

**DESIGN REVIEW DOCUMENTATION – RESULTS –** No: NSTXU 1.4.1 FDRs 017

**Title:** PFC Diagnostics (WP# 2341) \_\_\_\_\_

**CAT:** ☒A1 ☐A2 ☐A3

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

**Cognizant Individual:** R. Ellis \_\_\_\_\_ **Date of Review:** 3/28/19

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**Review Board Members:**

W. Blanchard, Chairperson  
B. Stratton, Diagnostic TA  
P. Titus, Analysis TA  
S. Gerhardt, Systems Integration  
D. Loesser, VVIH RE/Mech TA  
J. Klabacha, PFC Cog  
J. Mitchell CAD  
J. Petrella, Bakeout RE  
S. Raftopoulos, RE Magnets/Assembly  
T. Stevenson, Operations  
C. Neumeyer, Chief Engineer  
M. Safabakhsh, Manufacturing SME  
Y. Zhai, NSTX-U Project Engineer  
A. Castaneda, QA  
J. Levine, ES&H

**Other Attendees/Presenters**

P. Dugan  
R. Hawryluk  
S. Horst  
E. Langan  
G. Smalley  
W. Gattoni  
A. Indelicato (remote)  
J. Menard (remote)  
K. Lukazik (remote)

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**Items Reviewed:**

	<b>Sat.</b>	<b>Unsat.</b>	<b>Comments or n/a if not applicable</b>
Appropriate requirements identified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
Development plans and schedules	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
Reg. compliance incl. USI/USID and NEPA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NEPA 1631 _____
Disposition of CHITS from previous reviews	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
Cost objectives	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
Other review objectives addressed	<input type="checkbox"/>	<input type="checkbox"/>	_____

**SUMMARY OF RESULTS:**

The purpose of this FDR was to review the design of the diagnostic sensors for the center stack, inboard divertor and outboard divertor. These diagnostics include Mirnov coils, Langmuir probes, halo current shunt tiles, thermocouples, and plasma current and center stack halo current Rogowski coils. The review also covered the wiring layout for the sensors and the cost and schedule for the project.

P. Dugan presented an overview of the scope of the project including interfaces and requirements from the GRD and SRDs for the various diagnostics. R. Ellis reviewed the entire project in detail. This included resolution of the chits from previous design reviews, the design of each of the diagnostics and results of mockups and testing in support of the designs such as frequency response (Mirnov coils), electrical isolation (thermocouples) and vacuum compatibility (halo current Rogowski coils).

The review generated 13 chits. Of these, six were assigned to the PFC diagnostic project for resolution. Two were concerned with the electrostatic shield for the Mirnov coils, two with updating the wiring diagram, one with generating a 3D cad model from the wiring schematic and one with documentation. The review committee deemed the design review successful and recommends that the project proceed to the manufacturing and installation phase pending resolution of the chits.

**Disposition:** [check one]

☐ **Acceptable**

☒ **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 Person** \_\_\_\_\_

**Robert Ellis**

Digitally signed by Robert Ellis

Date: 2019.03.29 12:56:45

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Date: \_\_\_\_\_

**Cognizant Individual Acceptance** \_\_\_\_\_

Date: \_\_\_\_\_

**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

Revised 8/10/18