

Corrective Action Requests (CARs)

CAR-01: Acceleration of schedule and added scope without formal baseline change

Recommendation: Summary, the NSTX project received authorization to perform and accelerate work and procurements from DOE and elected to authorize the CAMs to execute the work without formal change control which is intended to provide a mechanism to document baseline changes, authorize the execution of the work and provide for a performance measurement baseline for the NSTX project to accurately measure performance and forecast project trends.

- The project should measure against a realistic baseline,
- Project is managing to an accelerated schedule not baseline,
- Follow formal change control processes and procedures,
- Document changes to the performance baseline,

Response: Agreed.

Action plan;

- Near term. The NSTX-U project will submit an Engineering Change Proposal (ECP) to change the performance measurement baseline to reflect the DOE-OFES approval to accelerate selected tasks. The ECP is being drafted and expected to be submitted for review and approval by November 11, 2011. The ECP will document OFES authorization to proceed with critical path/high value procurement and begin select outage removal tasks in advance of receiving CD-3 approval.
- The entire PMB will be assessed in concert with DOE-PSO and DOE-OFES mid fiscal year once the following prerequisites are met;
 - CD-3 approval received (January 2012 target)
 - Fiscal 2011 funding received and reconciled with other NSTX Program (non-project) objectives
 - A reasonable and achievable accelerated plan is prepared that provides;
 - Adequate contingency set-aside
 - Detailed accelerated procurement planning including identification of risk and availability of procurement staff to support the plan.
 - Critical skills resource leveling.
 - The decision to change the PMB is approved by DOE-PSO and DOE-OFES.

Action Taken – CAR-01:

- An Engineering Change Proposal (ECP-004) was approved (10Nov2011) to change the Performance Measurement Baseline (PMB). The ECP documented OFES authorization to proceed with critical path/high value procurement and begin select outage removal tasks in advance of receiving CD-3 approval.
- **In-progress:**
 - The entire performance measurement baseline (PMB) will be assessed in concert with DOE-PSO and DOE-OFES mid fiscal year once the following prerequisites are met:
 - CD-3 approval received (January 2012 target);
 - Fiscal 2012 funding received and reconciled with other NSTX Program (non-project) objective;
 - A reasonable and achievable accelerated plan is prepared that provides:
 - Adequate contingency set-aside;
 - Detailed accelerated procurement planning including identification of risk and availability of procurement staff to support the plan, and;
 - Critical skills resource leveling.
 - The decision to change the PMB will be approved by DOE-PSO and DOE-OFES.

Corrective Action Requests (CARs)

CAR-02: Variance Analysis Reports (VARs) must be written at the Control Account Level as a minimum.

Recommendation:

1. That PPPL establish a consistent control account level based on the WBS (Level 4 or Lower) and ensure that analysis is prepared at that level, with reference to the appropriate WBS element on CPR Form 5, such that their managers and others impacted by the control account can understand the variance root cause, associated impacts on project scope, schedule, and budget, and the corrective action plan.
2. That the EVMS System Description and other necessary documentation include VAR examples that show a well written VAR that describes variance root cause associated impacts on scope, schedule, and budget and corrective action plan.
3. That PPPL develop a procedure for preparing variance analyses to ensure consistency across the project.
4. That the upper WBS Level 2 SV/CV variance analysis thresholds be lowered to +15% and that the thresholds be rewritten to change "and" to "or", i.e., SV +15% or -10% OR >\$50K and >10% of BAC or any impact on a DOE Level 1 or 2 Milestone and CV +15% or -10% OR >\$50K and >10% of BAC.

Response:

1. Agreed. When a WBS Level II variance threshold is triggered a variance analysis report will be written at the control account level. Target: In place
2. Agreed. The PPPL Project Management System Description (PMSD), section 2.3.2 on Variance Analysis, will be updated to indicate that "when a variance threshold is triggered the variance analysis report must be written at the control account level". Target January 2012
3. Agreed. A procedure will be prepared to demonstrate the proper method for preparing a variance analysis report. Target: January 2012
4. Agreed. An updated PEP will be submitted for DOE approval with the following thresholds.
 - SV +15% or -10% or > \$50K and > 10% of BAC or any impact on any DOE Level 1 or 2 Milestone
 - CV +15% or -10% or > \$50K and > 10% of BAC

Action Taken – CAR-02:

- The PPPL Project Management System Description (PMSD) Section 2.3.2 indicates that "when a variance threshold is triggered the variance analysis report must be written at the control account level".
- The PPPL CAM Training Program, in lieu of a procedure, is used to provide CAMs a consistent approach for Variance Analysis Reporting. All PPPL CAMs received training on performing Variance Analysis/Reporting. A significant portion of PPPL's Training Program addresses VARs. See pages 17-30 at link: http://www-local.pppl.gov/EVMS/TRNG/PPPL_EVMS_TRAINING_02.pdf
- The NSTX Upgrade Project Execution Plan (PEP) has been updated as follows:
 - Explanations of variance to plan will be submitted to the FPD and into PARS II on a monthly basis when any WBS level 2 cumulative to date variance exceeds the following thresholds:
 - SV +15% or -10% or >\$50K and > 10% of BAC or any impact on any DOE Level 1 or 2 Milestone
 - CV +15% or -10% or > \$50K. and > 10% of BAC

Corrective Action Requests (CARs)

CAR-03: Schedule Integrity

Recommendation: *Schedule logic and excessive constraints degrades the integrity of the schedule and critical path. In summary, the NSTX project schedule needs to be reviewed for schedule integrity. Schedule integrity is necessary in order to ensure the schedule accurately represents the project activity sequence, the correct forecast of schedule start and finish dates for all activities, milestones, and project early start finish dates. A review of all activities and logic will ensure that the project schedule provides an effective and valuable management tool for assessing and analyzing schedule progress; and will ensure that the project schedule represents the true critical path and near critical activities to assist project management in effectively managing the project schedule.*

Response: Agreed. Accuracy and completeness of the project's master schedule is necessary to ensure correct and timely information to all levels of the project team. The Project's Master Resource Loaded schedule is the key document used for performance measurement, milestones and lower level working schedules. This master schedule is statused each month during a group meeting consisting of the CAM, Project Manager, Project Controls, CSU and NBI Managers, and Associate Director for Engineering and Infrastructure. As well as reviewing each task for progress, the CAM and Project Controls manager validate the logical sequences of tasks and add additional links if warranted. Furthermore, criticality of each task is noted by reviewing the total float value remaining on each task. To ensure work is prioritized properly, logically linked and consistent with budgetary guidance the project control office performs QC checks to ensure all ECP's are properly included, and that there are no unexplained hanging ends, unnecessary constraints or tasks without predecessors.

Action Taken – CAR-03:

- The Primavera schedule data base has been reviewed and updated to improve the schedule logic to minimize hanging ends and reduce the number of constraints to only those necessary relevant statistics

	<u>Before</u>	<u>After</u>
• Constraints	401	135*
• Hanging ends	176	1
• No Predecessors	432	1

*It should be stressed that the baseline schedule is funding constrained requiring that many task be delayed due to funding. The method employed to delay these tasks is to assign a "start no earlier than" constraint. Furthermore, all subsequent current schedule updates will be scrutinized to ensure schedule integrity.

Corrective Action Requests (CARs)

CAR-04: Inconsistent identification and application of LOE vs. Discrete across control accounts.

Recommendation: *The Committee recommends that policies and procedures be documented and enforced to require ALL CAMs to use the LOE EV method for their Project Management non-measurable activities and not simply let PM be absorbed in the overall discrete method used – or not accounted for at all. The issue is not one of too much LOE or not defining LOE accurately; it is that lack of consistency across the CAM's in either using LOE or not and how it is measured. The recommendation of this CAR is to have PPPL focus on a consistent and documented approach that is enforced across all control accounts by all CAMs.*

Response:

Agreed. Each of the work packages that are identified in the PMB will be reviewed to determine if level-of-effort (LOE) scope is inadvertently included in a work package that is identified as using discrete effort for EV technique. If instances are found where LOE and discrete scope is included in a work package an ECP will be generated to separate the LOE work from the discrete work so that the EV technique applied to the work package is appropriate. As a best practice the amount of LOE work included in a control account that is dominated by work packages that use discrete effort for EV technique is kept to a minimum (<15%) so as not to mask variances. Target: January 2012.

Action Taken – CAR-04:

- No work scope was found where discrete work was being used in lieu of Level of Effort (LOE) work; however, some CAMs budgeted their oversight time to individual discrete tasks rather than specific LOE Work Packages and did not budget specific time for “CAM-type duties”.
 - As mentioned above, in some Control Accounts specific time was not budgeted for activities such as CAM duties or Training. It was determined that this time was very small and any resulting variances would be minor.
 - On future projects a specific budget will be allocated in each Control Account to cover these types of activities

Continuous Improvement Opportunities (CIOs)

CIO-01: Estimate at Completion (EAC) Tracking and Maintenance should be improved.

Action Taken – CIO-01:

- Additional training was completed on EAC Analysis and maintenance: Completed
- EAC Log now maintained. See: http://www-local.pppl.gov/EVMS/CAMNB/EAC_LOG.pdf
- Additionally, each CAM is required to respond to a monthly email with any changes to his/her EAC. This process is still in the process of being measured for effectiveness: **In-progress**

CIO-02: The Chief Financial Officer (CFO) should validate actual costs from accounting system to COBRA

Action Taken– CIO-02:

- Monthly actual costs are validated by Accounting (log maintained)
- PMSD Procedure 8 Monthly Status Reporting has been updated to indicate that “the current month’s actual costs shall be validated by the Accounting Office on a monthly basis”.

CIO-03: Provide additional Earned Value (EV) Management Training

Action Taken– CIO-03:

- Additional training was held to specifically address some noted weaknesses in the areas of:
 - Change Control
 - Estimate at Complete (EAC)
 - Control Account Plans

CIO-04: Documentation requires corrections and clarifications

Action Taken– CIO-04:

- A section has been created on the PPPL EVMS Webpage to allow for the dissemination of information from the Project Manager
- PMSD has been updated to include UB and MR
- PMSD has been updated to clarify the matrix relationship between Engineering and Infrastructure and the CFO.

CIO-05: Documentation of EV technique for each Control Account to ensure objective performance measurement is consistent and documented

Action Taken– CIO-05:

- The WAF has been updated to include Earned Value Technique being employed. The updated WAF can be downloaded from: http://www-local.pppl.gov/ProjectMgmt/QUICK_%20WAF_2011-23FEB12.xls
- CAMs have been trained to maintain a definitive methodology for how they are taking % complete on tasks in their respective Control Accounts

Continuous Improvement Opportunities (CIOs)

- **CIO-06: Eliminate inconsistencies in change control processes and procedures**

Action Taken– CIO-06:

- A new process for CAMs to employ change control has been developed. An on-line Engineering Change Proposal (ECP) database is used by the CAMs to submit ECPs. The following site provides reference: http://198.35.0.12/fmi/iwp/res/iwp_home.html

- **CIO-07: The Project Execution Plan (PEP) and Responsibility Assignment Matrix (RAM) have Work Breakdown Structures (WBS) listings with one control account against four WBS elements**

Action Taken– CIO-07:

- This CIO was corrected during the EVMS Certification Review. See ECP-005.