

NCSX National Compact Stellarator Experiment

040522_CD3_AEP_Comparison_810_RTS

PRINCETON UNIVERSITY: **PPPL, NCSX Project**

To: **G.H..Neilson** **Date:** May 22, 2004

From: **R. Simmons** **Subj:** **Review of NCSX Acquisition
Strategies vs. AEP
Statements**

As per your request, I have reviewed the current status of the NCSX project for compliance with the approved NCSX Acquisition Execution Plan (NCSX-PLAN-AEP-00). My conclusion is that the project is indeed following the requirements and intent of the AEP. Although the budget targets and milestone schedule have changed due to the CD-2 Project Baseline and subsequent ECP-04-006s, there remain no material differences between the project's acquisition strategy and the AEP. Specifically:

- AEP Section I.B.1 (Overall Cost Objective) – the NCSX Project baseline was established in February, 2004, as \$86.3M . By the time of the CD-3 milestone, ECP-04-008 will be available and complete to reflect the most recent baseline, however, it is fully expected that the \$86.3M TEC will not be changed, but rather additional calls on contingency will be identified to reflect, for example, the 50% increase in the number of ports.
- AEP Section I.B.2 (Life Cycle Cost) – the NCSX life cycle costs based on NSTX operating data, sharing of common facilities with NSTX, C-Site cost estimates, and the TFTR decommissioning and dismantlement data, has been refined to reflect a life cycle cost estimate that includes the TEC, annual operations costs, and decommissioning and dismantlement costs.
- AEP Section I.B.3 (Design to Cost) – the NCSX Project continues to balance technical scope, schedule, and cost to arrive at a target cost objective. As part of the CD-2 preparations, a very proactive trade-off assessment of technical scope, schedule, and cost was performed on each and every estimate.
- AEP Section I.B.4 (Should Cost Methodologies) – the NCSX Project continues to utilize the most up-to-date and detailed cost estimate data available. To the maximum extent feasible, cost estimates are based on industrial inputs in the form of budgetary quotations or historical data from similar projects and procurements. In addition, each procurement, before being awarded, has undergone some form of price or cost analysis to compare TEC estimates for validation and/or revision of the TEC estimate.
- AEP Section I.D (Delivery Requirements) – as a result of the CD-2 baseline, the current first plasma date is May 2008..

- AEP Section I.E (Trade-Offs) – the NCSX Project continues to utilize trade-offs and other design solutions (e.g., conductor selection, wide use of prototyping early to ensure a robust and proven design results, etc.)
- AEP Section I.F (Risk) – the NCSX Project has followed the risk mitigation process outlined in the AEP exactly; the Project has taken a very proactive approach to risk mitigation. For the major components with the highest risk due to unique shapes and precise tolerances, two prototype R&D contracts each for the modular coil winding forms and the vacuum vessel were awarded and are nearing completion. In addition, in order to gain experience and develop the most robust winding methodologies, small scale winding prototypes using several racetrack and twisted race track forms have been developed and several conductor configurations have been wound to discover the keystone parameters. The conductor configuration properties have also been characterized by CTD in a separate R&D contract. Finally, a full-scale vacuum vessel weld joint weld R&D program has been initiated.
- AEP Section I.G (Acquisition Streamlining) – the partnership with ORNL continues as strongly as before with the flexibility to transfer specific procurements and testing and/or design support between PPPL and ORNL easily. In general, however, PPPL has retained the vast majority of procurement lead responsibility with direct support from the ORNL technical staff.
- AEP Section II.A (Sources) – the NCSX Project continues to actively seek out and pursue a high degree of supplier input and participation in the development of major systems via its numerous small and large R&D contracts and informal discussions with a wide range of suppliers. However, the responsibility for assessing this information and for developing the final requirements has been retained by the Project.
- AEP Section II.B (Competition) – the Project fully intends to pursue fixed-price fabrication contracts once the final design is selected. It is anticipated, that the current major R&D prototype suppliers for both the modular coil winding forms and the vacuum vessel will compete for the final fabrication contract on a fixed-price basis and that one will be down-selected to proceed. Consideration of use of incentive-type contracts will be considered where appropriate.
- AEP Sections II.C and II.E (Options for Source Selection Procedures and Contracting Considerations) – the NCSX Project continues to follow the requirements and plans outlined in the AEP.
- AEP Section II.E (Budgeting and Funding) – the Preliminary NCSX Funding Profiles presented in the AEP are now out-of-date due to the CD-2 baseline which established new goals.
- AEP Sections II.F through II.K (Business Considerations, Logistic Considerations, Test and Evaluation, Government Furnished Property, Government Furnished Information, and Environmental and Energy Conservation Considerations) – the NCSX Project continues to follow the requirements and plans outlined in the AEP.
- AEP Section II.L (Milestones for the Acquisition Cycle) - due to the CD-2 baseline, the first plasma date and associated interim DOE milestones have been

adjusted. The most recent revision to the NCSX Project Execution Plan (NCSX-PLAN-PEP-01) reflects the most recent baselined milestones.

If you have any questions, please contact me.