

NCSX IPT Meeting Minutes

The minutes from the NCSX IPT meeting of Tuesday, August 30, 2005 at 11:30AM are as follows:

Attendees: DOE-PSO: J. Makiel, G. Pitonak, B. Bozarth, L. Dietrich
DOE HQ: B. Sullivan, K. Chao, S. Barish
ORNL: J. Lyon
PPPL: R. Strykowski, J. Levine, R. Templon, F. Malinowsky
H. Neilson, W. Reiersen

1. DOE News (Barry)

- a) A Dep Sec memo was issued that formally approves the new project baseline;
- b) The initial FY-06 annual financial plan (AFP) will budget \$14.4M for PPPL and \$1.5M for ORNL = \$15.9M total for FY06.

2. Safety Management (Jerry)

PPPL had a recordable injury reported this month, the first in about 8 months. It was not related to NCSX work. Because housekeeping was a contributing factor, PPPL management and the NCSX project team are focusing more attention on housekeeping standards via mini-reviews and meetings with responsible line managers.

3. Next Lehman Review (Kin/Barry/Greg/Hutch)

The next Lehman review is scheduled for November 2-3. Hutch provided a tentative schedule and a detailed outline of topics that will be discussed during the review in accordance with the outline previously discussed in the last IPT meeting on August 2nd. Upon initial review by the IPT members (especially Kin and Barry), the proposed schedule and outline look good.

Kin stated that Dan Lehman may not be available for the review due to another conflicting review. However, Steve Meador will most likely chair.

[Action: Kin or Barry to advise Greg and Hutch on who will be on the Review committee, and if any changes to the proposed schedule and agenda are required].

4. Project technical progress (Hutch/Wayne)

MCWFs

Seven modular coil winding forms (MCWFs) are in process. Tom Brown (PPPL) visited Major Tool and Machine (MTM) to discuss the interface for comparing the measured dimensions against the CAD model. Other members of the NCSX team will be visiting MTM next week to oversee technical progress. PPPL Quality Assurance and DCMA continue to support the effort and will be at MTM for the inspection and testing phase of the first completed casting (C-1). The following is an update in status of each casting:

- a) As reported in the last IPT meeting, the C-1 casting shipping date has slipped to September 16th. The C-1 casting continues machining at MTM and progress is tracking close to the revised schedule provided from MTM about 3 weeks ago. 3 of the 4 machine setups have occurred which indicates that the C-1 casting will complete machining on Sept 2nd and begin the dimensional testing phase prior to shipment on Sept 16;

- b) The C-2 casting continues in the machining phase. The C-2 casting is progressing much better from lessons learned on the C-1 casting. The duration of machining is estimated to be about 50% less at this point;
- c) The A-1 and C-3 castings are about to leave the foundry (MetalTek) for arrival at MTM. All weld repairs and tolerance checks will be completed. The issue regarding the thin walls on the first A casting are believed to be attributed to the assembly phase of the type A mold prior to pouring. This conclusion was based upon the fact that the pattern was reexamined and found to be within tolerance. The thin wall was determined to be acceptable after technical evaluation by the NCSX team;
- d) The C-4 and C-5 castings have been poured at MetalTek and are undergoing routine quality assurance testing and weld repairs;
- e) The C-6 mold is being prepared at MetalTek for the next pour which will complete all "C" casing pours;
- f) The "B" pattern continues to be in the development phase at Lawton. Delivery of the pattern to the foundry (MetalTek) is scheduled for September 15;
- g) The A-2 casting is in preparation for the next pour around September 20th;

VVSA

- a) The VVSA panel forming effort continues. The first pair of 60 degree sections are completed and are about to be welded together to form the 1st period. Joining them together is the most critical part of their alignment and any misalignment must be addressed.
- b) The third 60 degree period continues to be weld fabricated;
- c) Panels for the remaining pieces of the VVSA are being 'mass produced' in a more production-like mode;
- d) Work on diagnostic ports is underway with port fabrication and polishing. Odd shaped ports have been subcontracted by MTM to another supplier.

Other components and facilities

- a) The Twisted Racetrack Coil (TRC) began cold testing in the Coil Test Facility. Testing will resume next week when NSTX comes back on line (Note: the CT Facility shares power supplies with NSTX). So far, no performance problems have been identified;
- b) The TF coils had a successful final design review (FDR). The TF coil wedge casting has begun the procurement phase;
- c) VVSA cooling tubes continue in procurement. The cooling tube design has been modified to simplify the manufacturing of pre-formed tubes. However, flexible tubing will be a fall-back material if the prefabricated bent tubing is not obtainable;

- d) Design and specification for insulation on the vacuum vessel continues. Nanogel, which is a pellet-type insulation, will be poured in the space between the vacuum vessel and modular coil shell. This insulation material is being investigated by the NCSX team for potential flammability characteristics at proposed bakeout temperatures. Also, analysis of cryostat port seal design is underway due to possible space constraints where the diagnostic ports pass thru the shell;
- e) An alternate design using traditional rigging to assemble the field period section, versus an expensive custom fixture, looks good. Rigging trials were performed using a concrete block flown thru a predetermined path using lasers to help confirm that this is a viable solution;
- f) A preliminary design review (PDR) was successfully accomplished for the vacuum vessel prep station, the first step in field period assembly.

5. Procurement (Rod)

- a) In addition to the two large procurements involving the VVSA and MCWFs, two new significant procurements are underway for the VV cooling tubes and the TF coil wedge casting. RFPs are currently on the street;
- b) There is approximately \$800K of new procurements in process which consist of schedule critical and non-critical components. Assembly components in support of winding the first modular coil (C-1) are in good shape. Most of the copper conductor to support all 18 coils has been received.

6. Review of critical issues (Hutch/Wayne)

- a) Test demonstrations for the field weld design that connects the completed field period assemblies (VVSA and coils) is resolved. This risk has been reclassified from category 2 to category 3 (retired);
- b) The modular coil assembly fixture will not be fabricated. A test trial was performed on a concrete shielding block to simulate the modular coils' flight path using traditional rigging equipment will be used instead. This risk has been reclassified from category 2 to category 3 (retired);
- c) New category 1 risk - - the available space inside the cryostat near the midplane is very tight. The vacuum vessel insulation boots further infringe on the available space requiring further boot design.

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

Although not explicitly discussed during the meeting due to time constraints, the following tasks from the last IPT meeting continue as follows:

- Close-out designs for vacuum vessel, C-type modular coil, and TF coil;
- Continue vendor fabrication activities & begin coil winding;
- Focus on design work related mostly to the support structures;
- Re-plan next years scope and resources adjusting for delays experienced this fiscal year regarding the modular coil winding forms.

8. Project performance thru July (Ron)

a) The SPI and CPI as of July are .96 and .98 respectively as reported against the new baseline.

Drivers for the SPI are as follows:

- Panel production for the VVSA continues to lag;
- Type C MCWF fabrication drawings delayed;
- TF procurements delayed due to delay in the FDR;
- Modular coil hardware fabrication delays due to late issuance of drawings, and delivery of 1st casting.

Drivers for the CPI are as follows:

- TF coil design cost more than estimated;
- Development of drawings for type C modular coil cost more than anticipated. (Increase cost for drawing for type A and B modular coils may also occur.)

b) To improve schedule, it is anticipated that the first two thirds of the modular coils will be wound using double shifts;

c) An estimated carryover at end of the fiscal year is anticipated to be between \$2.0M - \$2.5M with approximately \$1.0M in outstanding commitments.

9. ECP status (Ron)

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

There are currently no ECPs pending action. However, an ECP will likely be proposed to release contingency to support additional costs associated with the final design of the type A & B modular coils, as well as anticipated additional cost to wind all coils based on experience gained from the TRC demonstration.

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

- September 20 at 11:30am - - IPT Call
- Nov 2-3 - - Next Lehman Review.