

# NCSX IPT Meeting Minutes

The minutes from the NCSX IPT meeting of Tuesday, November 27, 2007 at 11:30pm are as follows:

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

DOE HQ: B. Sullivan

ORNL: J. Lyon

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

## 1. DOE News (Barry)

- a) OMB passback exercises occurred this past week. No significant issues to note.
- b) There is no update on the CR which continues to be indefinite. The NCSX Project Team believes that the project will be OK until March/April timeframe. However, a prolonged CR will thwart an accelerated baseline should this scenario be chosen.
- c) There is no update on the decision process at the Office of Science regarding the future plans of the NCSX Project/Program. More discussed Section 3 below.
- d) OFES is preparing a quarterly report on the NCSX Project for the Deputy Secretary. Each DOE Project will have about 5 minutes to present.
- e) The date for the Quarterly Briefing to OFES on FY07 4<sup>th</sup> quarter activities continues to be open. [Update: SC has decided that the quarterly brief for the Deputy Secretary will satisfy both quarterly requirements.] In the interim, the quarterly report will be prepared for the file. Also, the next SC Watch List Brief for SC-2 (Dr. Pat Dehmer) continues to be open at this time.
- f) A data request form was submitted to GAO for the NCSX Project, as well as for other projects within the DOE complex. The form provided an 'estimate-at-completion' (EAC) as presented at the August SC Project Review with appropriate caveats that the Project is currently undergoing baseline change and the EAC will likely change further until the new baseline is approved by the Deputy Secretary. Supporting documents (Project Execution Plan, OMB300, etc.) were also be provided with the form.

## 2. Safety Management (Jim)

- a) There were no NCSX related safety incidents.
- b) A Lab-wide safety forum was held last week. The forum was well received and good feedback was provided.

### **3. Rebaseline Status (Jeff/Barry/Hutch/Jim A/Rich/Greg)**

- a) The NCSX Project Team awaits a decision by the Office of Science whether to continue with the project or cancel the project. If a positive determination is made to continue, OFES must then establish annual funding guidance for the Project in preparation of the final baseline proposal (e.g., accelerated baseline) as well as non-MIE upgrade activities within the NCSX Program.
- b) The schedule of events (EIR, ESAAB, etc) to support the baseline change process will need to be updated again. It was agreed that the Project Team will establish a preparation schedule of the time required starting from the point when SC makes their determination and annual funding guidance is provided, to to prepare documentation in support of the External Independent Review (EIR) sponsored by OECM. At this time, it is likely that the re-baseline package will reach the Deputy Secretary's office for approval in the 3<sup>rd</sup> quarter of this fiscal year.
- c) It was agreed that the final rebaseline proposal package should:
  - Include restoration of workscope and/or adjustments previously discussed with OFES and SC-PSO since the August SC Review.
  - Put forth a solid plan to get the project to CD4 with appropriate re-analysis of cost and schedule contingency to support the remaining work. The current corrective action plan to reduce the existing schedule variance should be embodied into the revised baseline proposal. That is, all variances should be 'zeroed-out'.
  - Revise the schedule of previously proposed level 2 milestones.

### **4. Project Reviews (Jeff/Hutch/Jim L)**

The recent 'Construction Feasibility' review provided 17 technical recommendations to the NCSX Project Team.

In addition, a general concern about having adequate technical (engineering & design) resources was expressed by SC-PSO. A letter was sent to PPPL earlier this month to request a staffing plan as to ensure adequate resources are available. As a preliminary response to this concern, the following actions are underway:

#### PPPL

One engineer was recently hired. One engineer from Main Campus is providing part time support. Two additional engineering positions have been advertised (one was filled).

Reallocate existing resources within PPPL. That is, the modular coil winding manager will now work on PF coils, and the construction manager for final machine assembly will be made available to the Project now.

## ORNL

One engineer was recently hired. One contract analytical engineer was hired. Three contract designers will be brought onboard.

### **5. Project technical progress (Jim/Hutch)**

The following provides a brief status on the major components:

#### MC Winding

Modular coil winding operations are proceeding well. The last winding form is now in production. It appears that winding operations may complete earlier than anticipated. MC winding is no longer a critical path activity.

#### Field Period Assembly

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

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

- a) Station #1 activities have essentially been completed for all three vacuum vessel sectors.

##### Station #2 (mating modular coils together)

- a) Station #2 activities continue to be behind schedule approximately 2 months. A revised forecast start date is in January. This is a critical path activity.
- b) The primary delay to the commencement of Station #2 activities is due to the ongoing inboard flange interface design issue. However, a new welded shim design appears to be a promising resolution. An FDR is planned for tomorrow to address this issue. [Update: the FDR was successfully completed with only 3 minor chits. External technical reviewers were also present. The design as presented will now move towards implementation].
- c) In the interim, other preparatory activities continue for Station #2 including modular coil trial fit-ups, procurement of new weld equipment and welder qualifications, shim material and other parts procurement, and preparation of the modular coils. Delivery of the shim material for the first modular coil half period has a level 2 milestone assigned for December 2007.
- d) During a trial fit-up of modular coils, clearance issues were found between two coil types which were not fully appreciated in the CAD model. Additional modification work to the coils will remedy this issue. The Project will ensure that any additional work to prepare the modular coils will be incorporated into the 'best and final' baseline proposal.

Station #3 (assembly of coil half period '3-packs' over the vacuum vessel)

- a) The tooling fixture for Station #3 is in vendor fabrication with delivery in December 2007.
- b) Plans and procedures are still being developed.

### TF Coils

- a) Five TF coils have been completed. 4 have been delivered. A level 2 milestone was successfully met ahead of schedule.
- b) Three more TF coils are in production with the 6<sup>th</sup> coil completing vacuum pressure impregnation of epoxy.
- c) Overall, TF fabrication is going very well. Wedge casting deliveries, provided via subcontract to Everson Tesla Inc (ETI), appear to support fabrication schedules but are close to ETI's internal critical path. The project is addressing this with the supplier.

### Design

- a) Coil structure design work continues. A design review is scheduled for next week.
- b) A full compliment of trim coils (36 coils via 24 electrical circuits) is now part of the Project's scope. This work will become part of Station #5 activities, which puts it on the critical path. Design is now underway to support procurement later this year.
- c) Procurement of the PF coils and the machine support structure are scheduled for later this year.

## **6. Procurement (Rod)**

- a) Approximately \$105K of purchase orders are in the system mostly to support Station #2 activities.
- b) Requisition for NCSX related activities has settled down for the time being. However, the Procurement Division recently lost an experienced buyer and is currently seeking a replacement.

## **7. Review of critical issues (Jim/Hutch)**

- a) Modular coil interface regarding the inboard region of the 'within field period' flange interface. See 'Technical' (Section 5) above.

- b) There were several problems contributing to the metrology system malfunction which ranged from software to hardware issues. Most of these issues have been ironed-out. However, there continues to be a lingering issue regarding the malfunction of the Romer<sup>®</sup> arms. The Romer<sup>®</sup> arms are predominantly used for modular coil winding operations. Factory repair is underway and the Project is looking at obtaining 'loaners'.
- c) To improve metrology performance and reliability, the Project is looking into the use of photogrammetry. The Project has sent engineers to CERN and W-7X to gain more knowledge in this area. A metrology engineer from CERN is visiting PPPL to provide further support. PPPL is in the process of procuring hardware.
- d) Retired risk: a path forward for obtaining shim material has been found.
- e) Added risk: a full array of trim coils will be added to the Project's scope, and the work will become part of the critical path in the near future. The design effort must begin right away.

## **8. Planning for the next 6 months (Jim A/Hutch/Ron)**

The following activities will continue:

- Continue to prepare the Project's 'best and final' re-baseline package upon receiving budgetary guidance from OFES and the Under Secretary;
- Complete modular coil winding;
- Commence Station #2 activities;
- Continue off-site fabrication of TF coils;
- Design and preparation for Field Period Assembly Stage #3, coil structure design, PF and Trim coil design;
- The new NCSX Project Manager will be Don Rej. He will be briefly visiting PPPL and ORNL in December and again at PPPL for 2 weeks in January. He will be permanently onboard in February.

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) [Status: completed]

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

Dec 2007: Shims for 1<sup>st</sup> MC Half Period Assembly (Station #2) Available [Status: close to schedule, but if costs can be reduced, a small slip would be acceptable].

## 9. Project performance through end of October (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= \$7,738K

BCWP= \$7,050K

ACWP= \$6,149K

CPI= 1.15 (+\$901K)

SPI= 0.91 (-\$688K)

Costs (end of October) = \$73,327K.

Contingency= \$14,380K (or 33% base on work remaining)

The cost variance is positive. The only 'job level' with a negative cost variance is the modular coil punchlist activities. Specifically, the variance is attributed to the handling of the coils.

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

**Note from previous IPT meetings:** The project continues to be been graded "Red" because the Project's baseline is no longer deemed credible. It was determined that the Project should continue to formally track in PARS against the existing baseline, as per ECP53. In the interim, the Project will informally track against the proposed baseline as well as the current approved baseline.

## 10. 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.

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

Dec 18 ..... Next IPT at 11:30am  
TBD ..... SC Watch List Briefing  
Cancelled ..... Quarterly Report Briefing for 4<sup>th</sup> qtr FY07  
TBD ..... EIR by OECM  
TBD ..... ESAAB