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Exercise! Exercise!

The impact of hydrogen in aviation on airport emergency response

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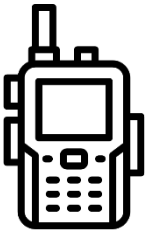
Advanced systems and solutions for better practices against hazards in the aviation system



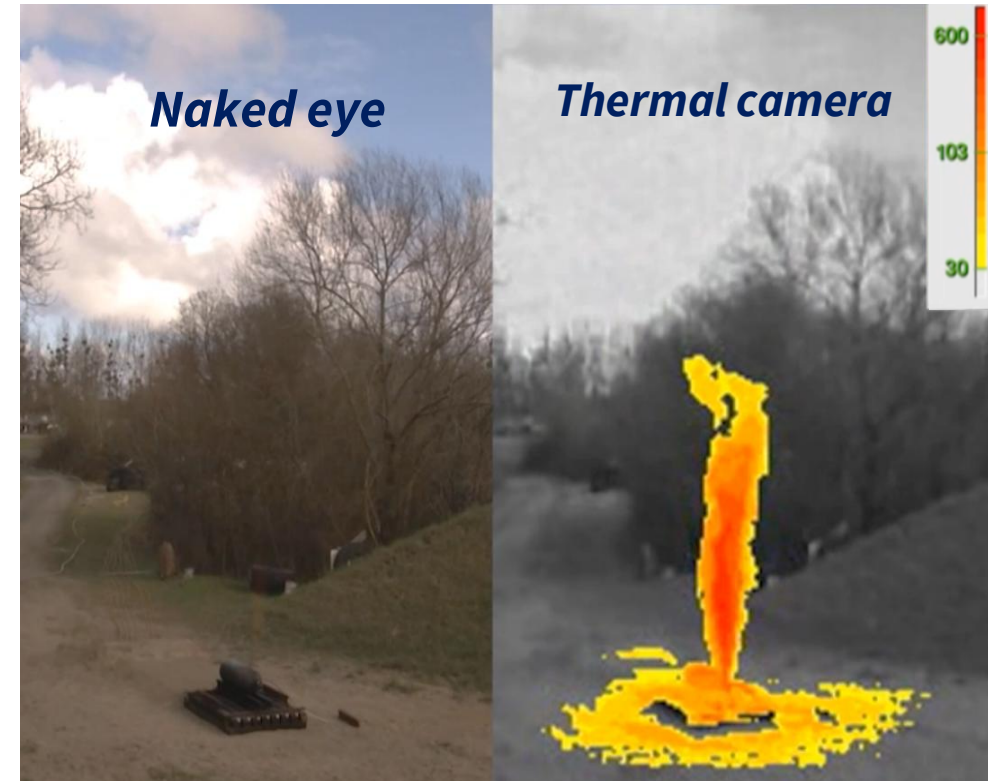
Problem formulation



Safety risks



Emergency procedures for multiple stakeholders



Objective



develop and test hydrogen-specific emergency responses
through
realistic airport scenarios and exercises.

Crash Card

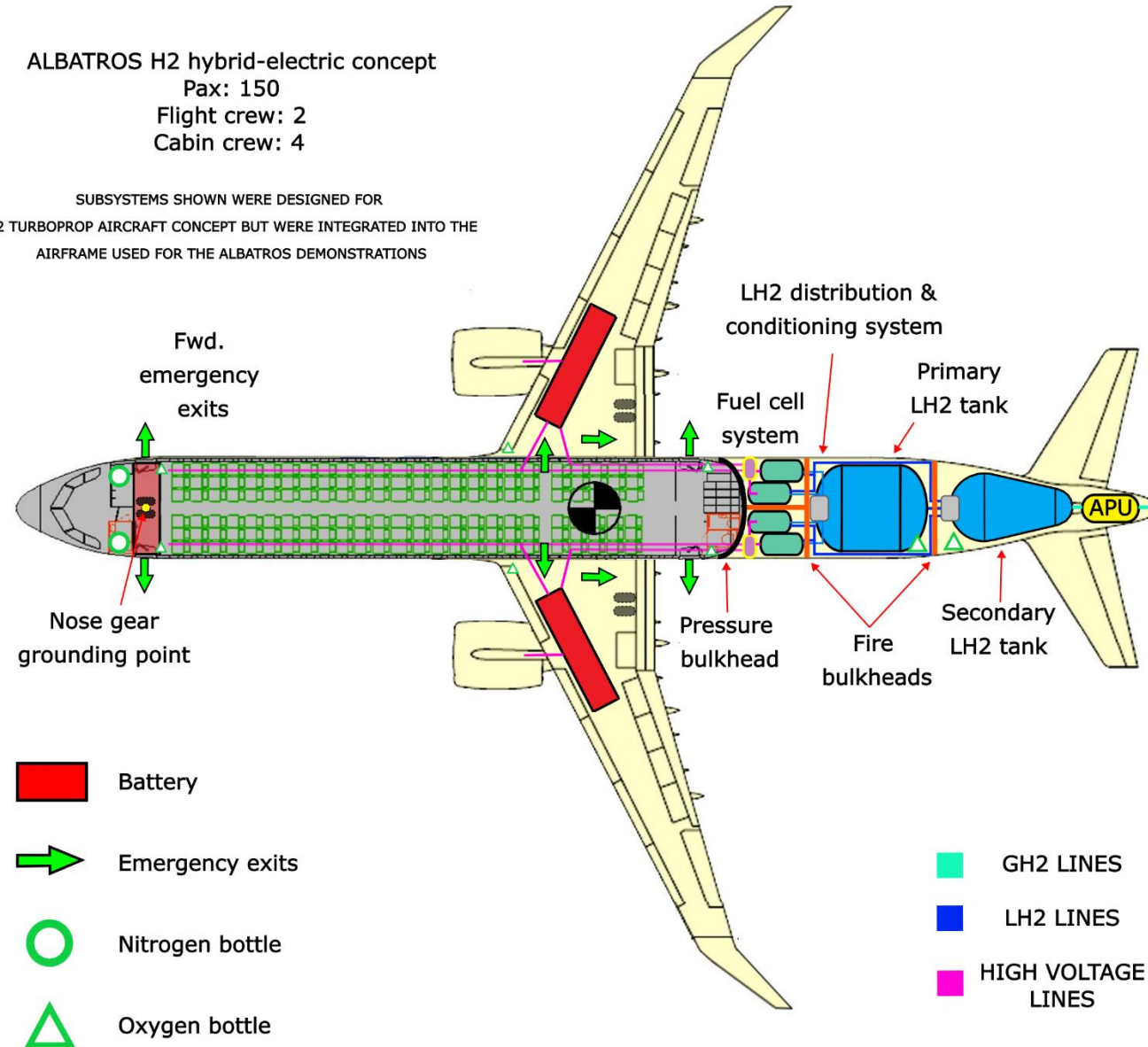
ALBATROS H2 hybrid-electric concept

Pax: 150

Flight crew: 2

Cabin crew: 4

SUBSYSTEMS SHOWN WERE DESIGNED FOR
H2 TURBOPROP AIRCRAFT CONCEPT BUT WERE INTEGRATED INTO THE
AIRFRAME USED FOR THE ALBATROS DEMONSTRATIONS



Scenario



- COMMS procedures

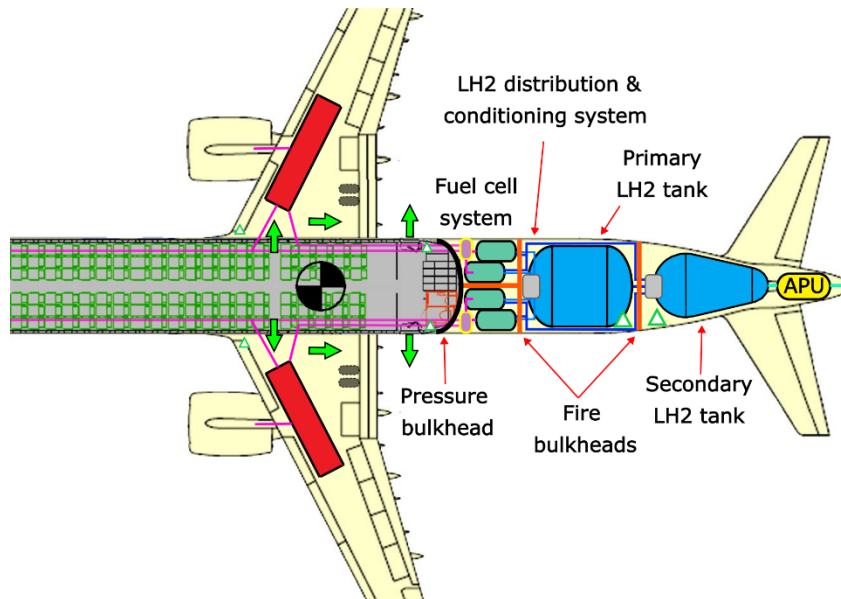


- H2 ignition
- Evacuation
- ARFF procedures

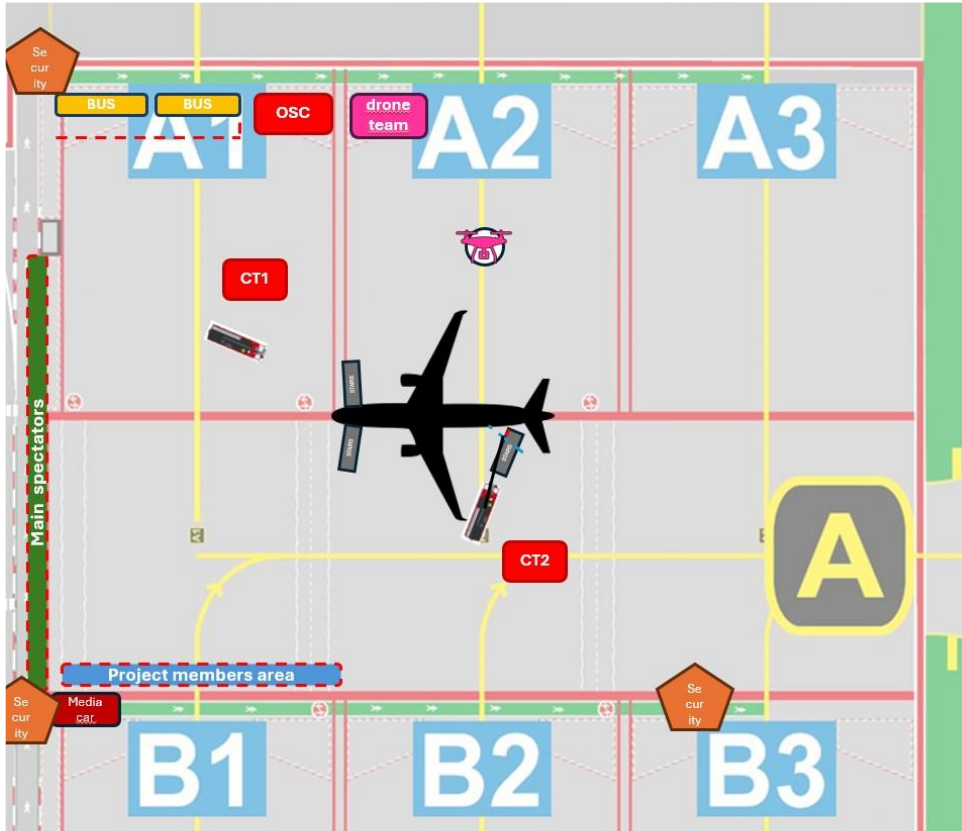


- Support
- Toolkit

Airport exercises



RTM versus AIA



RTM versus AIA



In-flight & Landing



Flight crew issues a mayday call
Fuel source (liquid hydrogen) and fuel remaining



Expected time until flammable concentration
When flammable concentration is reached

AEGEAN 2025, COPY ALBATROS Exercise hydrogen leak, request you

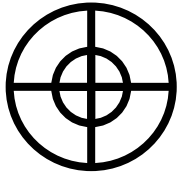


Designated Hydrogen Location

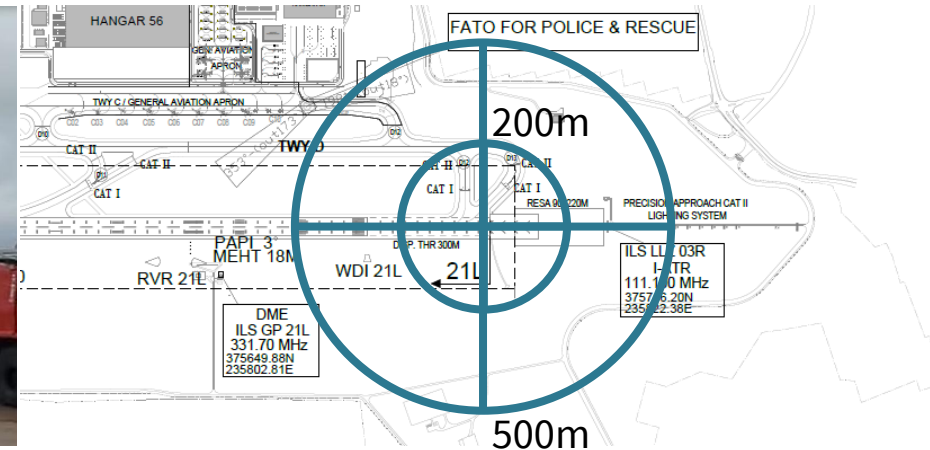


Properties:

- Electrically ground the aircraft
- Concrete surface
- Remote



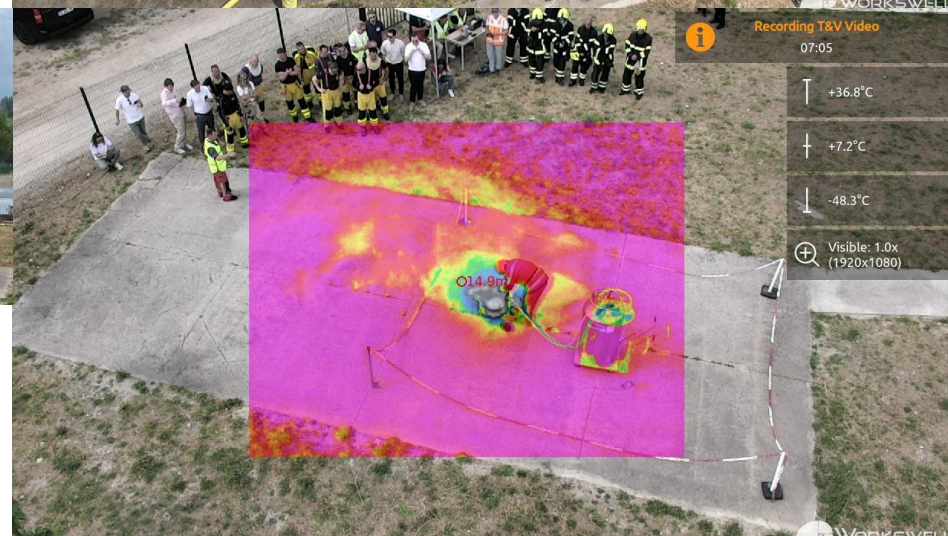
Safety zone of 200m radius, flexible up to 500m



Firefighting



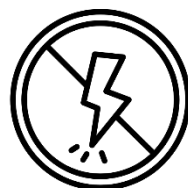
3 Day theory & practical training



Firefighting



Water curtain



Ignition prevention



IR camera



Evacuation & Rescue



Usable exits



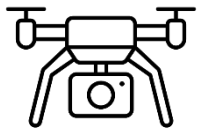
Fire Safety



Drone Support



Situational awareness
People counting



Drone operation



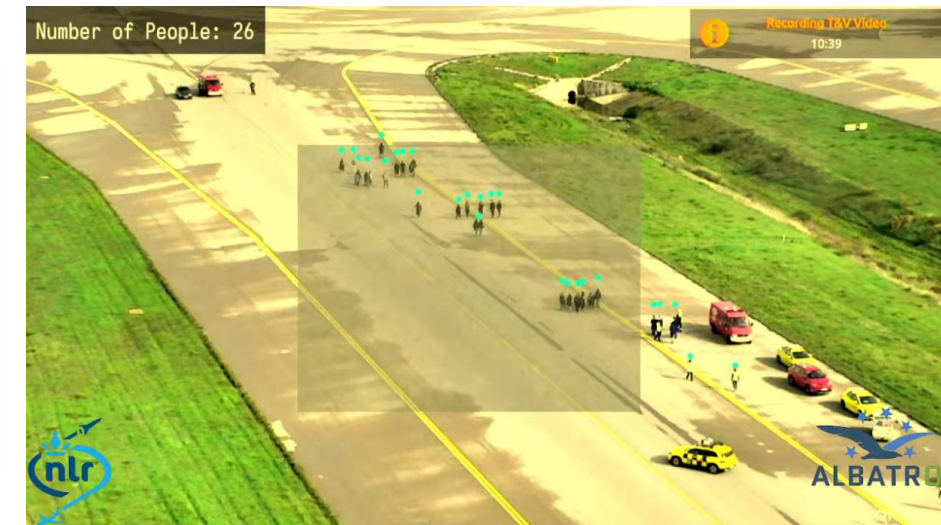
A2608/25: Unmanned flight will take place

Q) [EHAA/QWULW/IV/BO/AW/000/002/5157N00426E005](#)

DRONE ACTIVE WITHIN THE LATERAL BOUNDARIES OF ACFT STAND TAXILANE
ALPHA AND ACFT STANDS ALPHA UP TO 165FT AGL

LOWER: GND, UPPER: 165FT AGL

FROM: 25 Nov 2025 09:00 GMT (10:00 CET) TO: 25 Nov 2025 13:00 GMT (14:00 CET)



Digital Toolkit



Select the scenario:



Select the user:



LEAK DETECTION

This phase marks the initial stage of the emergency, when a hydrogen leak is detected or suspected. The goal is to identify the source of the leak, assess potential hazards, and ensure that first responders are able to react appropriately by being aware of hydrogen's characteristics. During this phase, the Flight Crew is also shown how the Hydrogen-powered aircraft HMI reacts to the event through warnings, alerts, and system indications enabling them to promptly recognise the threat and initiate the corresponding procedures.

Info Fire Department

Hydrogen – Behaviour and Hazards



Info Fire Department

H₂ Leak – Hazards and Firefighters Response



Info Fire Department

H₂ Fire – Hazards and Firefighters Response



HMI Flight Crew

Cockpit HMI Prototype for H₂ Fuel Cell Aircraft – 1



HMI Flight Crew

Cockpit HMI Prototype for H₂ Fuel Cell Aircraft – 2



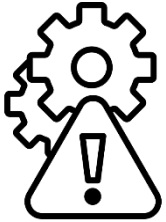
HMI Flight Crew



Lessons Learned



Lessons Learned – In-flight & Landing



More troubleshooting options for Flight Crew.



Communication mostly clear and standard.



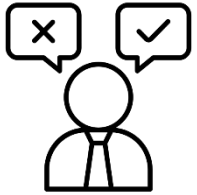
'Five minutes until flammable concentration' repeated even though time elapsed.



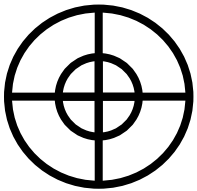
Insufficient knowledge on hydrogen.



Lessons Learned – Designated Hydrogen Location



Is it safest to taxi to designated stand?



Safety zone impacts emergency response.



Lessons Learned – Firefighting



Invest in equipment



Water supply



Aircraft specific crash cards



Hydrogen specific training



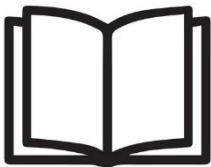
Lessons Learned – Evacuation & Rescue



Directions towards the front



Hydrogen indicators not clear



Updated safety briefing cards



Lessons Learned – Drone Support



Communication with ATC was clear

7600

Transponder or remote identification would be useful addition



Aerial overview was used

- ✓ fire fighters
- ✓ on-scene command
- ✗ crisis management



Should require minimal effort



Responsibilities should be allocated



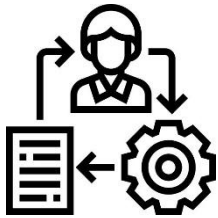
Conclusion



First large scale hydrogen emergency exercises



Training & future equipment



Reconsider airport operations



Hydrogen detection & risk mitigation for future aircraft designs.







Consortium

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