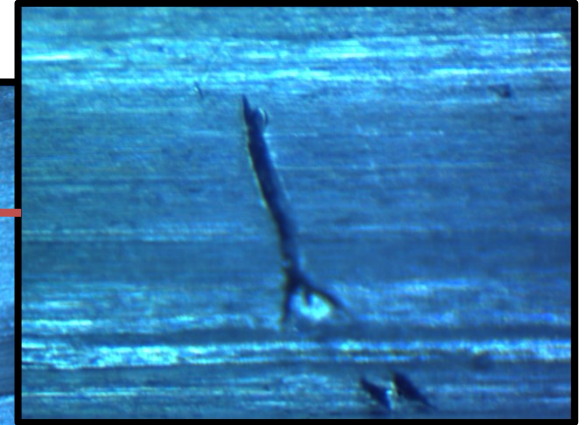
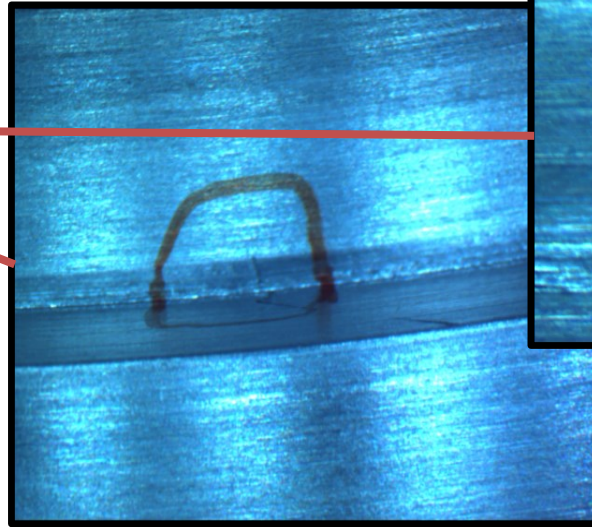
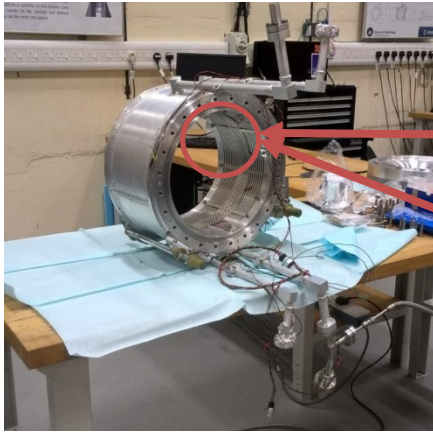


CM45 Hydrogen System

06/10/16

Indium Seals



Surface defects – x-ray and dye penetration test showed no results

Indium seals



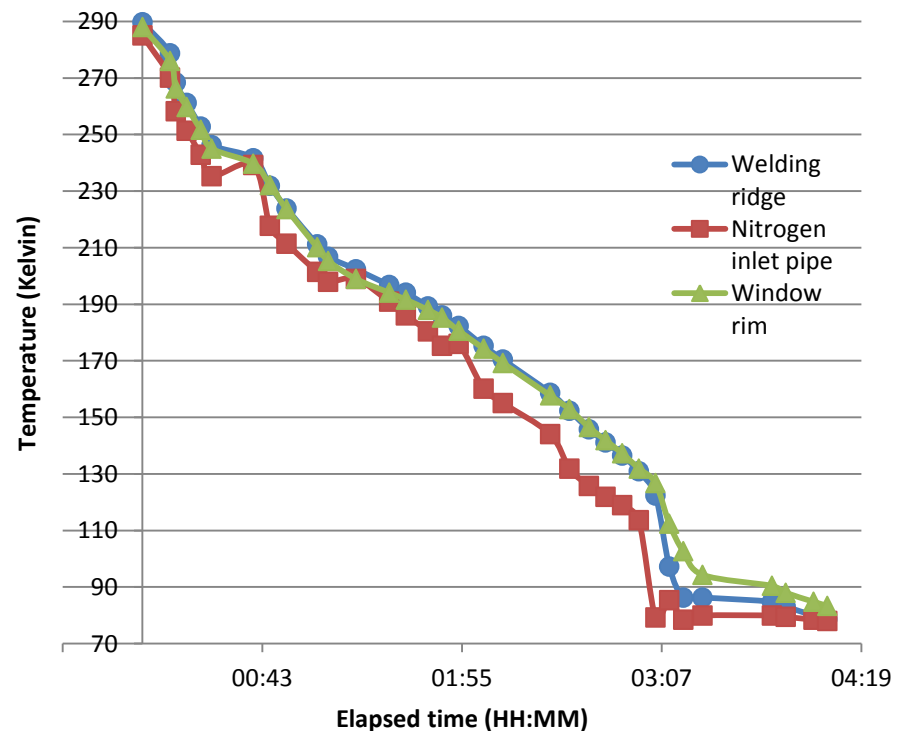
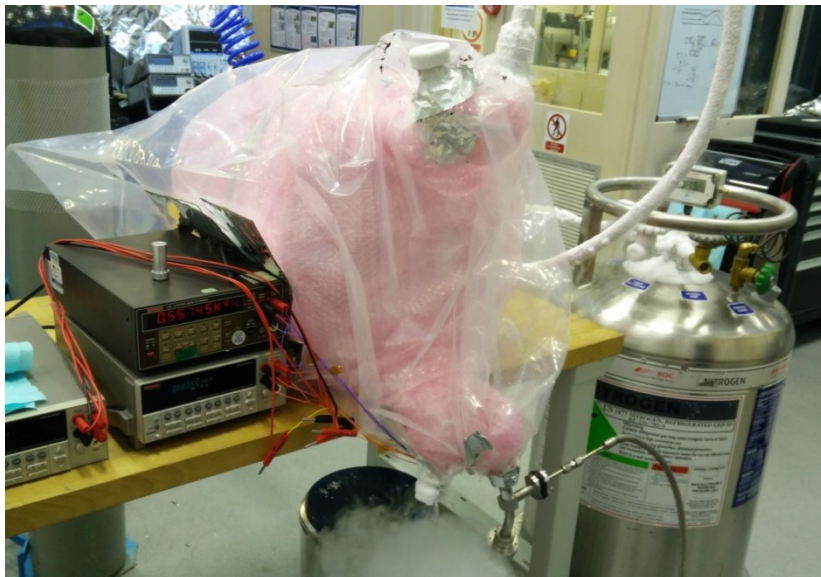
Indium seal was re-made to an agreed procedure:

- Aluminium (tongue and groove) and indium were cleaned with Acetone and then IPA
- Indium was laid in the groove
- Bolts were tightened in a diamond pattern – replacing spring washers with Belville washers
- Slip gauges were used to ensure the bolts were tightened such that the window was kept level with the absorber body

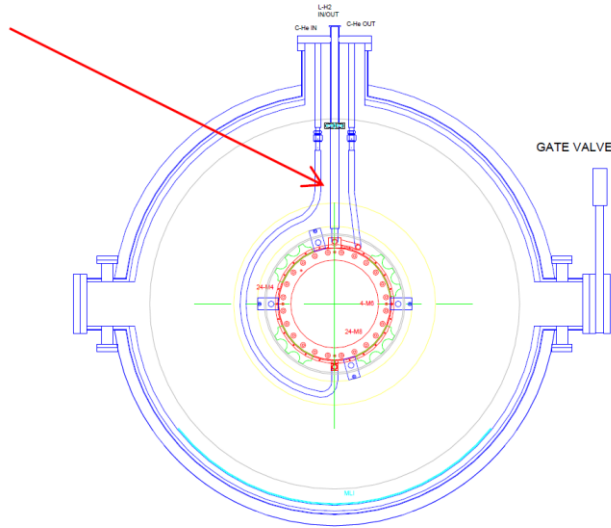
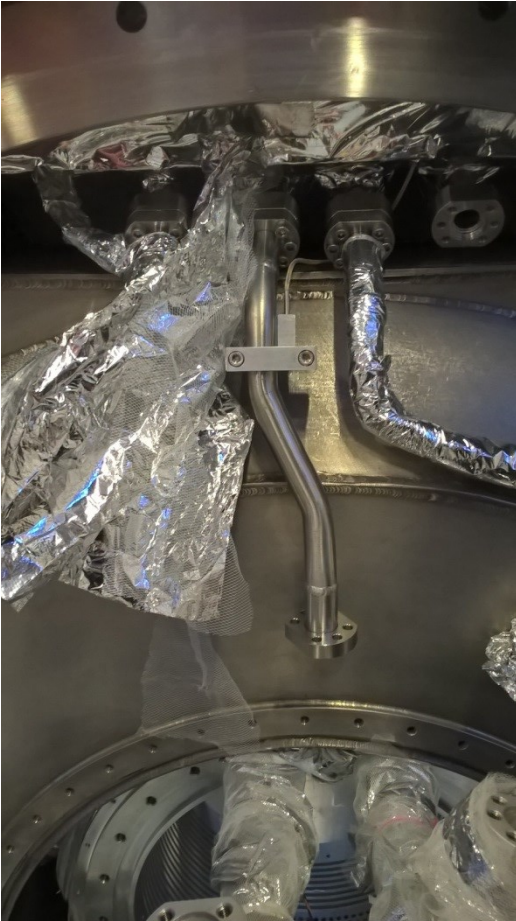
Indium seals

Absorber was thermally cycled three times to below 90K.

Leak checking showed no sign of a leak developing.

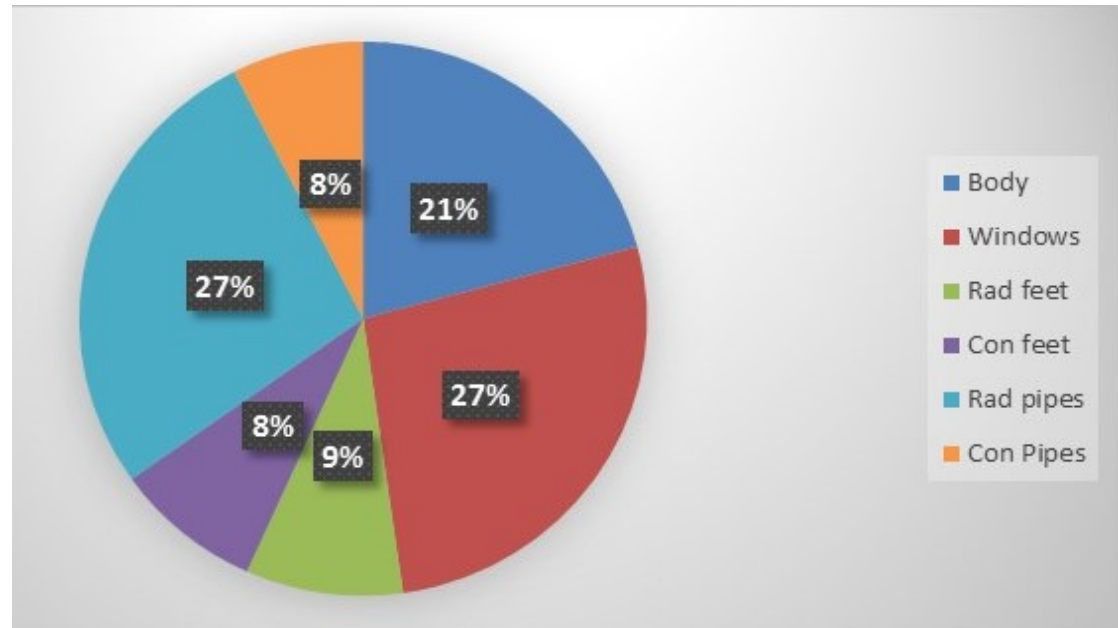
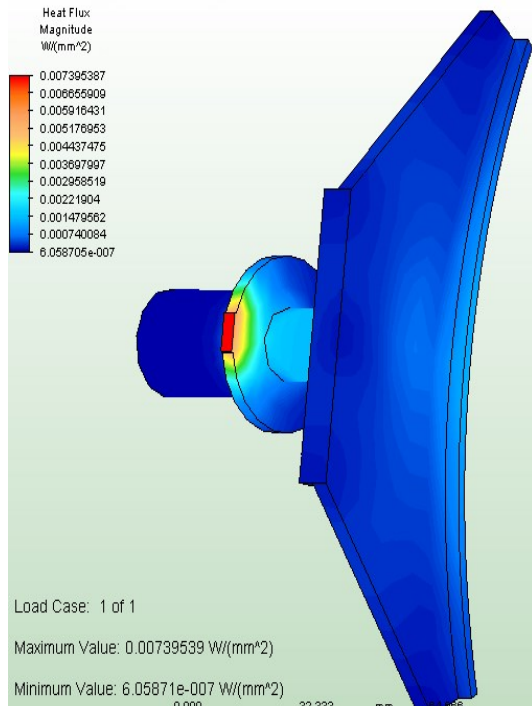


Improving cooling: forcing flow



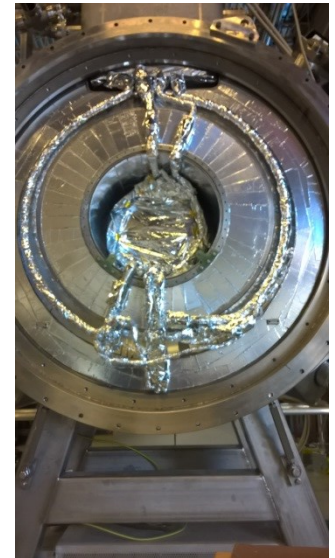
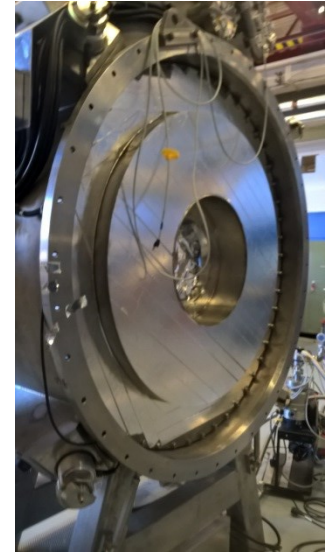
Heater installed on Hydrogen return pipe.

Improving cooling: Reducing thermal Loads



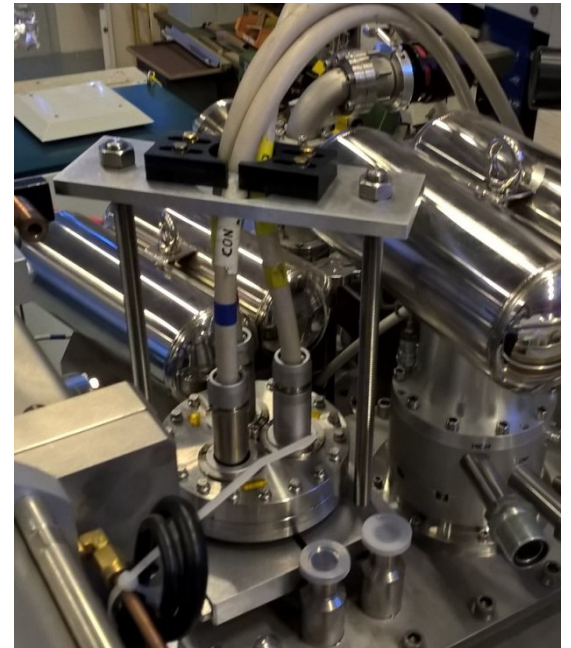
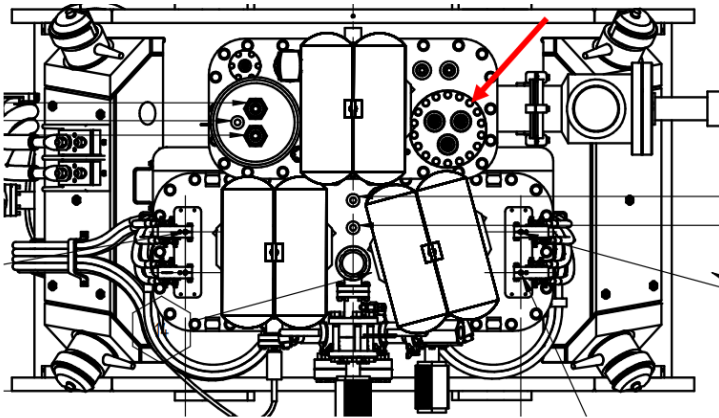
Improving cooling: Reducing thermal loads

- Covered warm, dull surfaces in Al. tape to reduce the emissivity
- Doubled the number of layers of MLI over the Al windows, to halve the heat load.
- Put ~3mm thick Polyurathane foam placed under the absorber feet



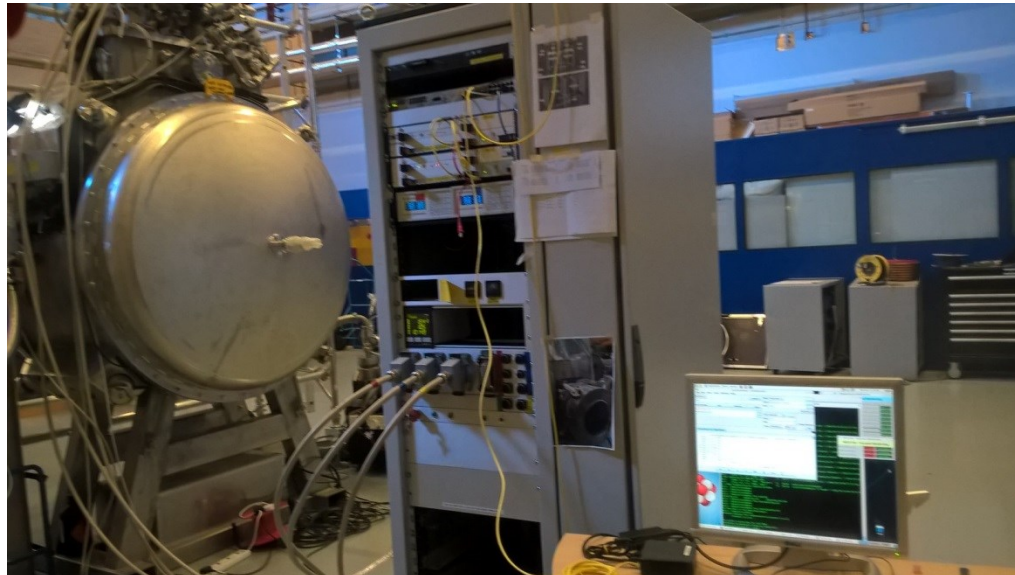
Sensors

- Three replacement Fischer connectors were fitted and the new heater was wired in
- Wiring thoroughly checked following work on absorber and replacement of feedthroughs.
 - Intermittent fault at the Fischer plug/socket
 - Not in the vacuum space
- Mechanically supporting cabling



Preparation for testing

- Cabling complete
- Sensors read out in archiver
- RA/MS agreed with department pressure engineers



Testing

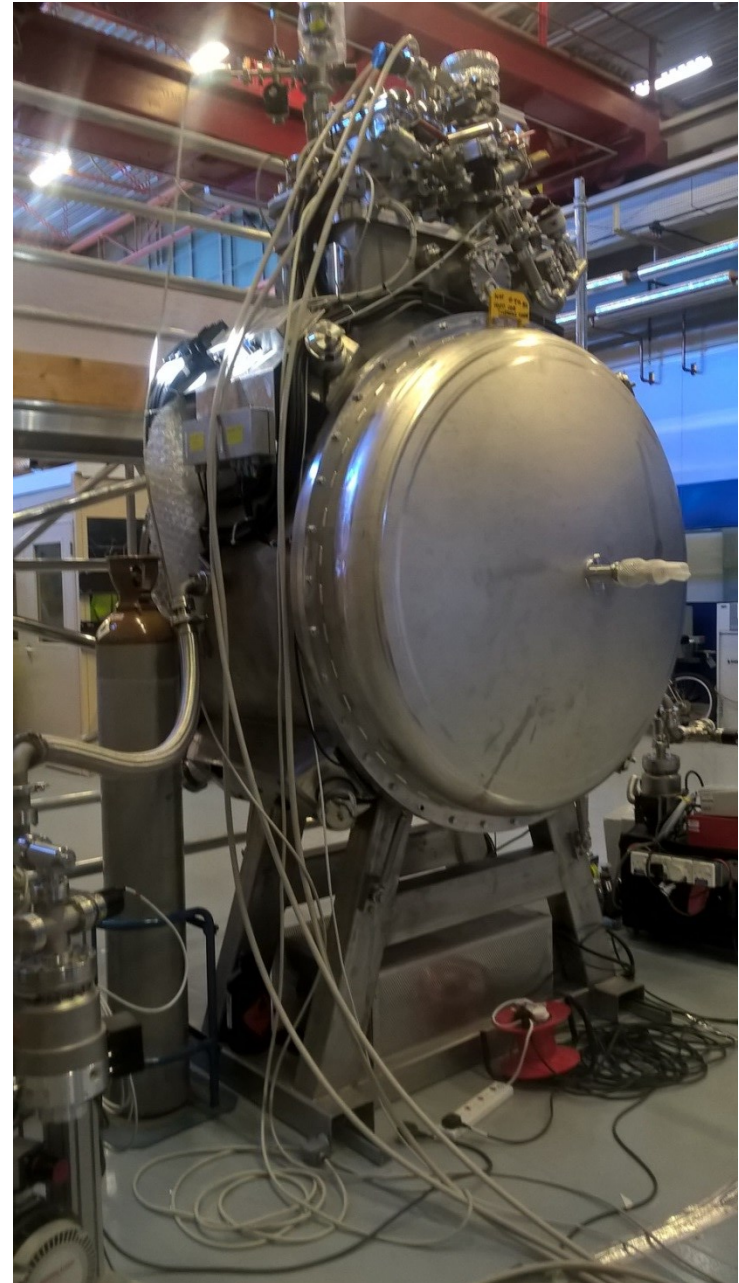
Leak checking with end caps on:
on:

No leak detectable between...

- helium-filled absorber and bore vacuum
- helium-filled pre-cool circuit and bore vacuum

Indium joints are ok!

But... leak from outside atmosphere into bore vacuum through end-cap flange.



Hydrogen System – MICE hall

Alongside testing in R9, we're still working towards operating in the MICE hall:

- Hardware

- Hydrogen detection system was inspected last week
- Prepared a maintenance record for relief valves, starting to test
- Fitting relief valve in-line with recommendations from review

- Paperwork

- agreed emergency procedures with MICE-ISIS Hydrogen working group
- Prepared Pressure Systems Technical File
- Updating the website



Work-plan

- Re-fit end caps and vac down bore (mid-Oct)
- Test the cooldown with helium in R9 (end-Oct)

If successful:

- Install the AFC back in the MICE hall (mid-Dec)
- Commission the system
- Sign-off and operate the LH2 system (mid-Feb)