

Cryogenic Instrumentation and Slow Controls Joint Consortium

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DUNE Technical Board Meeting
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Meetings

- We are having weekly meetings
 - Fridays, 10 to 11 am EDT
 - We had a meeting on Sep. 1st, there will be one this week
 - This frequency might change later on, but initially given the RRB deadline, my goal is to have weekly meetings
- Two mailing lists
 - DUNE-FD-CRYO-SC-CNSRT-REP: All IB reps, Closed list
 - DUNE-FD-CRYO-SC-CNSRT: All consortium list, Open
- Meetings will also evolve as IB rep vs All meetings
- Technical Lead is not finalized yet, will try to conclude soon

Consortium Internal Structuring

- We had first discussions on this at our Sep. 1st meeting
- I proposed three working groups:
 - Joint Cryogenic Instrumentation WG
 - Joint Slow Controls WG
 - A WG interfacing with LBNF
- These may seem too broad, but:
 - Would like to minimize the no. of WGs
 - Want to keep SP and DP joint
 - Also, initially all systems need to talk to each other until it is clear what system does what (DUNE vs LBNF vs Other Consortium)
- With time, the focus of these groups will evolve (overall design, hardware vs software, infrastructure, integration, test facility, physics etc.)

Consortium members

- I have had one-on-one meetings with almost all IB reps of the consortium to better understand the background, interests and funding possibilities/plans
 - Very productive meetings, have a better understanding now
 - This especially helped me to see where the holes are and which deliverables need new people
- Deliverables (things in blue need more people)
 - Thermometers (SP&DP: Valencia, CIEMAT, Hawaii)
 - Purity Monitors (SP: UH, UCI; DP:UCL)
 - Gas analyzers (Eng. Support from ANL; scope from LBNF)
 - Liquid level (Eng. Support from ANL, ND; scope from LBNF)
 - Cameras & light emitting system (KSU, BNL, Drexel)

Consortium members

- Instrumentation Feedthroughs (ANL, BNL)
- Slow controls hardware/infrastructure (UTK, UMD)
- Slow controls software (UTK, UMD, KSU, Warwick)
- Physics deliverables (Lot of Institutes, but will need more effort)
- Integration Deliverables (FNAL, ANL, UTK)
- While this doesn't look bad, there are clear holes
 - E.g. Performance validation with ProtoDUNE, Studies of fluid movement, gas analyzers, liquid level etc.
 - The scope also need to be ironed out with LBNF on a lot of this
- But, it is clear that we need more people joining to meet the effort, especially folks with DP experience
 - Have some specific targets, plans to reach out to them

LBNF thoughts

- Had a very productive meeting this morning with Dave Montanari on interfacing with LBNF
 - A lot of protoDUNE experience is discussed.
 - All relevant items discussed especially Cryostat internal piping, liquid level monitoring (DUNE vs LBNF needs), compliance with grounding/shielding, scope and boundaries, information sharing and collaboration for needs from both sides
 - There is also the DUNE vs LBNF vs Cryostat (CERN)
- I am in the process of producing a “Scope” document based on this conversation with David
 - Will put this up for discussion at an upcoming consortium meeting
- David is subscribed to the list and we agreed that he or a selected liaison will attend our meetings. And we will be notified of important LBNF meetings from their side.

Current focus: Defining Cryostat Penetrations

- Since the cryostat penetration deadline is approaching fast (end of September), we are holding focused meetings:
 - For SP, what are the FT requirements (FT size, location and how many) for Thermometers, Purity monitors, and Cameras
 - Initial discussion held at our last meeting
 - A “charge” with specific questions to arrive at some conclusions is sent out to the relevant groups in the consortium
 - Tomorrow's meeting: UH and UCI will present their initial work on this.
 - Next week: Thermometry and Cameras discussion
- Also working closely with the Calibration Task Force to address the cryostat FT requirements

Closing remarks

- Still in the process of refining the list, but converging well
 - The goal is to review the list with consortium soon and turn it into a WBS
 - Have been milling through ProtoDUNE, MicroBooNE, SBND WBS to understand the details on structuring
 - Cannot meet today's deadline (had to focus on my base grant proposal)
- Plan to start close interactions, information sharing and possibly a WG with LBNF as we move forward
- Definitely needs more people to meet the goals of the consortium and want to be in close loop with protoDUNEs as well so we are informed of the lessons learned and performance metrics – critical for how the design will form
- Will deliver the refined list of deliverables and WBS soon.