

**Princeton University**  
**External Independent Review (EIR) of the NCSX Project**  
**Princeton Plasma Physics Laboratory**  
**March 13-14, 2008**

**Review Panel**

George Coward, consultant (Chair)  
Graeme Murdoch, Oak Ridge National Laboratory  
Peter Titus, Massachusetts Institute of Technology  
Lutz Wegener, Max Planck Institute for Plasma Physics

This panel will report to A. J. Stewart Smith, Princeton University Dean of Research, and builds upon two earlier reviews conducted by the University in 2007. This review is structured as an assist visit, where Panel's findings and recommendations will be used by the Project Team in preparing their Baseline Change Proposal due at DOE on Mar 26; moreover, recommendations will assist in preparations for a DOE Office of Science (Lehman) Review Apr 8-10, and an DOE Office of Engineering and Construction Management Review May 21-23.

*The panel is charged to address the following issues and questions, and to provide additional findings and advice as they see fit.*

1. Does the Work Breakdown Structure (WBS) incorporate all the remainder of the project work, and does it represent a reasonable breakdown of the project work scope? Has the Project adequately incorporated developmental, fabrication and component assembly experiences in the bottoms-up estimate to enable a successful final machine assembly and improve reliability during research operations?
2. Are designs for the remainder of the work, including drawings and specifications, adequate and consistent with system functions and requirements? Do they include safety structures, systems, and components? Are there any items where you have major concerns, either technical or for the schedule?
3. Are bottoms-up detailed estimates of cost and schedule for the remaining work complete, realistic, credible, and consistent with the WBS and DOE funding guidance? In answering this question, examine maturity of design, complexity of activities, methods of estimation, and critical path.
4. Have risks been identified and properly classified? Are cost and schedule contingencies supported by and consistent with an appropriate risk analysis? Have risk mitigation actions been incorporated into the new baseline? Is there adequate cost and schedule contingency in the new proposed baseline to achieve a high level of confidence in completing the project successfully?
5. Are staffing levels and skill sets appropriate? If not, identify any deficiencies in the Integrated Project Team that could hinder successful execution of the project.
6. Is the project being properly managed and organized at this point? Is PPPL management providing necessary resources to deal with the issues?
7. What is the level of confidence that the NCSX Project Team can complete the project within the proposed baseline?