

## NCSX SC Project Reviews Recommendations Log, April 18, 2005

Item	Section Ref	Comment/ Recommendation	WBS / Respon- sibility	Action Needed	Status
<b>3. NCSX Mini-Review, December 7, 2004</b>					
3-1	2. Recommen- dation	Test the proposed coil cooling system [modular coil chill plates] as quickly as possible in the twisted racetrack coil to ascertain its effectiveness.	1. Nelson	As a first step, ensure that this issue is addressed in the test program for the twisted racetrack coil.	A test plan is being developed for the TRC that includes measuring the coil temperature vs time, coil resistance vs time, and coolant flow rate. The external chill plate method of cooling has already been tested in two previous coil R&D tests (the UT coil and the flat race-track coil).
3-2	2. Recommen- dation	As the Toroidal Field (TF) coils cannot be replaced without disassembly of the machine, the Committee urged the project to investigate ways to reduce risk/mitigate failure of the TF coils.	13. Kalish	Address via the design process. Strict attention to performer qualifications as well as QA and QC during coil fabrication will be the first line of defense.	Preliminary design was completed. The design was modified eliminating the necessity to cut through the insulation to achieve the wedged configuration making the design both easier to manufacture and decreasing the probability of a manufacturing defect. A make-or-buy analysis in conjunction with the PDR led to a decision to have PPPL wind the TF coils. The main reason is to reduce quality control risks that could lead to a coil failure.
3-3	3. Recommen- dation	Update the ETC semi-annually.	81. Strykowski	Action as stated. Updates ETCs in conjunction with semi-annual SC project reviews.	ETC for all jobs were updated in conjunction with the directed re-baselining in April, 2005, and incorporated in the new baseline. ETC's are evaluated on a monthly basis with ECP's processed when warranted.
3-4	4. Recommen- dation	The Office of Fusion Energy Sciences is still encouraged to accelerate the funding profile to allow for contingency to be used in the years when the project will need it the most.	81. Neilson / Strykowski	Follow-up with OFES on an on-going basis.	Increased funding was provided in FY-05, improving the project's contingency position for that year. The new baseline has contingency budgeted each year consistent with expected need.

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3-5	5. Recommen- dation	The project needs to have a more specific plan on staffing for the remainder of the project, especially the technical craft labor that will be needed in future years.	81. Strykowski	Address as part of FY-07 FWP process. Reduce the technician "spike" in the last year of the pro- ject.	Manpower loading is leveled on a rolling wave basis. A more detailed and realistic staffing plan has been developed as part of the April, 2005, re-baselining.
<b>2. NCSX Mini-Review for CD-3, September 1, 2004</b>					
2-1	2. Comment	The project needs to insure that the C-site power supplies can achieve conditions needed for mapping. Specifically configurations that are sensitive to errors may require introduction of certain rotational transform values.	82. Reiersen  Physics Fredrickson	82: Document that GRD field mapping scenario is satisfied.  Physics: Develop field mapping plans consistent with C-site power supplies.	The field mapping scenario requirements are enveloped by the first plasma scenario. <b>Closed</b>
2-2	3. Comment	To ensure that these fabrications stay within budget and to maintain the cost, controlling the changes to the MCWF and VVSA is essential.	1. Nelson	Ongoing attention.	To date, there have been no project-directed changes.
2-3	4. Comment	Contingency funding is backend loaded thus the project lacks flexibility with moving activities around.	Project and PPPL Man- agement	Addressed in 3-4	Addressed in 3-4
2-4	4. Comment	The project needs to ensure that activities that will be delayed (i.e., PF/TF coils) are not pushed back too far that they become critical path items or interfere with assembly of the components.	81. Strykowski	Ongoing attention.	
2-5	4. Comment	Finally, the committee identified that there may still be some optimization possible with the schedule.	81. Neilson	Follow-up with committee.	Discussed with committee member David Anderson. It was concluded that the possibility identified by the committee was precluded by the design. <b>Closed.</b>
2-6	5. Comment	The current funding profile is not optimized. There is inadequate BA in early years which limits the rate at which work can be completed and thus has direct impacts on the cost and schedule.	81. Neilson	Addressed in 3-4	Addressed in 3-4

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<b>1. SC Independent Project Review (IPR), June 8-9, 2004</b>					
1-1	2.2 Comment	The NCSX project is especially encouraged to follow through on its plans for R&D on the field weld joint that will be used to join the three 120 degree VVSA sectors.	12 Viola	Action as stated	Field weld joint R&D is included in project plan under Job 1202. Small-scale test of weld prep and procedures have been successfully completed. <b>Closed</b>
1-2	2.2 Comment	Fracture mechanics/fatigue analysis issue identified during FDR must also be investigated and resolved	14 Williamson Heitzenroeder	Bias the gating design to promote high casting quality in critical areas; specify higher level of inspection in those areas. Test alloy samples to determine fracture properties. Additional analysis and design to reduce stresses.	MCWF spec changed to include optimized casting process and inspection requirements to help reduce initial flaw size in high-stress areas. We have determined that fast fracture is not an issue for this material. In order to get some fracture results quickly the first round of fracture tests was performed on available cast material from the risers (i.e. molten metal reservoirs which "feed" the casting) and cast welding test plates of the prototype casting, but the results exhibited wide scatter. This scatter in results was not totally unexpected since the metal in the risers are likely to have more oxides and other impurities compared to the casting. Consequently additional fracture specimens are now being prepared from the shell region of the prototype. Tests on these specimens are expected to be completed by the end of May, 2005.
1-3	2.2 Comment	Procurement action [for MCWF] should continue with the understanding that the project team and the DOE contracting officer will assess adequacy of vendor progress and results prior to final award action.	8 Templon Heitzenroeder	Project will keep FPD informed of progress and issues throughout the proposal evaluation and selection process.	The adequacy of the vendors has received significant attention during the procurement process. Both the DOE Contracting Officer and OFES have accepted the project's assessment that the proposals are technically sound. <b>Closed</b>

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1-4	2.3 Recommen- dation 1	Consider offering an incentive fee for on-schedule delivery of the VVSA.	12 Templon Viola	Consider during VVSA procurement.	Incentive fee was considered during proposal evaluation and rejected due to constraints on project funds, <b>Closed</b>
1-5	2.3 Recommen- dation 2	Develop a split-order options strategy for the MCWF procurement prior to receipt of bids. Consideration should be given to possible impact on cost and funding profile	14 Templon Heitzenroeder	Consider during MCWF procurement.	A split-order was considered during negotiations and judged to be too expensive. <b>Closed</b>
1-6	3.2 Comment	Cost estimates and contingency for the remainder of the project may need to be updated after the proposals for MCWF and VVSA are submitted, especially if the costs are dramatically different from what was planned.	8 Strykowski	Evaluate based on proposal contents.	The contingency and costs for other work scope have been updated as part of the project re-planning that was done following receipt of MCWF and VVSA proposals. The new plan provides adequate contingency. <b>Closed</b>
1-7	3.2 Com- ment	The project has other high-risk activities besides the MCWF and VVSA procurements. As a result, ensuring adequate contingency is important for successful completion of the project.	8 Neilson	The project will, on a continuing basis, identify work efficiencies and value improvements in order to conserve contingencies needed for high-risk scope.	The contingency has been updated as part of the project re-planning that was done following receipt of MCWF and VVSA proposals. The new plan provides adequate contingency. <b>Closed</b>
1-8	3.2 Comment	The project needs to pay close attention to adequacy and availability of funding during FY05 and FY06 since most of the high risk work described above will be performed during this timeframe.	8 Neilson	Will discuss with DOE.	Funding adequacy was addressed in re-planning the project. Various measures were taken to ensure adequate BA in FY-05 to fund the MCWF and VVSA contracts. <b>Closed</b>
1-9	3.2 Comment	The project is evaluating options such as moving non-critical items activities for later work, rearranging the order of work to be performed, and finding work efficiencies to minimize the impact of the funding limitations in FY 2005-2006. The Committee felt that the project should continue to evaluate these methods.	8 Reiersen	Will continue to pursue cost savings. Schedules can be re-arranged to some degree if necessary in order to manage within the funding constraints.	Schedule re-arrangements were made as part of the re-planning to address cash flow issues and delayed delivery of the MCWF. <b>Closed.</b>

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1-10	3.2 Comment	The project should consider evaluating the limitations of current schedule acceleration plan [for the modular coil windings, i.e. second shift and overtime] and reexamine the cost impacts of various options available.	14 Chrzanowski	Will consider as part of future MC planning.	In re-planning the project it was found to be advantageous to add a third winding line, use 2-shift operation for the last 6 coils, and take modest credit for a learning curve. <b>Closed.</b>
1-11	3.2 & 4.2 Comment	The committee is also concerned about the increase in price of commodities. (3.2) Demand, and hence cost, for many construction commodities (e.g., steel, Inconel, copper, electrical equipment) has substantially increased. Availability of some of these items for NCSX could potentially become a schedule issue. (4.2)	8 Templon, Strykowski	Commodities issue, should it arise, will be addressed on a case-by-case basis. Will address as part of procurement planning.	Continuing to address as part of procurement planning. Materials price increases impacted the costs for the VVSA and MCWF procurements, but that risk is retired with fixed-price agreements. Availability has not been an issue. <b>Closed.</b>
1-12	4.2 Comment, 4.3 Recommendation 1	Comment: Flattening the project BA profile (reducing FY 2005 funding by \$4.5M) has significantly limited management flexibility to address the component fabrication, assembly, and testing issues that will inevitably arise.  Recommendation: OFES should give high priority to sustaining the project's BA funding profile, especially in FY 2006.	8 Neilson	Addressed in 3-4	The constraints imposed by flat funding in FY-05 were taken into account in the CD-2 baseline. Continuing attention addressed in 3-4. <b>Ongoing</b>
1-13	4.3 Recommendation 2	Update project baseline schedule to reflect actual MCWF and VVSA vendor delivery schedules as soon as they become known.	12, 14, & 8 Goranson Williamson Strykowski	Will update when vendor selected.	The schedule has been updated. <b>Closed</b>
1-14	5.2 Comment	The MCWF and VVSA procurements are planned as "best value" procurements. Care should be taken in specifying the detailed procurement process to assure that management has the flexibility to meet the intent of the best value process.	8 Templon	Will pursue as part of RFP development and procurement process.	This was integrated into the RFP development process. The selection process satisfied both the letter and the intent of the best value process, without any difficulty. <b>Closed</b>

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1-15	5.2 Comment	Management should ensure that the critical issues list stays current with project status and other events that could be important. For example, the nationwide shortage of basic materials and commodities could impact NCSX, but was not recognized in the critical issues list.	8 Reiersen	Will keep the critical issues list up to date. Commodities issue, should it arise, will be addressed on a case-by-case basis.	Critical issues list has been updated to recognize the commodities issue and reflect the issues currently facing the project. <b>Ongoing</b>
1-16	5.2 Comment	The project should develop a critical spares plan; including whether to buy a spare casting of each of the three types of mod coil winding structure. Such a spare could help minimize the time necessary to recover from a potential problem that might arise in fabrication or operations.	8 Neilson	Develop a critical spares plan.	Have documented the plan for ensuring that spares needed to support startup will be available. <b>Closed</b>
1-17	5.3 Recommendation 1	Consider instituting regular (e.g., monthly) project specific status telecons among PPPL/ORNL, PSO and OFES.	8 Neilson Pitonak Nardella	DOE decided that Laboratory staff will be included in future monthly status briefings for OFES.	Laboratories' participation started with the June 30 monthly. <b>Closed</b>
1-18	5.3 Recommendation 2	Pending successful outcome of the VVSA and MCWF procurement process, CD-3 approval should be granted.	Davies	Brief OFES on source selection decisions and project impacts.	CD-3 was approved on Sept. 16, 2004. <b>Closed.</b>