260-L LAr System Progress Report

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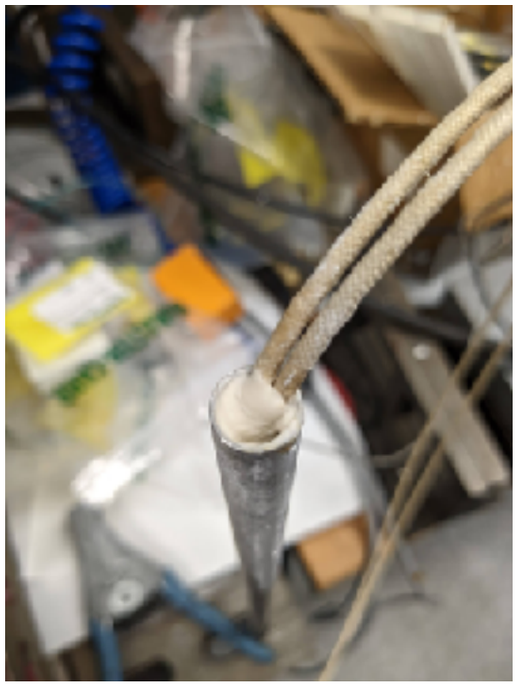
Lab Safety and Space Management

- COVID level in Suffolk County is HIGH now
- Face masks are required onsite at BNL
- Please remember to wear the face mask when arriving at the gate
- Take the additional trainings required for all employee
  - ~~Ethics and Privacy by 9/2;~~
  - Active shooter training by 9/30
- My crane operation training renewed
- CRP coldbox ESR is still under review

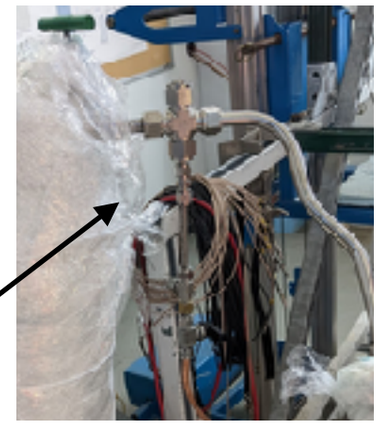
New LAr Heater Test

- **LAr heater to accelerate the circulation**
  - Maximum power 735W with 120V AC—>Max. current is ~6.2 A
  - 1/2” diameter with 6” length; Head to head weld to a 1/2 SS tube
  - Wire leads mechanically crimped, no soldering; Tube volume sealed with plaster
- **Heater test**
  - Water heating test with power supply with a AC variator with 0-140V AC output with current monitoring
    - The AC variator has a 10 Amp fuse, exceeding the heater rating
    - Current slight drops during water heating at constant AC power supply—>Resistance increases with temperature
    - Possible reason for heater broken: resistance drops in cryogenic temperature, overload with the same supply voltage:
    - Solutions: Limit the maximum voltage; Replace the 10 Amp with a 6 Amp fuse
  - LN2 boiling test will be conducted next in an open mouth dewar



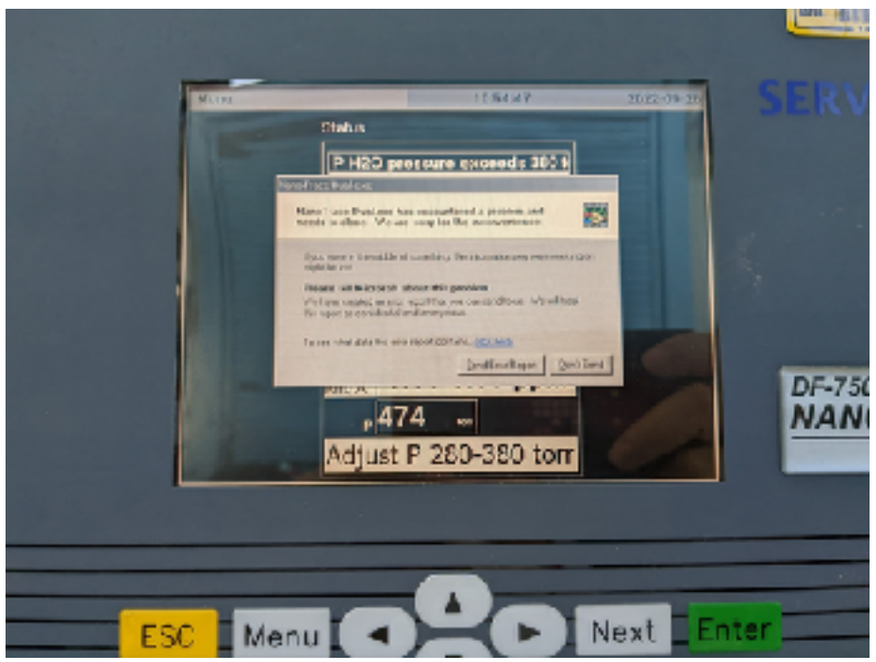

Inline filter liquid sampling test

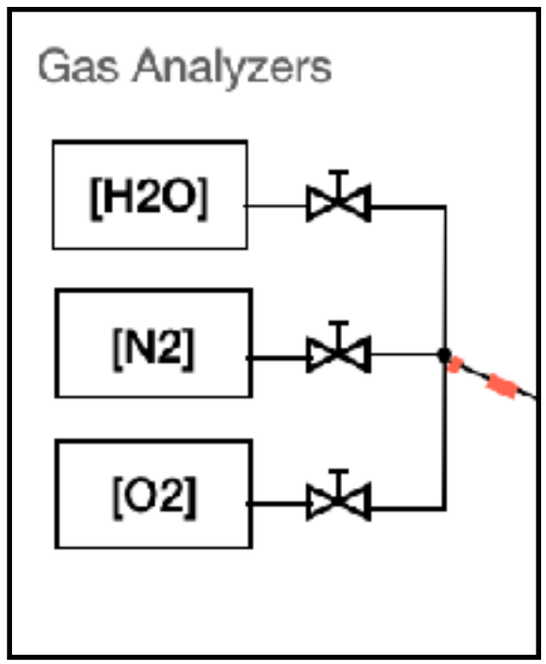
- **Inline filter performance test with liquid**
  - Direct liquid sample at the outlet of inline filter when transferring LAr from one supply dewar to the other one
  - Validate performance of inline filter with LAr without influence by the filling hose
  - Plumbing completed, system leak check in progress
  - Plan to conduct the measurement tomorrow



Oxygen Analyzer calibration

- **Oxygen analyzer calibration with input pressure**
  - Moisture analyzer error message occasionally pop ups
  - Analyzer stops data taking and disturb the flow/reading to the other analyzers
  - It seems to associate with the onsite power dip
  - Every time it can be solved with reset and INI file restoration
    - It works well since yesterday afternoon
  - Will conduct the measurement after inline filter test
    - If the problem still exist, will stop the flow to the gas analyzer

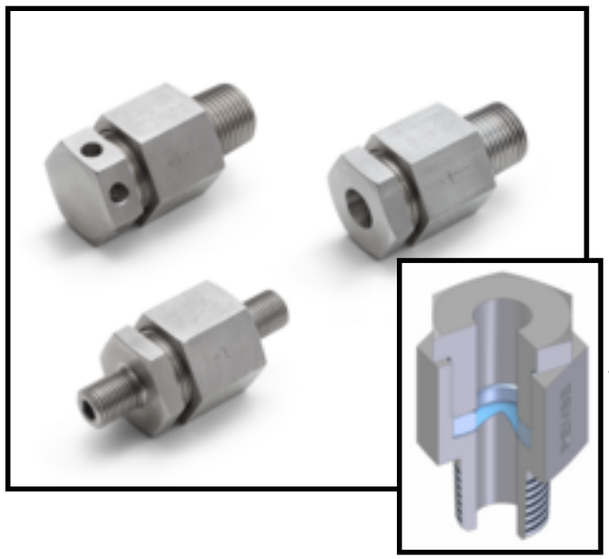


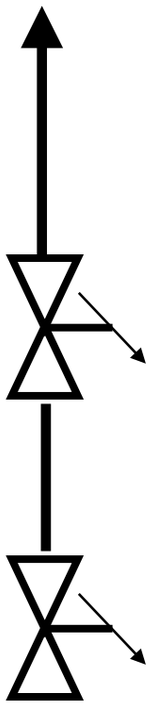


Improvement on pressure relief

- **Change to a 2-stage pressure relief device in series**
  - To ensure the leak tightness
  - Burst disk with metal seal to ensure no leaks
    - Potential vendor found with the product we need
  - Relief valve for safety ensure no air exposure
    - Aleksey provides an inline check valve but not leak tight to our requirements
  - Consulting with Mike Gaffney to get higher pressure rating

Burst disk





Relief valve

Plan for the next run

- **Improvement on the inline filter**
  - Change the location and devices for the pressure relief
  - Change to the rupture disk+relief valve structure on the inline filter and the filling line
- **Improvement on the filling line**
  - Replace the flexible hose to 1/2 SS tube for most part of plumbing
  - Reserve only ~3-4 ft flex hose for installation flexibility with swagelok fittings
  - Seal the drain valve on the main dewar with epoxy
- **Top flange improvement**
  - Open-up the top flange and move it to the assembly stand
  - Replace the broken heater tube
  - Replace the differential level gauge
  - Adding gas sampling tube
  - Increase the size of liquid sampling tube