



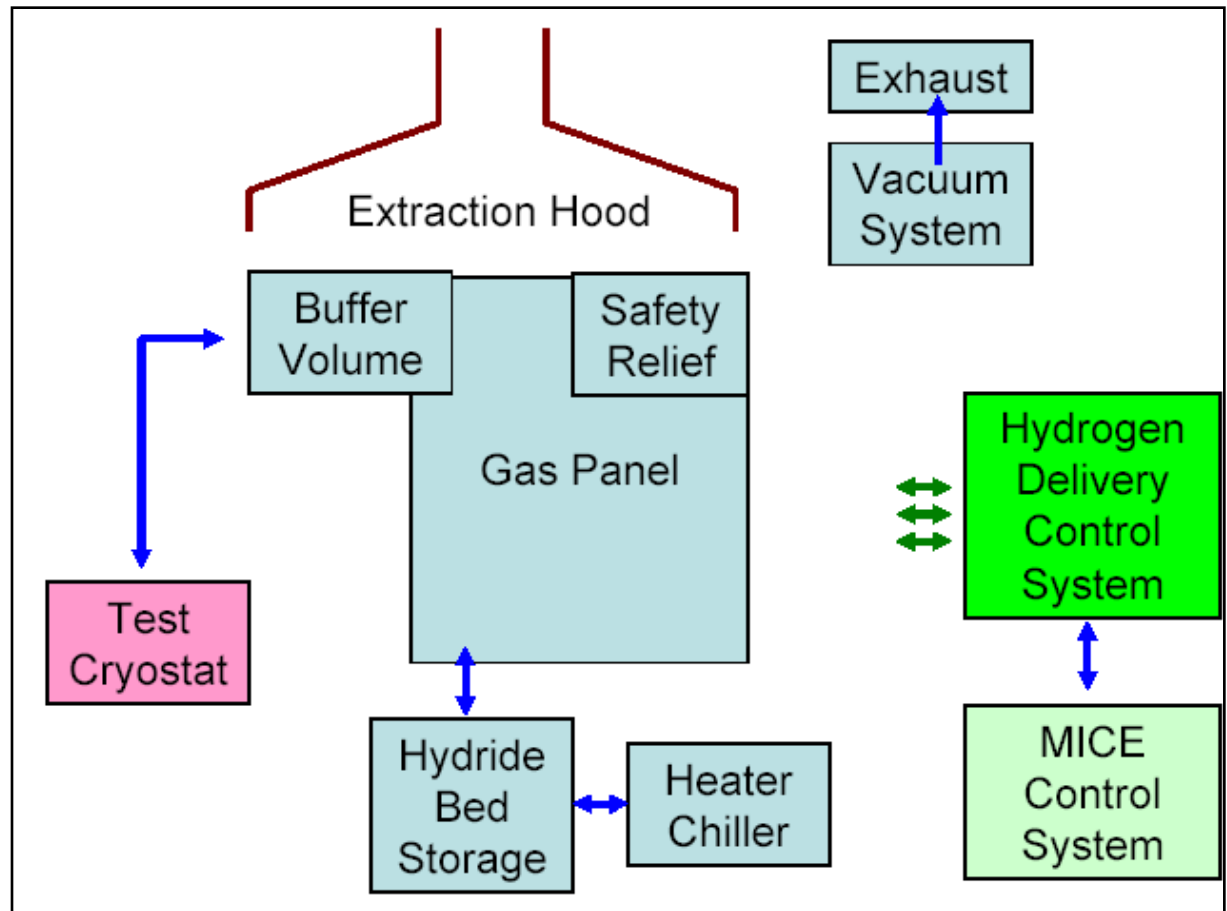
The Hydrogen Delivery System - An Introduction

M Hills



In Block Diagram

- Each Hydrogen Delivery System in MICE is designed to fill an Absorber with 22L of liquid hydrogen (~18000L (or 18m³) of gas) in a controllable and safe manner.
- Prior to use with the final MICE absorbers, the system will be tested with a Test Cryostat which represents the final absorber (this is the “R&D system”)

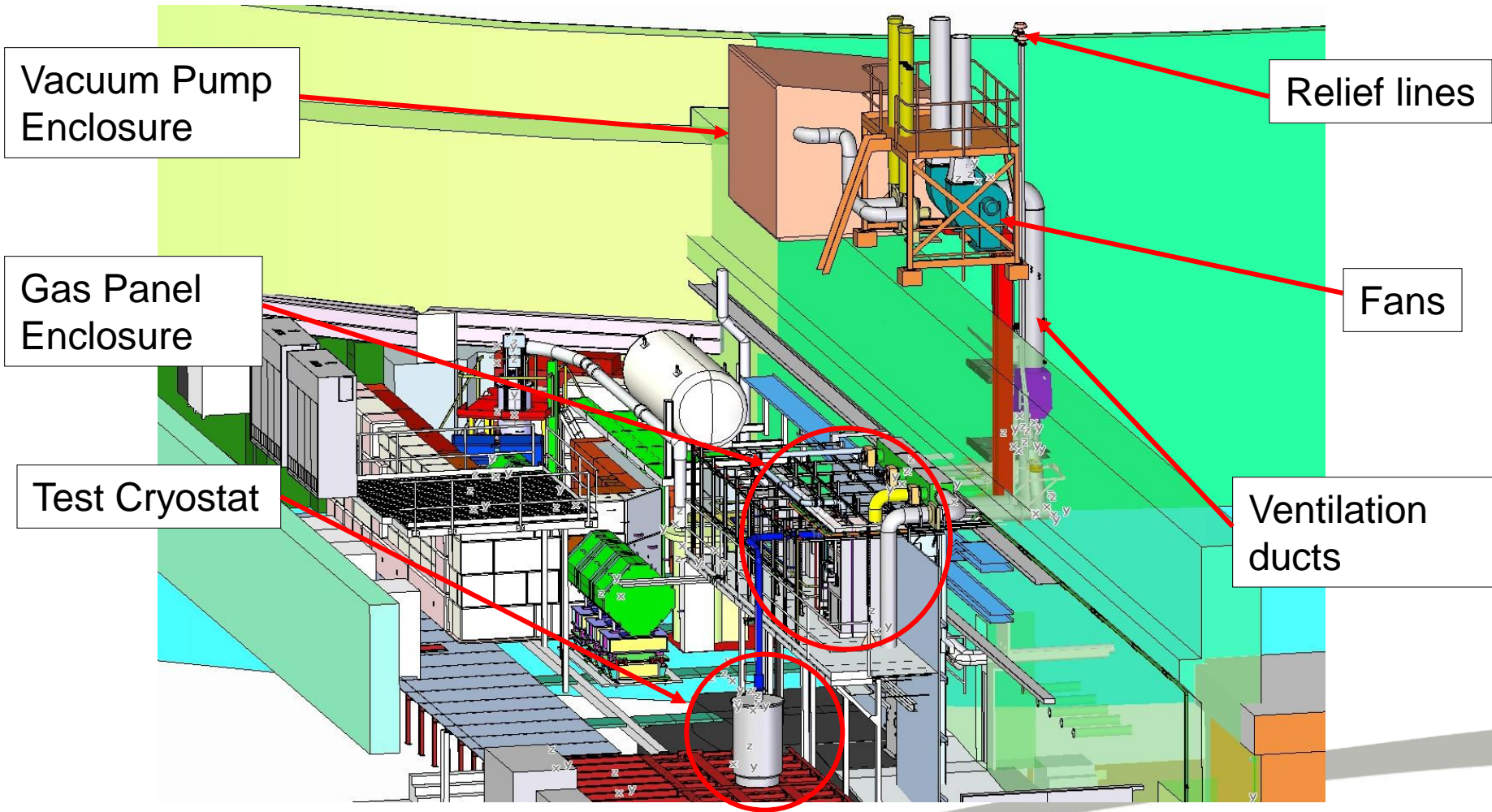




System Components



In CAD





In photos



- Gas Panel Enclosure is situated on the south mezzanine
- Hydride Bed heater/chillers located along the mezzanine
- Ventilation and vacuum pipework is routed above the magnetic shield wall
- Test Cryostat sits at floor level, approximately in the eventual location of the third AFC module





H2 Charging Station

- Hydrogen “Charging Station” (right) installed below south mezzanine
- Will provide a ventilated area for hydrogen bottles during the periods when the hydride beds are being filled
- Hydrogen bottles will only be brought into the hall during charging. This means for 1-2 days max. and (hopefully) once per bed.





Hydrogen Local Control Room (HLCR)



- Located adjacent to the main hall, opposite the MICE Local Control Room
- Home to the Hydrogen System control racks:
 - one for control functions specific to the first system
 - one for general control functions (H2 detection and ventilation system)
- Houses the UPS and battery rack to keep safety critical systems running during a power outage



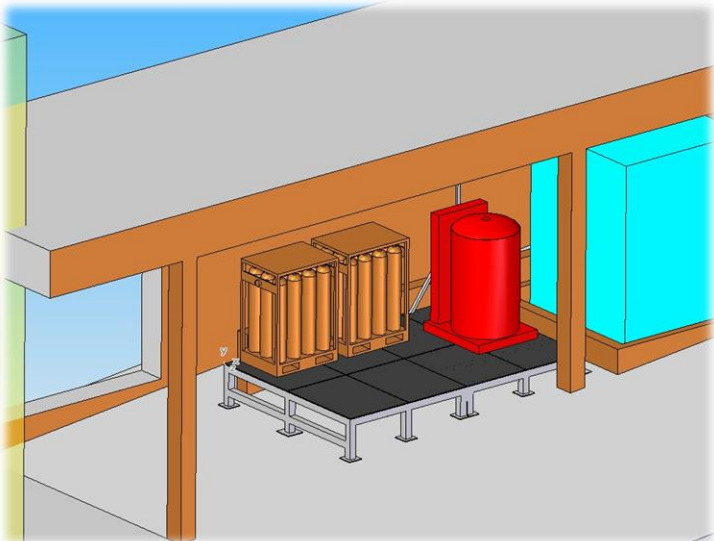
On the roof



- Vacuum Pump Enclosure (left) houses the vacuum pumps and is ventilated by the two smaller fans in the fan stack (right)
- Ventilation stack contains the fans and flow monitoring
- The relief lines vent above the stack platform



External Helium and Nitrogen Store



- Storage area for the nitrogen and helium bottle packs that serve the system
- Final stage of construction still in progress
- Gas panels for connection of the bottle packs have been manufactured and are ready to be fitted
- Gas panels include regulators that allow for automatic switching between packs
 - Current estimate is that continuous purging of the relief lines with nitrogen will use ~1 pack/week (with 3 systems)
 - With two packs of nitrogen in position and automatic changeover, there will be a week to replace a used pack during continuous running





In reality...

Hall Tour:

- Will visit all the areas described above
- Hall is a CDM (Construction Design and Management) area and also a (very low) radiation area
- PPE and radiation monitoring will be provided
- Please stay with the guides and watch your step





Latest news.....

- Matt Hills is taking a two-year career break – very best wishes from MICE
- Stephen Watson of STFC assumes responsibility for LH2 system w.e.f October 17th
- Successful pre-operation safety review held at RAL, expect formal report next few days
- Minor pipework on bottle rack and vac system to do, but all major installations are complete
- Very likely we can repeat LHe test and do LH2 test early in 2012
- Director-level safety responsibility (David Wark) has been established at RAL

