# NATIONAL COMPACT STELLARATOR PROJECT
# Engineering Change Proposal (ECP)

***COVER PAGE***
***(TO BE COMPLETED BY SYSTEMS ENGINEERING SUPPORT MANAGER)***

| **Originator: W. Reiersen** | **Date: September 17, 2004** |
|---|---|
| **ECP No: ECP-014** | **ECP Title: CD-3 Replanning** |

**Required Reviewers**

**Required Reviewers for this ECP:**
**Cog Engineers: Chrzanowski**
**Procurement Technical Representatives: VVSA (Viola), MCWF (Heitzenroeder)**
**WBS Managers: 12 (Goranson), 14 (Williamson), 18 (Cole), 25 (Stevenson), 3(Johnson), 4 (Ramakrishnan), 5 (Oliaro), 62 (Gettelfinger), 64 (Kalish), 84 (Zarnstorff), 85 (Gentile)**
**Project Engineers: Nelson, Von Halle, Dudek**
**Project Management: Neilson, Zarnstorff, Reiersen, Strykowsky, Simmons, Malinowski (QA), Levine (ES&H)**

**ECP Approval Level**

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

**Actions**

[1] Finalize impacted documents (GRD, Technical Data Sheet, PEP Table 2-2, and TEP) consistent with approved change, sign, and post approved revisions (Reiersen/Simmons)
[2]Update Design Descriptions for WBS 4 (Ramakrishnan), 5 (Oliaro), and 62 (Gettelfinger). Un-post Design Description for WBS 64 (Reiersen)
[3] Update WBS Dictionary and Cost Basis documentation consistent with approved change (Simmons and impacted WBS Managers)
[4] Assess viability of 150C bakeout with eddy current heating (Brooks et al)

***APPROVALS***
***(TO BE COMPLETED BY APPROVING OFFICIALS)***

| Change Level | Approving Official | Approval? | Signature |
|---|---|---|---|
| 3 | NCSX Project Manager | ☒ Yes ☐ No | Hutch Neilson Digitally signed by Hutch Neilson DN: CN = Hutch Neilson, C = US, O = PPPL Date: 2004.09.20 10:32:14 -04'00' |
| 3a (Expedited ECP) | NCSX Engineering Manager | ☐ Yes ☐ No | |
| 2 | NCSX Federal Project Director | ☒ Yes ☐ No | 9/20/04 |
| 1 | Associate Director OFES | ☐ Yes ☐ No | |
| 0 | Under Secretary of Energy | ☐ Yes ☐ No | |

# NATIONAL COMPACT STELLARATOR PROJECT
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***PART I***
***(TO BE COMPLETED BY ORIGINATOR)***

| **Originator: W. Reiersen** | **Date: September 17, 2004** |
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**Overview of Change**

**Type of of ECP:** ☐ **EXPEDITED** ☒ **STANDARD**

**Type of Change:** ☒ **TECHNICAL** ☒ **COST** ☒ **SCHEDULE** ☐ **EDITORIAL**

**(Check all that Apply)**

**Reason for Change:** Project replanning is required to accommodate the higher prices and longer schedules for the MCWF and VVSA procurements than were budgeted in the cost and schedule baselines.

**Impacted WBS Elements:** WBS 12 - VV, 14 - Modular Coils, 187 - Measurement Systems, 25 - NBI, 3 - Diagnostics, 4 - Electrical Power Systems, 5 - Central I&C, 62 - Cryogenic Systems, 64 - Helium Bakeout System, 81 - Project Management, 82 - Project Engineering, 84 - Project Physics, and 85 - Integrated Systems Testing

**Impacts of Change (Briefly Describe):** Fixed price proposals were recently received for the MCWF and VVSA production articles. The cost proposals were substantially higher than budgeted. The schedule proposals were substantially longer than in the baseline schedule would allow. Offsets were sought which would allow the First Plasma date to be held, would provide adequate contingency to complete the work remaining without increasing the TEC, and could be funded under the DOE funding profile. The schedule delays were offset primarily by shortening the time allowed for room temperature operation, prior to cooling down to operating (cryogenic) temperature for field line mapping and First Plasma, and by completing several startup tasks during the construction phase. The cost growth was offset by choosing to use C-site power supplies for initial field line mapping and First Plasma, by reducing the scope of the Central I&C system, NBI, and Diagnostics to only that required to satisfy CD-4 requirements, and by numerous minor changes. These changes do not substantially increase risk, alter the scope of CD-4, or reduce the ultimate capability of the device. However, more time and resources will be required for the device and facility to reach their fully upgraded capability.

**Assessment of Other Options:**

[1] Offsets which would significantly increase the risk to the project were rejected.
[2] Offsets which would require re-defining the CD-4 deliverables or reduce the ultimate capability of the device were rejected.
[3] Accommodating these changes solely by drawing down on budget contingency and schedule contingency was rejected because insufficient contingency would be left to complete the work remaining to be performed.
[4] Accommodating these changes by increasing the TEC and/or moving First Plasma date to a later date were not pursued because offsets were identified which made this option unnecessary.

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***PART I***

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**Detailed Description of the Change:**

**(Use Continuation Sheets and/or Attach Information/Sketches, As Needed)**

**List Attachments, Impacted Documents, etc.**

[1] Detailed description of change
[2] Resource-loaded schedule
[3] BA/BO analysis consistent with proposed change and DOE funding profile.
[4] Cost table by WBS
[5] Milestone table (to replace PEP Table 2-2 NCSX DOE Milestones)
[6] Assessment of contingency required for work remaining consistent with proposed changes
[7] Risk assessment of proposed changes
[8] Updated GRD
[9] Updated Technical Data Sheet
[10] Updated Test and Evaluation Plan

**Description of Change:**

See Attachment [1]