Summary

Hall C Slow Control Systems
- Implementation of EPICS slow control systems in progress.
  - ✶ Update of EPICS extension programs for the stand-alone test station performed.
  - ✶ Two DSG computers ordered to make Linux-based EPICS machines for system development.
- Meeting with Steve Wood to discuss EPICS Development.
  - ✶ Initial SHMS & HMS CSS GUI control screens will look like the current PLC HMI to aid users in the transition to EPICS control and monitoring. Cyro monitoring with a web-based screens will be initially developed.
  - ✶ The MS Windows-based SoftIOC that hosts the EPICS PV's (made from PLC tags) will be replaced at a future date with a Linux-based SoftIOC server dedicated to Hall C.
- Created test IOC on DSG-C-LINUX1 using built-in example template
- Created CSS screen to display example PVs.
- Installed Tomcat Webserver and webopi on DSG-C-LINUX1.
  - ✶ Tomcat is java-based server application that CSS suggests for hosting webopi files.
  - ✶ Successfully able to run Tomcat server.
- Investigated how Hall B's CSS screens are opened.
  - ✶ Hall B's screens are opened by typing clascss into terminal.
  - ✶ Screens are opened in runtime mode in a temporary CSS workspace.
  - ✶ Does not allow users to edit screens.
  - ✶ Modified script used by Hall B to work on DSG-C-LINUX1 and debugging executable to make it open a local test OPI file.
- Started development of CSS screens.
  - ✶ Created a "home" screen containing menus with options for each spectrometer and magnet.
- Found many PVs aren't being archived by MYA.
- Found out that Hall B OPI is being served by a VM being run by Computer Center.

Hall C Magnets
- Finalized Current Loop PLC program
- Started work on converting Python/SBC code to LabVIEW/cRIO
  - ✶ Found a potential bug with the Ethernet/IP driver for LabVIEW
  - ✶ Unable to access individual DINT bits for controlling relay channels.
    - ▪ Filed support ticket with NI, which has already been escalated to R&D.
- Calculated memory size needed in Controllogix 1756-L62 PLC controller to implement array to carriage data from 1756-IF4FXOF2F/A module at its max speed of 3.33 KHz
  - ✶ PLC I/O memory increments ~ 0.40 % (equivalent to 1936 bytes) when a 1756-IF4FXOF2F/A module is added to PLC chassis.
  - ✶ No problems adding this type of modules should be ok.
  - ✶ To keep the data in the PLC User memory for ten minutes after and before a quench event, it requires:
    - ▪ Array with a size of $4*10^6$ elements, which represents ~ 16 MB in terms of User PLC memory.
    - ▪ The max size allowed for the creation of an array by RSLogix5000 is 2 MB.
    - ▪ Since PLC ControlLogix L62 has a total of 4 MB User memory, holding an array of 16 MB size is not possible, even if array to handle input data is divided.
    - ▪ Currently available HMS PLC User memory is ~ 2.1 MB (50.37 %).
    - ▪ Currently available SHMS PLC User memory is ~ 1.53 MB (36.66%).

- Upgrading 1756-IF4FXOF2F/A firmware from 1.4 to 3.5 in progress.
    - ✶ Communication issues with the module; contacted Rockwell support.
    - ✶ Verified that 1756-IF4FXOF2F series A used in the Standalone PLC test stand has a 3.5 firmware running with no issues.

RICH

- Assembly of RICH N2 auto-change manifold in progress.
    - ✶ Created RICH-N2-auto-change-test.pdf
    - ✶ Created RICH-N2-auto-change-press-system-components.pdf

Figure shows some of the gas system components assembled for RICH N2 Auto-change

HDice

- "New" (borrowed from vendor) RF generator in HDice lab set up.
- Reviewed specifications for the proposed lock-in amplifier upgrade for the 3rd rack.
    - ✶ Zurich RF lock-in Amplifier model UHFLI.
    - ✶ DC to 600 MHz, 1.8 GSa/s, 12 bit
    - ✶ Software support available in LabVIEW, C, and Python.
    - ✶ Time and frequency domain analysis of signal inputs and trigger signals available.
    - ✶ A re-write of the HDice NMR program would be necessary to use this new lock-in amplifier.
- Revision of the flow chart for the new HDice NMR program with synchronous mode operation is in progress.

LTCC

- New solenoid valve power chassis ordered.
- Writing code for Solenoid valve controls and displays at Forward Carriage.
    - ✶ Tested code by using signals from the pressure transducers connected to S3 and S5.

2
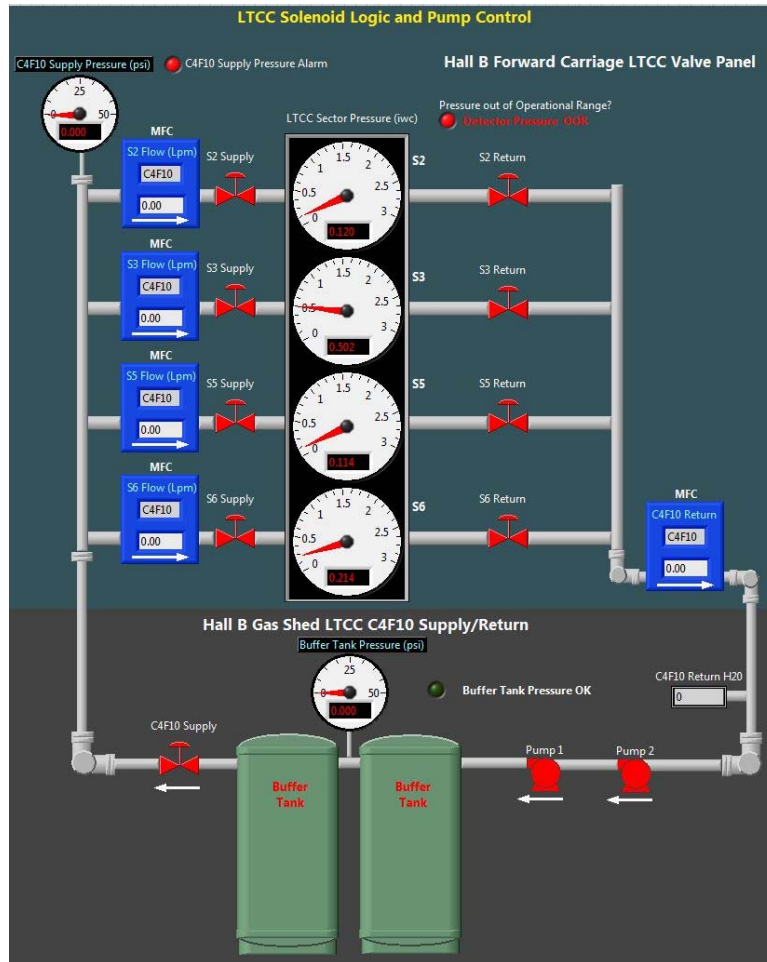
GUI to control and monitor LTCC solenoid valves at forward Carriage

cRIO Test Station

- Debugged LabVIEW program's cRIO controller configurations.
  - ★ Communication issues with NI-9205 module; unable to find input channels to read voltage from Krohn Hite voltage source.
  - ★ Issue solved by changing configurations in NI-9235 cRIO controller.
    - ▪ Changed programing mode from FPGA interface to scan interface.
- Ran final test for cRIO module NI9205 (All tests for ±0.2 V: Gain, Offset, INL, DNL).
  - ★ Results of the test within the operational parameters given by NI specs.

DSG

- Made final edits to and posted Notes 2018-20, 2018-21, 2018-22, and 2018-23.
- Development of slow-controls system based on National Instruments single-board cRIO **(sbcRio) FPGA** I/O in progress.
  - ★ Serial driver debugging for interfacing Sensirion SHT75 humidity and temperature sensor IC to PMC-FPGA interface.

Antonioli, Mary Ann

- Worked with Amanda on setting up "new" RF generator in **HDice** lab.

cRIO Test Station
- Ran final test for cRIO module NI9205 (All test, ±0.2 V). Tested Ok.

DSG
- Made final edits to and posted Notes 2018-20, 2018-21, 2018-22, and 2018-23.
- Formatted and edited two Notes on HDice CT-BOX.
- Continued editing PLC Note.

Bonneau, Peter

HDice
- Revision of the flow chart for the new HDice NMR program with synchronous mode operation is underway.
- Reviewed specifications for the proposed lock-in amplifier upgrade.
    - ✶ Zurich RF lock-in Amplifier model UHFLI.
    - ✶ DC to 600 MHz, 1.8 GSa/s, 12 bit
    - ✶ Software support available in LabVIEW, C, and Python.
    - ✶ Time and frequency domain analysis of signal inputs and trigger signals available.
    - ✶ A re-write of the HDice NMR program would be necessary to use this new lock-in amplifier.

Hall C Slow Control Systems
- Implementation of EPICS in Hall C slow control systems.
    - ✶ Update of EPICS extension programs for the stand-alone test station.
    - ✶ Two DSG computers are on order to make Linux-based EPICS machines for system development.
- Meeting with Steve Wood to discuss Hall C EPICS Development.
    - ✶ Initial SHMS & HMS CSS GUI control screens will look like the current PLC HMI to aid users in the transition to EPICS control and monitoring. Cyro monitoring with a web-based screens will be initially developed.
    - ✶ The MS Windows-based SoftIOC that hosts the EPICS PV's (made from PLC tags) will be replaced at a future date with a Linux-based SoftIOC server dedicated to Hall C.
- Held status and planning meetings on the implementation of EPICS in Hall C Control systems.

- Development of slow-controls system based on National Instruments single-board cRio (sbcRio) FPGA I/O.
    - ✶ Serial driver debugging for interfacing Sensirion SHT75 humidity and temperature sensor IC to PMC-FPGA interface
- Revised top-level DSG website index pages.

Campero, Pablo

Hall C

- Calculated memory size needed in Controllogix L62 PLC controller to implement array to carriage data from 1756-IF4FXOF2F/A module at its max speed of 3.33 KHz
  - ✴ PLC I/O memory increments ~ 0.40 % (equivalent to 1936 bytes) when a 1756-IF4FXOF2F/A module is added to PLC chassis; no problems, addition of this type of modules should be safe.
  - ✴ To keep the data in the PLC User memory for ten minutes after and before if a quench event happen it would be required:
    - ▪ Array with a size of $4*10^6$ elements, which represents ~ 8 MB in terms of User PLC memory.
    - ▪ The max size allowed for the creation of an array allowed by RSLogix5000 is 2 MB.
    - ▪ Since PLC controlLogix L62 has a total of 4 MB User memory, holding an array of 8 MB size is not possible, even if array to handle input data is divided.
    - ▪ Current HMS PLC User memory available is ~ 2.1 MB (50.37 %).
    - ▪ Current SHMS PLC User memory available is ~ 1.53 MB (36.66%).
- Upgrading 1756-IF4FXOF2F/A firmware from 1.4 to 3.5 in progress.
  - ✴ Communication issues with the module contacted Rockwell support.
  - ✴ Verified that 1756-IF4FXOF2F series A used in the Stanalone PLC test stand has a 3.5 firmware running with no issues.
- Edited and compile Hall C PLC task weekly report.

- Edited and compile DSG weekly report.
- Debugged LabVIEW program cRIO configurations for the **cRIO Test Station**.
  - ✴ Communication issues raised when test for NI-9205 module started, unable to find input channels to read voltage from Krohn Hite voltage source.
  - ✴ Issue solved by changing configurations in NI-9235 cRIO controller.
    - ▪ Changed programing mode from FPGA interface to scan interface.
  - ✴ Run test for NI-9205 module in automatic mode, which comprises all ADC tests (Gain, Offset, INL, DNL), results acquired into the specifications.

Eng, Brian

Hall B LTCC

- Ordered additional parts for solenoid power chassis.

Hall C Magnets

- Started work on converting Python/SBC code to LabVIEW/cRIO
- Found a potential bug with the Ethernet/IP driver for LabVIEW
  - ✴ Unable to access individual DINT bits for controlling relay channels. Filed support ticket with NI which has already been escalated to R&D.

Hall C Slow Controls

- Found PVs that aren't being archived by MYA.
- Found out that Hall B OPI is being served by a VM being run by CC.

Hoebel, Amanda

HDIce

- Made corrections to CT-Box note.

Hall C

- Finalized Current Loop program to test.
- Reading information on EtherIP_driver for PLC-to-EPICS.

Jacobs, George

- **Hall A SOLID HGC** gas system note completed.

RICH

- Assembly of RICH N2 auto-change manifold waiting on pressure transducers.
- Created RICH-N2-auto-change-test.pdf and placed in the O:\\DSG\George\rich folder
- Created RICH-N2-auto-change-press-system-components.pdf (from spreadsheet)

Leffel, Mindy
Absent

Lemon, Tyler

Hall C Slow Controls

- Created test IOC on DSG-C-LINUX1 using built-in example template and also created CSS screen to display example PVs.
- Installed Tomcat Webserver and webopi on DSG-C-LINUX1.
  - ✶ Tomcat is java-based server application that CSS suggests for hosting webopi files.
  - ✶ Successfully able to run Tomcat server, but webopi does not run.
- Investigated how Hall B's CSS screens are opened.
  - ✶ Hall B's screens are opened by typing *clascss* into terminal.
  - ✶ Screens are opened in runtime mode in a temporary CSS workspace.
    - ▪ Does not allow users to edit screens.
  - ✶ Modified script used by Hall B to work on DSG-C-LINUX1 and debugging executable to make it open a local test OPI file.
- Started development of Hall C CSS screens.
  - ✶ Created a "home" screen containing menus with options for each spectrometer and magnet.

McMullen, Marc

LTCC

- Ordered the new solenoid power chassis. It is expected later next week.
- Worked on solenoid controls software and display for Forward Carriage.
  - ✶ Performed some testing using signals from the pressure transducers connected to S3 and S5.