

**Minutes of the 21<sup>st</sup> Meeting of the SBN Oversight Board**  
**(Fermilab, June 9, 2023)**  
**(updated August 28, 2023, September 13 2023)**

**Committee Attendees:**

S. Brice (Chair, Fermilab)  
A. Ereditato (Switzerland)  
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)

**Committee Absentees:**

S. Bertolucci (INFN, Italy)  
J. Evans (UK)  
A. Fava (ICARUS Deputy Spokesperson)  
M. Nesi (CERN)

**Non-Committee Attendees:**

P. Wilson (SBN Program Head), J. Saviano (Secretariat), D. Gibin (INFN, Italy), C. Montanari (Fermilab), A. Schukraft (Fermilab), G. Karagiorgi (Columbia U), D. Salmieri (CERN, ICARUS Scientific Secretary)

**Action Items:**

- Brice reach out to Spokespeople to talk about reconstruction experts and possibility of workshop to be held at Fermi this summer.
- Brice make some suggested edits to the SBN Oversight Board founding document to reflect the changing role of the Board as both detectors enter stable operations.

**Introduction and Review of Last Meeting**

There was talk in the last meeting about winding down the Oversight Board, but the Spokes think it's still useful and would like to see it continue. Need to determine how we can improve, optimize the meetings. This will be discussed at the end of the meeting.

**Questions/Comments:** No comments.

**Spokespersons Update - O. Palamara**

O. Palamara, C. Rubbia, D. Schmitz, A. Fava, A. Guglielmi

Meetings continue to be held as needed. Goal has been trying to fill the SBN IB committees with members from SBND and ICARUS. Roles have been filled for the Result Approval Committee and Speakers Committee, but still working on the publication committee (SBND members). SBND is hoping to use this opportunity to form an internal Publication Committee and will select 2 people from there to work on the SBN Publication Committee. Hope to complete this within next 2 weeks, at which time the names will be sent to SBN IB

Chair/Deputy Chair.

Next SBN Board meeting to be held on June 26th – Daniele and Georgia have been invited to talk about the SBN analysis group organization and plans.

**Questions/Comments:** None

**SBN Institutional Board Update – E. Worcester**

K. McFarland (IB Chair), E. Worcester (IB Deputy Chair)

Slides presented

- Recent SBN IB Activity
  - Last meeting held Feb 16
  - Next meeting to be held when new SBN committees have been named
  - SBN IB Chair election committee in place and process has begun
  - SBN IB Chair and Deputy met with SBN Young leaders
- SBN Committee Status – membership confirmed for Speakers and Results Approval committees.
- SBN IB Chair Election – committee has been selected to coordinate (H. Ray, L. Patrizzii, W. Ketchum). Nominations end June 12. K. McFarland will serve as chair until replacement is elected.
- Discussions with SBN Young – recommendations for early career members provided and passed along to experiments for consideration. Question asked whether SBN is treated as an “experiment” and if same rules apply. Who would be notified about outcome of code of conduct report filed? Would it go to Chair/Deputy? Message was sent to Fermi Legal, but no response received yet.

**Questions/Comments:** Brice believes SBN should decide what the answer to the question (“is SBN an “experiment””) should be and request that that be implemented. Worcester said that was how she phrased the question to Legal.

Rubbia said we should consider the Young as full members of the collaborations and that they should be encouraged to participate in any type of discussions at any time. Worcester said there are forums for everyone to discuss this. The Chairs thought it a good idea for their leadership to talk to the Young Leadership in case there were topics they (Young) wanted to discuss. Rubbia said that the Collaborations should have been included in this type of discussion and the initiative taken by the SBN IB leadership should have been discussed with the members of the IB. Worcester said there are forums in the individual collaboration meetings, and she will make sure SBN Young stays on the agenda as a standing item during SBN IB meetings.

Schmitz said it’s important for SBN to decide what it wants, and it should not go to Legal/Fermilab before discussion is had between both collaborations. Worcester stated it was more of gathering information and sharing what the Chairs thought would be a good answer. It wasn’t intended to be a definitive thing. Schmitz said that in general, there is a situation of two scientific collaborations trying to work together through a program and he doesn’t believe the model where we verge toward

3 collaborations is the right model. The SBN IB should be used as a common element that joins the 2 collaborations together and executes things on behalf of both collaborations. The fact that the IB is acting independently in a number of ways is concerning.

Worcester said there is no perfect model for what should and should not be done – it's an odd position being the only people in the role that we're in and there's no perfect model for what we should and shouldn't do. There's a certain paralysis that comes with (the Chairs) having to hold a meeting every time something is done.

It would be useful for everyone to have a discussion to be more clear about what the delineations are in terms of what can and cannot be done independently. It's been difficult to navigate what the right balance is between being efficient and useful and not overstepping. Consensus that it's not simple and a meeting should be held to discuss this concern once the new Chair has been elected.

Palamara believes we need to be really careful to avoid having 3 entities. Having a discussion prior to any actions will help avoid situations like this in the future. SBN Young is confused because they don't necessarily know who to talk with and having a discussion will be good.

Delia added that she attended the code of conduct seminar on behalf of ICARUS and gave a presentation. She believes if there are any initiatives to take this matter forward, either she or M. Convery should be involved or at least know there are discussions taking place. SBN Young should be involved in any discussions.

The Chairs have been meeting with SBN Young semi-regularly for the whole time of the IB to make sure if there were any questions or issues raised, they're being addressed. This topic is probably the one that's asked about the most. We treated it more of having an open line of communication than anything else.

### **SBN Joint Working Groups Update – D. Gibin**

D. Gibin (INFN Italy), G. Karagiorgi (Columbia University)

#### Slides presented

- SBN Working Groups: Review of groups and goals
- Slow Control WG: **SBND** – Ongoing efforts to establish control/monitoring system for important devices. Major updates: Improvements for TPC wire bias powers and cold electronics slide, adding front-end pages for shifters.
- Slow Control WG: **ICARUS** - Updates for ICARUS drift HV, Archive Engine monitoring, white rabbit switch (WRS) monitoring
- SBN Analysis Infrastructure WG: Resources allocated for 2023 as requested by Fermilab Computing, ongoing ICARUS production campaigns based on recent release, targeting preliminary results for summer conferences, preparation underway to start SBND production, AI group represented on new SBND Operations Planning Task Force.
- Infrastructure plans for first SBN analyses – Co-organizing July 2023 workshop at

Fermilab with SBN Analysis Group, analysis Infrastructure effort will focus on unifying simulation, reconstruction, systematics treatments between 2 experiments, SBN AI group recently reorganized, but needs new members.

- SBN DAQ and Data Pre-processing WG: **ICARUS** Upgrades to new operating system, continued discussions with White Rabbit timing system experts at CERN on sustainable supports for SBN needs, common developments/maintenance
- SBN DAQ and Data Pre-processing WG: **SBND** DAQ is being run using one subsystem at a time and integrating a few subsystems and data are being validated, DAQ group exploring possibilities for TPC channel mapping, monitoring tools and infrastructure for various subsystems exist and are being used during DAQ runs, EPICS I/O control programs for detector control and GUI pages for monitoring are complete for all devices at SBN-ND.
- SBN Analysis Trigger WG: Group activities were relaunched since last meeting. The group is looking forward to another mini workshop in a similar format.
- SBN CRT WG: **ICARUS** – Two-layer top CRT external telescope included in regular data taking. Bottom CRT to be included in regular data taking soon, CRT-PMT based event filter implemented in event reconstruction chain. Validation ongoing. CRT-TPC matching in progress
- SBND CRT A-frame Test Stand: Checking for light leaks, verifying electronics functionality, measure SiPM gain voltage curves; characterize MIP muon response, Used for all 16 North Wall modules.
- SBN Analysis Working Group: activities of SBN Oscillation group have been revitalized, ongoing discussions on SBN analysis strategy. SBN Analysis Workshop July 25-28 at Fermilab will focus on 4 main topics.

**Questions/Comments:** Shaevitz is happy to hear integration work is happening. Workshop will be great to bring this together. What is the status on the framework analysis. What has been accomplished and what needs to be accomplished?

Since the beginning, we tried to have as common a framework as possible. So now, it is more linked to the differences between the 2 detectors. Up to now, the old infrastructure in order to compute the sensitivities re has been some guesses as to what the level of systematics could be. Now we need to do a campaign/Monte-Carlo simulation to study one-by-one the possible sources and try to identify the biggest one. The goal is to share all the information and approaches. In order to do the analysis, we need to have common goals.

### **SBN Project Update – A Schukraft**

Slides presented

- Near Detector – SBND; the cryostat and detector are now inside it.
- High-level status check – all complete.
- Detector Rigging Preparations; all subsystems completed another QC check. Detector successfully lowered into the cryostat on April 25. Took less than half day to complete. Thanks to installation coordinator, Roberto Acciarri, Project Engineer, Dave Pushka, Technicians – John Najdzion and his team and Tom Wicks and his rigging team. Special thanks to the DSO, fire department and ISD for providing emergency generator for the crane.

- Slides of detector being lowered.
- Preparing the Top Cap Welding – flange installation, repeating QC tests, preparing for cryostat access through access port on top cap
- CRT North Wall Installation – complete. 18 CRT modules tested & characterized on an A-frame setup to be installed, assembled as a whole on loading deck prior to installation, entire wall rigged into place and hung from North Wall steel support posts.
- Cryogenics Installation Progress – gas analyzer system installation in progress. Warm Gas collection system installation complete. Need to connect top of cryostat. Delivery of bellows and ceramic isolators delayed by vendor until Aug/Sept. Pressure test for Ar Dewar and connecting piping ongoing. LAr delivery contract placed with Air Products and is on schedule and under budget.
- Remaining Subsystem Installation – All parts for TPC Calibration laser system received. HV Production feedthrough and purity monitors testing ongoing at NLTF.

Next milestone – welding of the cryostat top cap in early July. Cryogenics commissioning forecast to start around September.

**Questions/Comments:** Rubbia offered his congratulations for all the work that’s been done.

### **ICARUS Commissioning and Operations**

C. Montanari (INFN Pavia) – ICARUS Technical Coordinator

Slides presented

- Detector Status: no major updates. It continues to run in stable condition. Neutrino data being collected. Some trigger synchronization issues have caused some loss of data. Routine calibration activities will take place during beam off periods. Summer shutdown activities being organized. Interference with SBND commissioning activities, impacting work on cryogenics and purification, is being dealt with.
- Beam Shutdown is July 9, 2023. Presented list of working group activities during the summer shutdown. Calendar for July has list of all activities scheduled to take place during this time.

**Questions/Comments:** Brice asked about the first slide where trigger synchronization issues were mentioned, is it referring to the NuMI beam? Montanari responded, yes. There was a change in the Main Injector cycle time to 1.33 seconds and by doing that it also changed some parameters in the early warning system, and we lost synchronization with the beam. The parameters were changed with no notice. Brice stated we’re looking to increase power by shortening the main injector cycle time multiple times over the next few years. Were there conversations with the people who changed the parameters without consultation and how confident is everyone that this won’t happen again? Montanari said the parameters were changed not thinking it would affect anything and now we know what the effect is, they know we need to be informed and it won’t happen again. Brice asked if there’s good communication, so everyone is aware when cycle time shortenings are going to happen. Montanari said yes. This was just unexpected. Guglielmi added the loss of data was a couple of days and even if we’re not the main users of NuMI, people will advise us. We are

increasing checking the consistency of the early warning of our beam data locally. Brice said it sounds like that particular failure mode will not happen again.

### **Other Business**

S. Brice – Chair, Fermilab

Review of the purpose of this Oversight Board (OB) Meeting. The Spokespeople have discussed it and have decided they would like the Board and the meetings to continue. There is value to having it, so we will continue. We should discuss what we are doing well, what needs improvement, what can we duplicate or propagate out more broadly.

The quarterly update on the program, which is going to turn into an update on the operations of the two experiments, would benefit a much wider audience. Both collaborations should receive those updates. It would be most usefully done as a meeting, rather than just circulating notes, but that's up for discussion.

Ereditato – has a question about the OB meeting. If there is a committee/panel, either they monitor or make recommendations and in the most difficult situations, make decisions. It's a charge. What are we doing? Are we monitoring? If so, there should be reports from some referees. If we are making recommendations, there should be some sub-group, which is addressing one critical item. If we are making decisions, then we should say "this part should be supported with more resources, etc." He asked what the mandate is and said maybe this is a good opportunity to change it if needed. If we are to monitor and make recommendations, then we should enlarge this panel because we would not be able to do this job properly as we are now. The composition of this meeting is largely made up of people who are in both experiments, and they have to some extent a conflict of interest. It's a mild conflict, but still.

Brice added – the purpose of this Board has morphed over the years due to the creation of the SBN Institutional Board. With the creation of that Board, it triggered a change in the OB to be more of a monitoring and advising Board. This is an opportunity for us to reconsider what the purpose of the Board is and should be.

Ereditato said we should have statements at the end that say, "We have concerns", make it a little more formal. Really send a message to the collaborations. Otherwise, it's just presentations of the work.

Shaevitz agrees with Ereditato. This SBN program is moving into a different time where integration of 2 experiments is high on the list for running, triggering, data analysis. The OB

should do some oversight and monitoring/advising with respect to those. The emphasis would switch to more of monitoring those type of things since construction is coming to an end.

Brice said maybe there should be an ICARUS Detector Operations talk and an SBND Detector Operations talk, then we have not just the one talk on SBN joint working group, but maybe we have 2 or 3 – shining more of a light upon the analysis. Shaevitz said there also needs to be focus on the running, triggering, reconstruction, etc. How lots of resources are needed, how they're gathered, and how they're able to do a joint analysis together.

Rubbia said Ereditato's statement is very important, and we need to clarify it for ourselves.

Schmitz said everyone has valid points. Up to now, we've asked the leaders of the SBN analysis group (Gibin/Karagiorgi) to summarize all the work going on in the various working groups, but if we're going to be effective, we need to hear directly from those working groups. We need to assess whether the groups that are in place are the right ones. If we looked at the existing 6 groups, we would find a wide variety of activity, productivity, effectiveness, and it would be good for us to assess. Working groups were set up by this body, we approved the existence, and discussed convenorship (which were usually based on discussions with the collaborations). The OB knew who was leading the efforts. Maybe this is where we drill down and start asking the questions – are these the right working groups? Are they doing what we think they need to be doing? Which working groups are missing that we think we need as we enter in next stages of the experiment.

Palamara said we need to discuss what is the composition of the OB. Brice agreed and said that was his next question – what should be the composition of this Board. Palamara said we should find the purpose first and then discuss the composition.

Brice gave an example of the FRA Board, saying they're a very different structure. In that composition, the Spokespeople would report to the Board, and it would not be made up of collaborators. That's a structure that we don't want. It wouldn't be useful to bring in people who are not collaborators on either experiment and we want the Spokespeople to be part of the Board.

Purpose – What thoughts do people have about the high-level purpose of the Board. The ultimate goal would be for the Board to ensure quality physics from the SBN program.

Ereditato stated he thinks this body should be reinforced with 2-3 experts (not members of the collaboration). The specificity of this body when we were created was to make a soft landing at a becoming one collaboration. This is still a subject. We need to be right in giving

the necessary, small pushes. Let's make sure this is a unique program where people from different collaboration work together in the most effective way,

Brice responded to the idea of bringing non-collaboration members. It's appealing, but as we start getting into the marquee oscillation results, it will limit the amount of detail we feel comfortable going into. We would have to limit what's shared in meetings or somehow make the members an official part of the group (because they're not held to collaboration rules). It is worth thinking about, having outside experts consulting at this level.

Schmitz has a thought regarding external collaborators. It would be nice to hear directly from the working groups. They would tell the Board what is and what isn't working.

Shaevitz suggested a simple charge -make it a monitoring and advising board. Joint projects of SBN (hardware, running, computing, physics analysis)

Delia said this body is part of an international agreement. The original mandate was to monitor the program in the installation and commissioning phase of the experiments . If substantial changes to the mission of the OB are envisaged, the official documents (deposited with the funding agencies) should be amended accordingly.

Guglielmi pointed out a slide from the mission document of SBN OB. "The SBN OB is not directly a decision-making body since policies must ultimately be approved by the scientific collaborations."

Schmitz said this was written during the construction phase. Maybe a sentence should be added to say "Now, the SBN OB should do XYZ"

Brice asked about the structure. Is what we have appropriate? Should we change the high-level structure? Are we missing pieces?

Palamara said the general structure is correct. Where we need more change is the purpose of the Oversight Board.

Brice will make some suggested edits and draw in people who've spoken up.

Schmitz recommended we converge online before the next meeting

Next meeting is scheduled for September

Brice announced he will be transferring to a new role and will no longer be the head of the



SBN OVERSIGHT BOARD

June 9, 2023

Neutrino Division. Fermilab is currently looking for his replacement and Brice will remain as interim Head. Since the head of the Division is the Chair of the OB, his role will need to be replaced by someone else.

Palamara said it's possible the new Head would not be a member of the SBN. Brice said everyone should be able to trust the new Division Head. That person may even become part of the collaboration. More discussion will need to be held once some decisions have been made.

Notes will be distributed to the board well in advance of the next meeting.

### **Other Business**

Guglielmi brought up the issue of publication and all the confusion. Brice mentioned the email from Joe Bakken, which was a reminder for people who are submitting papers. A clarifying email is scheduled to be sent out either this afternoon or on Monday.

*The SBN-OB meeting was adjourned at 10:47am.*

Next meeting 3 months from now - 9 Sept. 2023