Hydrogen Research & Innovation Days

24-25 November 2025

Clean Hydrogen Partnership

Co-funded by the European Union

Hydrogen Research & Innovation Days
24-25 November 2025

EUROPEAN HYDROGEN SAFETY PANEL

2025

Clean Hydrogen Partnership

Co-funded by the European Union

Strong public-private partnership with a focused objective

The Clean Hydrogen Partnership is a unique public private partnership supporting research and innovation (R&I) activities in hydrogen technologies in Europe.

Clean Hydrogen Joint Undertaking

European Commission

Hydrogen Europe Research

Research grouping
over 60 members

Hydrogen Europe

Industry grouping
More than 130 members
50% SME

Aim is to strengthen and integrate EU scientific capacity, in order to accelerate the development and improvement of advanced clean hydrogen applications.

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European Hydrogen Safety Panel (EHSP)

Vision, Mission and Composition

The **EHSP's primary role** is to provide **independent safety expertise** to the **Clean Hydrogen Joint Undertaking (Clean Hydrogen JU) at both project and programme levels**. It acts as a **knowledge hub**, providing objective information dissemination and promoting hydrogen safety education. The panel plays a key role in supporting the **scaling up of hydrogen energy** while ensuring that safety aspects are adequately managed.

MISSION OF THE EHSP:

- Promote hydrogen safety as a core priority in Clean Hydrogen JU-funded projects.
- Provide expert guidance and risk assessment to prevent hydrogen-related incidents.
- Promote a strong safety culture across the hydrogen value chain.
- Facilitate knowledge exchange on safety best practices among industry, research, and policymakers.
- Strengthen public confidence in hydrogen technologies by means of transparency and reliability.

Activities are grouped in 4 pillars and organized in Task Forces (TF), with a Chairman

The European Hydrogen Safety Panel

Background and history

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.

2006-2009

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.

2017

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

2020

As of the Call for proposals 2020, all the projects funded by the JU resulting from innovation action topics have the requirement of developing a safety plan at the project level, which is reviewed by the EHSP.

2021

Clean Hydrogen Partnership

The EU will support the Clean Hydrogen JU with €1 billion euro for the period 2021-2027, complemented by at least an equivalent amount of private investment (from the private members of the partnership. Moreover, in the REPowerEU communication, EU intends to additionally support the JU with €200 million for further developing the Hydrogen Valleys in Europe.

2023-2024

The EHSP relaunches under the consortium composed of IDOM and Ariema, with the supervision of the Clean Hydrogen Joint Undertaking.

Taskforces & Objectives

Operative Structure. Task Forces.

The EHSP assists the Clean Hydrogen 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

Chairman

TF1

Project Level

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

TF2

Program Level

Answering urgent questions, short introductions to hydrogen safety
provision of specific guidelines (collecting inputs from projects).

TF3

Data Collection

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

Communications

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

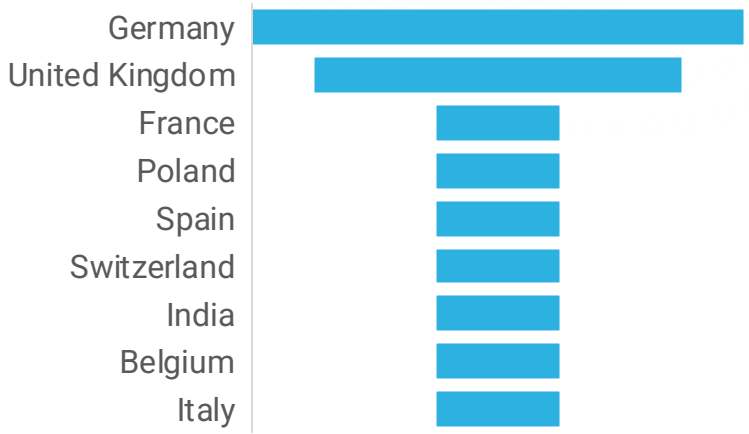
EHSP new Composition

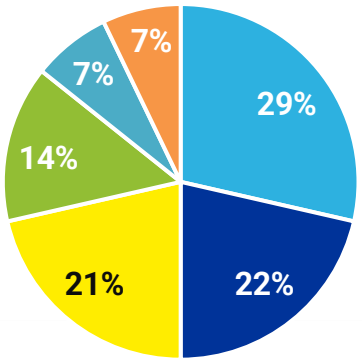
Composition of the pool of Experts, Statistics

The actual Panel (2025) consists of a Pool of:
- 14 experts
- from 9 nationalities

Female 20%

Male 80%





- Higher or Secondary Education Establishment
- Public Organisation
- Private for Profit Organization
- Research Organisation
- NONE
- Other

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What has been done?

Outcomes of Task Force 1 – Project Level

Safety Planning

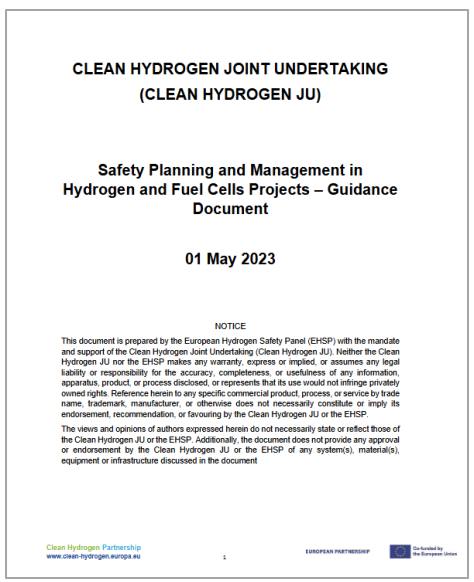
Guidance Document – Updated Version May 2023

Available at the EHSP website

25 MAY 2023

New guidance document for the Safety Planning and Management in EU hydrogen and fuel cell projects

English (1.52 MB - PDF) Preview Download



CLEAN HYDROGEN JOINT UNDERTAKING
(CLEAN HYDROGEN JU)

Safety Planning and Management in Hydrogen and Fuel Cells Projects – Guidance Document

01 May 2023

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Clean Hydrogen Partnership
www.clean-hydrogen.europa.eu

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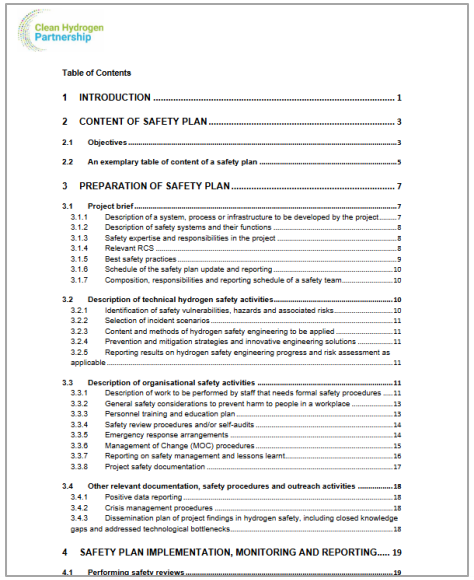

Clean Hydrogen Partnership

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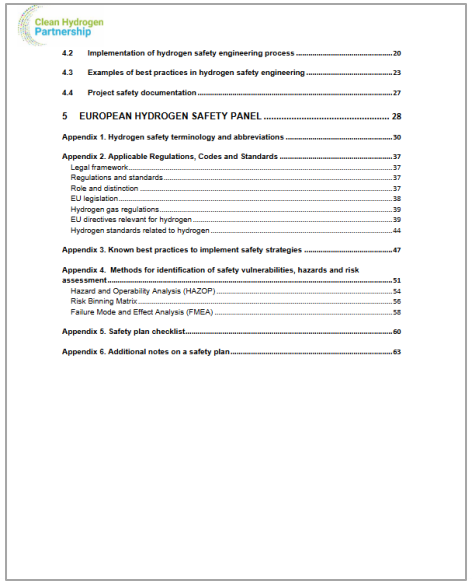


Clean Hydrogen Partnership

"To bring the benefits of hydrogen to society, hydrogen technologies must be safely developed and used across a variety of applications and sectors."

Clean Hydrogen Partnership

Co-funded by the European Union

What has been done?

Outcomes of Task Force 1 – Project Level

Template for Safety Plan

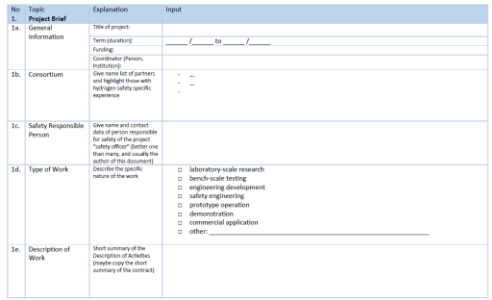
Updated Version May 2023

Available at the EHSP website

31 MAY 2023

Simple template for a safety plan interim publishable version

English (261.64 KB - PDF) Preview Download



No	Topic	Explanation	Input
1.	**Project Brief**		
1a.	General Information	Title of project:	
		Term (duration):	_____/_____ to _____/_____
		Funding:	
		Coordinator (Person, Institution):	
1b.	Consortium	Give name list of partners and highlight those with hydrogen safety specific experience.	- ... - ... -
1c.	Safety Responsible Person	Give name and contact data of person responsible for safety of the project "safety officer" (better one than many, and usually the author of this document)	
1d.	Type of Work	Describe the specific nature of the work	☐ laboratory-scale research ☐ bench-scale testing ☐ engineering development ☐ safety engineering ☐ prototype operation ☐ demonstration ☐ commercial application ☐ other: _____
1e.	Description of Work	Short summary of the Description of Activities (maybe copy the short summary of the contract)	
1f.	Project Phases (origin of change)	What is done in which phase of the project (free text input)	
1g.	Hydrogen Inventory	Type of hydrogen storage and maximum inventory of hydrogen physically stored on site(s) per storage type	☐ p < 2 bar _____ kg ☐ p < 20 bar _____ kg ☐ p <= 200 bar _____ kg ☐ p > 200 bar _____ kg ☐ liquid (cryogenic) _____ kg ☐ solid storage (metal hydride) _____ kg ☐ other (e.g. LOHC): _____ kg
1h.	Location	Where is your activity, respectively hydrogen located (industrial, public, colocation with other technologies and hazards, etc)	☐ specially controlled area ☐ industrial environment ☐ research lab ☐ public ☐ co-located with other hazardous materials, fuels etc.: _____

No	Topic	Explanation	Input	Responsible, if not "safety officer"
2.	**Project Safety**			
2a.	Relevant regulation, codes, standards and safety policies	List all relevant regulation and applied codes and standards for your project	- ... - ... - ... - ...	
2b.	Hazard Identification and Risk Assessment	Provide a chronological list of hazard identification procedures and risk assessments done (or planned) and summarize key results or provide full documentation in attachments	- ... - ... - ... - ...	
2c.	Prevention and mitigation	List all prevention strategies and installed mitigation technology used (e.g. ventilation, water sprays, sensors,...). Follow the first 8 safety principles. (potential outcome of 2b)		

No	Topic	Explanation	Input	Responsible, if not "safety officer"
3.	**Operations Management**			
3a.	Nominal and limit values of critical process parameters	Provide a list of controlled or easy to check process parameters, like filling status of a liquid, pressure and or temperature and there corresponding design and limit values (potential outcome of 2b)		
3b.	Procedures for operation	Refer to checklists for start up/ and shut-downs, operation instructions (potential outcome of 2b and possibly attached in 4)		
3c.	Emergency alarm, evacuation and response plans	(maybe just attach them in 4 and indicate this here)		
3d.	Personnel education and training	Describe or list all measures where involved persons (operators, first responders,...) are participating in courses and explain how this is documented		
3e.	Monitoring and Periodic Reviews	Describe the procedures and periodicity of checking whether everything above is in place and known by all relevant people		
3f.	Reporting of safety events and lessons learned in HELLEN and HIAD	Describe plans for sharing safety critical information		

No	Topic	Available?	Where (Link, Library, Room, ...)
4.	**Checklists and other helpful documents** (for EHSP highly relevant documents in **bold** font)		
	Block flow diagram (PID) or simplified process flow diagram	☐	
	ATEX zones	☐	
	Process chemistry	☐	
	Material of construction	☐	
	Material data safety sheets	☐	
	Material and energy balances	☐	
	Electrical classification	☐	
	Pressure relief system design	☐	
	Ventilations system design	☐	
	Technical documentation of further safety / mitigation equipment	☐	
	Checklists before or after start	☐	
	Results of ISV before or at project start	☐	
	Results of ISV or risk assessment before hardware installation	☐	
	Results of ISV or risk assessment before operations	☐	

What has been done?

Outcomes of Task Force 2 – Programme Level

Strategic Support

- Support the Clean Hydrogen JU PO in establishing the best practices for a reference safety culture
- Development of Emergency Crisis Management strategies – used in case of incidents in EU projects

Crisis Management Procedure

"The EHSP supports and promotes the development of strong safety cultures in organisations engaged in hydrogen technologies."

Other Supports

- Hydrogen Safety Forum – collaboration of US Hydrogen Safety Panel (USHSP) and EHSP – shared best practices and hydrogen incidents
- International Conference of Hydrogen Safety (ICHS) – EHSP experts participate in Scientific and Organizing Committee of the conference
- Development of emergency and crisis management approach for EU projects – *(Under review for progress)*

What has been done?

Outcomes of Task Force 3 – Data Collection and Assessment

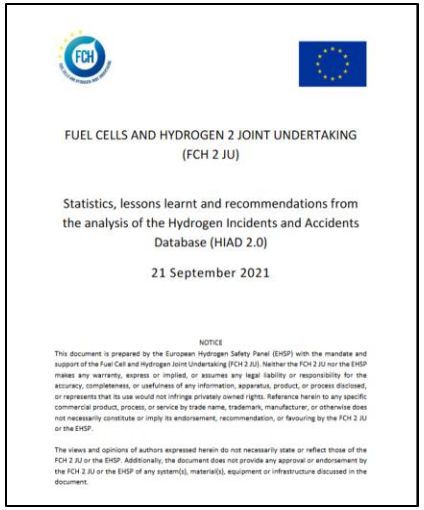
> *"Hydrogen systems can be as safe as systems based on conventional energy carriers, provided the specific properties of hydrogen and the hydrogen system are properly addressed."*

Statistics, lessons learnt and recommendations from the analysis of the Hydrogen Incidents and Accidents Database (HIAD 2.0) - *(Pending review initiation)*

Available at the EHSP website

HIAD 2.0 (developed by JRC) is a database collecting systematic data on hydrogen-related incidents, accidents or near misses publicly available from JRC-PTT-H2SAFETY@ec.europa.eu

- Assessed more than 700 events
- Statistics are generated
- Derived lessons learnt and recommendations published a report and an article in a scientific journal
- Used for risk assessment and for safety training of safety engineers, emergency response and safety leaders
- HIAD dataset was shared with > 110 academic and industrial experts


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

Statistics, lessons learnt and recommendations from the analysis of the Hydrogen Incidents and Accidents Database (HIAD 2.0)

21 September 2021

NOTICE

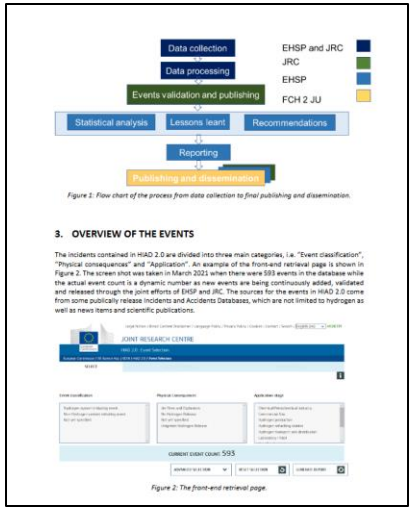


Figure 1: Flow chart of the process from data collection to final publishing and dissemination.

3. OVERVIEW OF THE EVENTS

Figure 2: The front-end retrieval page.

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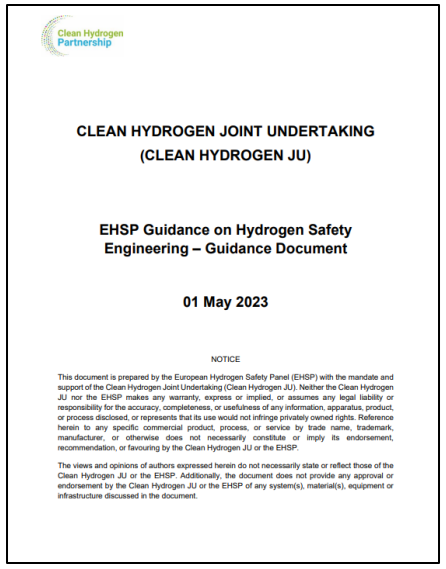
What has been done?

Outcomes of Task Force 3 – Data Collection and Assessment

> *"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."*

Safety Engineering

New Guidance document – May 2023 *(Under review for updates)*



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CLEAN HYDROGEN JOINT UNDERTAKING
(CLEAN HYDROGEN JU)

EHSP Guidance on Hydrogen Safety Engineering – Guidance Document

01 May 2023

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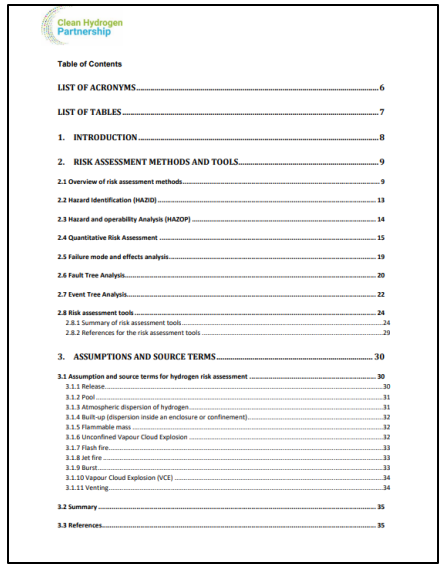

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Available at the EHSP website

25 MAY 2023

New guidance document on Hydrogen Safety Engineering

English (1.36 MB - PDF) Preview Download

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What has been done?

Outcomes of Task Force 4 – Communications

Communication Strategy

Updated document – 2025

7 Key Messages

"To bring the benefits of hydrogen to society, hydrogen technologies must be safely developed and used across applications and sectors"

"Hydrogen systems can be as safe as conventional energy carriers, provided their specific properties are properly addressed"

"Hydrogen safety is an active area of research that supports implementation and operation of hydrogen systems"

"The EHSP provides impartial expertise and objective information to relevant stakeholders, including the public."

"The EHSP provides impartial expertise and objective information to relevant stakeholders, including the general public"

"The EHSP supports stakeholders on hydrogen safety issues, including advice, reviews, and accident investigations"

"The EHSP supports and promotes the development of strong safety cultures in organisations engaged in hydrogen technologies"

"Hydrogen will play an essential role in energy systems as a clean and sustainable energy carrier"

Open Call for Expression of Interest to participate as an Expert

Website: https://ehsp.eu/

Contact mail: ehsp-chju@idom.com

Responsibilities include:

- Review project safety plans, update key guidance documents, and provide technical advice through workshops and direct support
- Advise on strategic safety issues, collaborate with international stakeholders, and contribute to the development of internal procedures
- Data management and analysis
- Communication and outreach activities

The selected experts will be assigned to task forces based on their specific expertise in the following topic areas:

- Infrastructure Engineering: Integrity design
- Electrical Engineering: Electrical Integration Design
- Chemical Processes: Gas Storage
- Chemical Processes: Gas Production
- Chemical Processes: Gas Transport
- Chemical Processes: Hydrogen refueling stations
- Fire Protection: Risk Evaluation
- Fire Protection: Risk Management
- CFD tools
- Regulation Compliance
- Communication Skills

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Icons Set

Guidelines for Project Presentations

- Each presentation should last **10 minutes**. Strict timekeeping is essential!
- Limit your presentation to a maximum of 10 slides
- Emphasise the **concrete impact** of your project
- focus on measurable results, outcomes, or innovations
- Use the **Arial** font to maintain a consistent style
- You may use **any slide layout** from the existing template that best supports your content

File Naming Convention

- Please name your presentation file as follows to assist the audiovisual team:

Adjust "*Day1_Session_1_H2Production_NameSurname*" to reflect your specific session

Submission Deadline

- Wednesday, 19 November 2025