National Compact Stellarator Project (NCSX) Project Control System Review

February 2003

EXECUTIVE SUMMARY

A review of the National Compact Stellarator Project (NCSX) Project Control System (PCS) was conducted February 27 and 28, 2003. This review was conducted to give DOE a level of confidence that the contractor has developed a project control system that will operate in a compliant manner and produce timely reports with valid data. The review team was asked to answer the following questions:

1) Does PPPL's proposed Project Control System meet current DOE Earned Value Management System assessment and reporting requirements? Specifically:

   a) Are the planned reporting format and frequency adequate considering project size, complexity, and risk?

   b) Does the system produce timely and accurate reports in a readable and meaningful format?

   c) Is the system flexible enough to changes without extensive modification?

2) Is the Project Control System management structure adequate and appropriate for guiding the proposed project through to completion, considering the joint responsibilities of PPPL & ORNL? Are the PPPL and ORNL roles and responsibilities for PCS reporting clearly documented and understood?

The Committee finds that all the above questions are answered in the affirmative and has provided some recommendations that will hopefully strengthen the system.

1.0 INTRODUCTION

1.1 Background

The Committee was assembled at the request of Greg Pitonak, DOE Project Manager for the National Compact Stellarator Project (NCSX) at Princeton Plasma Physics Laboratory (PPPL). PPPL is the lead DOE laboratory for the project and Oak Ridge National Laboratory (ORNL) is a partner doing a significant portion of the design work. At the time of the review the project had completed a Conceptual Design Review in the summer of 2002, and CD-1 was approved in November 2002. The purpose of the review was to give DOE a level of confidence that the project control system will be operated in a compliant manner and produce reports with valid data for the NCSX Project.

1.2 Membership

The review committee members were:

Ken Domann	NuMI Project Office, Fermilab National Accelerator Laboratory
Suzanne Herron	Spallation Neutron Source, Oak Ridge National Laboratory Manager, Management Information and Project Controls
Ron Lutha	DOE NuMI Project Manager, Fermi Area Office (Chairman)
Ann Nestander	NuMI Project Office, Fermi National Accelerator Laboratory

1.3 Review Process

The review took place on February 27 and 28, 2003. Greg Pitonak developed the charge to the Committee, the agenda and the areas of focus. The morning of the first day consisted of presentations by the NCSX Project Manager and the NCSX PCS Manager. The afternoon of the first day was spent performing follow-up discussions. The morning of the second day was utilized for committee discussions and preparing the draft report. The findings, conclusions and recommendations of this report are based on the charge, documentation provided, presentations via videoconference, and teleconference calls with project team members.

2.0 REVIEW FINDINGS/CONCLUSIONS/RECOMMENDATIONS

2.1 Does PPPL's proposed Project Control System meet current DOE Earned Value Management System assessment and reporting requirements?

<u>Findings</u>

- The areas described in EIA-748, "Earned Value Management Systems" are addressed in the PPPL PCS.
- The Project Control System was approved by DOE in 1996 and has been used successfully on six like-size PPPL projects in recent years.
- The Project Control Manager appears very knowledgeable of project control processes and has extensive experience in using this Project Controls System.
- It was stated in the documentation provided, presentation material, and discussions with project management that both PPPL and ORNL are using the PPPL PCS for reporting earned value and monitoring the project, i.e. a single system.

Conclusions

- The project control system is consistent with the fundamentals of the Electronic Industries Alliance standard EIA-748, "Earned Value Management Systems" dated June 1998.

Recommendations

None.

2.1.1 Are the planned reporting format and frequency adequate considering project size, complexity, and risk?

Findings

- The planned reporting format is the same format that PPPL has used for several projects in the past.
- The PCS information (format and frequency) meets the requirements of the DOE NCSX Project Manager.
- PPPL's PCS appears to have the ability to generate many types of reports that include the details of labor budgets, expenditures and resources usage.

Conclusions

- The planned reporting format and frequency should provide an adequate tool to project management and staff to monitor and manage the NCSX project.

Recommendations

- Consider developing reports that compare budgeted and earned hours to actual hours. Also, consider including earned value on existing reports that compare budgeted labor cost to actuals.

2.1.2 Does the system produce timely and accurate reports in a readable and meaningful format?

Findings

- Reports from various projects utilizing this PCS were presented to the review committee, however the committee did not review a complete set of reports for the NCSX project since the NCSX project is in the advanced conceptual design stage.
- PPPL will provide the required reports to the DOE NCSX Project Manager on a monthly basis for input into the DOE/HQ Project Assessment Reporting System (PARS).
- Reports will be distributed to NCSX project participants electronically.
- Cost and schedule variances will be reported on a monthly basis. The work around plans for the variances are developed by the Job Managers, reviewed by the Project Controls System Manager and then concurred by the NCSX Project Manager.

- The Project Manager and DOE Project Manager have reviewed (and used on previous projects) the planned reports and are satisfied with their format and believe the data is sufficient for them to effectively manage the project.
- PPPL's PCS Description states that they utilize two Performance Measurement Techniques (PMT's) for assessing earned value, Percent Complete and Level of Effort. During the review presentations it was stated that in some cases the project also uses the 50/50 PMT for recording earned value for deliverable on certain contracts. Earned value assessments are made at the individual task level and on occasion, at the resource level, and tasks appear to be defined in discrete terms to facilitate an objective assessment of progress.

Conclusions

- Planned reports for the NCSX project are well developed and should provide an accurate tool for managing the project.
- Utilization of the 50/50 PMT as described above could lead to inaccurate earned values.

Recommendations

- Consider the concept of automated data upload into the Project Control System (PCS) reporting database to minimize the possibility of data entry errors.
- Incorporating subcontractor cost loaded schedules directly into the PCS will help to ensure accurate data and reports and should be used throughout the project to the extent possible.
- PPPL should consider using some of the other PMT options, (for example, milestones, and units complete, etc.), in circumstances where they will provide a more objective measure of earned value.

2.1.3 Is the system flexible enough to changes without extensive modification?

Findings

- Primavera Project Planner is the scheduling software being used and Microsoft Excel is used for integrating the BCWS, BCWP, and ACWP into reports.
- DOE approved the PPPL PCS in 1996. No major changes have been made to the system.
- It was stated that the Project Control Manager could do "what-if studies" with the system rapidly.

Conclusions

- Primavera, which has been used by PPPL extensively for a few years and has been used successfully in other DOE laboratories, provides the needed capabilities and flexibility in scheduling and performing "what-if" studies. The Excel based reporting system seems to be adequate for this size of project, however this area was not examined in detail by the committee.

Recommendations

- None.

2.2 Is the Project Control System management structure adequate and appropriate for guiding the proposed project through to completion, considering the joint responsibilities of PPPL & ORNL?

Findings

- The NCSX project is led by PPPL with ORNL providing major technical leadership and support as a partner.
- Face to face meetings are held with PPPL Job Managers on a weekly basis and remotely with the ORNL Job Managers.
- The Project Control Manager, consistent with established change control procedures, manages the system and generates the reports.
- The Project Controls Manager is the one person that has the day to day knowledge of the NCSX PCS.

Conclusions

- The committee noted that there are only two back up support staff for the NCSX PCS Manager. Both are well versed in the workings of the Project Control System.

Recommendations

- Routine visits to subcontractors and ORNL to analyze progress will assist in ensuring accurate reporting.
- Consider strengthening the support to the NCSX Project Controls Manager.

2.3 Are the PPPL and ORNL roles and responsibilities for PCS reporting clearly documented and understood?

Findings

- Management responsibilities have been assigned and identified in the PEP and the Work Breakdown Structure.
- The Project Control Manager is responsible for implementation and operation of the PCS.
- WBS and Job managers are responsible for the management, execution, and reporting status of the technical, cost and schedule aspects of their defined scope.
- It was stated that the Job Managers develop the information that goes into the PCS both at PPPL and ORNL, and take ownership of their areas of responsibility.

Conclusions

- The committee has observed that the roles and responsibilities are clearly documented and the presenters stated that the Job Mangers have developed the cost and schedule for which they have accepted ownership.

- Continued effort will be required by the Project Control Manager to ensure accurate information is being produced.

Recommendations

- Project Management should continue to emphasize their commitment to quality cost and schedule control by setting high standards for the job managers in the analysis and use of the reports.

Other Observations and Recommendations:

- In light of the stated need for matrix support within PPPL and ORNL for engineering consider involving upper laboratory management to encourage the timely support of the matrixed personnel.
- It will be important to routinely do risk-based contingency analyses for the duration of the project.
- Closely monitor the modular coil and vacuum vessel contracts, and any others on or near the project critical path, to ensure their timely completion. Write subcontracts to ensure that the project is protected in areas dealing with scheduling. Follow-up with vendors to ensure that progress reporting is accurate. Use shop visits and inspections as appropriate.

Attachments:

Charge Letter
Agenda

Department of Energy
Princeton Area Office
P.O. Box 102
Princeton, New Jersey 08542-0102

February 3, 2003

Ron Lutha, Fermi Area Office

SUBJECT: REQUEST TO CONDUCT A REVIEW OF THE PROJECT CONTROL SYSTEM (PCS) FOR THE NATIONAL COMPACT STELLARATOR PROJECT (NCSX) AT THE PRINCETON PLASMA PHYSICS LABORATORY (PPPL)

Thank you for agreeing to conduct a review of the Project Control System for the National Compact Stellarator Experiment, a $73.5M innovative concept fusion experiment that is planned as a new start project for DOE in FY2003. While PPPL is the lead DOE laboratory for the project, Oak Ridge National Laboratory is doing a significant portion of the design work. The project completed a Conceptual Design Review last summer, and CD-1 was approved in November 2002. Specifically, we ask that the Review address the following items:

1. Does PPPL's proposed Project Control System meet current DOE Earned Value Management System assessment and reporting requirements? Specifically:

   a. Are the planned reporting format and frequency adequate considering project size, complexity, and risk?
   b. Does the system produce timely and accurate reports in a readable and meaningful format?
   c. Is the system flexible enough to adapt to changes without extensive modification?

2. Is the Project Control System management structure adequate and appropriate for guiding the proposed project through to completion, considering the joint responsibilities of PPPL & ORNL? Are the PPPL and ORNL roles and responsibilities for PCS reporting clearly documented and understood?

I look forward to the review on February 27, 2003 per the attached agenda, and receiving your letter report by early March, 2003. We appreciate your assistance in this matter. Please contact me if there are any questions at 609-243-3713.

Greg Pitonak
DOE Project Manager for NCSX

Enclosure:
Agenda

cc: D. Lehman, SC-81, GTN
H. Neilson, PPPL, MS-40
J. Faul, PAO
K. Domann, FNL
J. Carney, SC-81, GTN
R. Strykowsky, PPPL, MS-40
J. Monhart, FAO rec'd
S. Herron, ORNL
W. Marton, SC-52, GTN
R. Simmons, PPPL, MS-40
A. Nestander, FNL

National Compact Stellarator Experiment
Project Control Systems Review
February 27-28, 2003

Agenda

Thursday February 27, 2003

Eastern Standard Time

10:00 AM	Introductions	G. Pitonak/R. Lutha
10:10 AM	NCSX Project Overview	H. Neilson NCSX Project Manager
10:20 AM	PCS Overview	R. Strykowsky NCSX PCS Manager
Noon	Lunch /committee discussions	
1:30 PM	Follow-up discussions	
3:30 PM	End of day summary	

Friday February 28, 2003

3:00 PM	Review committee outbrief	R. Lutha