



Dipartimento dei Vigili del Fuoco, del Soccorso Pubblico e della Difesa Civile
CORPO NAZIONALE DEI VIGILI DEL FUOCO
Central Directorate for Fire Prevention and Technical Safety

Activities of the Italian National Fire Brigade on Hydrogen Safety

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Italian National Fire and Rescue Service



- **Overview of the Italian National Fire and Rescue Service activity (C.N.VV.F.)**
- **Global approach of Hydrogen from First Responders**
- **Hydrogen blending: transport networks**
- **Hydrogen: road transport**
- **Hydrogen: rail transport**
- **Hydrogen: production and storage**
- **Hy-Responder EU Project and experimental tests**



Assure Urgent
Technical
Rescue



National Fire and
Rescue Service
(Fire Brigades)

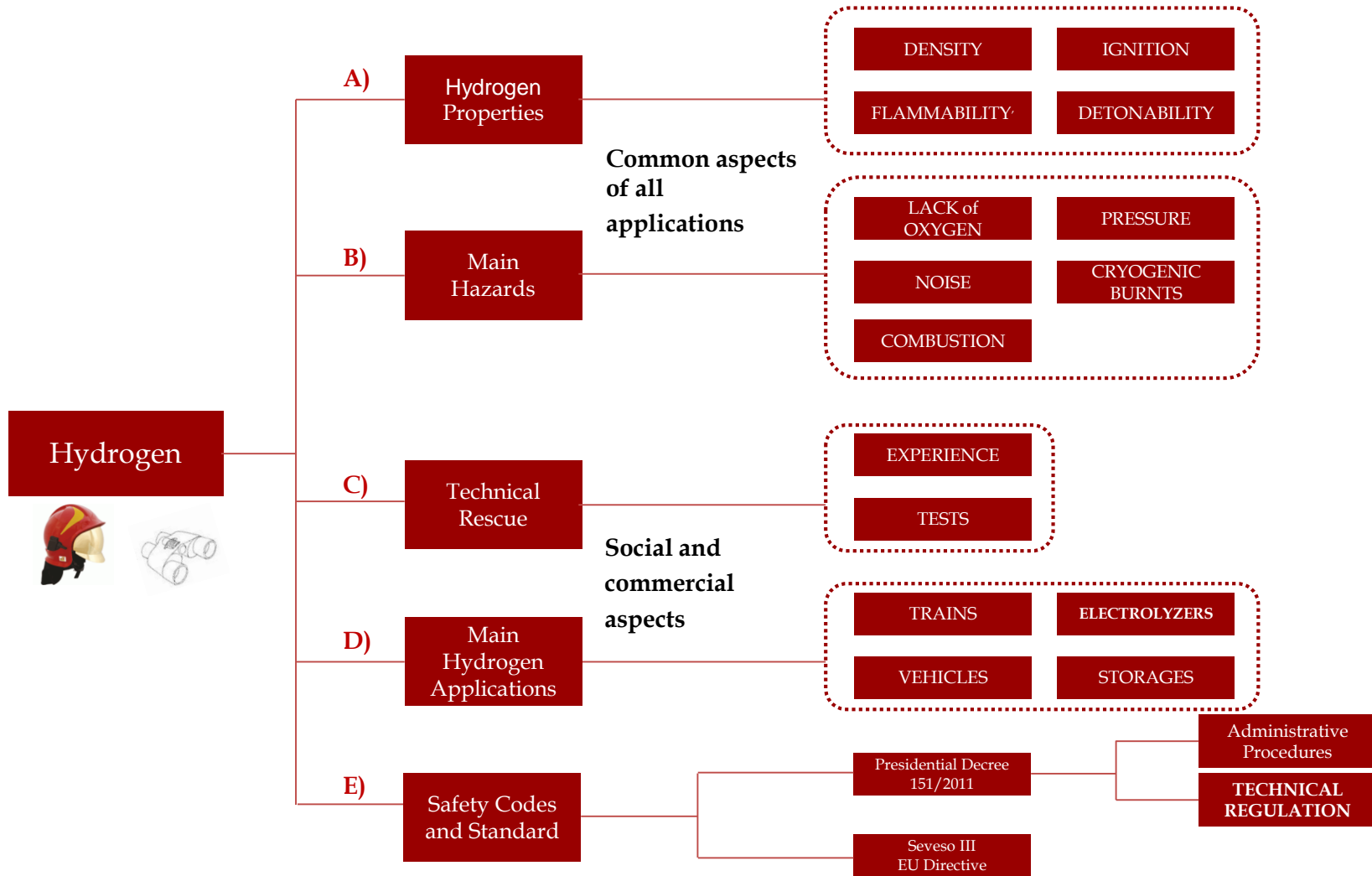


Technical Fire
Prevention
Regulation

- **The National Fire and Rescue Service (*Corpo Nazionale dei Vigili del Fuoco - CNVVF*)** is the Ministry of the Interior arm to:
 - **provide emergency technical rescue** and assistance to the public
 - **protect the safety and integrity of all the living and precious non living things present in the territory**
- **Fire prevention technical regulation** is the overriding public interest function intended to:
 - achieve safety of human life, protect property and environment
 - promote study, tests, standards, devices and modes of action aiming at preventing or limiting the occurrence of a fire and its connected consequences



Global approach of Hydrogen from First Responders





Safety in hydrogen transport networks (blend H₂-CH₄):

- The Italian National Fire and Rescue Service has already performed joint-activities with **SNAM** (one of the world's leading energy infrastructure companies) **at the Contursi (SA, Italy) plant** with a 5% - 10% H₂ blend (2018-2019);
- Institutional activities aimed at the **pre-normative study for the use of H₂-CH₄ blend** have been **conducted**;
- Joint-activities have been also done with the University of Rome "La Sapienza", Polytechnic University of Turin, University of Pisa, University of Padua and with SNAM for the **development of a procedure for the analysis of risk for the safety of transport networks**;
- Assessments for the **development of an experimental test field** are in progress.

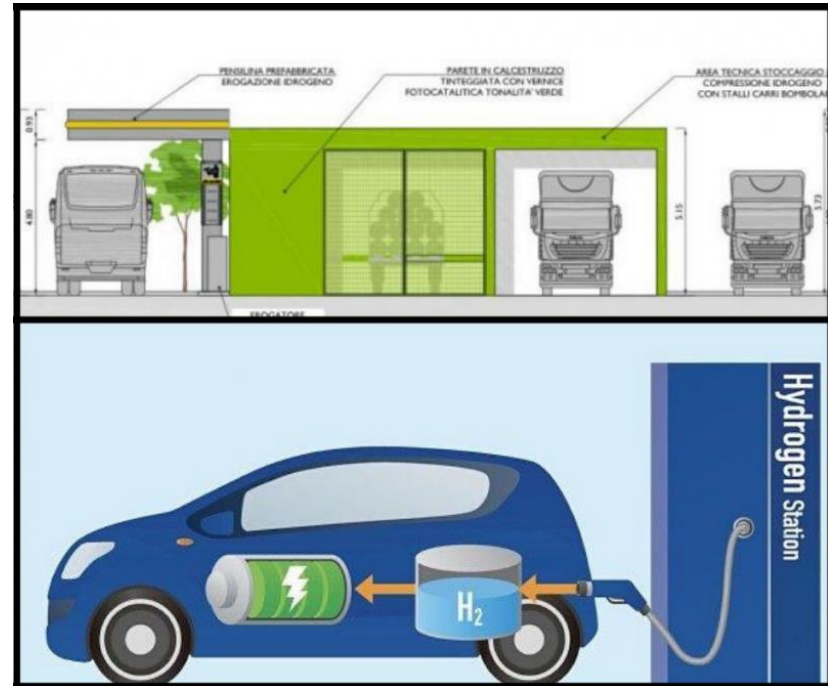




A new technical regulation has been promoted: Ministerial Decree 23 October 2018, “fire prevention technical regulation for the design, construction and operation of hydrogen distribution systems for automotive use”



EU - Investments: hydrogen experimentation for road transport with the aim of promoting the establishment of hydrogen fuelling stations and to implement hydrogen line testing projects. Investments for € 530 million are expected from the National Recovery and Resilience Plan.



By 2026, 40 refuelling stations are planned on Italian roads, especially along green corridors for trucks; **by 2030 it is estimated that 5-7%** of heavy vehicles will run on hydrogen

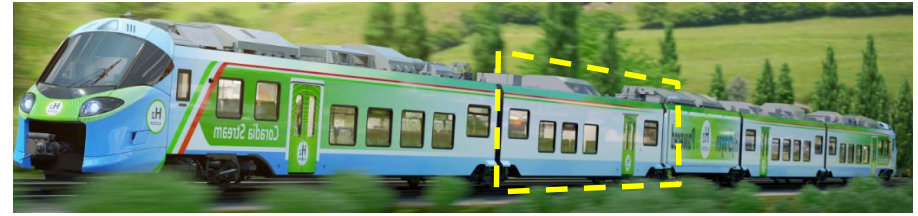


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Hydrogen: rail transport

Hydrogen experimentation in rail transport



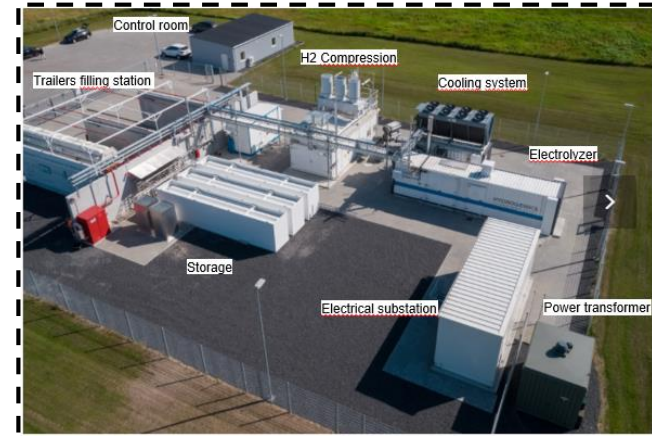
The main location of railway investments are:

- Iseo Edolo Brescia railway line in Valcamonica
- Lecce Gallipoli line in Salento
- The Circumetnea railway line
- Adriatico Sangritana railway line
- The Cosenza-Catanzaro regional railway lines
- The rail link between Alghero and the airport



A new technical regulation has been promoted: **Ministerial Decree 7 July 2023** “technical regulation for fire prevention of hydrogen production systems using electrolysers and their storage systems”

- The decree represents one of the main contributions of the Ministry of the Interior to achieving the next environmental objectives by guaranteeing the main safety requirements. **The contribution of the Italian National Fire and Rescue Service** is the result of the operational experience gained
- **It defines the fundamental measures** to be taken to guarantee an adequate level of safety in the event of fire, in particular, it identifies:
 - the typical elements of a plant
 - the dangerous elements
 - the main active and passive protection measures
 - the operating rules for installations
 - the safety distances per plant element.
- **In this field, the Italian National Fire and Rescue Service is also involved in:**
 - ENEA Hydrogen Valley feasibility study;
 - Innovative systems for storage as **Hydrogen storage in metal hydrides** or **Liquid Organic Hydrogen**.



- As part of the European initiatives related to the diffusion of hydrogen as energy vector, the Italian National Fire and Rescue Service has been part of the European Project “HyResponder”.
- The activity, coordinated by Ulster University, saw also the involvement, as Italian partner, of the Department of Chemical Engineering Materials and Environment of La Sapienza University; **The Italian National Fire and Rescue Service was involved as “End User” and has shown its active participation, including in the experimental tests** conducted at the “École nationale supérieure des officiers de sapeurs-pompiers – ENSOSP” at Aix-en-Provence (France) and in the **test done at Training School of the Italian National Fire and Rescue Service located in Montelibretti (Rome).**
- **As part of the project, a Hydrogen Application Emergency Response Guide was also produced for the use of First Responders and it includes:**
 - deep academic knowledge related to Hydrogen (physical properties, main applications and related hazards)
 - possible intervention scenarios, i.e. operational tactics sheets aimed at guiding emergency responders on how to operate and what to assess in situations involving H₂.





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Thank you for your attention
