

# NCSX IPT Meeting Minutes

The minutes from the NCSX IPT meeting of Tuesday, Aug 29, 2006 at 11:30AM are as follows:

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

DOE HQ: B. Sullivan, K. Chao

ORNL: J. Lyon

PPPL: R. Templon, H. Neilson, R. Strykowski, R. Hawryluk,  
W. Reiersen

## 1. DOE News (Barry)

- a) A continuing resolution continues to appear likely. Not much more is known of its extent;
- b) The initial financial plan shows a holdback of \$78K from the FY07 NCSX budget authority of \$15.9M.

## 2. Safety Management (Hutch)

PPPL provided a formal response to the ISM re-verification report performed the week of June 12<sup>th</sup> with a focus on NCSX activities. As one of the outcomes of the report, the NCSX Project updated the coil winding procedures to identify what personal protective equipment is needed on a step-by-step basis. These safety notes are linked to the Job Hazard Analysis that is performed for each procedure.

## 3. Lehman Review (Hutch/Wayne/Jeff)

- a) A letter was sent by Jeff as the FPD to the NCSX Project Team that requested a disposition plan for the recommendations made by the SC Project Review Team during the May 2006 Lehman review. Two recommendations of note are:
  - Evaluate the need for additional winding station capability. Update: The NCSX Team has determined that an expansion to the winding line will help facilitate the winding schedule and possible offset overall cost. Another new winding fixture is currently being fabricated via off-site vendor;
  - Evaluate the need for cold testing of the type A and B modular coils. Update: The NCSX Team has determined that a cold test of a second type 'C' modular coil will be performed, and the cold test for a type A and B modular coil will not be performed at this time.

The first purpose of the cold testing is to validate the prediction made by the finite element analysis for stress/strain deflection under load. During cold testing of C-1, power supply noise, magneto interference, and the cryogenic environment compromised the strain gage data. The next C coil (most likely C-5) will utilize fiber optic based gages for stress/strain evaluation.

The second purpose of cold testing was to monitor the coil's thermal properties and to validate the location of thermo-couples during normal coil operation.

Jeff requested that the NCSX Project draft a two-page response to their decision process of why a type A and B modular coil will not be tested.

b) The next Lehman Review is scheduled for December 12-13 at PPPL.

#### **4. Project technical progress (Hutch)**

The following provides a brief status on the major components:

##### MC Winding

- a) The C-1 MC: The C-1 is complete;
- b) The C-2 MC: The C-2 was potted, successfully warm tested, and is in the process of de-molding and final clamp installation. The C-2 MC shares the same lead block design as C-1 and will undergo the same lead block remedy as C-1 as a conservative measure;
- c) The C-3 MC: The C-3 is complete;
- d) The C-4 MC: The C-4 was VPI'd last week;
- e) The C-5 MC: The C-5 is having chill plates installed and then will be prepared for VPI;
- f) The A-1 MC: The A-1 has completed cladding and is now being wound. Cladding took a little longer than anticipated, but the learning curve for this coil was significantly less than the early type C coils. However, winding operations on the A coil appears to be less complex than the C coils;
- g) The A-2 MC: In queue for winding operations;
- f) The A-3 MC: In queue for winding operations.

##### MCWFs

The following is the status of MCWFs in vendor production:

- a) The next modular coil will be the B-1 instead of A-4 with delivery expected in mid-September. The change in coil sequence is more favorable to the NCSX Project to meet the subsequent field period assembly phase of the project;
- b) Modular coil winding form production is going well. Approximately 8 months left to go on the winding form contract;

In summary:

0 in foundry phase  
10 in machining phase  
8 delivered  
18 total

## VVSA

The VVSA effort continues as follows:

- a) VVSA #1 has completed metrology measurements for now and has begun mapping points for the heating & cooling tubes and the diagnostic loop locations. Interferences between these features were found and are being worked out;
- b) VVSA #2 has been mounted in the fixture at Prep Station #2;
- c) VVSA #3 continues fabrication at Major Tool and Machine. Delivery is anticipated in mid September;
- d) Metrology measurements have taken longer than anticipated due to the learning curve of the equipment and software, and equipment failures that were experienced. A best-fit analysis for final machine assembly will be performed upon the arrival of VVSA #3.

## TF Coils

- a) The TF Coil contract with Everson Tesla Inc. (ETI) is underway. Fabrication of tooling (i.e., the winding mandrel), the clean room, and brazing head trials are underway;
- b) Materials for the wedge fixture will be provided by a vendor in Sweden that has previous experience on the German Wendelstein-7X experiment. The fixture will be cast in lieu of a weldment, and will be pre-machined by Tesla in England, and then shipped to ETI in Pennsylvania for attachment to the TF coil. This issue will delay PPPL's receipt of the first coil assembly, but the slip will be recovered by the third TF coil. The TF coils are not a critical path item.

## Other activities

Design activities continue.

### **5. Procurement (Rod)**

- a) Procurement continues to support both major and minor material contracts including EIO, Major Tool & Machine, and Everson Tesla Inc as discussed above;
- b) New procurement actions include procurement of another modular coil winding fixture, and the cladding and chill plates for the 'B'-type modular coil. Approximately \$260K of parts are in procurement for an early October delivery.

### **6. Review of critical issues (Hutch)**

- a) There are no new Category I critical issues;
- b) An existing Category II critical issue continues with the re-work of the lead block area of the C-2 modular coil as discussed in Section 3 of these minutes.

## 7. Planning for the next 6 months (Hutch)

The focus will continue to be on the receipt of MCWFs and winding of modular coils as a critical path activity.

Other planned activities are:

- Continue fabrication, and receipt, of vacuum vessel segments;
- Commence field period assembly with Prep Station #1;
- Monitor and oversee TF coil vendor fabrication. First TF delivered in February;
- Continue with design support.

It was noted that the project will continue to be 'budget constrained' thru FY07. The FY07 budget will be 20% less than FY06 budget. To relieve this condition, and to compensate for a low contingency allotment for FY07, the NCSX Project will propose shifting non-critical and near-critical work into FY08. This re-planning proposal will be provided in detail by mid-September via the Project's response to the July 13<sup>th</sup> letter from Faul to Goldston.

## 8. Project performance through July (Ron)

The project cost performance data thru the end of July: SPI=.99 and CPI=.97. These indices have not changed in the last 3 months;

The CPI for winding operations only: CPI=.90;

The incremental CPI for the month of July: CPI=.92;

Free balance contingency (i.e., contingency available after clearing existing cost variances) is approximately 20% based on the remaining work.

The Project will undertake its annual 'beginning of fiscal year' re-planning for FY07 in October. The plan will be reviewed by DOE in mid-September as discussed in Section 7 of these minutes.

## 9. ECP status (Ron)

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

- a) ECP 49 was approved by the Federal Project Director (FPD) for the release of contingency and retirement of \$290K of work;
- b) ECP 50 will be a technical change for workscope reduction of magnetic diagnostic work. This ECP will not require FPD approval.
- c) ECPXX will be proposed for the re-planning effort in October as discussed in Section 7 of these minutes

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

TBD.....NCSX Monthly Watch List Report for August  
Sep 19<sup>th</sup>.....Response to CV and Contingency Usage Letter to PSO  
Sep 26<sup>th</sup>.....Next IPT Meeting  
Dec 12-13.....Next NCSX Lehman Review