

LArFCS Cryogenic System Progress

Yichen, Sergey

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LArFCS Construction

▶ Gas sampling panel assembly

- The assembly is still in progress
- I've done a part of the plumbing and tube bending
- Some minor modifications still needed for the panel
- Will finish the assembly when Russ is back



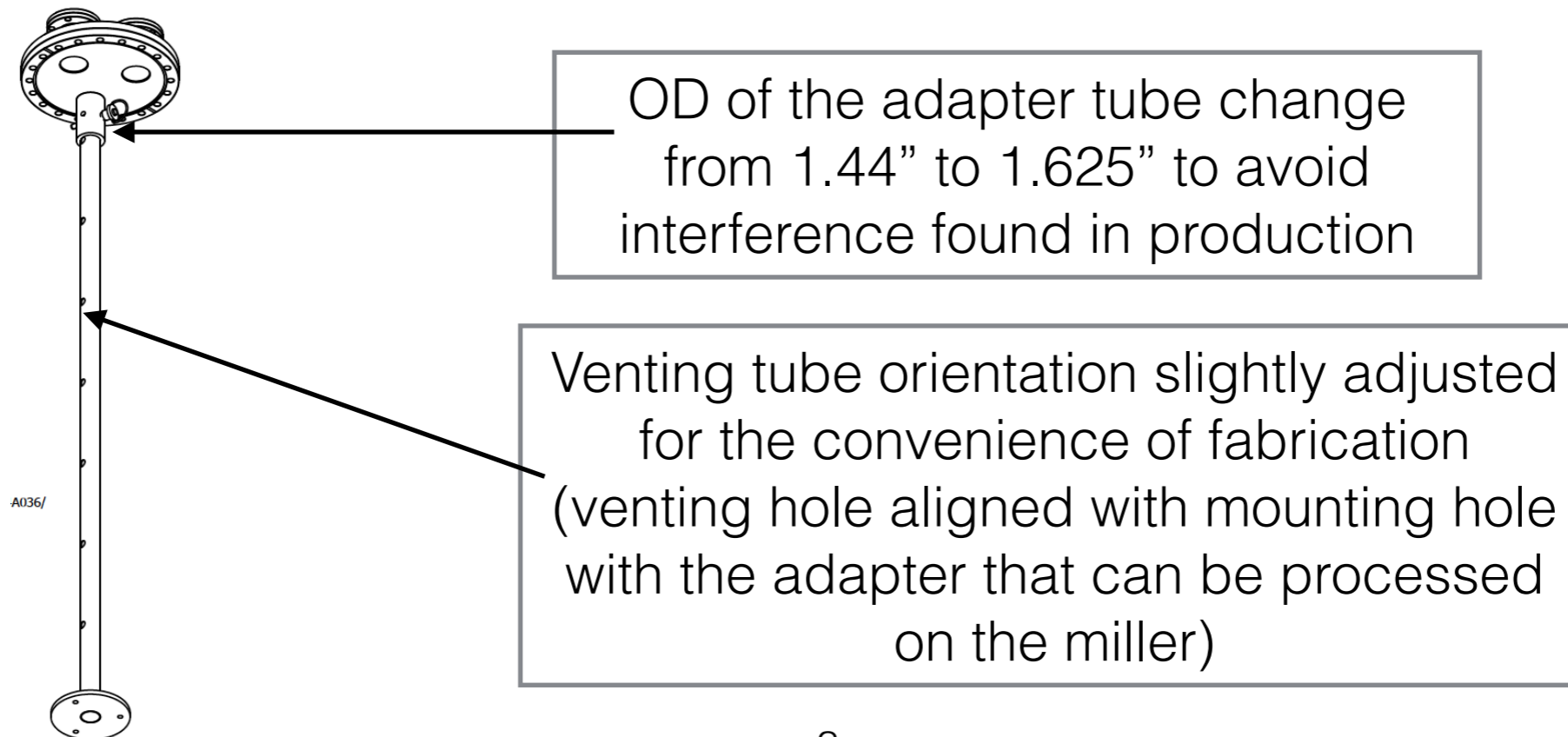
LArFCS Construction

► PrM preparation

- PrM stack fixed
- I'm sending our Xenon lamp to UC Irvine for comparison test
- Number of electrons extracted from the PrM cathode in the previous run is estimated to be $\sim 10^5 - 10^6$
- Jianming mentioned Fermilab once tried to use UVLED as light source for PrM, performance is not very good, he is looking for the references

► PrM mounting structure

- KHV is still fabricating the adapter tube and long mounting tube
- Lead time is ~ 3 weeks



6000 Gallon LN2 tank Site Survey

- ▶ **Airgas cryo technician conducted the site survey last Thursday**
 - Mike Gaffney attended the site survey
 - Mike provided his summary (see [BNLIF-doc-331-v1](#))
 - A site survey by Airgas cryo tech is expected soon
 - A couple problems found during the site survey (Details on next slides)
 - Mike Gaffney refers to the CAD cryogenic group to help and guidance for the commissioning
 - The problems are required to be resolved by cryogenic professionals
 - Andy Warkentien did the last commissioning of the tank when it moved from Bldg 21 (compressed gas station around 2007-2008) to the previous Princeton Ave. location
 - Setting up meeting with Andy at the tank to go through the problems found in the site survey



6000 Gallon LN2 tank Site Survey

► Problems found in the 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

Ours



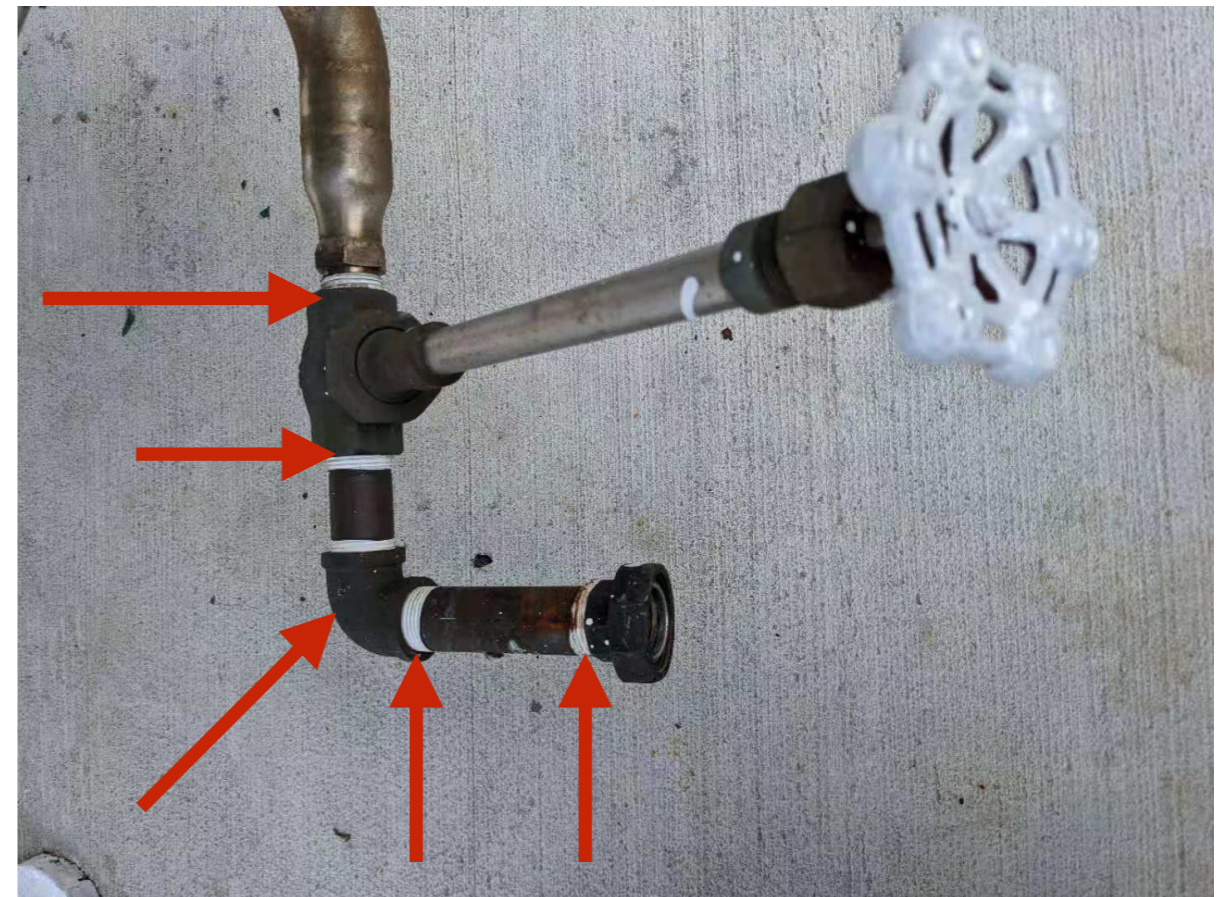
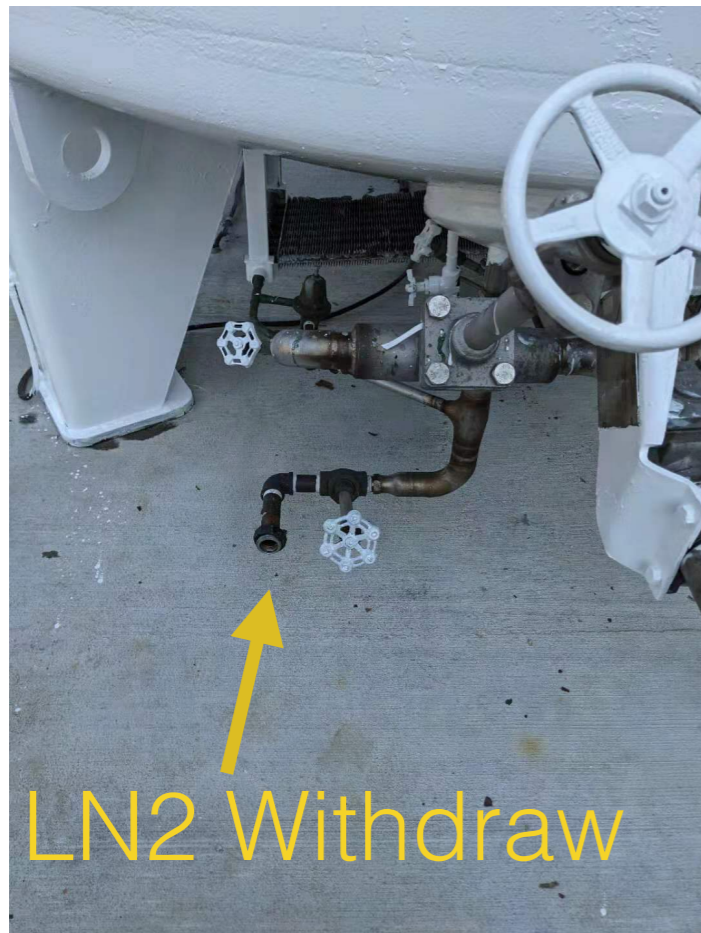
Example



6000 Gallon LN2 tank Site Survey

► Problems found in the survey

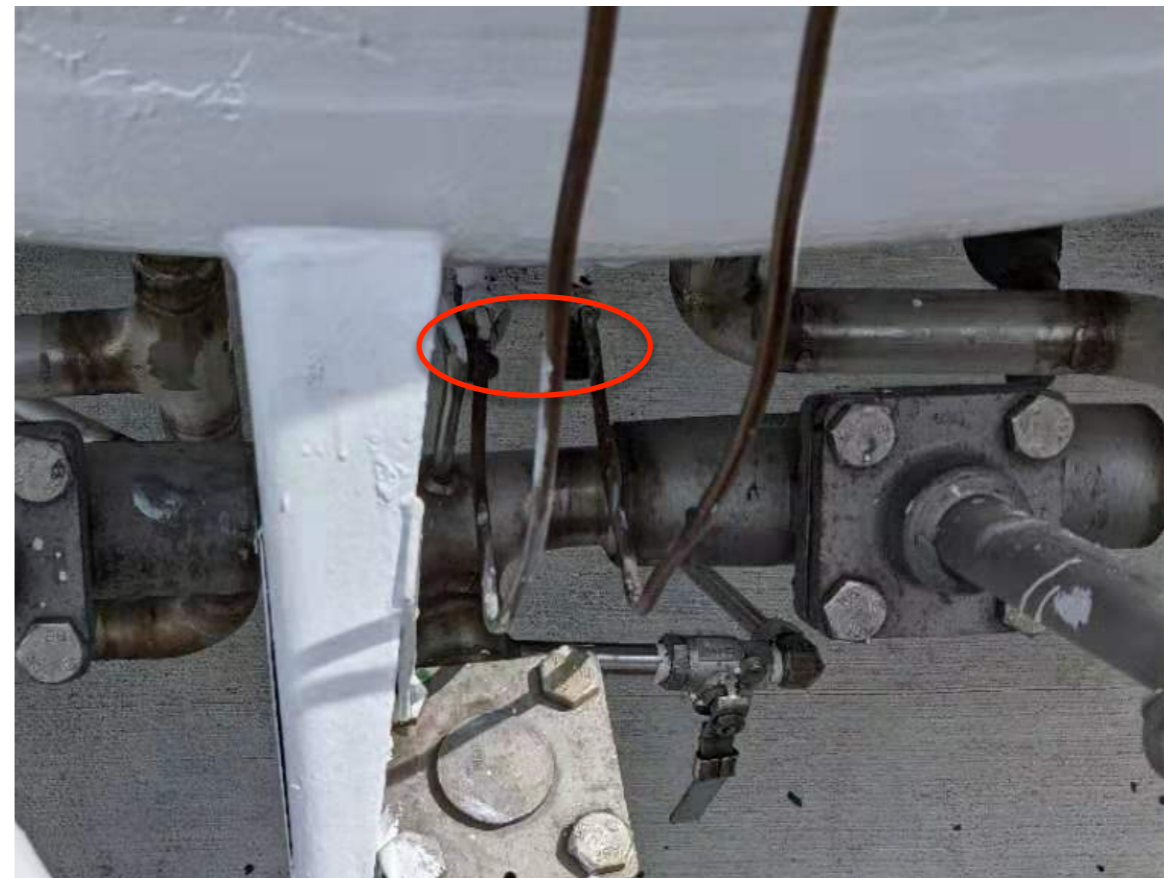
- non-cryogenic compatible materials used on the current plumbing
 - Teflon tape and brass fittings found on the LN2 withdrawn, not suitable for cryogenics
 - Requirements: Replacement with cryogenic compatible materials by cryo tech. (concurred by Mike)



6000 Gallon LN2 tank Site Survey

► Problems found in the survey

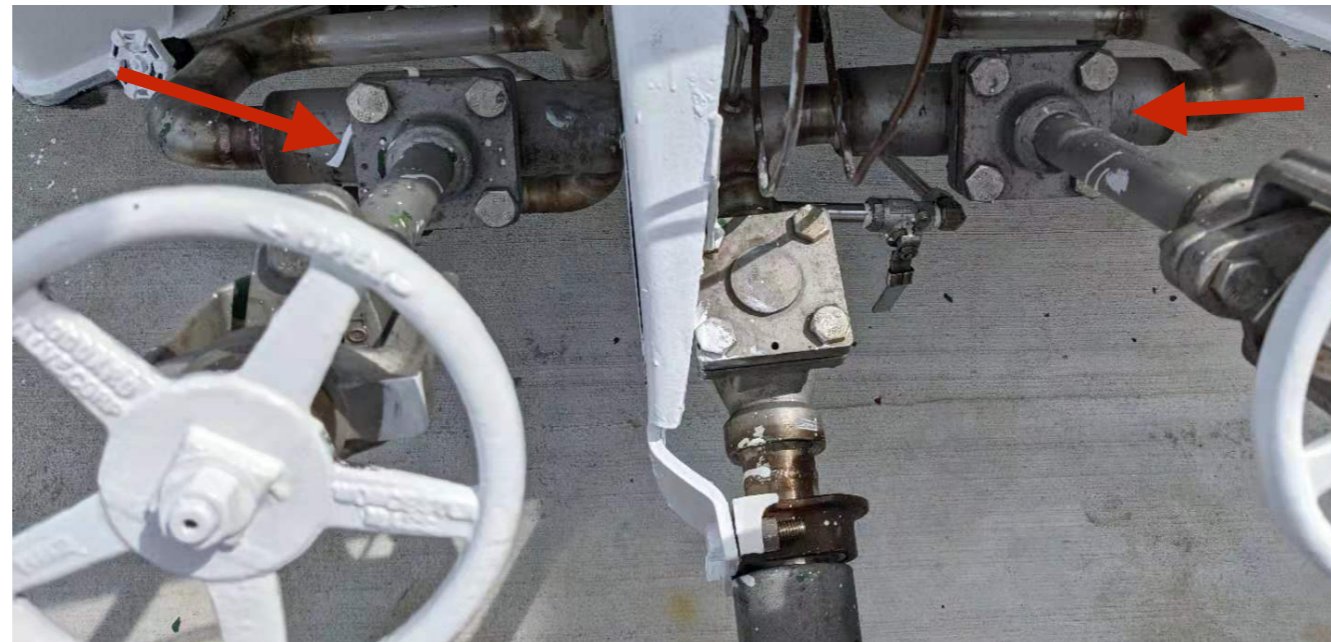
- Valves on the pressure differential level gauge on the tank worn out
 - Requirement: Replacement with new valves
- The pressure and level gauge are in good shape
- Airgas is going to install a remote electrical level gauge to monitor and control with solar panel once re-establish the delivery



6000 Gallon LN2 tank Site Survey

▸ Problems found in the 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)
- No label on the valves
 - A couple valve labels are missing
 - Requirement: At least clearly label the operational valve for filling by the truck driver
 - Additional Requirement from Mike: Put on label in accordance with the P&ID diagram



6000 Gallon LN2 tank Site Survey

► **Problems found in the survey**

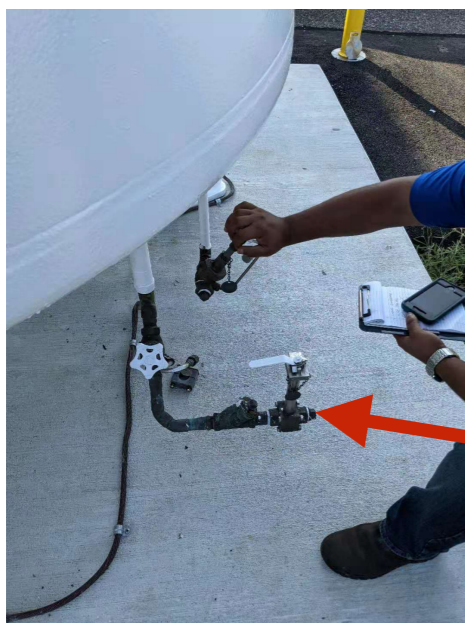
- Venting valve for LN2 filling pointing to the concrete
 - It would cause damage to the concrete pad
 - Requirement: A sheet of metal, Aluminum/SS plate underneath the valve to avoid LN2 direct pouring to the concrete surface



6000 Gallon LN2 tank Site Survey

► Comments and Suggestions

- The truck route is a part of the site survey
 - Most like need a trailer for the delivery
 - Need to make sure enough space on the parking lot
- Auxiliary LN2 output at the back of the tank can be used to implement the LN2 plumbing fixture
 - The function of filling portable dewars from the front kept
- Airgas will conduct a standard cleaning procedure before filling
 - Purge the tank for at least 5 times with LN2 flushed into the tank
 - The purging usually take 6 hours



6000 Gallon LN2 tank Site Survey

▶ **Comments and suggestions**

- The radiator for pressure building doesn't need to be replaced for now

▶ **Next steps**

- Fix the problems found in the survey with the help from CAD cryogenic group and Magnet Div.
- Get approval from Mike Gaffney to conduct the initial filling/purging by Airgas
- Final safety approval for commissioning the tank for filling portable dewars
- Setup delivery contract with Airgas

