NCSX Work Approval Form (WAF)

WBS Number: 821/822
WBS Title: Engineering Management and Systems Engineering
Job Number: 8202
Job Title: Engineering Management and Systems Engineering Support
Job Manager: Wayne Reiersen

Description:

Engineering Management

The Engineering Manager is responsible for the successful execution of the engineering design, fabrication, and assembly efforts. Specific responsibilities include:

- Risk management
- Project planning, including implementing the PPPL Work Planning (WP) program
- Safety, including implementing the PPPL Integrated Safety Management (ISM) program

Responsible Line Managers (RLMs) are responsible for managing the on-site fabrication and assembly work and the design, fabrication, and assembly of ancillary, facility, and electrical systems. Line management of the ORNL scope is part of WBS 19.

Systems Engineering Support

Responsibilities include:

- Requirements management
- Design verification, including a program for systematic design reviews
- Configuration management and change control, including processing of Requests for Deviations (RFDs), Engineering Change Proposals (ECPs), and Engineering Change Notices (ECNs), and interface control
- Document control, including maintaining a Web-based system for finding and retrieving project data and utilizing the PPPL Ops Center

Schedule: See Attachment

Approvals:

Wayne Reiersen
Digitally signed by Wayne Reiersen
DN: cn=Wayne Reiersen, c=US, o=PPPL
Reason: I am the author of this document
Date: 2007.07.03 08:34:12 -04'00'

Job Manager _____ Date _____

Hutch Neilson
Digitally signed by Hutch Neilson
DN: CN = Hutch Neilson, C = US, O = PPPL
Date: 2007.07.03 08:39:51 -04'00'

Responsible Line Manager _____ Date _____

Hutch Neilson
Digitally signed by Hutch Neilson
DN: CN = Hutch Neilson, C = US, O = PPPL
Date: 2007.07.03 08:37:50 -04'00'

Project Manager _____ Date _____

Mike Williams
Digitally signed by Mike Williams
DN: cn=Mike Williams, c=US, o=PPPL, ou=Engineering, email=williams@pppl.gov
Date: 2007.07.03 09:04:39 -04'00'

Engineering Department Head _____ Date _____

NCSX June 2007 ETC
TABLE I - Design Labor

WBS Number: 821/822
WBS Title: Engineering Management and Systems Engineering
Job Number: 8202
Job Title: Engineering Management and Systems Engineering Support
Job Manager: Wayne Reiersen

Job	WBS	Function	Resource Requirements	Basis of Estimate	
8202 - Engineering Management and Systems Engineering Support (Reiersen)					
	Travel		$5K /year through 1st Plasma		
	821 - Engineering Management				
		Engineering management	50% LOE for Reiersen through FY2007. Then 40% of Heitzenroeder starting in FY08 through first plasma. 50% LOE for Heitzenroeder for balance of FY07 to expedite resolution of key design issues.	This LOE is consistent with project experience and appropriate for balance of project.	Reiersen/Heitzenroeder
		Responsible line management	60% LOE for Dudek through final assembly. An additional 15% for Dudek from the start of FY08 through the completion of scope in WBS 2, 3, and 6 for which he has line management responsibility.		Dudek
		Responsible line management	15% LOE for Reiersen for WBS 13, 15, and 17 scope for which he has line management responsibility though FY2007. Then 10% of Heitzenroeder starting in FY08 trough completion of these WBS elements.		Reiersen/Heitzenroeder
		Responsible line management	15% LOE for von Halle from the start of FY08 through the completion of WBS 4 and 5 scope for which he has line management responsibility.		vonHalle

NCSX June 2007 ETC
TABLE I - Design Labor

WBS Number: 821/822
WBS Title: Engineering Management and Systems Engineering
Job Number: 8202
Job Title: Engineering Management and Systems Engineering Support
Job Manager: Wayne Reiersen

822 - Systems Engineering				
	Requirements management	340 hours split between Reiersen and Simmons through first plasma.	This LOE effort includes the review and approval of product and assembly specifications and assembly prcedures plus the effort to develop and maintain a DBMS for tracking the flowdown and verification of requirements. It is consistent with project experience and appropriate through 1st Plasma.	Reiersen/Simmons
	Design verification	80 hours for Reiersen through FY07. Remaining 430 hours split between Reiersen and Simmons starting in FY08 through first plasma	Design reviews are conducted systematically in the development of subsystem, assembly, and major component designs; in the design of tooling; and at junctures where critical decisions are made. The effort includes chartering the reviews and posting the review documentation and chits. This LOE effort is consistent with project experience and appropriate through 1st Plasma.	Reiersen/Simmons
	Configuration management and interface control	850 hours for Simmons through 1st Plasma	This LOE is consistent with project experience, primarily for processing changes, and appropriate through 1st Plasma.	Simmons
	Document control	10% LOE for Simmons through 1st Plasma 10% LOE for Such through 1st Plasma	This LOE is consistent with project experience and appropriate through 1st Plasma.	Simmons Such
	Training	5% LOE for Simmons through 1st Plasma	Training modules have been developed and training largely accomplished. Additional work will be on implementing changes and training new project personnel.	Simmons

NCSX June 2007 ETC
TABLE I - Materials and Subcontracts

Description:	None											

NCSX June 2007 ETC
TABLE III - Fabrication and Assembly

Fabrication and Assembly		None										

NCSX June 2007 ETC
TABLE IV - Uncertainty of Estimate and Residual Risk Assessment

WBS Number: 821/822
WBS Title: Engineering Management and Systems Engineering
Job Number: 8202
Job Title: Engineering Management and Systems Engineering Support
Job Manager: Wayne Reiersen

Uncertainty of the Estimate

	High	Medium	Low	Uncertainty Range (%)	Comments/Other Considerations
Design Maturity	X			-5%/+10%	LOE effort dependent on length of schedule
Design Complexity			X		LOE effort dependent on length of schedule

Note: High/Medium/Low uncertainty assessment from Job Manager. Uncertainty range based on AACEI recommended practice 18R-97 as amended for NCSX.

Risks and Residual Impacts

Job	Risk Description	Likelihood of Occurring	Mitigation Plan	Basis of estimate	Cost Impact Low	Cost Impact High	Schedule Impact Low	Schedule Impact High
8202	None							

Notes:
[1] **Low cost and schedule impacts are considered the minimum (0-percentile) impacts should the event occur.**
High cost and schedule impacts are considered the maximum (100-percentile) impacts should the event occur
[2] **Cost impacts should be entered as loaded costs**
Cost impacts should NOT include standing army costs which are separately calculated from the schedule impact
[3] **The schedule impacts should be entered as the min and max impacts on the critical path.**
If there is no critical path impact then the schedule entries should be zero.
[4] **Likelihood of occurrence should be entered consistent with our risk classification methodology, i.e.**
VL= Very Likely (P>80%), L=Likely (80%>P>40%), U=Unlikley (40%>P>10%), VU=Very Unlikely (P<10%), NC=Non-credible (P<1%)