

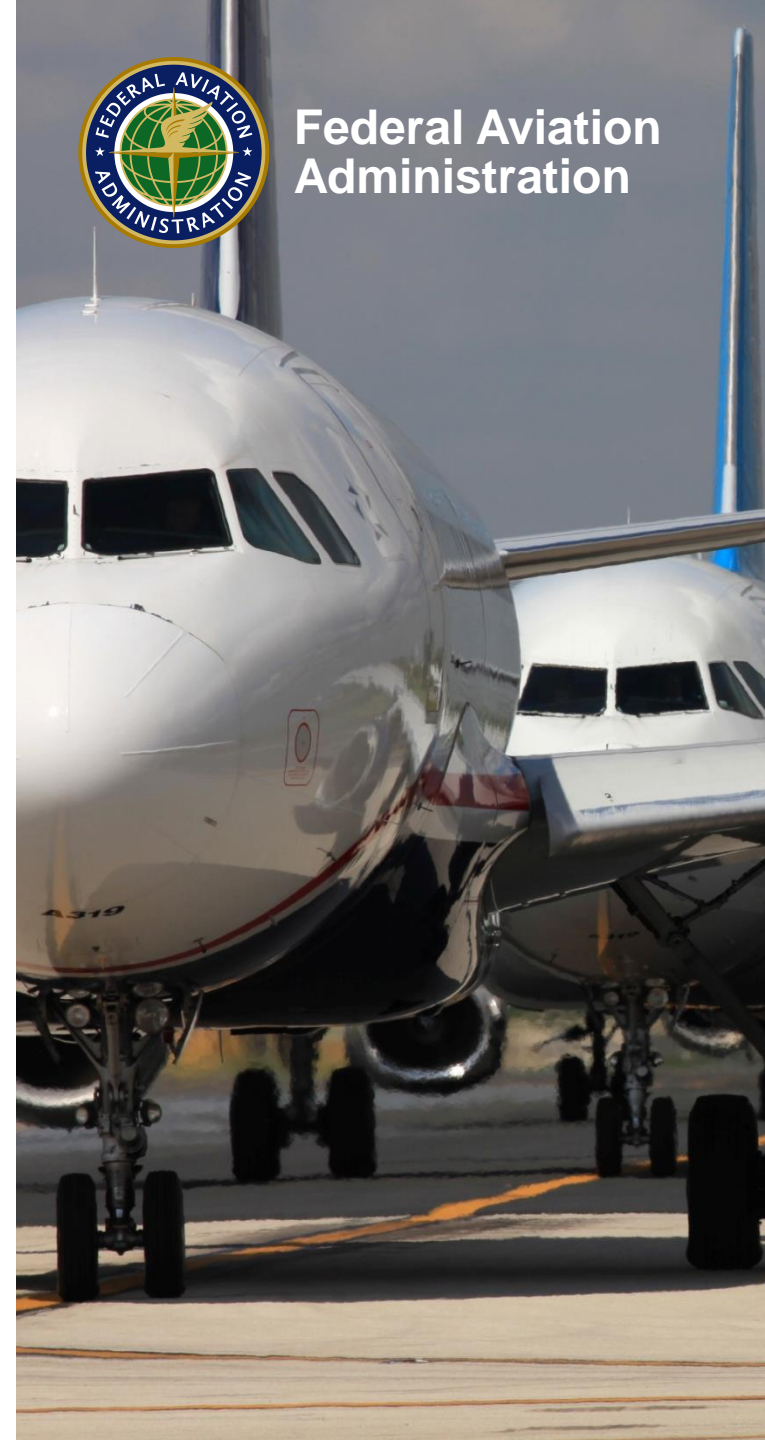
Destructive Fuel Cell Testing

International Aircraft Systems Fire
Protection Working Group
Dresden, Germany
May 12 - 13, 2015

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Fire Safety Branch
<http://www.fire.tc.faa.gov>

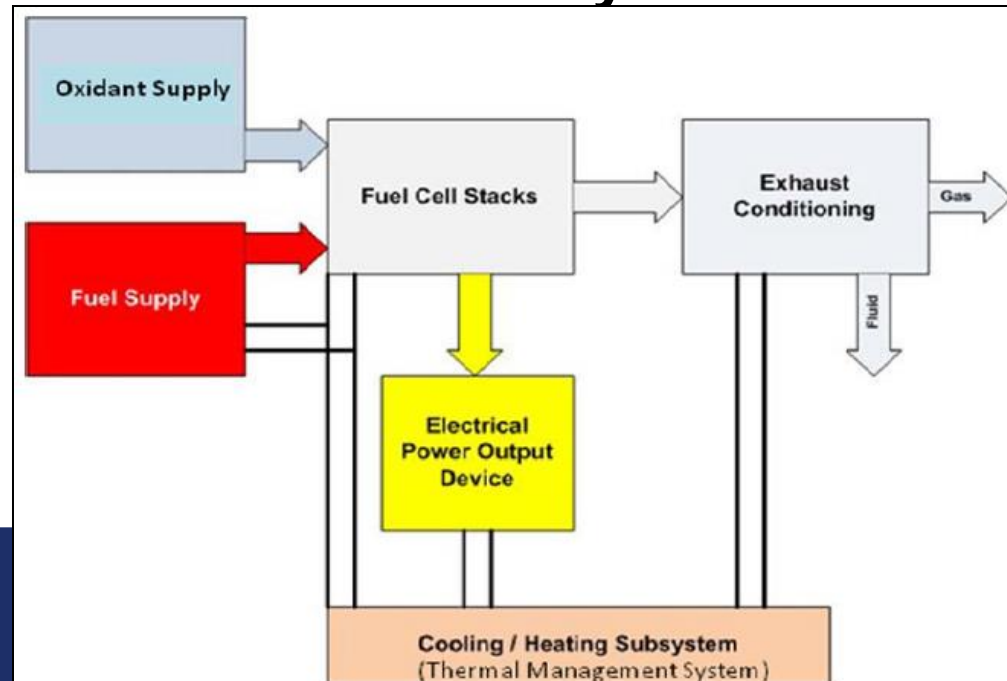


Federal Aviation
Administration



Background

- Aviation industry is pursuing efforts to install Hydrogen Fuel Cells on aircraft for a number of potential operations, such as the main battery, ram air turbine, APU, galley power, etc.
- In addition, the byproducts of a Fuel Cell System are being looked at to supply water onboard as well as Oxygen Depleted Air for fuel tank inerting or cargo fire suppression



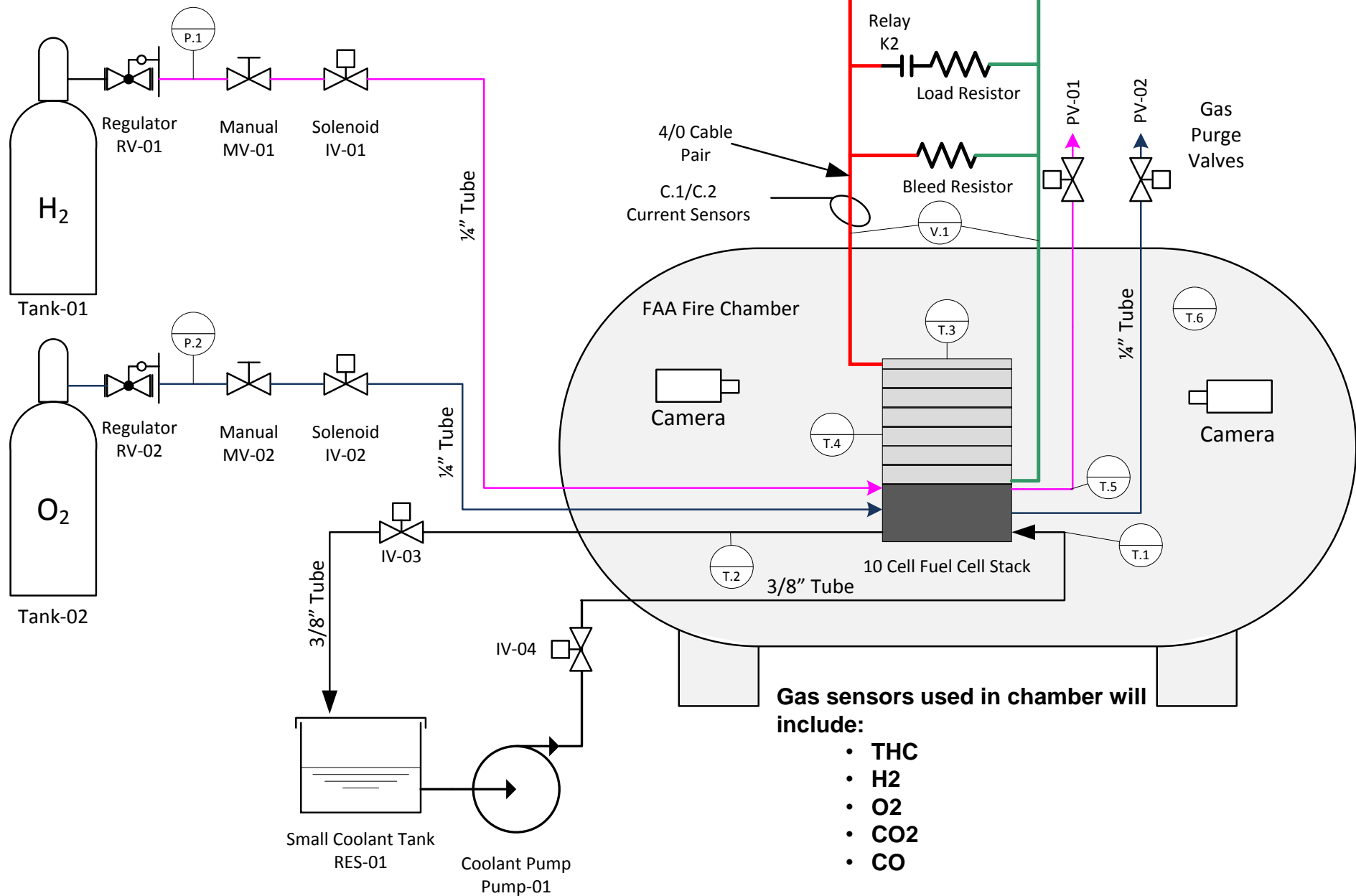
Background

- **FAATC is working with industry partner to conduct initial destructive testing of H2 fuel cell stacks**
- **Objective is to better understand failure modes and consequences**
- **Tests are planned for early June, 2015**

Test Setup

- **Tests are to be conducted in our 10 m³ Pressure Fire Modeling Facility**
- **3 test units supplied by industry partner will be evaluated**
 - Loss of Cooling Test
 - Short Circuit Test
 - Third unit available for repeat testing if needed

Test Setup



Loss of Cooling Test

- **Unit will be started up with Reactant and Coolant gases flowing normally**
- **Relays will be closed, producing an approximate 500A load on the system**
- **The coolant pump will be stopped**
- **Recording of video and data will be continued until a failure event occurs.**



Short Circuit Test

- **Load resistors will be configured in parallel with bleed resistor**
- **Unit will be started up with Reactant and Coolant gases flowing normally**
- **Load resistors will be used to create currents in excess of 1000A**
- **Recording of video and data will be continued until a failure event occurs.**

Questions

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