

Vacuum system in R5.2 for the cryostats SSU, SSD, and FC

Presentation to CM42

22/06/2015

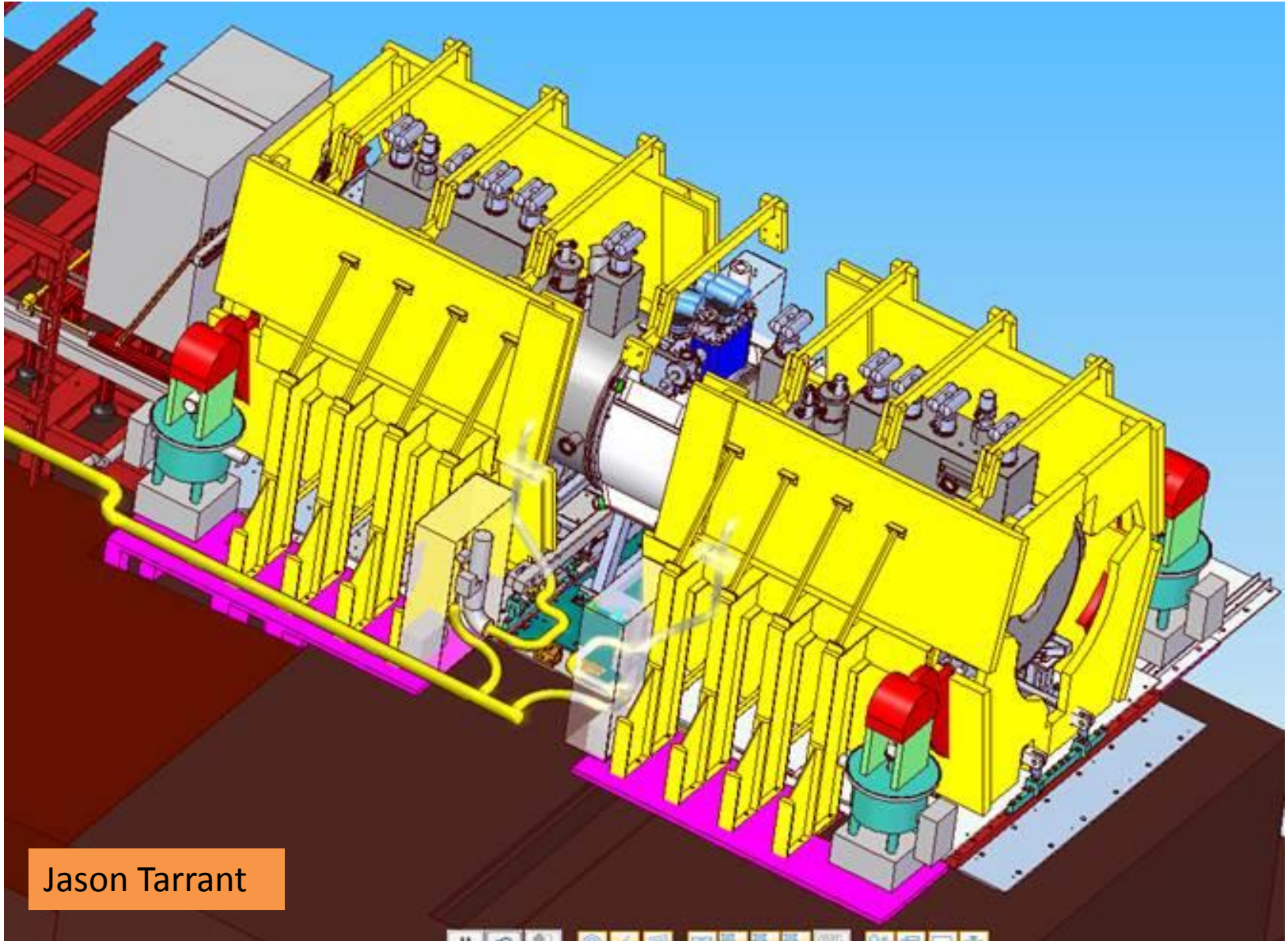
The Vacuum Group

- Hardware: Tom Weston (DL), Roy Preece (RAL), Mike Courthold (RAL), Mark Tucker (RAL)
- Controls: Ian Mullacrane (DL), John Webb (DL), Peter Owens (DL), Phil Warburton (DL)
- Integration into local EPICS: Pierrick Hanlet (LTV from FNAL)
- Integration with Hall services: Andy Nichols (RAL), Andy Gallagher (DL), John Govans (RAL) and others (drawings by Jason Tarrant and Paul Barclay, both RAL)

Overall description

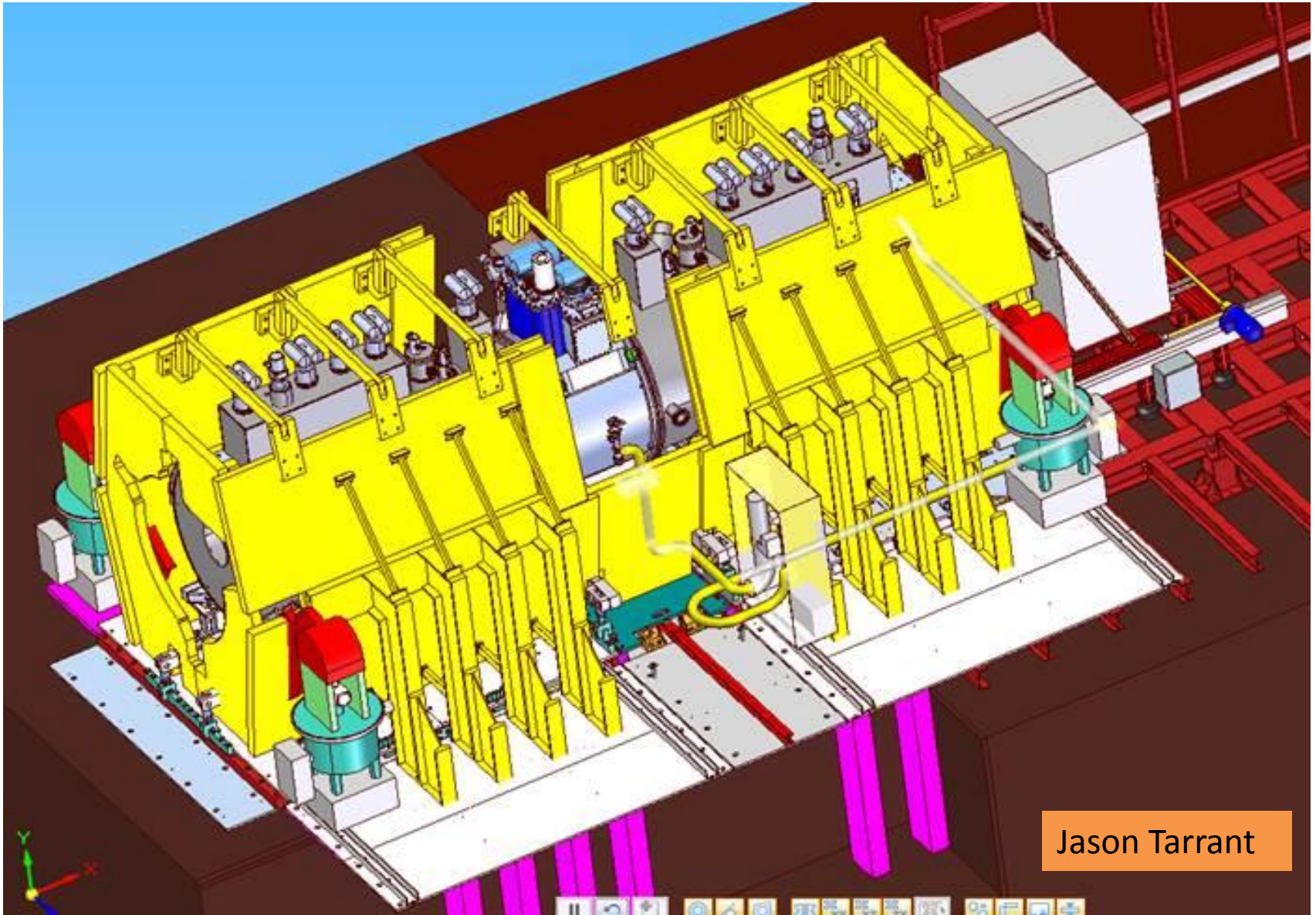
- The turbomolecular pumps (TMPs) are as close as possible to each cryostat.
- The TMPs are outside the PRY, protected from magnetic fields.
- The TMPs can be backed by a shared backing manifold system.
- DN100 (CF) pipework connect them with the cryostats.
- The backing line pipework is DN100 (LF).
- There are two backing pumps, one of which will be running whilst the other is spare. Each pump contains a 500m³/hr ROOTS backed by a dry scroll pump.
- The vacuum system is fully automated with in-built safety via interlocks.

Model view of South side of cryostats



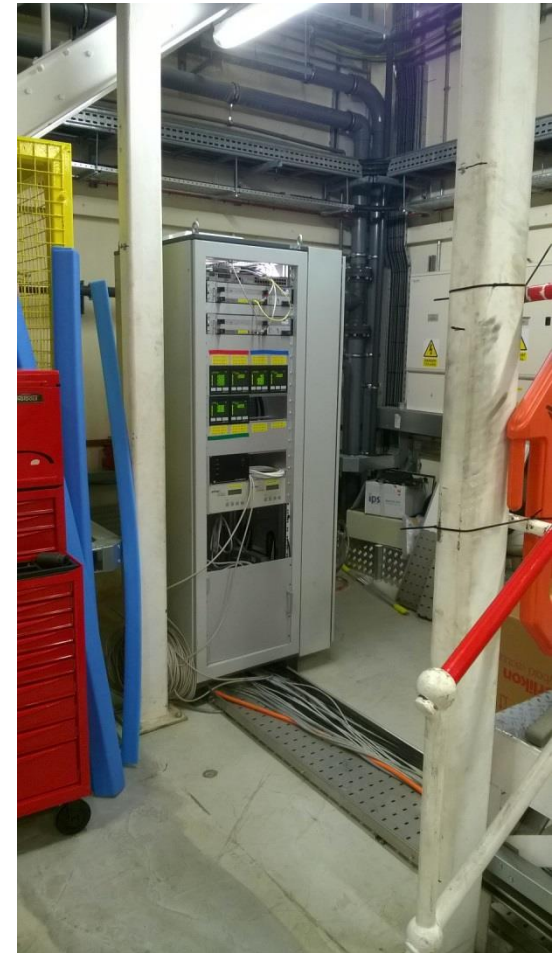
Jason Tarrant

Model view of North side of cryostats



Jason Tarrant

Edwards iQ backing pumps, pipework towards cryostats, and the controls rack in the North-West corner of R5.2



Along the South side of the cryostats

The branch with gate-valve to
the North side at the EMR/KL
position.



Pumping stations on the South-side for the two Spectrometer Solenoids



Additional turbopumps on the North-side for the Spectrometer Solenoids

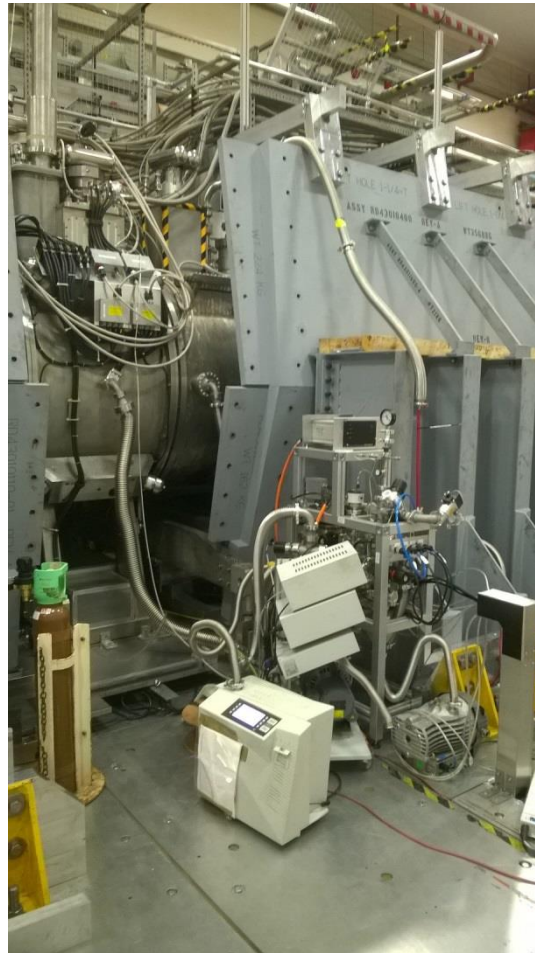
On SSU



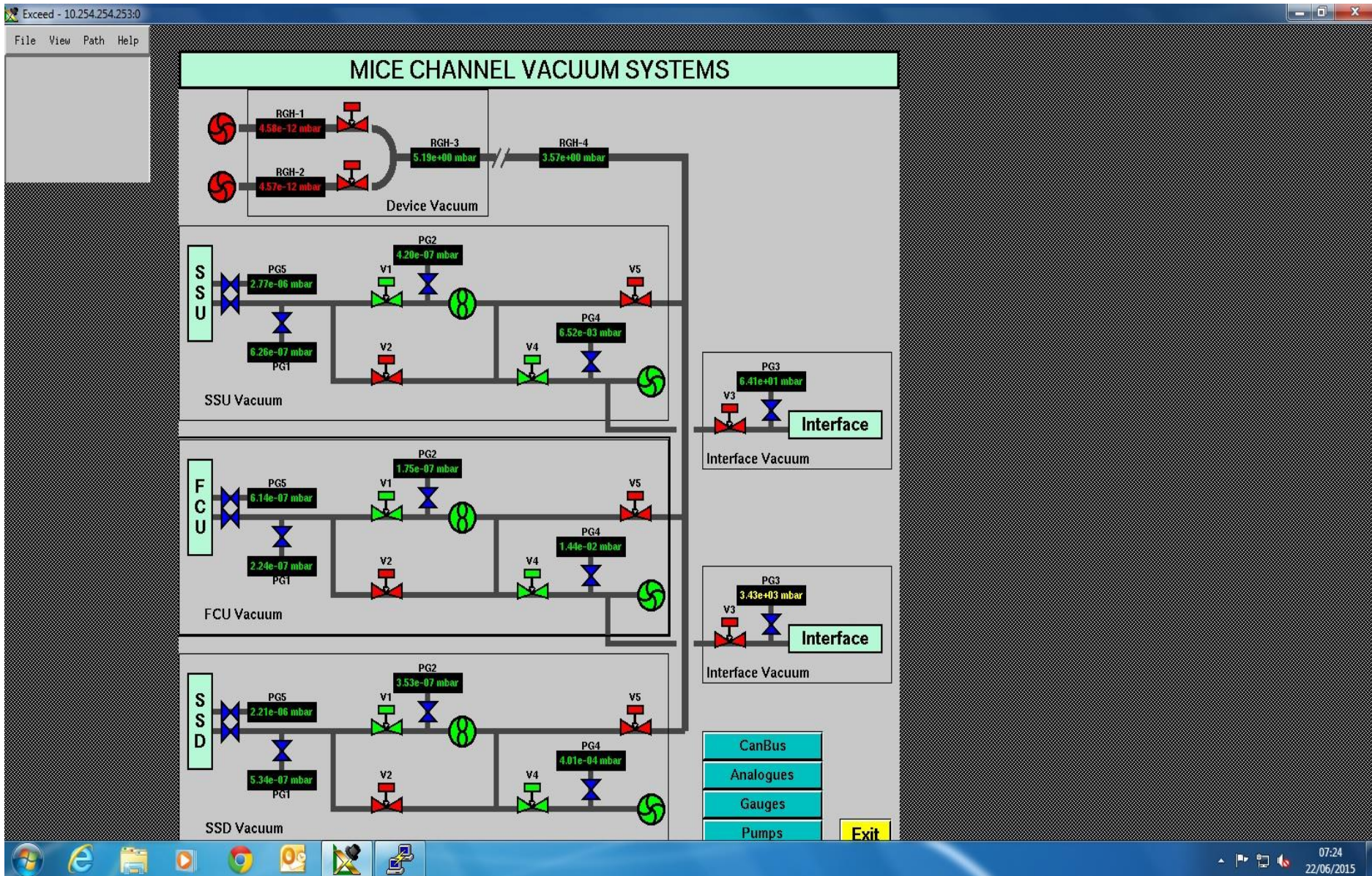
On SSD



Turbopump station for the Focus Coil



GUI



Summary of latest changes

- Two 300 l/s TMPs have been installed on SSU and SSD (North-side) isolated by manual gate-valves with position read-out.
- Pipework of the pumping stations has been slightly modified to enable them to operate as stand-alone systems, or to be backed by the manifold.
- The dry pumps backing the ROOTS on the manifold are being changed from iQDP80 to XDS46 scroll. This will negate the need for high volume nitrogen flushing of the seals and bearings of the iQDP80s.