

NCSX IPT Meeting Minutes

The minutes from the NCSX IPT meeting of Tuesday, September 18, 2007 at 11:30pm are as follows:

Attendees: DOE-PSO: J. Makiel, L. Dietrich, G. Pitonak, A. Indelicato

DOE HQ: B. Sullivan

ORNL: J. Lyon

PPPL: R. Templon, H. Neilson, J. Malsbury, J. Levine, J. Anderson,
R. Hawryluk, R. Strykowski

1. DOE News (Barry)

- a) During a DOE de-brief for Dr. Orbach on the findings of the August SC Project Review, two questions arose: (1) are we fully certain that the NCSX device can be successfully constructed, and; (2) are we fully certain that the magnetic field integrity necessary for stellarator physics can be maintained for the experimental life of the device. An appropriately charged technical review will be initiated to address these issues. OFES is initiating the requirements for this action. Princeton University will be tasked with performing the review.
- b) Hutch stated that the scientific and programmatic review of the NCSX Stellarator Program on Sept 15th and 16th went well. Presentations by Hutch, Allen Boozer, Mike Zarnstorff (NCSX Physics) and Jim Lyon were given. No conclusions can be made as to the outcome of the review at this time. However, a report by the review committee is anticipated by the third week of October.
- c) There was a brief discussion of what's next in the re-baseline process. At this time, a formal timeline is not available. The resolution of Dr. Orbach's questions in paragraph 1a above must now be addressed.
- d) There is no news on the FY08 budget except that a continuing resolution is likely. The Project appears to be in pretty good financial shape at least for the first quarter. No major procurements are planned and carryover funds will augment the continuance of planned work.

2. Safety Management (Jerry)

- a) There were no NCSX related safety incidents.

3. SC Project Review (Jeff/Barry/Hutch/Jim)

- a) Two significant committee recommendations from the SC Project Review (Aug 15-17) are: (1) Provide an optimized funding scenario, and; (2) Examine the partial restoration of workscope. The NCSX Project Team stated that they will provide one baseline proposal to address these recommendations. *[Update: Guidance was later provided to the Project Team requesting that the revised baseline proposal only incorporate the removed workscope issue and not include the 'optimize' funding scenario. A brief impact statement is all that is required for the optimal funding scenario.]*
- b) The Project is ensuring that the machine's capabilities are consistent with (i.e., equivalent to) the 2005 baseline, as recommended by the SC Review Committee. This initiative will involve restoring scope removed since 2005, except where it can be shown that alternate scope, arising from value engineering improvements, will better satisfy the 2005 baseline performance requirements, and better support the post-MIE Phase III research program.
- c) The final NCSX SC Project Review report has been issued.

4. Project technical progress (Jim/Hutch)

The following provides a brief status on the major components:

MC Winding

Winding operations are proceeding well.

Field Period Assembly

The Field Period (FP) Assembly effort continues as follows:

Station #1 (VV prep - diagnostics, h/c tubes)

- a) Proceeding well with no noted issues.

Station #2 (mating modular coils together)

- a) Design continues for the welded inboard region of the 'within field period' modular coil interface. A developmental weld trial occurred. Deflection of the conductor due to weld distortion was noted. A concept for a modified welded shim configuration has been developed to address the problem. Results from small-scale tests are promising. The design is being developed based on this concept.
- b) Other preparatory work includes the full completion of 3 modular coils (complete instrumentation, metrology, flange preparation, etc.) and procurement of interface hardware. However, completing the interface design is the critical path focus.

TF Coils

- a) Two TF coils have been delivered. The third coil is awaiting release at the vendor (ETI in PA) until the Project addresses a relatively minor construction issue concerning 'dry spots' in the epoxy matrix;
- b) Work continues at the vendor on the 4th and 5th TF coils;
- c) An inquiry was made regarding what the receipt and inspection tests are upon arrival of the TF coils at PPPL. *[Update: In a later meeting, the WBS manager for the TF coils stated that electrical, dimensional and physical inspection was performed at ETI with Project oversight prior to shipment. Physical inspection is performed upon receipt at PPPL to check for damage. Given the short shipping distance between Nazareth, PA and Plainsboro, NJ, dimensional distortion during shipment is considered unlikely.]*

5. Procurement (Rod)

- a) Approximately \$140K of open requisitions for interface hardware (bolt assemblies, flange studs, shims, etc) and an assembly fixture for FPA Station #3 are in process.
- b) Approximately \$180K of purchase orders are also in the system to support Station #2 activities including thermocouples, alumina coating, field machining support, hardware, etc.).

6. Review of critical issues (Jim/Hutch)

- a) Modular coil interface regarding the inboard region of the 'within field period' flange interface. See 'Technical' section (paragraph 4) above.
- b) There were several problems contributing to the recent metrology system malfunction which ranged from software to hardware issues. However, these issues are now being ironed-out and the system is once again supporting the Project. This issue was also impacting Station #2 activities which is a critical path activity. It is estimated that 5 weeks of float will be lost to this problem.
- c) In response to the above, two items have been added into the risk registry regarding metrology support.
- d) To improve metrology performance and reliability, the Project is looking into the use of photogrammetry. The Project will send engineers to CERN and W-7X within the next month to help gain more knowledge in this area.

7. Planning for the next 6 months (Jim/Hutch/Ron)

The following activities will continue:

- Continue to prepare the Project's re-baseline package and address the SC Project Review Committee's finding and recommendations and support the 'constructability' review requested by the Under Secretary for Science;
- Modular Coil winding;
- Complete Field Period Assembly Station #1, and commence Station #2 activities;
- Off-site fabrication of TF coils;
- Design preparation for Field Period Assembly Stage #3;
- Continue efforts to recruit a permanent Project Manager. A Search Committee has been established and it is anticipated that a new Manager will be brought on-board as soon as possible to ensure adequate overlap period with Dr. Anderson.

Upcoming Level II milestones are as follows:

A new schedule of level I and II milestones are proposed for the Project as part of the re-baseline package. Upcoming level II milestones proposed in the new project baseline are:

Nov 2007: MC Interface FDR (excluding C-C)

Dec 2007: Deliver TF Coils for FPA #1 Assembly (Qty=4)

Dec 2007: Shims for 1st MC Half Period Assembly (Station #2) Available

8. Project performance through end of August (Ron)

Since the Project's authorized baseline is no longer credible, the following statistics are based on the proposed baseline retroactive to May 1st.

BCWS= \$4,745K

BCWP= \$4,429K

ACWP= \$3,977K

CPI= 1.11 (+\$424K)

SPI= 0.93 (-\$316K)

Costs (end of August) = \$71,080K.

Contingency= \$31.3% (against new baseline)

The schedule variance is attributed to delays with the modular coil welded interface design and previous metrology issues which has impacted work preparation activities for FPA Station #2 as discussed above.

Note from previous IPT meeting: The project continues to be graded "Red" because the Project's baseline is no longer deemed credible. It was determined that the Project should continue to formally track against the existing baseline, as per ECP53, at least until the SC Project Review in August or until the end of the fiscal year.

A determination will be made thereafter as whether to continue with the existing baseline, or track against the proposed baseline. In the interim, the Project will informally track against the proposed baseline as well as the current approved baseline.

9. ECP status (Jim/Hutch)

The following are current and anticipated Engineering Change Proposals (ECPs) that require DOE approval:

- a) There are currently no ECPs pending DOE approval. An ECP will be developed to support the project's re-baseline in fall/winter.

10. Planned IPT meetings (and other events) are as follows:

- Oct 16-17..... Root Cause Analysis Workshop (DOE only)
- Oct 22..... Next IPT at 1:00pm
- TBD Constructability Review
- TBD Quarterly Report Briefing