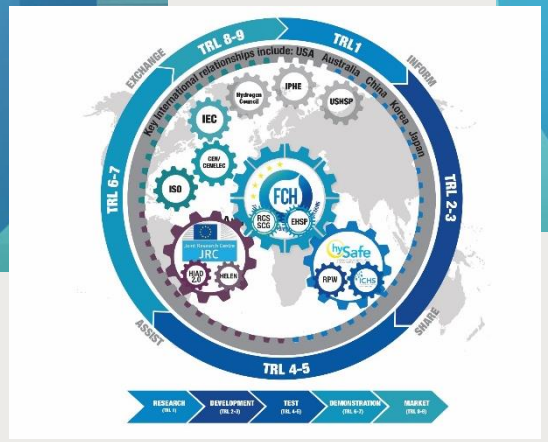
https://www.fch.europa.eu/page/european-hydrogen-safety-panel

Outcomes: Support at Programme Level

Products and Services of the EHSP

Emergency Crisis Management // Collaboration: EHSP-USHSP // ICHS

Emergency Crisis Management



Collaboration: EHSP-USHSP

ICHS

https://www.fch.europa.eu/page/european-hydrogen-safety-panel

Outcomes: Public Outreach

Products and Services of the EHSP

Communication Strategy // Website // FAQs // TIM // KEY MESSAGES

EHSP & FCH 2 JU CONFIDENTIAL

FUEL CELLS and HYDROGEN 2 JOINT UNDERTAKING (FCH 2 JU)

European Hydrogen Safety Panel (EHSP)

Communication strategy 2020–2024

24 April 2020

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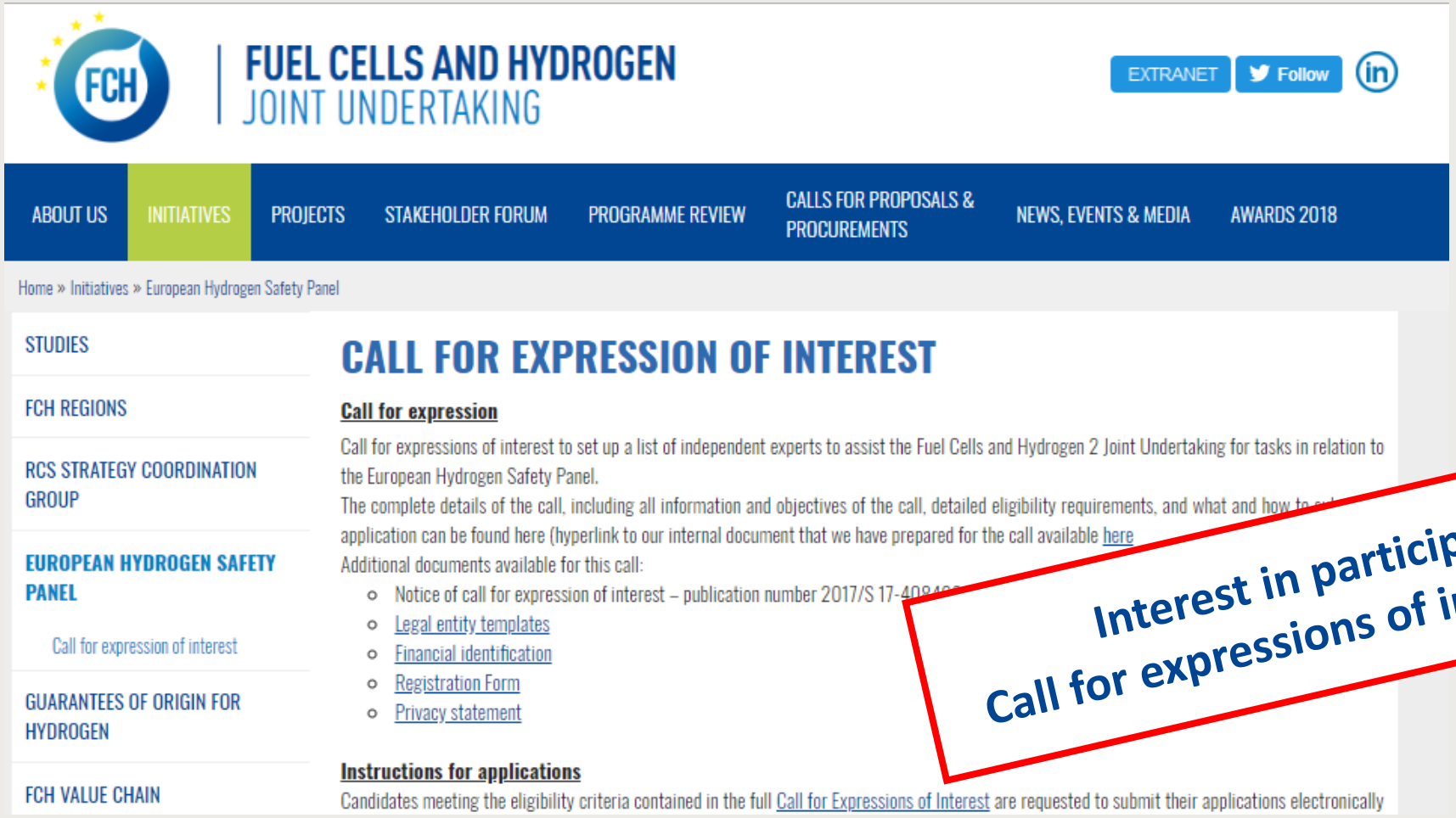
KEY MESSAGES

1. Hydrogen will play an essential role in energy systems as a clean and sustainable energy carrier.
2. To bring the benefits of hydrogen to society, hydrogen technologies must be safely developed and used across a variety of applications and sectors.
3. Hydrogen systems can be as safe as systems based on conventional energy carriers, provided the specific properties of hydrogen and the hydrogen system are properly addressed.
4. Hydrogen safety is an active area of research that supports the implementation and operation of hydrogen systems.
5. The EHSP provides impartial expertise and objective information to relevant stakeholders, including the public.
6. The EHSP supports stakeholders on issues related to hydrogen safety, including general advice, safety reviews, and accident investigations.
7. The EHSP supports and promotes the development of strong safety cultures in organisations engaged in hydrogen technologies.

The EHSP: An essential, open and free ressource

Call for expression of interest open



Interest in participating?
Call for expressions of interest open!

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