Detector Support Group
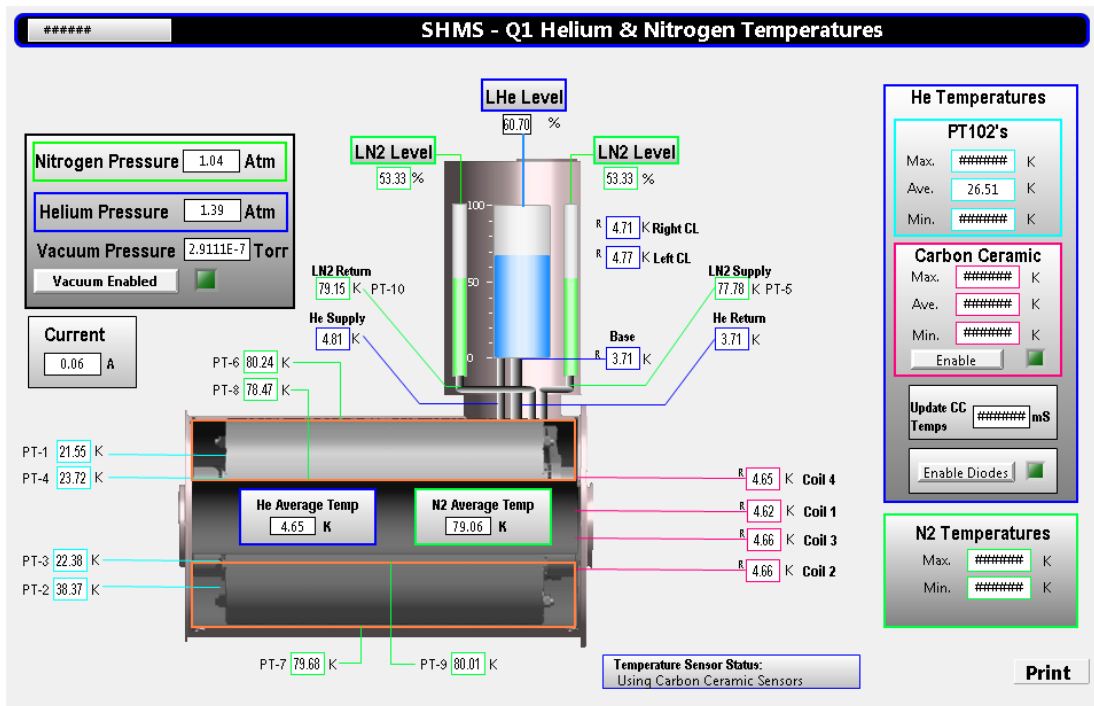**Weekly Report, 2019-03-27**

Summary

Hall C EPICS

- SHMS-Quadrupole_1 cryogenics CSS-BOY screen developed.
  - ✦ SHMS-Q1 Helium and Nitrogen Temperature HMI screens combined in one screen.

SHMS – Q1 Helium and Nitrogen Temperatures CSS-BOY screen

- Communication tested between SHMS/HMS PLC and EPICS.
  - ✦ Problems found in writing Boolean and integer data types from the *EPICS OpcIocShell* (OPC Client) to DSG-PLC.
- CSS-BOY screen test developed to test conversion of PLC tags to EPICS PVs.
- High voltage list-view and histogram screens created for 13 SHMS detectors using CSV-to-CSS Python script.
  - ✦ Drop-down menu added to screens.
- Backup-and-Restore Python programs improved to decrease execution speed.
  - ✦ Previous version implemented individual caget/caput commands for each PV.
    - ▪ Execution time is ~300 ms/PV.
  - ✦ New version uses pyepics' caget_many/caput_many command to read/write arrays of 500 PVs at a one time.
    - ▪ Execution time is ~1.5 ms/PV.

Hall C CAEN-SY4527 Test Station

- Creation and configurations of EPICS-SoftIOC application in progress.
  - ✶ Installed *"makeBaseApp"* to build and run SoftIOC sample.
  - ✶ Created *Top* directories required to run and configure SoftIOCs.
  - ✶ Created *Host-Base IOC* boot directory.
- Voltage testing continued for all module channels.
  - ✶ 48 channels tested.
  - ✶ Checked measured output voltage against the monitored voltage provided by the CAEN crate.
    - ▪ These two values are compared against the voltage set point.

RICH

- Python d0 calculation debugged.
  - ✶ Compared to C program, Python's calculation of center of d0 spot differed by ~ 5µm for each mirror.
  - ✶ After debugging, the location of the d0 spot center is the same in Python and in C.
    - ▪ Difference was due to C program using center of histogram bins whereas Python was using left edge of histogram bins.

LTCC

- Gas supply diagram created in Visio.

LTCC C_4F_{10} Gas Supply
M.A. Antonioli
3/20/19
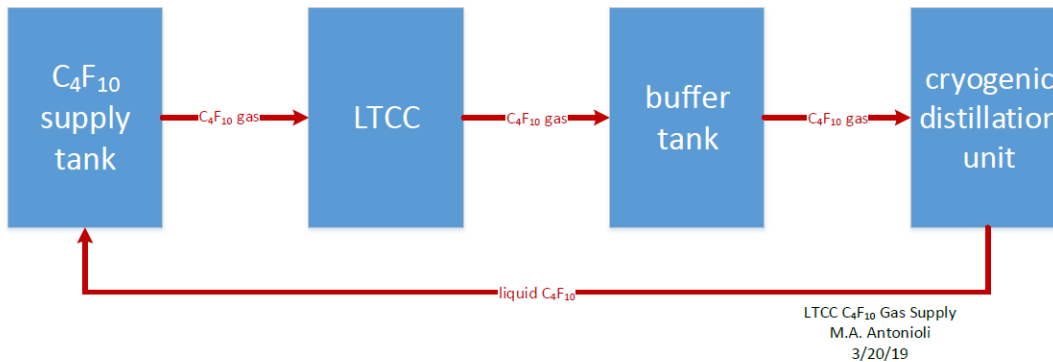
- 120VAC solenoid coils uninstalled from old sniffer system (fire protection system) to be used as spares.
- Zeroed and calibrated Distillation Unit's scale.
- C4F10 Supply tank weighed on scale.
  - ✶ The current weight is 36 Kg.
  - ✶ The last recorded value was 44Kg (2/19) before the tank was moved to the hall, which gives a total usage of 0.23Kg/day over the last 35 days for both sectors (3 and 5).
  - ✶ Scale indicates 0.23Kg/day, MFC indicates 0.20Kg/day

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Sector	Daily Flow (L)	Est. Total Use (Kg)	Days since fill
3 Supply	17.56	5.8	56
5 Supply	29.24	9.1	51
C4F10 Ret	34.11	11.26	56

Hall A HCAL
- Tested and labeled 41 BNC to LEMO cables.

Engineering Division
- PCB population for VME FSD boards completed for Machine Protection System.

Accelerator Division R&D
- Received 1 cm x 1 cm superconducting Nb3Sn strip resonator sample and used it to set up wire bonder parameters.

DSG R&D
cRIO Test Station
- NI-9265 wiring diagram created in Visio.
- Summary document made of first eight modules in cRIO Test 1.
- Test of module NI-9216 conducted.
  - ✶ Four test cables fabricated and wired to module.
  - ✶ Wiring tested by reading RTD module channels individually.
    - Found ~ 0.5 Ω noise average for all eight RTD channels.

FPGA Artix-7 Test Board
- Test program developed to change test board's physical clock (defined by a 100 MHz oscillator) to meet specifications for temperature sensor I^2C communication (0 – 400 MHz).