Minutes and Action Tasks of July 23, 2020 Electronics and Readout Integration Meeting

- Attendee: Francesco, Patrick Koller, Min Jeong, Sasha, Anne, Linda, Geoff, Trevor and Ting

- News and action task:
  - Sasha reported they found a DAC which can output up 200V unipolar. They are also thinking to eliminate cold amp on the e-pcb.
  - The wight of the VME crate hosting PGA is expected to be around 10 to 15kg. It is a 6U VME crate. We need 4 of them near cryostat top flange.
  - Dubna is still waiting for a list of recommended copper-to-fiber converters from Linda. Also the review guidance on class 3B laser system.

- Francesco on BEN setup of slow control feedthrough design
  - Detail in the slides posted on the indico page
  - The new design has four components: the feedthrough tube on top of the flange, the cryo-volve control box, the service box and the PLC readout crate.
  - The feedthrough has readout electronics custom PCB and raspberry PI inside a faraday cage (a metal cylinder tube) for temperature sensors and level meters.
  - The service box provides DC-DC converters for 24VDC and 5VDC and Ethernet switch.
  - Current design with the service box, cryo-valve control box and feedtrhough PCBs on detector ground. The PLC readout is on building ground.
  - 24VDC PS can be either from the PLC rack or dedicated PS. This will be determined later.
  - The service box and cryo-valve control box could be potentially placed on cryostat access platform near top flange within 1.5meter.
  - Linda suggests to carefully examine the grounding scheme to avoid grounding loop. Questions were asked on how the ground termination was made using wire outer shield. Linda will look more of the schematic and send comments/suggestions to Franceco.
  - Linda would like to get spec sheets of the DC-DC converters used in the design
  - Linda made a comment on the coating on the aluminum support piece in the auxiliary box (page 14). Often, we need to remove the coating completely in order to get good connection.
  - The design work is still continuing. We will hear an update from Francesco later.
  - Suggestion to put design documentation in DUNE docDB under topic of "ArgonCube2x2"

- Min Jeong on cryostat access platform design requirement
  - There is a need for redesign the handrails for the MINOS catwalk. This will impact how the argonCube2x2 cryostat access platform design
  - We need to understand device layout on the platform before to start the detail design
  - We have input from light detection group, PLC feedthrough (francesco). We will hear drift HV and charge readout systems in next meetings.

- Min Jeong suggests put the four VME crates for PGA cards on one rack. Sasha thinks this is no problem.
- We will look a way to put the PLC devices on the same rack too.
- Min Jeong alo suggests to put the small purity filter tank under the platform. Francesco think this is OK.
- We will use electrical insulation material (G10 or fiber glasses) as floor cover
- Linda suggest to keep a distance of 6" between steel support beams and cryostat shell as they will be on different grounding.
- Min Jeong is to use 8" as design guideline for steel structure beams and cryostat
- Linda also asks to add a layer of insulation material (G10 or FR4) under the concrete block supporting cryostat
- There are still some issues we need to clarify regarding egress requirement
  - There will be a lot of equipment on top of the cryostat top thus the middle section of the platform likely to be blocked.
  - In order to have a narrow platform (to get MINERvA modules closer to argonCube TPC), the egress pathway cannot include the middle section of the platform. The emergency exist routine for people on west side of the platform will use west MINOS catwalk, people on east of platform to use east MINOS catwalk.
    - This needs to be clarified with FESS
  - As the overhead bridge at downstream of MINOS hall is part of egress pathway for east side catwalk, we will not be able to remove it without new egress stairs
    - Potentially we need more space at downstream end, the easier solution is move the argonCube test layout couple of meter further upstream
    - We will look the building roof cover situation to determine how much we will move
- We will continue the discussion in next meeting

- Action task list:
  - Linda to send Dubna a list of copper-to-fiber converters
    - https://docs.dunescience.org/cgi-bin/private/ShowDocument?docid=1835
  - Linda to collect review guidance on class 3B laser system
    - https://esh-docdb.fnal.gov/cgi-bin/RetrieveFile?docid=385
    - FESHM 4260
  - Francesco to send Linda spec sheets of the DC-DC converters used in feedthrough
  - Francesco to create an entry in DUNE docDB under “ArgonCube2x2” to collect PLC feedthrough design documentation
  - Min Jeong to ask FESS for guidance on MINOS egress issue
  - Ting to get estimate how much we move upstream detector layout
- AOB
  - There is a half hour overlap with weekly ICARUS installation meeting which starts 10am.
  - We are suggesting moving our start time at 11am. Please let me know of any problems
  - We will meet in two weeks