



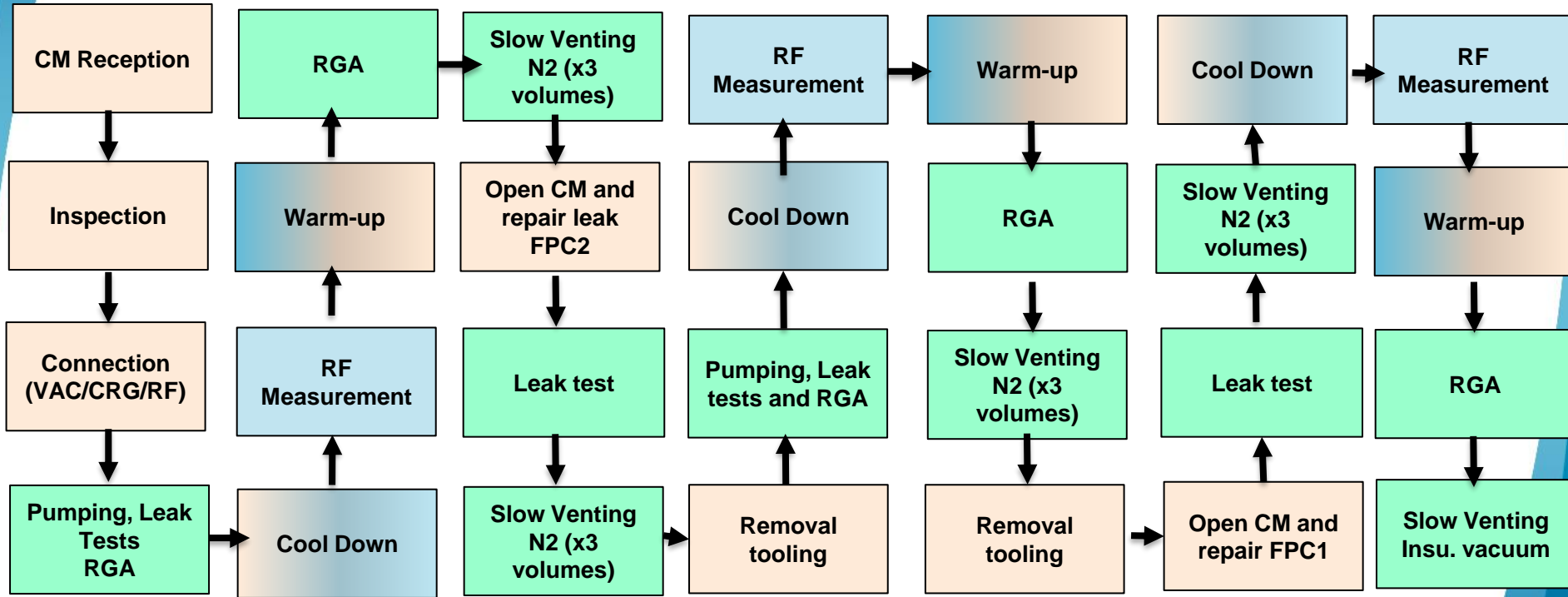
RFD CM- M7 testing- Vacuum

N. Valverde, K. Turaj on behalf of HL-LHC WP4, SY-RF-SRF and AL/40-30



18.06.2024

Workflow of RFD CM in SM18- Vacuum



Acceptance criteria

Leak tightness requirements:

- Helium to beam vacuum $2 \cdot 10^{-10}$ mbar.l/s EDMS 1389669
- Air to beam vacuum $2 \cdot 10^{-10}$ mbar.l/s EDMS 1389669
- Helium to insulation vacuum $< 1 \cdot 10^{-9}$ mbar.l/s EDMS 2228665
- Air to insulation vacuum $1 \cdot 10^{-8}$ mbar.l/s EDMS 2228665

RGA Requirements EDMS 2779658:

3.2 Residual gases composition

The RGA scan must be normalized to the highest peaks (H_2 or H_2O) and the RGA is considered non-conform if one of the following levels is not respected.

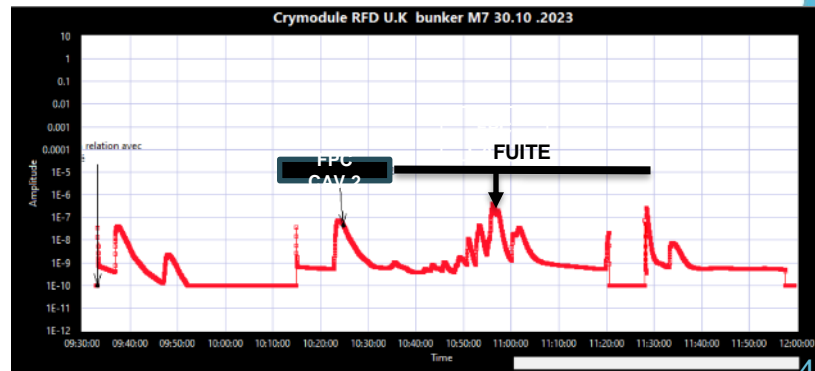
- Highest gas not being H_2 or H_2O ;
- Mass of 40 (argon) > mass 39: Indication presence of Air;
- Light hydrocarbon (27,29,35,37,39,41): at least 100 times lower the maximum peak;
- Masses > 50: at least 1000 times lower the maximum peak;
- Presence of mass 4 (He).

Leak check beam line

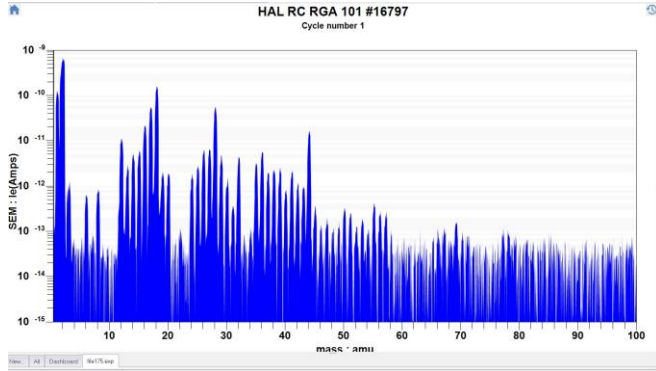
Installation pumping group with laminar flow



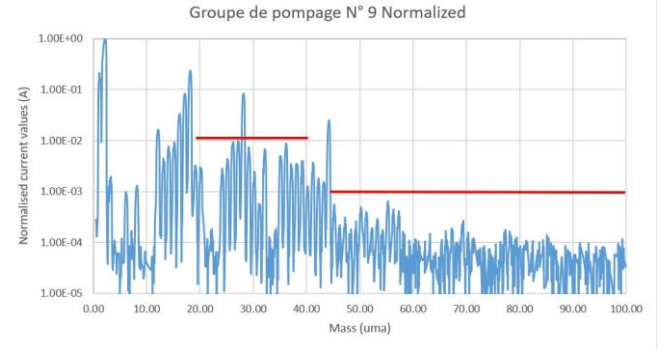
Non-acceptable leak found on the FPC2
Leak rate : 3×10^{-7} mbar.l/s
(Report EDMS2978057, NCR EDMS2995891)



RGA Beam Vacuum

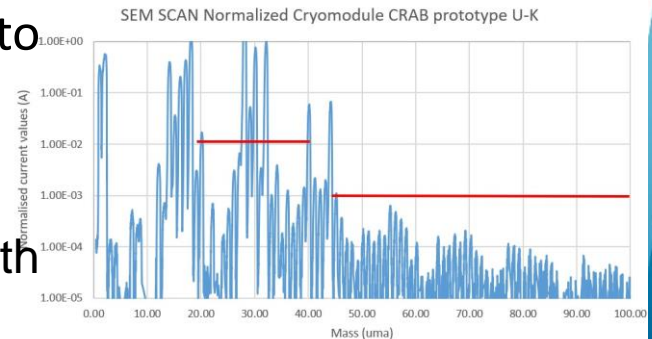
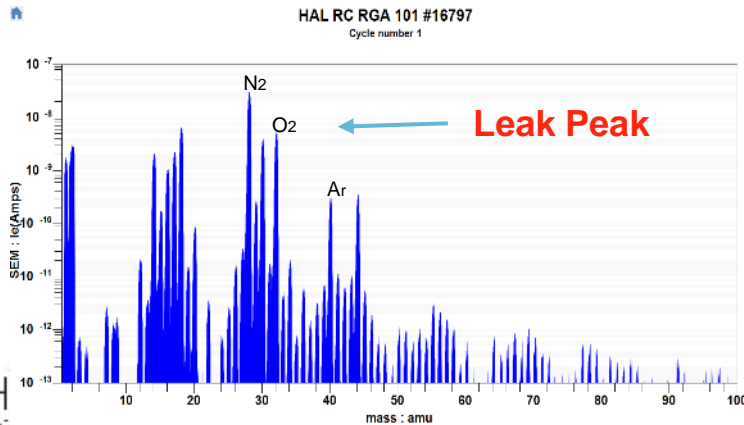


RGA of the pumping group alone



5 RGA of the pumping group connected to beam vacuum

Leak confirmed with the RGA

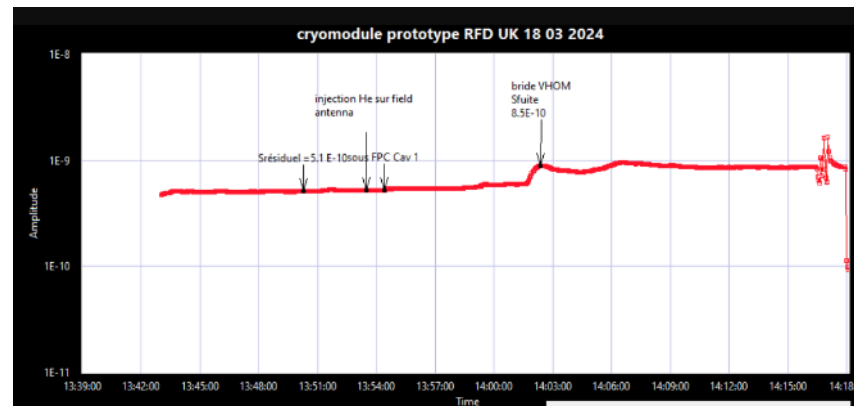
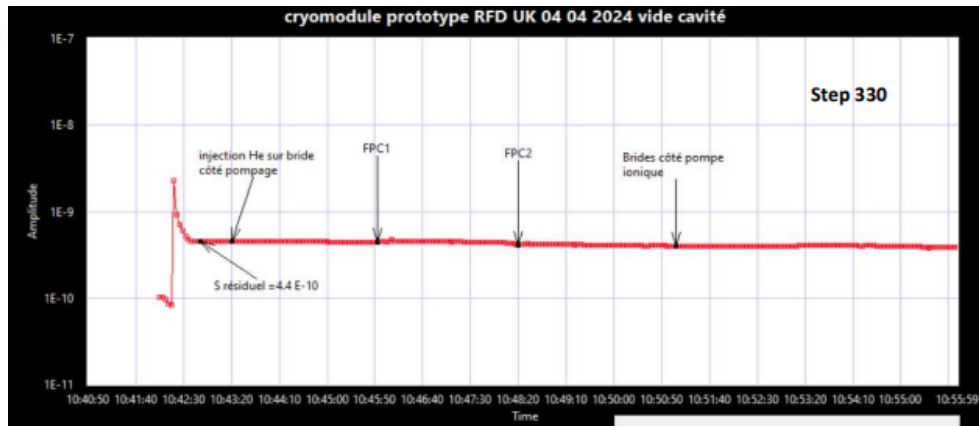


Leak Test after repair

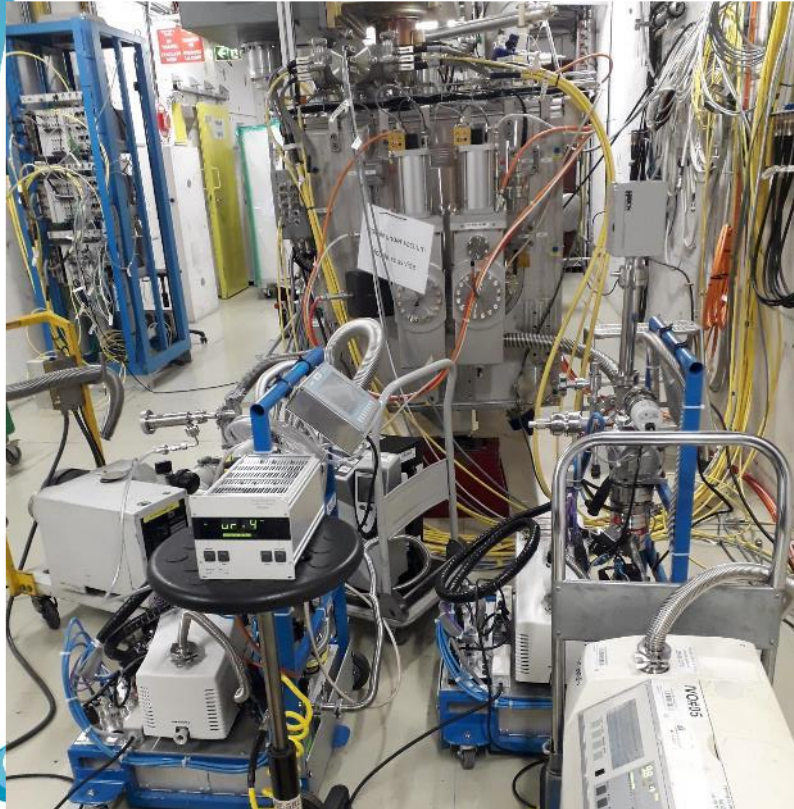
Leak test of beam vacuum after repair: EDMS 3065066 EDMS 3065223

No leak in FPC2 after the repair

However, leak found on VHOM2, leak rate 2.33×10^{-10} mbar.l/s → Accept as it is; it's too risky to try to repair it.



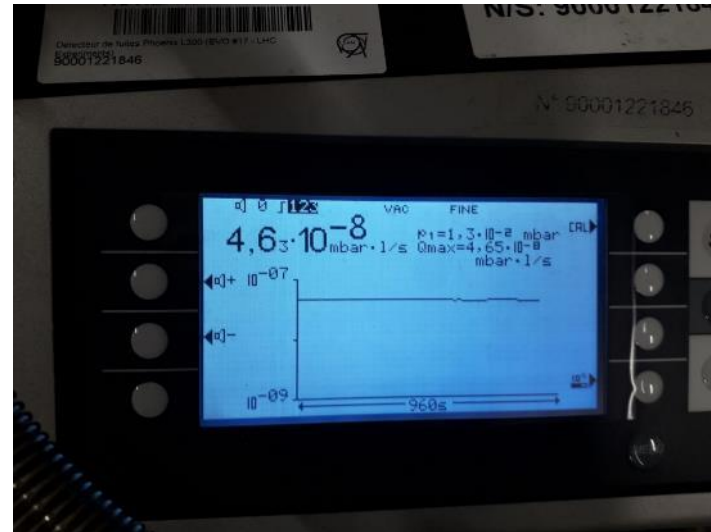
Leak Test Insulation Vacuum



Pumping with one primary dry pump and a group ACP40 TE/VSC

Leak Test Insulation vacuum

During pressure test of the Cryo Lines, the pressure of the insulation vacuum and the beam vacuum was stable



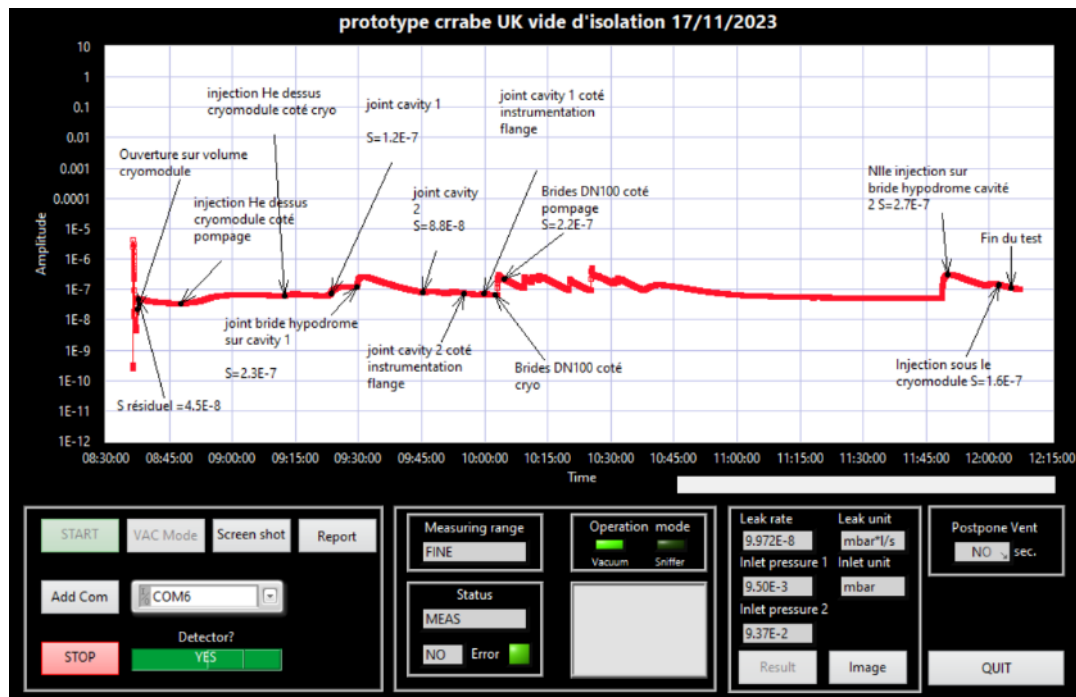
Leak Test Insulation Vacuum

Leak test insulation (spraying helium around the VV) :

Two leaks at 10^{-7} mbar range detected (connection to pumping group, small window of the VV).

Both leaks repaired after the RF test.

(Report EDMS 2978054,
NCR EDMS 3009145)



Thanks to TE-VSC for their support, specially to
A. Harrison and G. Bregliozi

QUESTIONS?

Remise à la Pa d'azote filtré du vide cavité avec vanne micrométrique 1mbar/s

Groupe de pompage n°9 RF/SRF



Vanne venting du groupe



vann
e
ventin
g

Remise à la Pa (1000 mbar) d'azote filtré du vide isolation avec vanne micrométrique

Mise en place d'une vanne de venting sur le groupe de pompage



Détail de la vanne de venting

