

# Certification Challenges

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**Certification  
Conference**

*October 24, 2023  
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## Certification Challenges

Introducing Fuel Cell Systems and Hydrogen in aeroplanes.

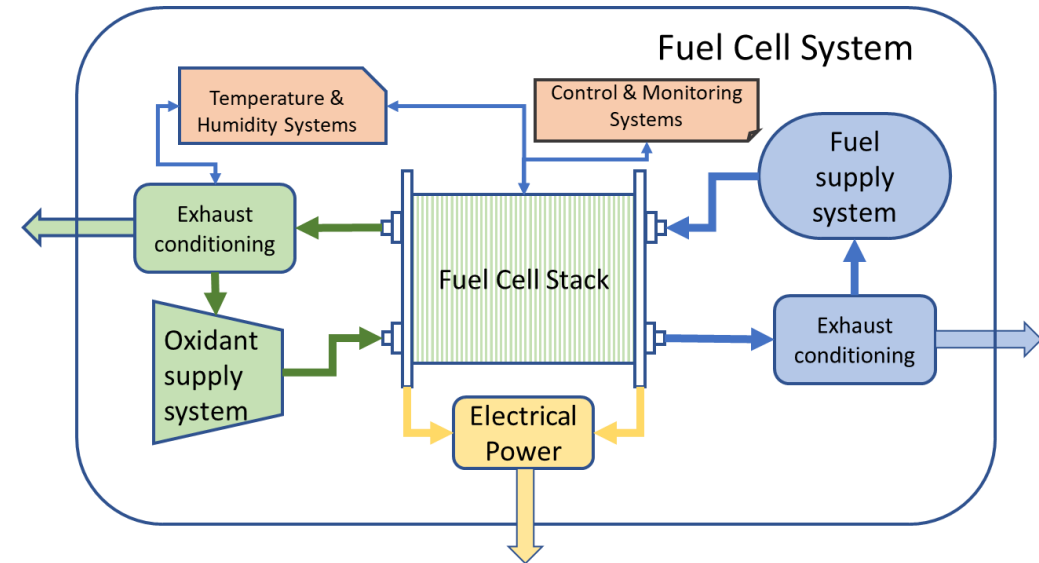
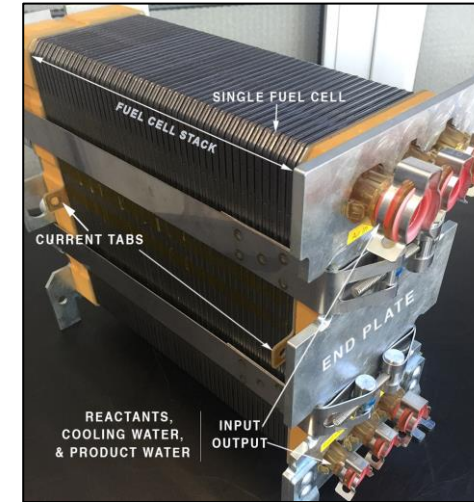
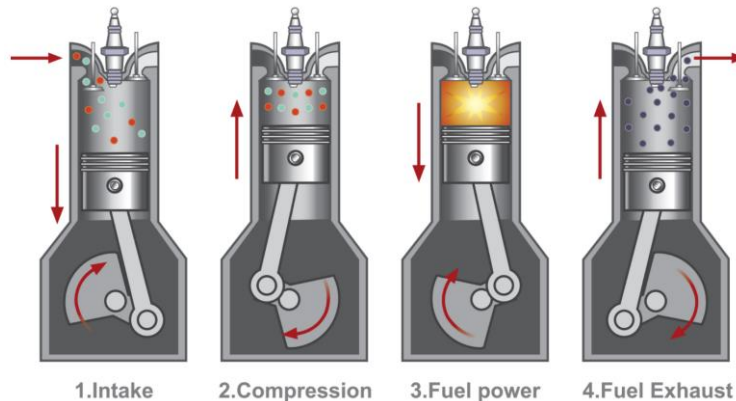


# Hydrogen

## A new substance on board

With the need and wish for more sustainable flying, Hydrogen is considered to be a very promising candidate:

- Either as reactant in a Fuel Cell System
- Or as a combustive fuel in an engine





# Hydrogen

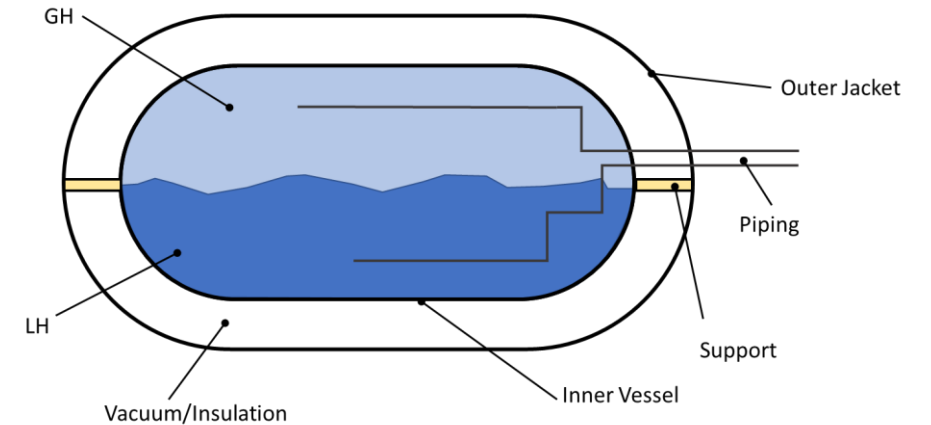
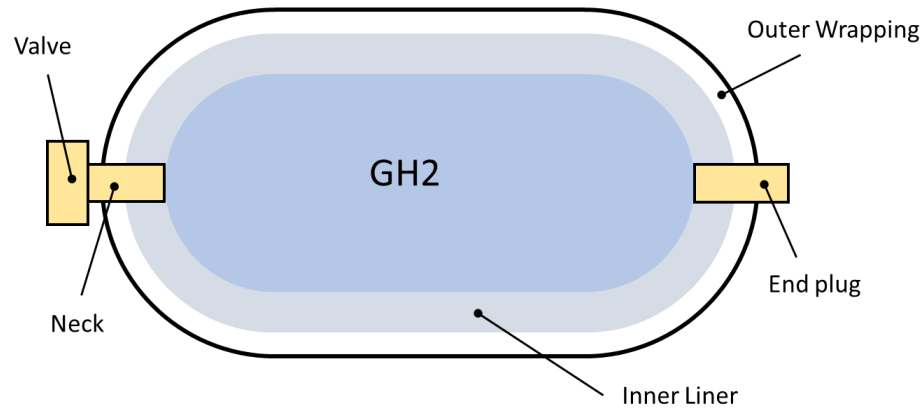
## Specific characteristics and hazards

- Fire or explosion risk
- Mechanical/material hazards
- Crashworthiness and ditching
- Physiological hazards
- Cryogenic (for Liquid Hydrogen)
- Fueling and handling hazards



# H2 Storage and Distribution

- Liquid Hydrogen
- Gaseous pressurised





# Certification

- Current CSs not fully covering Fuel Cell Systems / Hydrogen
- Special Condition and AMC in progress
  - Airworthiness Review Committee “Energy Supply Devices” Report (Dec 2017)
  - General conclusions different Innovative Partner Contract
  - Inputs from Eurocae/SAE Fuel Cell Systems WG
  - General conclusions from research activities
- SC applicable to all CSs with CS specificities (proportionality) in AMC
- Relation to Engine TC vs Aircraft TC discussion



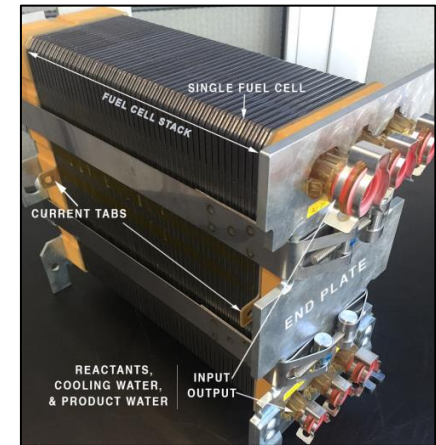
# Special Condition -> Performance Based

## Proposal: consider as Energy Supply Device

Energy Supply Device (ESD):

An ESD means any system installed on the airplane for the purposes of energy supply as required by systems or functions on the aircraft.

The ESD includes functions of energy storage, energy generation or discharging energy, refilling or recharging, and or jettisoning.



Note:  
different ESD covered by this SC is to be determined





# Special Condition

## Steps

- Fine tuning wording special condition
- AMC for:
  - Fuel Cell Systems
  - Hydrogen storage, per first need identified





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# Thank you!