Design Review Documentation - Results No.:

Title: **Shorted Turn Protection FDR** **CAT:** ☒**A1** ☐ **A2** ☐**A3**

Type of Review: ☐**Peer** ☐**CDR** ☐**PDR** ☒ **FDR**

Cognizant Individual: **G. Tchilinguirian** **Date of Review:** **1/23/20**

Review Board Members:	**Attendees:**	**Attendees:**
Chair: T. Stevenson	P. Bisbal	G. Zimmer
RE J. Dellas	D. Boyer	
CE R. Ellis	J. Corl	
TA S. Gerhardt	J. Galayda	
TA P. Dugan	R. Hawryluk	
	F. Hoffman	
TA P. Sichta	A. Indelicato	
TA R. Camp	J. Landi	
TA C. Freeman	R. Rosenblat	
TA D. Battaglia	N. Rahman	
TA W. Que	W. Reese	
PE Y. Zhai	F. Yang	
QA A. Castaneda		

Items Reviewed:	**Sat.**	**Unsat.**	**Comments or n/a if not applicable**
Appropriate requirements identified	X	☐	
Development plans and schedules	X	☐	
Reg. compliance incl. USI/USID and NEPA	X	☐	
Disposition of CHITS from previous reviews	X	☐	
Calculations (all listed are signed and filed)	X	☐	
Cost objectives	X	☐	
Other review objectives addressed	☐	☐	n/a

SUMMARY OF RESULTS:

The purpose of this final design review (FDR) was to present sufficient technical material for review to prove that the STP can be implemented in a manner that satisfies project requirements and has an achievable cost and schedule acceptable to the NSTX-U Recovery Project. To reach this level of design maturity, there has been further progress since conceptual, preliminary, and peer reviews to present steps leading towards this final design. Chits attained during previous reviews have been addressed, shaping the final design of the system. A report of all CHITS preceding this design and how they were addressed is included in the project documentation.

Some of the major issues that have been addressed in the process of refining the Preliminary design were related to the redundant measurement of voltages at the FCPC SDS cabinets, the use of the existing FPDP infrastructure to communicate faults, the use of the existing DCPS interconnection and test harnesses to certify the system for use.

The FDR covered the real-time design of components needed to measure, model and evaluate the coil behavior, detect faults, and signal a failure to FCPC's fault system to take appropriate action. A final design for a test harness to functionally test the Shorted Turn Protection system using the Autotester was also presented. Ten minor chits were generated.

Disposition: [check one]

- ☐ **Acceptable**
- X **Acceptable pending resolution of concerns**- CHITS identified above must be resolved prior to installation.
- ☐ **Incomplete -** Additional design work is required prior to another design review.
- ☐ **Unsuccessful** – Corrective actions must be taken and another review process must be initiated.

Design Review Chair: Timothy N. Stevenson Digitally signed by Timothy N. Stevenson Date: 2020.03.02 16:50:36 -05'00' Date:

Cognizant Individual Acceptance Date:

Gregory J. Tchilinguirian Digitally signed by Gregory J. Tchilinguirian Date: 2020.03.03 13:06:32 -05'00'

Distribution: Review Board Members, Operations Center, Responsible Engineer (RE), Cognizant Individuals, Project Manager, Project Director, relevant Technical Authorities (TAs), Chief Engineer (CE), Fire Protection Engineer, Attendees, QA, ES&H, Security, Requesting & Performing Dept. Head