

NATIONAL COMPACT STELLARATOR PROJECT Engineering Change Proposal (ECP)

COVER PAGE

(TO BE COMPLETED BY SYSTEMS ENGINEERING SUPPORT MANAGER)

Originator: R. Strykowski	Date: January 31, 2007
ECP No: 053	ECP Title: Near Term Replanning

Required Reviewers

Required Reviewers for this ECP: H. Neilson, W. Reiersen, L. Dudek, J. Chrzanowski, G. Gettelfinger, D. Williamson, M. Cole, M. Viola, F. Dahlgren, T. Brown, R. Simmons, M. Williams, J. Levine, J. Malsbury

ECP Approval Level

Expedited ECP? Yes No
 Change Level: 2 Federal Project Director
 Approving Official: 2 Federal Project Director

Actions

Accept proposed near-term replanning and incorporate cost and schedule replanning into January 2007 status reporting.

APPROVALS

(TO BE COMPLETED BY APPROVING OFFICIALS)

Change Level	Approving Official	Approval?	Signature
3	NCSX Project Manager	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
3a (Expedited ECP)	NCSX Engineering Manager	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	NCSX Federal Project Director	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
1	Associate Director OFES	<input type="checkbox"/> Yes <input type="checkbox"/> No	
0	Deputy Secretary of Energy	<input type="checkbox"/> Yes <input type="checkbox"/> No	

NATIONAL COMPACT STELLARATOR PROJECT

Engineering Change Proposal (ECP)

PART I *(TO BE COMPLETED BY ORIGINATOR)* ECP-053

Originator: R. Strykowski

Date: January 31, 2007

Overview of Change

Type of ECP: EXPEDITED STANDARD

Type of Change: TECHNICAL COST SCHEDULE EDITORIAL

(Check all that Apply)

Reason for Change:

As a result of the last Office of Science Review (Lehman Review) in December, 2006, it was agreed that the NCSX Project would re-estimate the remaining project work after first developing more experience with critical field period assembly issues. In addition, recent value engineering activities have led to the adoption of new, lower-risk concepts in the modular coil interface and coil structures designs. These changes require new design and development work in the near term. Additionally, although significant efficiencies are evident in the Modular Coil winding operation, it is recognized that the balance of coil winding operations will require more labor than originally estimated. Consequently, the Project is replanning its near-term work (next 6 months) to reflect changes in estimates, new work, transfer of some scope out of MIE Project to GPP, adjusted rates (a reduction), and some re-scheduling of work to accommodate these changes. The TEC remains at \$92.4M, however, this ECP requests a drawdown in contingency of approximately \$594K (reduction in contingency from \$6,627K to \$6,033K. There is no impact on Level II milestones or the project completion date.

Impacted WBS Elements: 12, 13, 14, 15, 17, 18, 4, 6, 7, & 8.

Does this Change Impact Material Already Procured or Parts/Assemblies Already Assembled/Manufactured using this Material: Yes No

If "Yes", what is the recommended disposition of this material/part/assembly?

Assessment of Other Options: This ECP reflects what the Project believes are the most technically sound and cost effective approaches. Retaining the original concepts for coil interfaces or structures design would result in a significantly higher cost and schedule risk to downstream critical-path field period assembly operations.

List Attachments, Impacted Documents, etc.

- (1) Revised Baseline Schedule – dated February 1, 2007
- (2) Comparison of ECP-053 to ECP-052
- (3) ECP-053 Cost Details by Job

NATIONAL COMPACT STELLARATOR PROJECT

Engineering Change Proposal (ECP)

PART I

(TO BE COMPLETED BY ORIGINATOR)

Originator: R. Strykowski

Date: January 31, 2007

Detailed Description of the Change:

Description of Change: (Budget) Attachment 2 Provides Comparison of ECP-053 to ECP-052. Below is a summary of the major items:

- WBS 12 (Vacuum Vessel) – net reduction of ~\$12K due primarily to rate reductions and offsetting replanning of work scope from FY07 to FY08
- WBS 13 (Conventional Coils) - net decrease of ~\$64K due primarily to overhead rate exemption reduction.
- WBS 14 (Modular Coils) – net increase of ~\$2,088K primarily due to the following:
 - Change in Modular Coil Interface concepts and design leading to increase in hardware costs, coefficient of friction tests, joint designs, and other development and testing
 - Re-estimate of coil winding activities to reflect experience to date.
 - Re-estimate and replanning of cost of materials and components (gages, consumables, thermocouples) and additional tech shop machining and fabrication support to reflect re-evaluation of the modular coil production effort – this increase was offset by some rate reductions
- WBS 15 (Coil Structures) - net reduction of ~\$272K due primarily to simplification of the design of the support structure from a “stand-alone” concept to one that is supported off the Modular Coils. Offsetting this was some replanning and re-estimates of the design effort to reflect this new concept.
- WBS 17 (Cryostat and Base Structure) - net increase of ~\$15K due primarily to replanning of work scope from FY07 to FY08 and offsetting rate reductions
- WBS 18 (Field Period Assembly) - net reduction of ~\$178K primarily due to the following:
 - Elimination of Station 4 (TF Coil Pre-Assembly) – decision made that due to the simplified coil structure (WBS 15) there is no longer a need to pre-assemble TF coils into a 3-pack prior to mating with the other stellarator core components (MC & VV). As a result, the activities for Station 3 and 5 were re-estimated to reflect installing TF coils individually. Offsetting this decrease was a re-estimate of the metrology support needed in FY2007 – based on experience to date.
- WBS 4 (Electrical Power Systems) - net reduction of ~\$338K due primarily to the following:
 - Reclassified auxiliary AC power scope as a GPP Project consistent with Cost Accounting Guidelines.
 - Reduction in power system design integration activities to reflect reassignment of AC power to GPP and re-estimated level of support for diagnostics needed for first plasma.
- WBS 6 (Facility Systems) - net increase of ~\$156K due primarily added scope to define the requirements which are needed to support cryostat design
- WBS 7 (Test Cell Preparations & Machine Assembly) - net reduction of ~\$89K due primarily to reassignment of AC power to GPP

- **WBS 8 (Project Oversight & Support) - net reduction of ~\$686K due primarily to the following:**
 - **Re-allocation of Management and systems engineering budgets based on re-estimate of near-term project needs.**
 - **Additional budget to cover bottoms-up estimating activities requested by DOE. (Applies to all WBS).**
 - **Anticipated overhead rate reductions and lowered MHX exclusion threshold at PPPL. (PPPL indirect cost structure modification proposal was reviewed by DOE-CH and PSO. CAS Disclosure statement is currently being modified accordingly and approval is anticipated based on absence of any objections from DOE reviews.)**
 - **Salvage value of the VVSA die materials returned by subcontractor.**

Description of Change: (Schedule):

New design and development work, described under WBS 14 and 15 above, is scheduled in the near term to develop the concept changes being made with this ECPs. Downstream activities that are linked to these tasks were re-scheduled. For the first field period, completion of Vacuum Vessel Prep (Station 1) is unaffected, completion of modular coil subassembly (Station 2) is delayed by 1 month (July to August, 2007), and completion of modular coil-to-vacuum vessel assembly (Station 3) is delayed from October to December, 2007.

No Level II milestones are impacted. A detailed resource-loaded schedule is attached.