

LArFCS Cryogenic System Progress

Yichen, Sergey

9/14/21

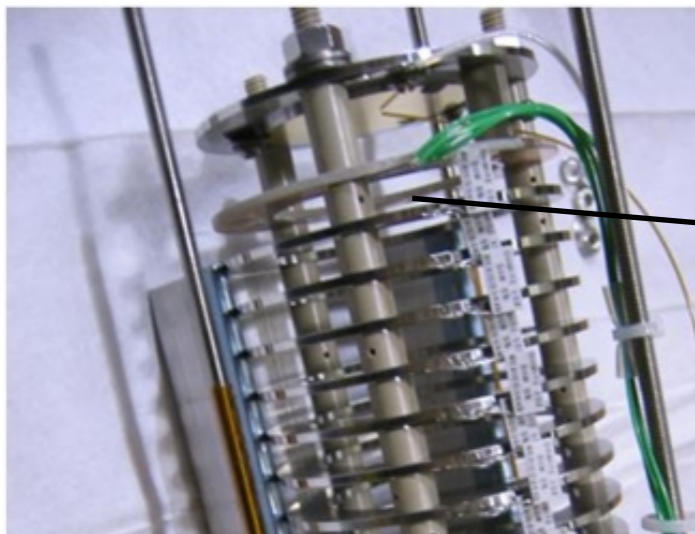


LArFCS Construction

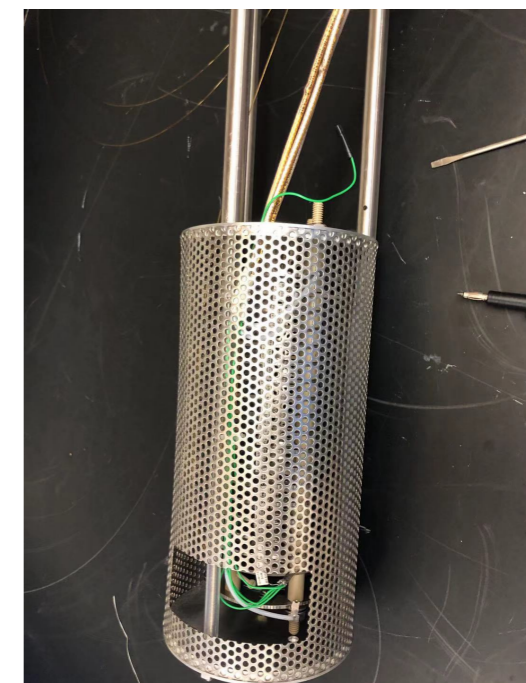
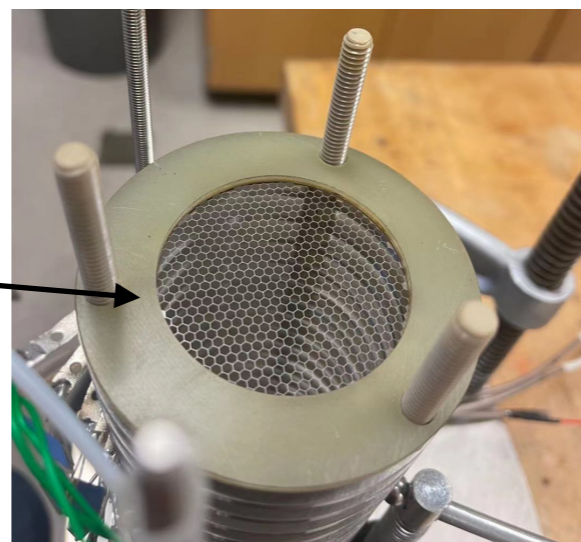
► PrM progress at UCI

- Refurbishment of our PrM stack completed
 - Missed resistors soldered to the stack
 - Broken wires found on cathode side grid
 - Replaced with the most recent honeycomb grid (Original grid is made in parallel wires)
 - Assembly complete, waiting for the test
 - Sending the Xenon lamp this week once it's available

Original



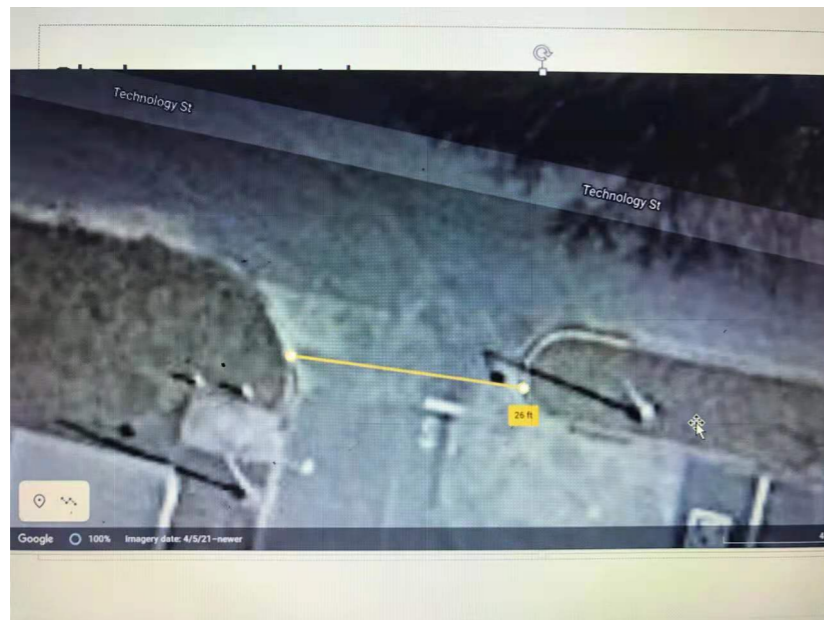
Current



6000 Gallon LN2 tank Site Survey

▶ Airgas is still generating the site survey report

- Current hold up is their logistics department is determine a viable route to access to the tank
- Entrance intersection width may limit the access of the full size 18-wheeler truck
- I was required to conduct a field measurement to confirm the actual width of 26 ft.
- Once their logistics department cleared on the delivery route, the final site survey report will be approved by Airgas and provided to us



6000 Gallon LN2 tank Commissioning

- ▶ **CAD cryogenic experts (Andreas Warkentiens, Mark Sardzinski) visited to help fix the problems**
 - They are people appointed by Mike Gaffney
 - They agreed to help us resolve the problems
 - Regular maintenance job for them and our problems are typical, no technical difficulties, only limit is they are low on man power recently
 - The insulation vacuum of 100 mTorr is confirmed to be okay for operation.
 - Suggestions on the next steps provided (on the next slides)
 - I'm putting up a part listing to review by CAD experts



6000 Gallon LN2 tank Site Survey

▸ Single pressure relief devices on the safety tree

- Recommendation: implement identical safety tree (burst disk+relief valve) on a three-way valve
- Worn label on the relief valve and burst disks

▸ Pressure relief tree solution

- They can do the installation for us
- Recommend to get the parts from Airgas with suggested specs
- CAD has facility to re-certificate the relief valve

Ours



Example



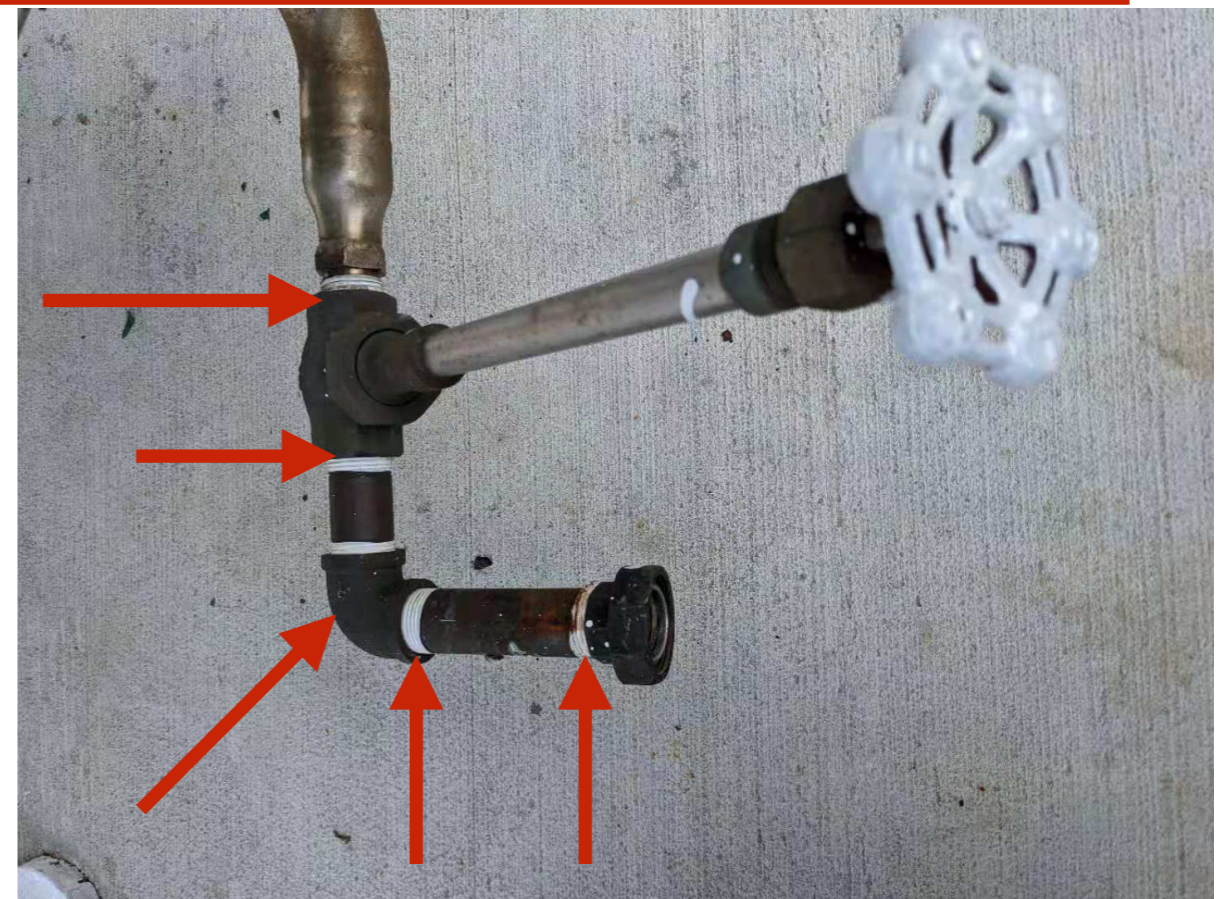
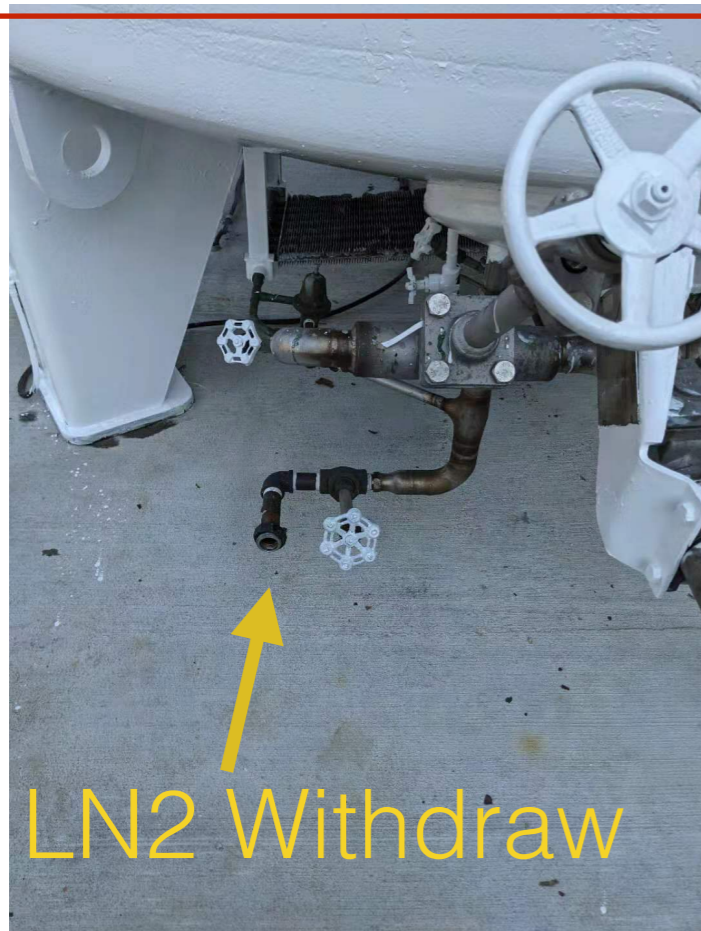
6000 Gallon LN2 tank Site Survey

▸ non-cryogenic compatible materials used on the current plumbing

- Teflon tape and brass fittings found on the LN2 withdrawn, not suitable for cryogenics
- Requirements: Replacement with cryogenic compatible materials by cryo tech. (concurrent by Mike)

▸ LN2 output port issues resolution

- The current cryogenic valve with cryogenic brass body can be reused
- Just need to order Stainless Steel tubing with the right size, and fitting
- Sealing will be done with cryogenic tape or cryogenic paste



6000 Gallon LN2 tank Site Survey

▸ Filling valves and free hanging gasket materials

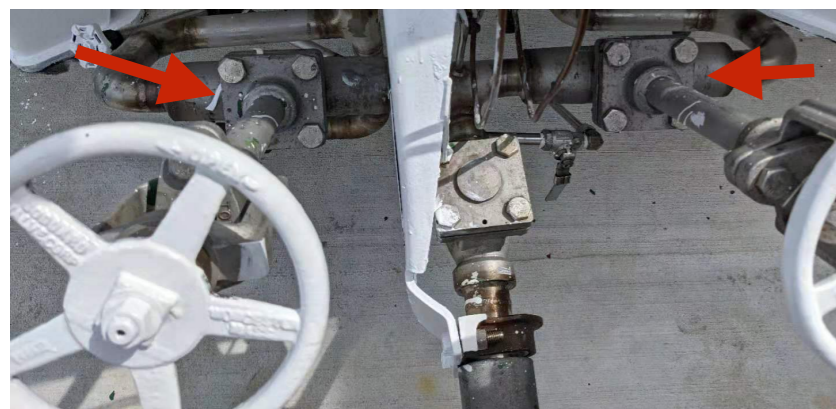
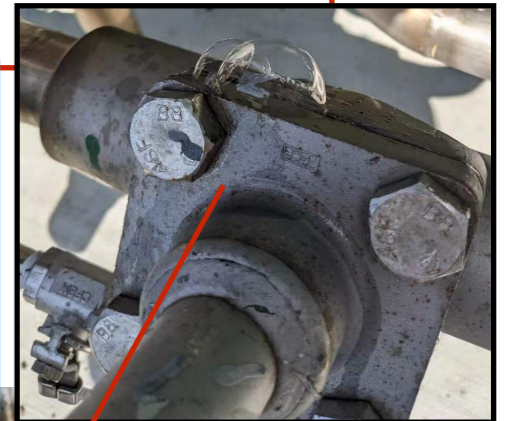
- The leakage situation will usually be worse in cold
- Requirement: Fix by cryo tech. (concurred by Mike)

▸ Leakage on the filling valve resolution

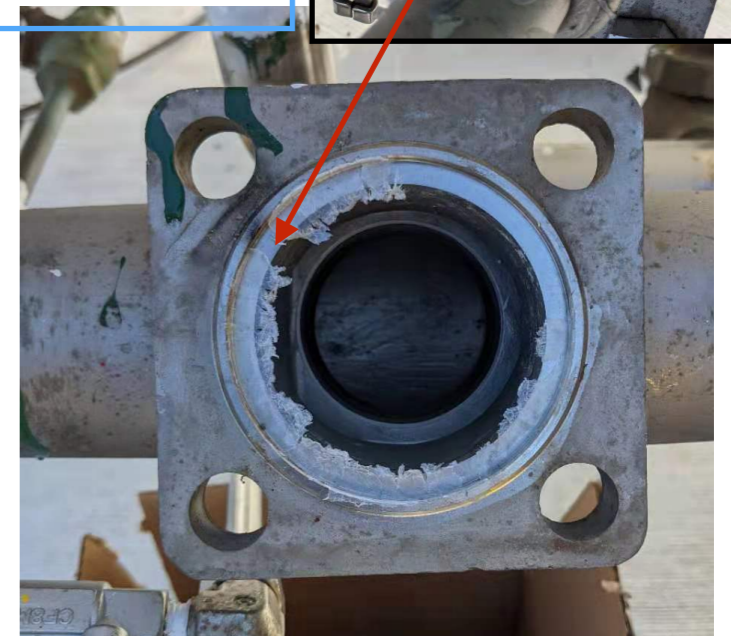
- Leakage is common on such valves
- The white strip hanging there is a part of previous sealing material
- The seal needs to be replaced
- Need to take apart the filling valves to check the seal

▸ Filling valves troubleshooting

- Opened on the two filling valves (We can open it, but needs cryo. expert to put it back)
- Right valve leaking badly does shows a gap on the sealing
- Confirming with the CAD experts for the materials they have in stock



Left



Right



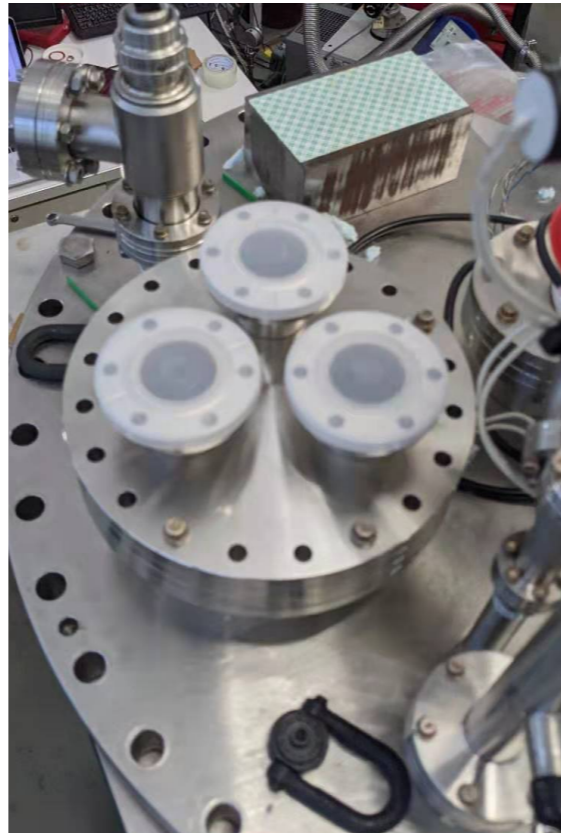
LArFCS Construction

► PrM Mounting structure fabrication

- The Top Flange and mount done by KHV
 - Complete with some after production modification with problems found on site visit
 - Picked up at the factory after completion
 - Mocking up installation on the the main flange
 - The actual measured dimensions agrees with the design



LArFCS Construction



ESH Safety Inspection

▶ ESH Inspection on HighBay

- Scheduled this afternoon
- The lab space thoroughly cleaned up
- Corner room cleaned up, everything useful has been taken out
- Area with clearance distance requirements cleared

