



SBS Project Management

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SBS Project Manager

Management Overview

- SBS Program management oversees three projects:
 - **SBS Basic (WBS 1)** involves the acquisition of an existing magnet and the associated work of preparing it for use during the SBS research program. The effort includes modifications to the magnet, including machining a slot in the yoke for beam passage, field clamps, and a solenoid to reduce the transverse magnetic field on the beam line, the design and development of the infrastructure needed to run the magnet, and the construction of the platform on which it will stand.

WBS1 COMPLETED ON JAN 31 2016

- **Neutron Form Factor (WBS 2)** involves the construction of the PMT-based Coordinate Detector (CDet) , trigger electronics , pole shims, rear clamp, detector frames, electronics huts and lead shielding .
- **Proton Form Factor (WBS 3)** involves the construction of forty GEM detector modules with associated front-end and DAQ modules.
- **SBS Dependencies:** ECal, polarized helium target, GRINCH, Front GEM tracker and HCal.
- [Monthly DOE reports](#) on wiki.

Highlights of SBS

- WBS 1
 - Project completion on Jan 31st 2016.
 - Saddle and racetrack coils, corrector magnets, vacuum beam pipe and iron shielding at JLab.
- WBS 2.1 CDET
 - Completed all 168 of the 14-scintillator groups and 16-fiber bundles.
 - QA of 14-scintillator groups over 60% complete.
 - Assembled 3 modules. One module is setup for cosmic tests.
- WBS 2.2 Hall Infrastructure
 - Electronics shielding hut roof, roof supports and exit field clamp at JLab.
 - Support structure for the corrector magnets will be ordered in August.
 - SBS Detector stack and GEM frames will be ordered in August.
- WBS3 (UVa GEM)
 - 34 of the 40 GEM rear tracker modules have been constructed at UVa. Constructing 2 modules per month.
 - The readout electronics have been purchased and are being manufactured. 57 MPD modules and 73 5-slot backplanes already at UVa.

Highlights of SBS Dependencies

- **^3He target**
 - Engineer and design started in May after the agreement on the conceptual design. Break through with metal/glass interface.
- **Front tracker**
 - Shipped the second chamber with carbon frame to JLab in Nov 2015.
 - Work on GEM electronics to increase data transfer rates.
 - Chamber 3 modules in cosmic tests. Chamber 4 modules have been constructed.
- **HCAL**
 - Delivered 169 of 288 modules to JLab. Submodule frames at JLab.
- **GRINCH**
 - Photon detector array and gas vessel at JLab and are being assembled.
 - Work on DAQ with NINO cards using VETROC as TDCs.
- **ECAL**
 - Report sent for thermal annealing test with beam
 - Stony Brook working on C200 prototype to implement a scalable mechanical design.

DOE 2015 SBS Review

- Final DOE [committee report](#) was positive with three recommendations and numerous comments.
- Next DOE review is Nov 7 and 8th (Monday and Tuesday).
- [Recommendation tracking document](#).
- Three recommendations in DOE report
 1. [Report](#) on ECal thermal annealing tests with comparisons to thermal annealing model by Feb 2016.
 2. Report on trigger and DAQ electronics by Sept 2016.
 3. Evaluation of technical feasibility, cost and schedule of ECal project by JLab by summer of 2016.

First Recommendation

1. The team should provide to DOE a report on the ECal annealing tests by February 16, 2016. This report should use the beam test data to validate the heat annealing model, and use the model to predict performance under expected operating conditions.

Response:

- [Report](#) was sent to DOE in March 2016.

Second Recommendation

2. A document describing trigger and DAQ electronics including a timing diagram for the trigger should be provided one month before the next review.

Response:

- *Need to update existing document that Alexandre Camsonne wrote for the 2014 review.*

Third Recommendation

3. The Laboratory is urged to evaluate the ECal project including the technical feasibility of the annealing solution, and ECal project cost and schedule, by summer 2016.

Response:

- *Seamus and students from SBU at work on C200 to develop a scalable mechanical design for thermal annealing.*
- *A report comparing technical, schedule and cost of three options for ECal (UV curing, thermal annealing and BNL SPACAL) was sent for review by 3 members of DOE review committee in July. Final recommendation report to DOE in August.*

Executive Summary: Comments

1. The group should formulate a plan for measuring trigger efficiency.

Response: Quote from report : “*It appears possible to investigate trigger efficiencies by loading the memories of the FADC and Fastbus systems with simulated data.*”

1. *Can this be done?*
2. *Who will lead this group?*

Executive Summary: Comments

2. The ECAL and the polarized ^3He target external dependencies are notably behind schedule.

Response for ^3He target:

- The conceptual design report for target has been reviewed.
- Hall A has hired 2 designers. After CDR, workforce requirements at Jlab reviewed with completion by July 2018.
- Hall A began working on polarized target in May 2016.

Significance and Merit: Comments

1. The Collaboration is encouraged to extend the effort on the simulation and analysis framework to include:
 - Higher level analysis including tracking, clusters, etc.
 - Tracking the spin rotation angle of particles through the spectrometer in order to be able to extract the transverse polarization of the nucleon.
 - Analysis of accidentals, by mixing events.
 - Trigger efficiency simulations.
 - Radiative corrections and form factor extraction methodology.

Response:

- The simulation group is working on including GEM tracking.
- Spin rotation has been included in MC.
- Need to work on accidentals analysis.
- Need to develop plan for trigger efficiency simulations
- Document on radiative corrections from each experiment?
- Overall document summarizing MC results and timeline

Significance and Merit: Comments

1. *To broaden the involvement of the theory community, it would be desirable to organize a workshop concerning the impact and interpretation of the form factor measurements.*

Response:

- *Organized workshop “Probing transverse nucleon structure at high momentum transfer” in Trento on April 18-22nd, 2016.*

Conclusion

- WBS 2
 - Project completion on Jan 29th, 2017.
 - CDET scheduled to assemble the remaining 3 modules by end of August.
 - Remaining SBS infrastructure items will be ordered in August.
- WBS 3
 - Project completion on Feb 1st, 2017.
 - Scheduled to complete the 40 modules by October 2016.
 - Manufacturing and delivery of electronics is ongoing.
- DOE Review on Nov 7 and 8th.
 - Report that evaluates the technical feasibility, cost and schedule of ECal and outlines the Lab strategy.
 - Report on the DAQ and trigger.
 - Conceptual design report on polarized 3He target.
 - Report on the Monte Carlo status and timeline
- **Need to start planning for Experimental Readiness Review to get the SBS experiments on the schedule. Feb or March 2017??**