

## Lab Status/ AEM Meeting Notes

Monday Nov. 20, 2017

<https://indico.fnal.gov/conferenceDisplay.py?confid=15787>

### Incidents:

- None.

### Accelerator Operations:

- Accelerator complex coming back into operation after the shutdown.
- Good week last week. MI only beam to NuMI. ~250kW w/o switchyard.  
NUMI: 2.65E18; BNB:1.28E19; Muon: 6.22E15 p; MTest: 1.46E13; Mcenter: papers signed, no beam yet. Muon campus set up underway.
- FAST reached two milestones: 31.5 MV/m/CM; 300 MeV e- beam.

### MicroBooNE:

- 93% BNB uptime, DAQ uptime 96.3%.
- Router up and stable.
- Low CPU efficiency due to off-site users. Problems with data staging.

### Minerva:

- DAQ live time 100% since Nov. 12.
- MINOS live time 99.8%, good data 97.2%.
- Job success rate 72%, CPU efficiency 72%; low due to dCache hardware issue.

### NOvA:

- ND running smoothly; 2.4E18 delivered and recorded.
- FD has stability issues. Uptime: 91.5%; recorded 2.12E18 of 2.4E18.
- Looking into DAQ scripts and possible memory leaks, and network instability.
- Job success rate 95%; CPU efficiency 27% due to dCache problems.

### g-2:

- Inflector operating, most detectors online and working. Trolley working well and several field maps made.
- Hall secured Friday and commissioned entrance counters.
- Plan to circulate and store beam this evening.

### PPD Operations:

- Safety: A test beam user had a fender-bender Friday night near Meson Cryo. No injuries.
- Mu2e
  - Solenoids: (1) PS/DS model coil VPI-ing postponed until after Thanksgiving. GA planned to do it Nov 18th, but found that some VPI molds not sufficiently sealed. The Solenoid Team will send an expert to GA to observe this activity. (2) Lab gave ASG permission to do coil insertions of the TS first article. Insertion scheduled for the week of Nov 30th. An expert will be sent to ASG to observe this activity. (3) HAB commissioning continues. The TS prototype taken to full operating current. Need to test to 20% higher, since each unit will be tested to 120% over operating current. To be done either this week or next.
  - Tracker: Fabricated two Panel Assembly Structures (PAAS-C) last week to go along with the PAAS-B. Two PAAS-A have been sent back to the vendor, since

- they failed to put in some holes. Expected back the week of Nov 27th. PAAS-A fabrication should finish in 2-3 days. Upon completion, one full complement of PAAS-A/B/C will be shipped to the University of Minnesota.
- TDAQ: Completed a test of sending clock signal from the Xilinx DTC board to 2 Polarfire evaluation cards. The clock extraction worked as expected.
  - CMS
    - Phase 1 Upgrade was given green light on HE installation, pending a few details to be monitored/followed up. Expect to move forward on HCAL Barrel Production after a CMS review tomorrow, again probably with a few provisos.
    - HL-LHC upcoming reviews
      - Endcap Calorimeter Technical Review @ FNAL Nov 29 - Dec 1
      - Presentation of MIP Timing Detector to LHCC on Dec 1
      - NSF PDR covering (part of) trigger, muons, TFPIX, Barrel Cal. Dec 12-14
  - Astro
    - DESI preparing for Director's review of commissioning operations that will take place in December at LBL.
  - Test Beam
    - MTest users --T1209 (CMS outer tracker) and T992 (3D sensor group). Both getting stable beam. An ORC upcoming on 11/29 and a down day on 12/13.
    - At MCenter, LArIAT is preparing for beam. Will start commissioning and taking cosmic data over the next 2 weeks; start taking beam on Dec 4. Plan to run 24/7 until the end of December, at which point, NOvA will continue with installation.
  - Detector Operations and Development
    - Alignment/Metrology: Completed alignment of the motor mounting plates to the middle section of the DESI corrector barrel. Completed alignment of a laser setup to the arc center point on a wire folding device for SBN
    - Silicon Detectors
      - SPT -3G (CMB): Completing the second batch 6 detector wafers addressing assembly and testing. Completing assembly and micro bonding of squid readout components.
      - CMS HGCal: Completed insulating and modifying of cassette testing cold box. Setup gantry height and slings for lifting cassette and frame. Organized Lab C to make room for manipulating box and gantry for CO2 cooling.
      - CMS upgrade: Assemble and setup module for evaluating micro bonding feasibility with new fixtures.
    - Experiment Installation
      - Made MC-1 ready for FESS contractors to work on the roof above the cryo system by installing a protective cover.
      - Lariat inner flange has been installed and is ready for leak check.
      - HAB laser room work has proceeded as far as possible until Mike Geelhoed asks for more help.
    - Special Materials (MAB/Lab3)
      - Finished and delivered two Carbon Fiber boards for NSTEC

- Continue R&D work for Mu2e tracker
- Electrical Engineering: Teri Shaw spent ~10 days at CERN to verify ProtoDUNE ground infrastructure, spent time with Cold Electronics and Photon Detector teams to verify grounding schemes and look for identifiable system noise. So far, initial noise measurements look promising in ProtoDUNE ColdBox tests.

#### **ND Operations:**

- LArIAT: Found a bug in interrupt handling of the CAEN A3818 PCIe readout controller; CAEN provided a beta release of the firmware which fixed the problem. Ongoing DAQ debugging during installation/commissioning.
- Joint SBN DAQ development: discussions and work ongoing.
- DUNE:
  - APA#1 successfully completed its cold cycle in the cold box at CERN. APA#2 delivered to CERN Nov. 17<sup>th</sup>. The full CPA module was assembled and lifted in the clean room last week. Tentative date for IPR, 20-22 March 2018.
  - Arapuca: Tallbo test ended Tuesday; opened to inspect. No WLS residue found.
  - Near Infrared Test in LAr: Brief interruption to melt Ar ice in the inner jar, quickly recovered a good level of LAr. Taking data.
  - DUNE Physics Week meeting last week.
  - The sample of fully simulated and reconstructed cosmic-ray events for the 10kt Far Detector module finished and cataloged in SAM. Using it to start an alignment study of the FD.
  - Testing cold electronic boxes at BNL for protoDUNE. 17 boxes have passed and a few need repairs. A full complement should be at CERN the week of Dec. 3rd.

#### **LBNF Project:**

- No report.

#### **TD Operations:**

- Operations
  - CMTF: LCLS-II F1.3-06 testing is complete
  - NML (FAST/IOTA ) is cold at 2K; Plan to warm up at the end of November or early December; have until July to complete IOTA
  - MDB: HTS is cold at 4K; STC is planned to be cooldown this week;
  - VCTF is operational; cold testing SPQA117 testing is finished today; Removing CAV0311, 0312 and 0301 MQXFS1d cooldown in January
- Projects:
  - LCLS- II Cryogenic Distribution System;
  - PIP2IT cave transferline Final Design Review this week; Fabricating external transferline;
  - SuperCDMS-SNOLAB SLAC Director's Review preparation
  - Supporting procurement of dilution refrigerators for Axion detector and Quantum Computing initiative;
  - Supporting infrastructure and installation for the NEXUS experiment in the MINOS hall;
  - IB-1 warm helium storage improvement project → all pipes are welded; pressure tested; are in the trench; paving is next
- R&D: N2 infusion, Nb3Sn coating studies; Nb/Cu equipment installing in new location
- LCLS-II: CM01-10 in various stages of assembly and testing.

- Muon g-2
  - Inflector coil winding plans and possibility of further funding were discussed with PPD representatives. The g-2 project funding ends this week.
- Mu2e
  - TS prototype cold test in HAB continues. Quench Protection & Power System checkout in progress. Reached 1730A (target 2100A, 20 % margin over operating current), still making PS adjustments.
  - Due to scheduling problems with key GA team members, impregnation of PS/DS model coil now expected after Thanksgiving.
  - Technical support of TS production coil testing and module assembly was discussed with the magnet sector management.
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- LCLS-II Magnets
  - Test and qualification of quadrupoles continue, SPQ118-121 are in different stages. SPQA117: cold test completed last Monday, SPQA118: cold test started Friday, will complete before Thanksgiving.
  - EDWA is completed and installed for MTF measurements. A leaking MDCC magnet was disassembled. New coils will be wound.
- MDP 15-17 T dipole R&D – Inner coil winding in progress
- LARP/HL-LHC-AUP
  - Prep for coil QXFA108 winding -- 1<sup>st</sup> pre-series production coil for US HiLumi-AUP and will be used in the 3<sup>rd</sup> and final prototype magnet. The final prototype magnet will be fabricated to be tunnel-ready for the LHC.
- Infrastructure:
  - CCD installing upgraded networks.
  - Investigating frequent ODH alarms

**Computing Operations:**

CCD:

- Good week.

SCD:

- Problems with dCache hardware controller on Friday, Nov. 10<sup>th</sup>. Reinstalled on the 15<sup>th</sup>. Impacted several experiments data caching as noted earlier.
- CMS: All ok.

**Office of Communication:**

- Undersecretary of Energy for Science to visit the Lab tomorrow.

**Directorate:**

- No report.