

## Minutes of the 11<sup>th</sup> Meeting of the SBN Oversight Board (Fermilab, December 11, 2020)

### Committee Attendees:

- S. Brice (Chair)
- A. Ereditato (Switzerland)
- J. Evans (UK)
- A. Guglielmi (ICARUS Deputy Spokesperson)
- O. Palamara (SBND Co-spokesperson)
- C. Rubbia (ICARUS Spokesperson)
- D. Schmitz (SBND Co-spokesperson)
- M. Shaevitz (US NSF)
- R. Wilson (US DOE and ICARUS Deputy Spokesperson)

### Committee Absentees:

- M. Nesi (CERN)
- S. Bertolucci (INFN)

### Non-Committee Attendees:

A. Fava (ICARUS Commissioning Coordinator), K. McFarland (IB Chair), J. Saviano (Secretariat), P. Wilson (SBN Program Head), D. Salmieri (ICARUS), J. Zennaro (Speaker)

### Action Items

No Action Items

### Introduction and Review of Last Meeting

S. Brice, SBN Oversight Board Chair, welcomed the members and participants to the Eleventh Meeting of the SBN Oversight Board, and reviewed the action items status from the 11 September 2020 meeting.

### SBN Project Update, P. Wilson

P. Wilson, SBN Program Deputy Coordinator, provided an SBN project update.

Slides were presented that covered:

- Status of lab during COVID-19,
- Pilot program for travelers during COVID,
- SBND Director's Mini-Review (Oct 26 & 27)
- SBND Installation 2-day Review (Nov 16 & 19)
- Light Systems
- DAQ & Electrical Installation
- Practice of installation of APA plane
- Installation & Cryostat
- Top cap design and production status
- Cryogenics update
- SBND critical path update

Discussion: Dave Schmitz asked about a concern mentioned in the review report about the number of technical personnel that will be available to us. What can be done by either the representatives of the program or collaborations on this call to help with that going forward? Peter talked about how ND has been hit hard in the past year by retirements and the Tech pool has been significantly depleted. We have been getting some help from other Divisions and from temporary contract technicians. It's critical that we get the expected personnel from the collaborations to work at Fermilab. Making sure that collaboration students and Post docs are here to do the assembly of the TPC for SBND is another critical item. There's still a need for technicians for the ICARUS installation for the top CRT. If there are other resources within the collaboration (a technician who can come to Fermilab for a few weeks), we will work with the institutions to figure out how to get people here. We're open to creative solutions – how the lab can support that.

### **ICARUS Commissioning, A. Fava**

Angela Fava presented an update on the Commissioning of ICARUS.

Detector Commissioning status: stable operations in nominal conditions since the end of August. Cosmic-ray interaction events collected, and data being analyzed for calibration purposes. Dedicated runs taken for specific commissioning tasks.

Slides were presented:

- Sample events @500 V/cm
- LAr purity: trend and plans for improvement
- TPC electronic noise at FNAL mitigation
- Improvement of TPC noise in West cryostat
- Studies of TPC noise on the WEST cryostat
- Early assessment of TPC performance
- PMT activation
- PMT calibration
- Slow controls development and commissioning
- High-Level planning of commissioning activities

Present activities on PMTs and plan (slide): Fine gain equalization, check gain stability using both laser and random trigger ongoing. Measurement of PMT rates for different discrimination thresholds

Prepping additional PMT activities for trigger: measurement of rates as function of different PMT logic combinations; installation of PMT signal adders; set up preliminary data acquisition with both TPC and PMT systems.

Additional slides on Commissioning of the trigger system, DAQ: status of essential items, Early CRT commissioning

Discussion about additional activities remaining to be ready for data taking with BNB in November and for physics.

Questions: Alberto Guglielmi added some notes – The team performed a very good action in past 10 days. Lot to do to understand and investigate the standard noise. We've solved about 70% of noise problem in west cryostat but need to continue to investigate the other 30%. Also, work has begun on the east cryostat. Need to understand the source of noise. Some noise is fine but need to complete to understand better before we turn on everything. Steve added that more trips to Fermilab may be needed to work with Linda Bagby and Bill Badgett.

### **Joint Working Groups, O. Palamara**

O. Palamara, SBND Co-spokesperson, provided an update.

Slides presented covered the breakdown of the 5 working groups, SBN slow controls, SBN CRT WG, SBN Infrastructure WG and recent activities.

Status of the SBN Analysis WG was presented by the O.P. at the PAC meeting on December 8<sup>th</sup>

Summary: Making progress toward SBN oscillation physics sensitivity results based on the full event simulation and reconstruction. Measurements from SBN data begin to be used to refine and tune the simulations and address detector systematics. SBN tools for neutrino event selection and reconstruction and for background rejection will soon be validated with real data.

No questions or comments.

### **SBN Institutional Board, K. McFarland**

Kevin McFarland, IB Chair provided an update on the SBN Institutional Board

Discussed status of rules writing committee, need for assignment of IB Deputy, definition of individual membership in SBN organization, admission of new institutions, Permanent rules (by-law) for SBN IB.

Next meeting scheduled for February

No questions or comments

### **SBN Computing Calculations Overview, J. Zennamo**

Joseph Zennamo presented updates on the SBN Analysis Infrastructure.

Computing Model – Fermilab computing divisions require an annual review of expected computing resource usage for all major experiments. This year's review was in May 2020. Numbers were based on assumptions that can be updated as we get new information. The slides shown to SCD were broken down by experiment. Working to best understand how to design a computing model that will accommodate this amount of data most efficiently.

Slides presented covered: Inputs to the computing model: Data, Inputs to the computing model: Simulation, Inputs to the computing model: CPU Usage, Inputs to the computing model: Disk Usage, Assumptions of the computing model.

Summary: Estimates are under the inputs and assumptions presented, not determinations of detector trigger configuration, SBN program planning, or specific physics analysis needs. Aiming for improvements to reduce need: more efficient algorithms and data storage, use of multithreading and heterogenous computing (including high-performance computing centers).

Questions/Comments:

Kevin said it doesn't look like there's a forecast of re-simulation from scratch because of update to GENIE model. Might be an issue after a couple years. Joseph responded that there are 2 major production campaigns per year and those would be simulated from scratch. Bottleneck is getting stuck off of tape so it's more advantageous to start from scratch. This is meant to be a cumulative campaign, not an incremental campaign.

Steve asked Joseph how he would characterize SCD's response to these numbers? Joseph responded: SCD provided a template and we could only highlight so much text. We did provide the information from these slides. SCD called for a follow-up mtg, we explained the physics reality of the 2 detectors, and they started to come up with methods to create a computing model with what they could provide. Signal processing or increasing the disc footprint could be made available to SBN. Instead of going back to tape, go to dedicated SBN site. Provide ability to use disc instead of tape because it becomes an infrastructure challenge for SCD. We have a lot of non-Fermilab resources (open science grid, institutions with more computing power) and can take advantage of those. The tape usage would be very large, and they're concerned with the final number. Our main concern is the difficulty of reading off tape.

### **Other Business**

None

*The SBN-OB meeting was adjourned.*

Next meeting 3 months from now 12 March 2021