

9-8-2022 2x2 Electronics Integration Meeting

- Attendees
 - Alex, Karolina, Carrie, Linda, Norman, Armin, Dan Dwyer, Zoey, Cindy, Matt, Louise, Howard, Trevor, Alan, Geoff, Steve H, James, Sasha, Dan Carber, Anne, Vanessa, Jean W, Jack S, Tim Bolton, Andrews L, and Ting
- News and quick progress reports
 - Placement of MS7 of 2x2-Minerva is expected next Tuesday
 - Light readout QA/QC has issue with accessing ADC. Geoff to look at this issue
 - 2x2@LArTF in operation mode. Need to coordinate resource with 2x2 project.
 - Next round of 2x2@LArTF tasks and their task managers
 - Module QA/QC – James/Louise/Mike M
 - Module modification – Ting/MinJeong /Livio/James/
 - Cabling and preparation for underground installation – Linda/Matt/MinJeong
 - DAQ/DCS development – Geoff
 - Status and progress of those tasks are listed in next page
- Purity monitor progress – Alex Moor
 - RPS not installed in PAB
 - Rack for underground is the one on the catwalk most downstream
 - Still need to work out underground layout
 - Nice to show the underground picture and location of the purity monitor
- Module modification work preparation
 - Will wait CSS committee's review of Lesker di-electric breaker before replacing module-0 top plate
 - Will look possibility of adding grounding strip, LED and capacitor with existing TPC top
 - Leaving G10 sleeve off not increase exposure to humidity; we do need to wrap module up with plastics if we leave the module out of shipping box. Still needs to work out the detail if we leave the module without G10 sleeve for long time – a few months potentially
 - Will look structure issue of supporting module without G10 when bottom 80/20 frame is not effective
 - James suggests we can do Johnston coupling replacement and pressure test while TPC top is mounted on module → need to check with Mike Z. Pressure test will take time to setup and safety review
 - Livio suggests not to move the racks around. Linda strongly agrees with this.
 - Livio says that removal G10 sleeve is the most dangerous operation for potential cable damage.

DUNE 2x2 Electronics Installation Tasks

(September 8, 2022 update)

2x2-Minerva

- MS8 checkout. Need to smooth some cables – talk to Joe Harris
- MS7 placement – possible Tuesday
- State of the DAQ

ArgonCube TPCs:

- ORC of readout electronics racks with bench-top suppliers recommended by committee on August 31
 - RPS tested and released for QA/QC on module-1 – Linda
 - Started light QA/QC tests this week – Livio/Karolina
 - **Module-1 next week**
 - **Having problem with communicating with ADC: Geoff to look on Monday**
- 2x2@LArTF is in operation phase
 - Module QA/QC – James/Louise/Mike M
 - Module modification – Ting/MinJeong /James/Livio
 - Cabling and preparation for underground installation – Linda/Matt/MinJeong
 - DAQ/DCS development – Geoff
- **It is a requirement to follow FNAL engineering practice and safety rules**
 - **2x2 tasks at FNAL are scheduled and supported by neutrino division through 2x2 project**
 - Electrical and electronics tasks – **Linda Bagby**
 - Mechanical and cryo tasks – **MinJeong Kim**
 - 2x2 computing – **Geoff Savage**
 - **2x2 project manager coordinates overall schedule and resource use**
 - Tight budget. Shortage of technical labor → **all request goes through project first**
 - **Design and safety reviews are coordinated by 2x2 project**
 - 2x2@LArTF experimental liaison officer and facility manager – **Cindy Joe**
 - ND Division Safety Office (DSO) – **Jonny Staffa** (replacing Angela Aparicio)
- Readout electronics racks for DAQ/DCS development and underground installation
 - Cabling for DB37 on MPV → VGA (Matt)
 - Cabling for DB37 on MPV → Pacman boxes, RTD and cooling fans (Matt)
 - Use LArTF to work out cable routing and support details
 - Drift HV cable support scheme being worked out
 - To use 50cm minimum bending radius (30cm required)
 - To have identical cables for all TPCs: loop over extra length over top of HV filter rack
 - Strain release and cable support with conduits: 1.5" (connector at filter end has 34mm OD)
- Preparation for module modification – MinJeong/Livio
 - Lifting fixture and trial run of module transfer between garage and pit ✓
 - Johnston coupling installation on Module-0 vacuum top and leak tested ✓
 - Dielectric breaker qualification – MinJeong/Mike Z
 - Collecting Bern data on Lesker breakers for CSS committee
 - New breakers with proper rating ordered ✓

- TPC readout feedthrough qualification – MinJeong/James
 - **This is already the last minutes situation. Cannot wait any longer.**
 - Consortium subsystem responsibility for proof and acceptance tests following docDB 25016
 - Charge readout (LBNL), light readout (Bern), drift HV (SLAC)
- Module-0 modification scope and procedure
 - Tasks and instructions: DUNE docDB 26516
 - Knowledge transfer from experts to commissioning/operation
 - Grounding detail inside module
 - Feedthroughs dis-connection details
 - Closer look of feedthrough PCB boards
 - **What tasks can be performed with current TPC top plate?**
 - New top plate might not be ready for a while
 - Need to reduce number of times of feedthrough cable disconnections
 - **We will look possibilities of adding new grounding, LED and capacitors without replacing TPC top**
- Next round of tasks
 - QA/QC test of module-1 and module-0 →gaining experience for installation and commissioning
 - Module-0 modification and QA/QC
 - Going back to focus on electronics integration work
 - Detector control: MPOD, RPi, HV... + environment
 - ADC readout scheme based on 10gbps switch
 - Preparing underground electronics installation: cabling routing and support, low-noise AC, networking
 - DAQ hardware and software: beam clock, common timestamp, trigger, DuneDAQ, integration with Minerva...