

**DESIGN REVIEW DOCUMENTATION – RESULTS – No: #NSTXU 1-2-4-3-1 CDRS 100****Title: NEUTRAL BEAM INJECTION (NBI) DUCT SHIELD CONCEPTUAL DESIGN REVIEW****CAT: ☒A1 ☐A2 ☐A3****Type of Review:** ☐ Peer ☒ CDR ☐ PDR ☐ FDR**Cognizant Individual: Austin Cao / Bob Ellis** \_\_\_\_ **Date of Review:** \_ September 18, 2019

---

D. Loesser	Design Review Chair and Mechanical TA
M. Cropper	Operations
D. Cai	RE, Vacuum and fueling
P. Titus	TA, Analysis
P. Dugan	System Engineering
T. Stevenson	Alt. Chief Engineer
Y. Zhai	NSTX-U Project Engineer
ES&H	W. Slavin
QA	F. Malinowski

**Other Attendees**

R. Ellis  
M. Ramos  
J. Mitchell  
M. Safabakhsh  
A. Kodak

---

Items Reviewed:	Sat.	Unsat.	Comments or n/a if not applicable
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"/>	_____
Disposition of CHITS from previous reviews	<input type="checkbox"/>	<input type="checkbox"/>	N/A _____
Cost objectives	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
Other review objectives addressed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

**SUMMARY OF RESULTS:**

The Conceptual Design Review (CDR) considered the design of the shielding plates for the NBI duct and assessed the feasibility of the design approach. The NBI duct shielding shadows the existing upstream shielding without occluding the neutral beam free aperture and protects the vacuum vessel against melting caused by the combination of (1) reionization of the neutral beam and (2) heating due to the radiative effect of the plasma.

The general requirement documents include

- NSTX-U-RQMT-GRD-001, "General Requirements Document"
- NSTX-U-RQMT-SRD-011-02, "System Requirements Document Diagnostics"

The review mimics the design in a neighboring NBI duct and uses the same proven design as a solution for this NBI duct. The requirements are not as concise as the design panel suggests and a CHIT was generated to better define goals/requirements. The estimated labor cost was questioned to be inadequate and revised (CHIT).

Eight CHITS were generated. The review committee deemed the design review successful 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** \_\_\_\_\_ **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