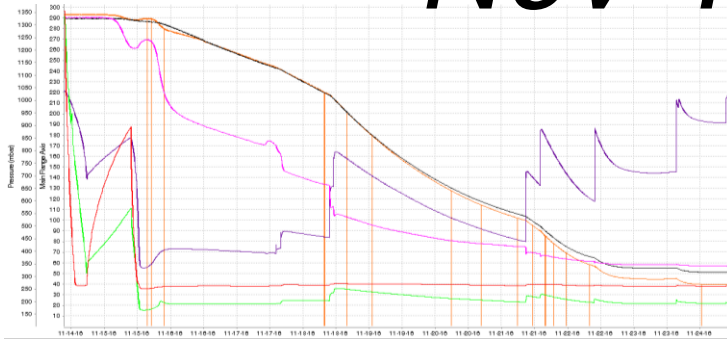


# MICE Liquid Hydrogen System

MIPO – 17/01/17

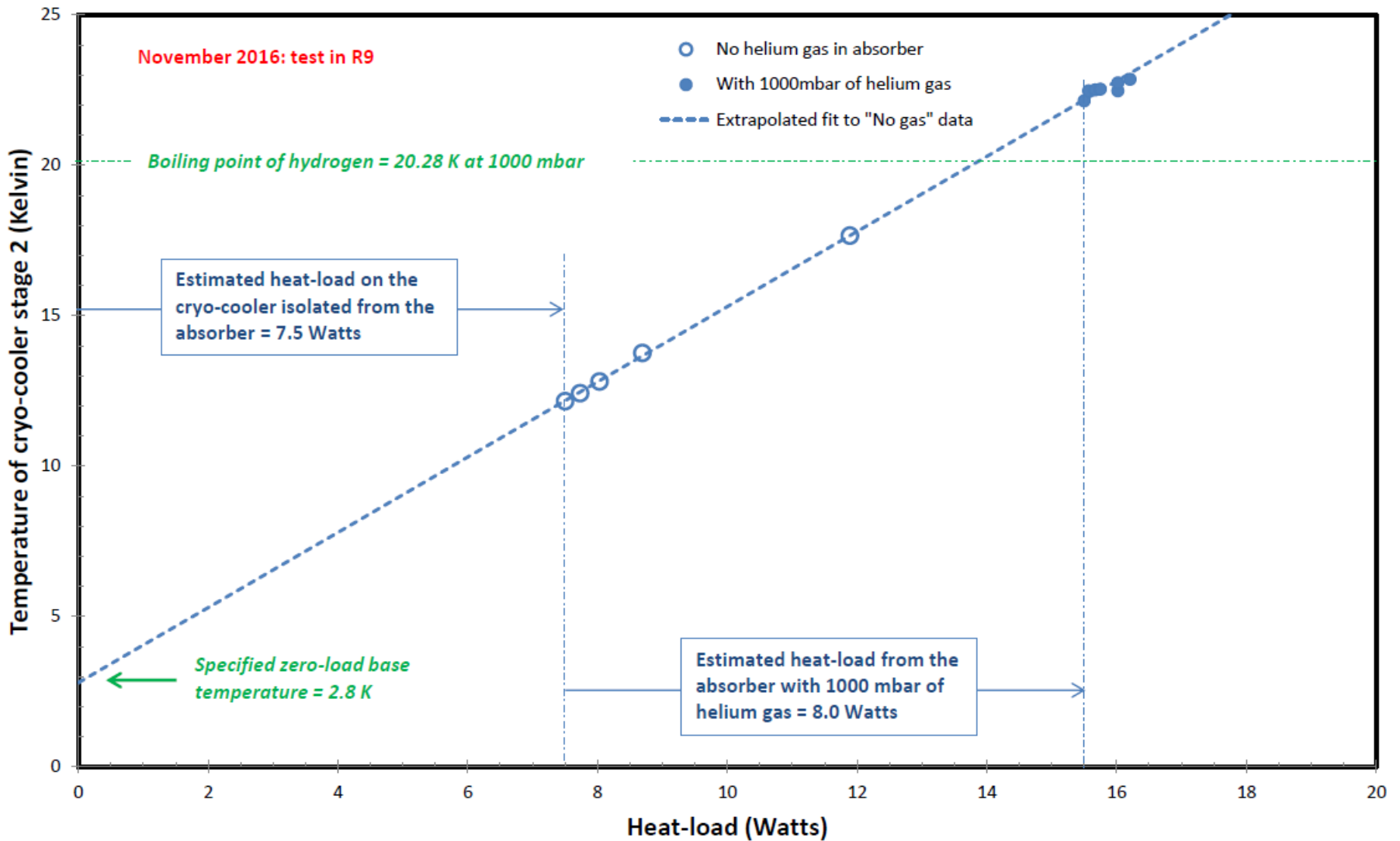


# Nov 16 Cooldown



Sensor	Location	Final reading at equilibrium
MICE-HA-TS-04	Cryocooler 1 <sup>st</sup> stage	39K
MICE-HA-TS-06	Cryocooler 2 <sup>nd</sup> stage	21.8K
MICE-HA-TS-07A	Absorber gas inlet pipe	56K
MICE-HA-TS-09	Absorber body (outside)	50K
MICE-HA-TS-03A	(Absorber body (inside))	39K
MICE-HA-VG-03		1049mbar

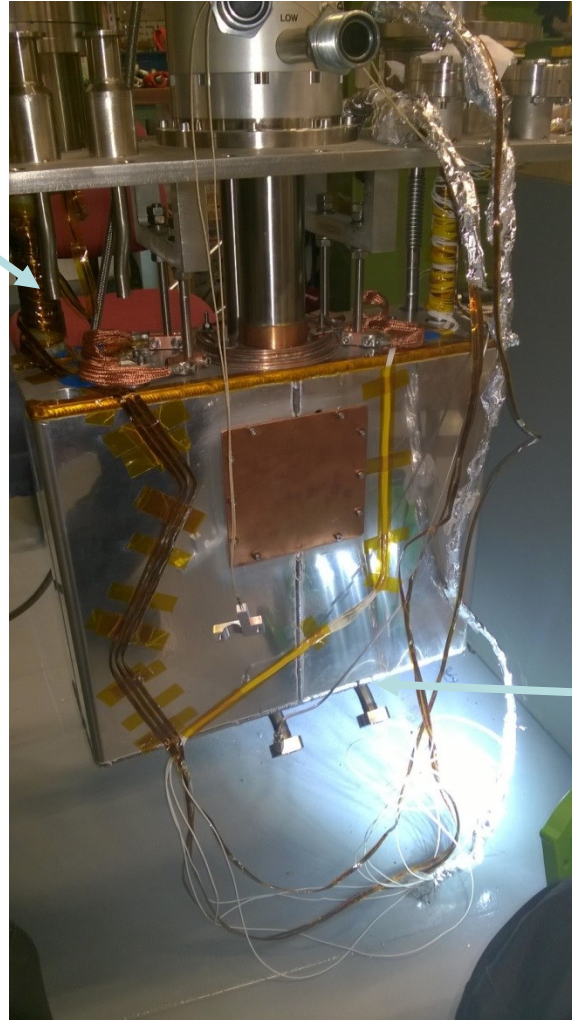




**To cool the system to liquefy hydrogen, we need to reduce both the heat load through the turret and the heat load from the absorber.**

# Modifications - Turret

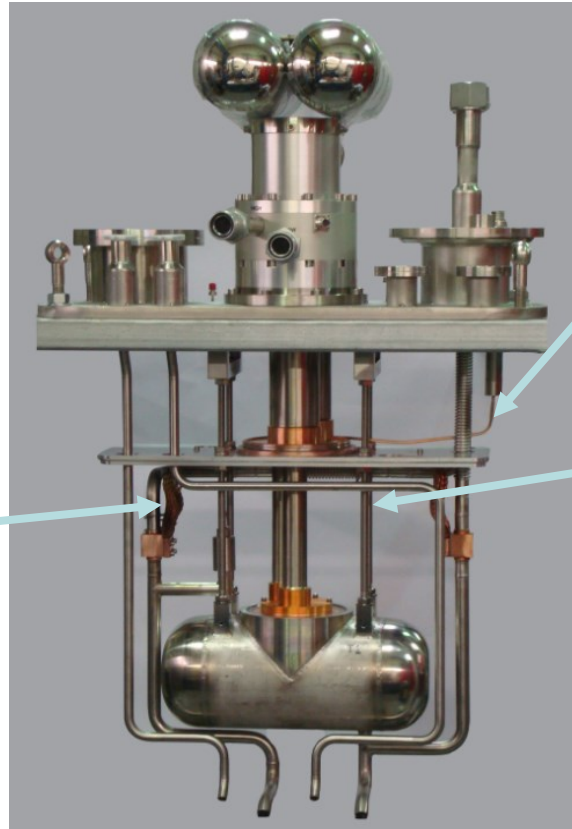
Removed pre-cooling pipework



Modified rad shield so wasn't touching cold pipework

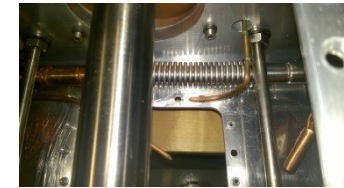


# Modifications - Turret

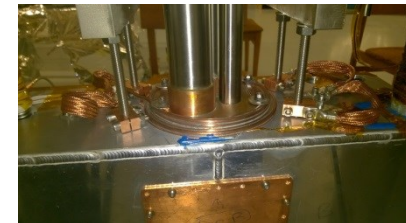


Removed thermal braid heat sinking cold pipework to rad shield

Removed one of two capillary tubes for pressure sensors



Heat sunk M10 supports to the rad. shield



# Modifications - Turret



## Improved MLI



- Added extra 10 layers of MLI
- MLI over all surfaces supports and pipework

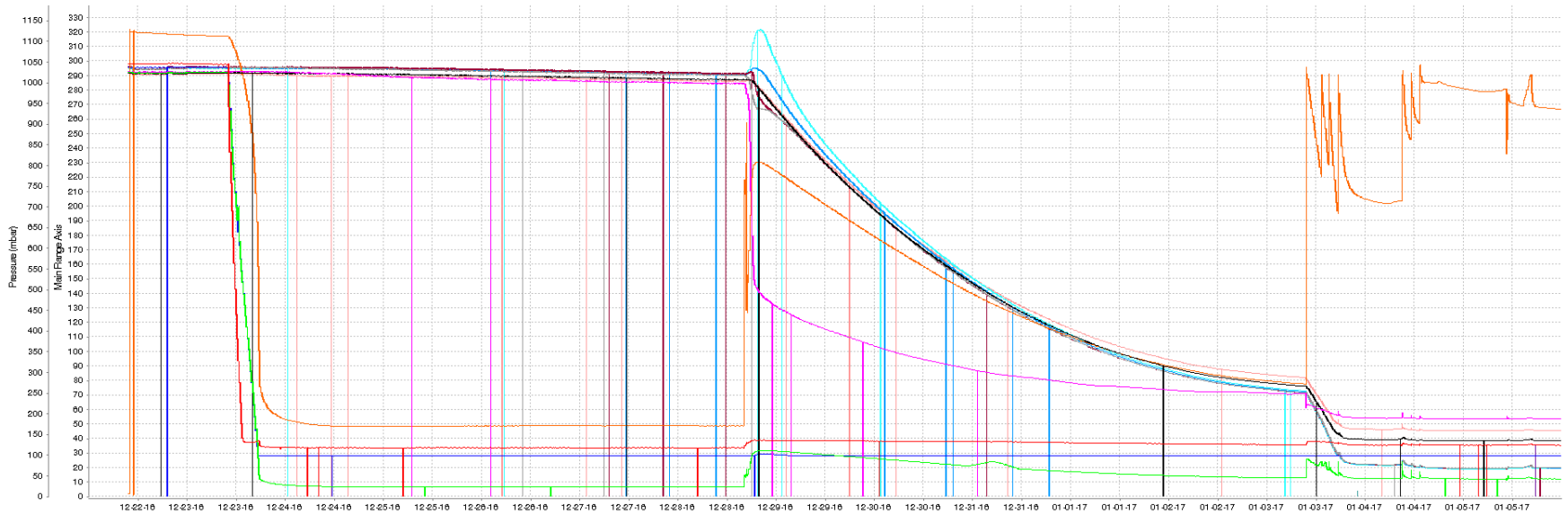


# *Modifications - Absorber*

- Removed pre-cool pipework
- Pulled pipework off warm bore
- Added more MLI on windows (now 40 layers)



# Cooldown Dec 16/Jan 17

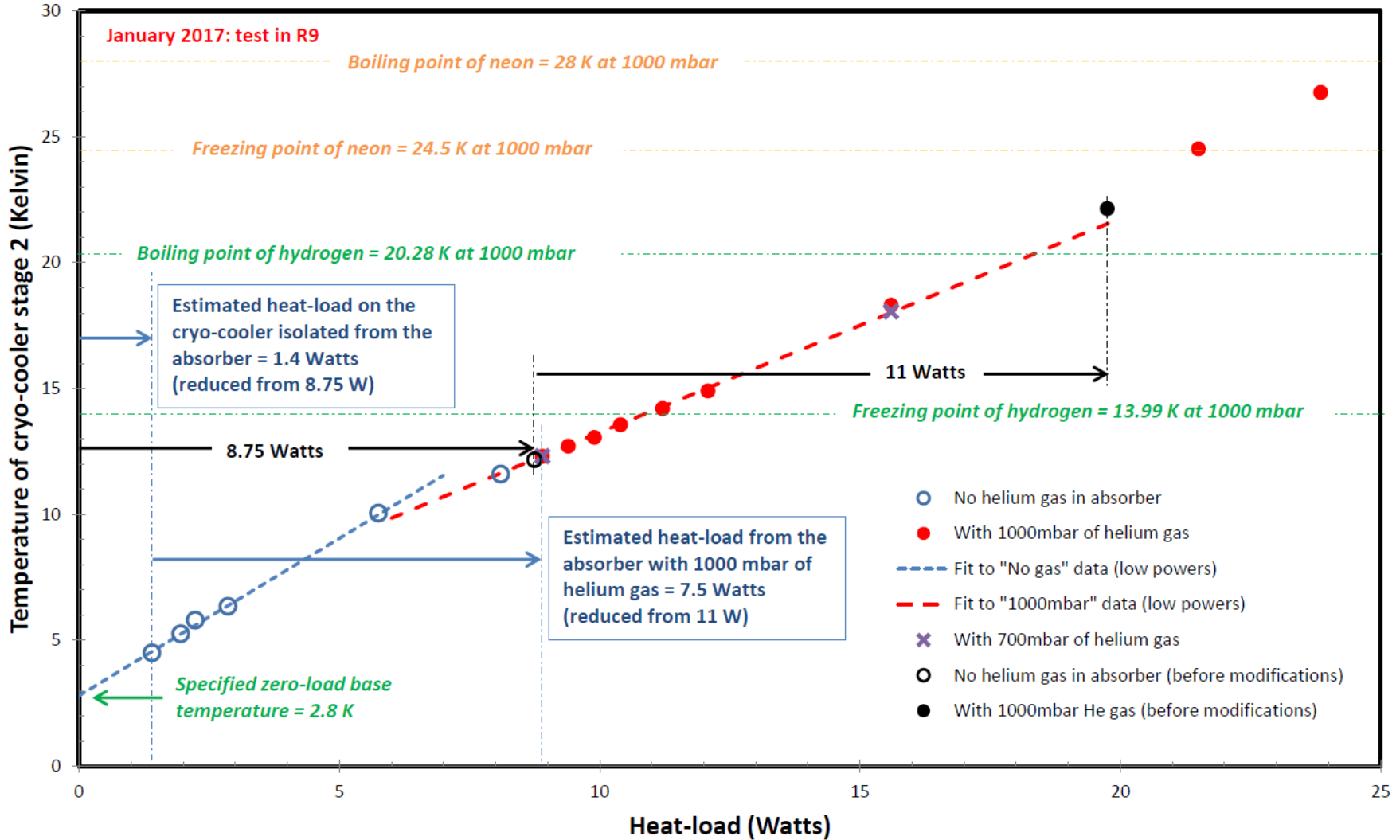


Sensor	Location	Final reading at equilibrium	
		Nov 16	Jan 17
MICE-HA-TS-04	Cryocooler 1 <sup>st</sup> stage	39K	35.5K
MICE-HA-TS-06	Cryocooler 2 <sup>nd</sup> stage	21.8K	12.2K
MICE-HA-TS-07A	Absorber gas inlet pipe	56K	54K
MICE-HA-TS-09	Absorber body (outside)	50K	39K
MICE-HA-TS-03A	(Absorber body (inside)	39K	19.4K
MICE-HA-VG-03		1049mbar	



# Cooldown Dec 16/Jan 17

Heat-loads on the cryo-cooler of the modified hydrogen system in the AFC



# *Issues*

1.  $\Delta T$  between the absorber (19.4K) and the condenser (12.2K)
  - test with Neon
2. Temperature sensor readings
  - thermally sink sensors better

