



FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

**Hydrogen Incidents and
Accidents Databases**
Workshop on Safety of Electrolysis

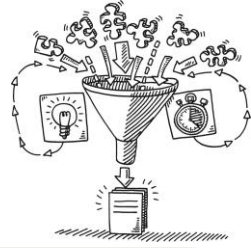
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European Commission
Joint Research Centre

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What is HIAD?

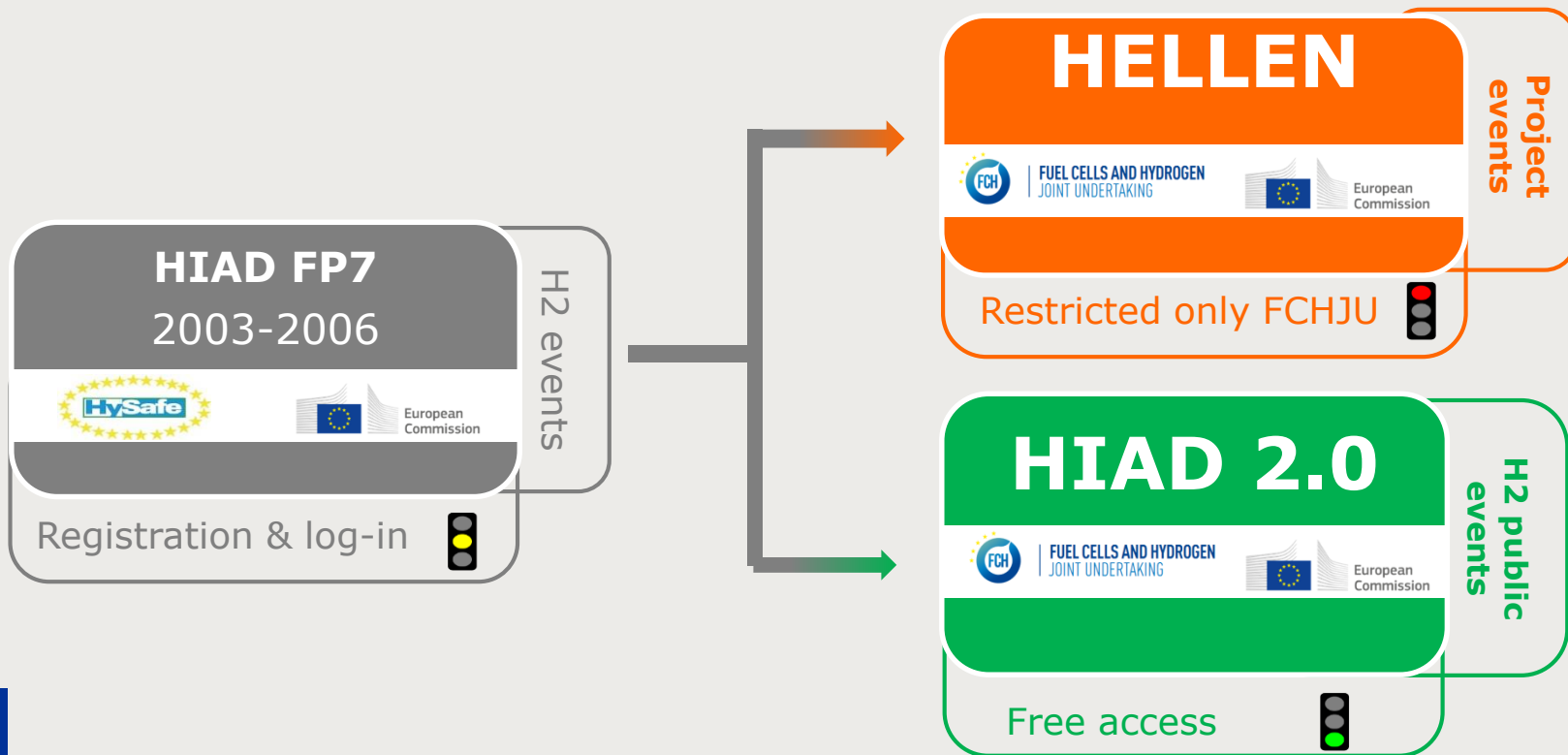
A web-based information tool on hydrogen safety-related data



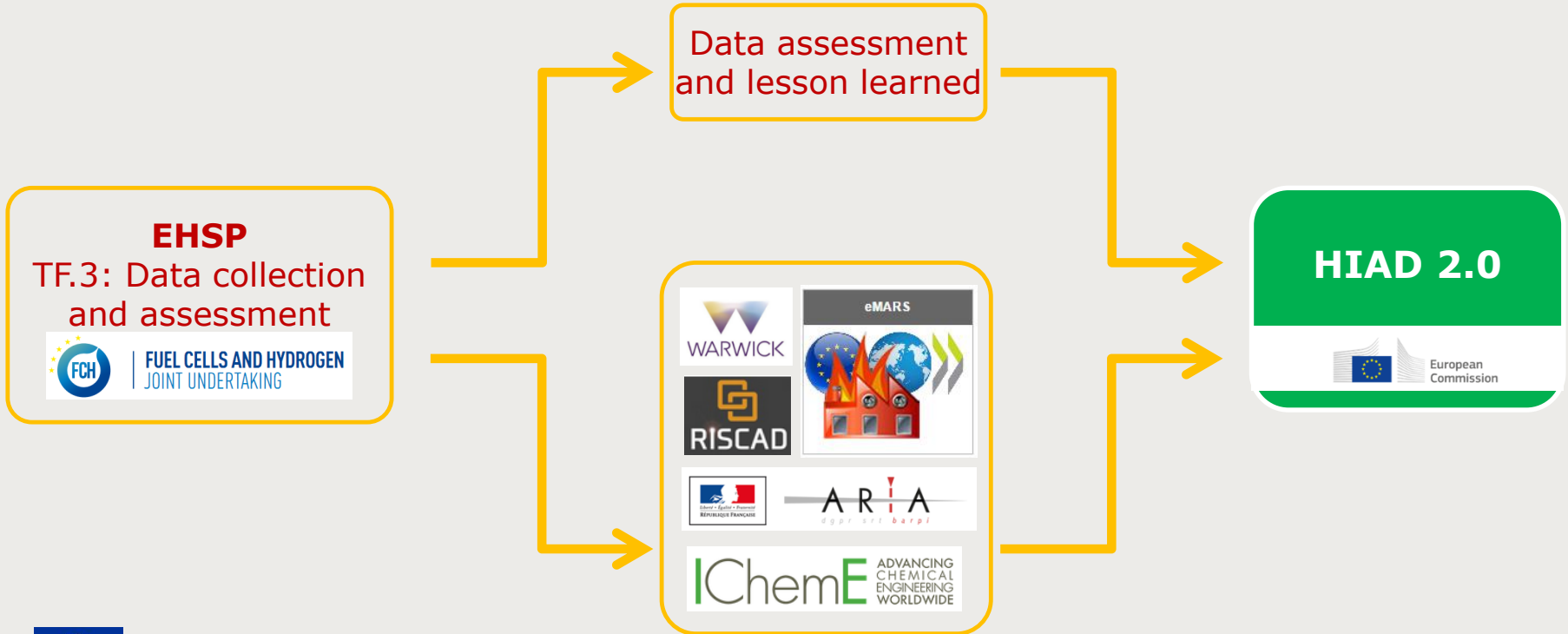
- To enable a return-of-experience and provide a **safety lessons** learned on the do's and the don'ts
- To keep the industry and research updated with **recent hydrogen** events and offer a **historical repository**
- To assist all stakeholders in better understanding hydrogen-related undesired events
- (possibly) to assist development of **facts-based type-approval** and **permitting procedures** (failure statistics, failure mechanisms)



The history of the databases



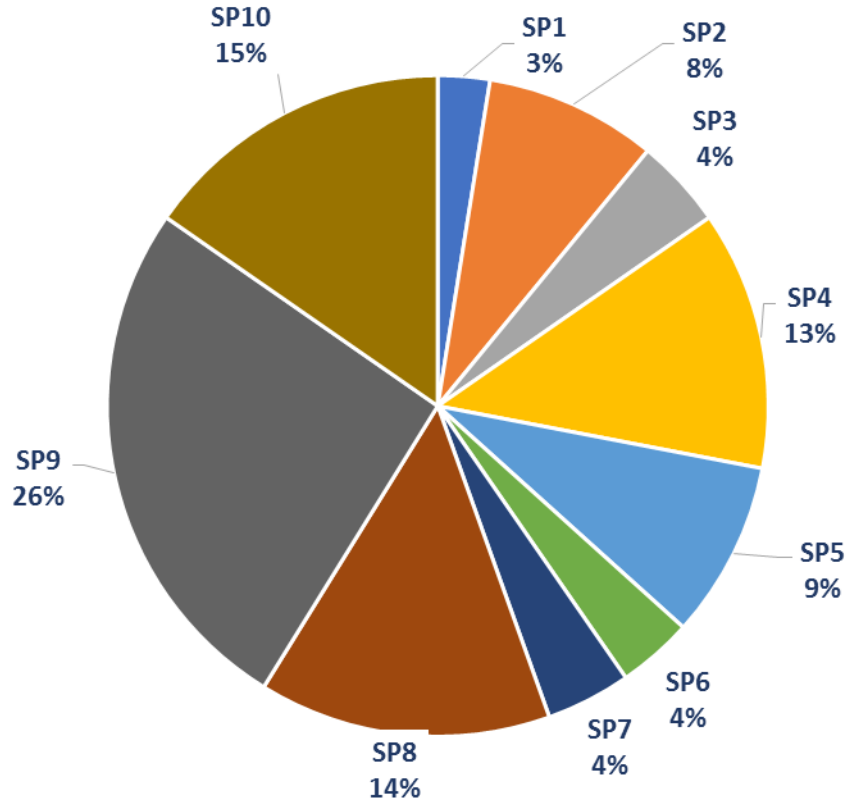
EHSP Recent activities



Number of events: ~600 (2020)



EHSP assessment



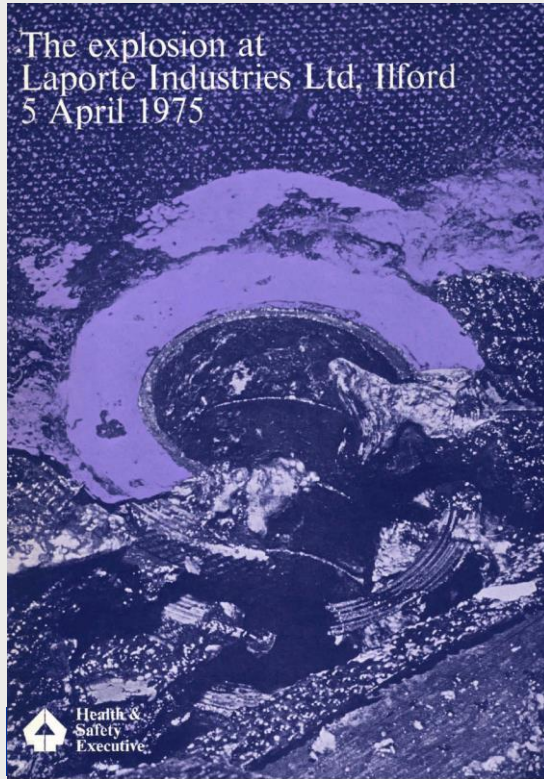
SP9 = Train/educate staff

SP10 = report near miss & incident in safety plan

SP8 = availability of passive barriers

SP4 = interlinking detection and counter-measures

Electrolysis in HIAD2.0 (*vintage*)



5 April 1975 HIAD #778

“... explosion probably occurred on the oxygen separating drum into which hydrogen had leaked (>13%).

...The evidence suggested that gas analyses were not always carried out - assumed values were entered in the process log.

...The ingress of hydrogen into the oxygen drum was apparently due to corrosion/erosion in the electrolysis cells.

Electrolysis accidents (*selection*)



In H2TOOLS

<https://h2tools.org/lessons/water-electrolysis-system-explosion>

Breakdown of separator

Lack of gas analyses

<https://h2tools.org/lessons/potential-catalyst-fire-hazard-oxygen-generator-filter-change-out-maintenance>



No on-site
maintenance foreseen

In HIAD 2.0

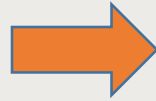
Chlorine electrolysis (#94, #243, #237, #253, #634, #843, #935, # 950)

H₂ leaks, flammable mixture (Cl, K), igniting at flare, during maintenance, after tripping

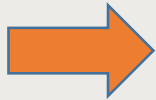
Hydrogen electrolysis

- HIAD #889 - US 2020 - nothing known
- HIAD #970 – Korea 2019 - next presentation

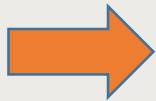
The hydrogen accident databases



Projects safety-related events, including LEADING indicators (e.g. near misses)



Commitment to report in HELLEN in every AWP call



Only very few projects report..



We need your contribution!



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If you are part of a project and need to establish a communication channel for HIAD, please contact me



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