



71-970303-CLN-01

TO: DISTRIBUTION
FROM: C NEUMEYER
SUBJECT: FINAL DESIGN REVIEW OF CENTER STACK

Approved: (signature on file) J Spitzer, WBS 1 Manager

A successful Final Design Review (FDR) of the NSTX Center Stack (WBS 13) was held on February 25-26, 1997. This FDR was one of three topics addressed by a subset of the original members of the Engineering Cost and Schedule Review (ECSR) team originally assembled for a global review of NSTX in July 1996.

NSTX Cognizant Engineer, and WBS manager, is J Spitzer. Committee consisted of:

B Montgomery - MIT (chairman, but participating at a remote location (MIT) due to illness)
T Todd - MAST (acting on-site chairman)
D Gwinn - MIT
P Anderson - GA
C Neumeyer - PPPL NSTX Eng Mgr

The writer was authorized by the committee to follow up with the processing of the chit forms and close out of the review in accordance with the project procedures. Accordingly, a subset of the list of concerns developed by the review committee at the end of the first day (those relating to the center stack) were mapped into chit forms, and the "review board comment/recommendation" entries on the forms were developed by the writer based on the subsequent discussions between the committee and the presenters.

A summary of the chits and their dispositions is attached. The individual chit forms filled out with the same information as given in the summary are located along with this memo in the NSTX File Server, Project Files, WBS 1, in a folder identified by this memo number. After appropriate action is taken by the Cognizant Engineer, these chit forms must be signed off in hard copy form and submitted to the project file in order to complete the close out procedure.

Additional points raised by the committee which are not directly related to the center stack were as follows:

1 - Question raised by T Todd re: vacuum pumping speed calculations

A write up prepared by L Dudek/A Nagy was supplied to T Todd.

2 - Question about references in Aux Sys documentation to elastomer seals

This point was clarified; various ex-vessel components (e.g. valves, diagnostics) may have elastomer seals.

3 - Questions concerning behavior of flex connectors, how much do they deform and what are the stresses

It was agreed that this subject needs to be addressed with the design of the TF outer legs.

4- Committee recommends the removal of the Decon facility from the Hot Cell due to concerns about space around the machine and electromagnetic influences in the Decon facility due to NSTX operations

It was agreed that this would be desirable if funding can be made available.

G Pitonak commented in addition that:

Feasibility study should be performed on costs & issues involved in removal of Decon facility , including an analysis of available FY97 TFTR funds for accomplishment as a TFTR shutdown task.

5 - Concern regarding position of stabilizing plates, in particular with respect to SN plasma operations.

This was discussed between S Kaye and T Todd. Flux plots of various NSTX equilibria were supplied to T Todd. The position of the plates is a compromise due to the large variety of NSTX plasma shapes. It was agreed that while the plates do not appear to conform well to the SN plasma shape near the X-point, the fit at the midplane is good so that the stabilizing effect will be satisfactory.

Summary of the review as presented by the committee at the conclusion of the meeting is as follows:

NSTX ECSR Follow-up Review Summary

- The Committee is favorably impressed with the project's strong progress since the original ECSR last summer:
 - NSTX has received appropriate support from PPPL management, and an excellent design team has been brought together and appears to be functioning well.
 - Overall satisfaction with project's response to ECSR recommendations and design chits.
 - Magnet centerstack design has been greatly improved and the Final Design Review has been completed with three principal recommended actions requiring follow-up.
 - Additional \$0.8M cost for relocating NSTX to the TFTR Hot Cell appears reasonable. We concur with maintaining 21% overall contingency in project cost estimate.
- The Committee has a relatively small number of detailed comments, the most significant of which are:

Centerstack

What are the plans for additional insulation testing; how do they fit with the procurement plans?

Concerns about fabrication of coils

Concern about TF joint opening under load, and flexing of hub structure

Rest of Project:

The Committee recommends the removal of the Decon facility from the Hot Cell due to concerns about space around the machine and electromagnetic influences in the Decon facility due to NSTX operations

cc:

P Anderson (GA)
D Bashore
A Brooks
J Chrzanowski
J Citrolo
L Dudek
T Egebo
H M Fan
D Gwinn (MIT)
P Heitzenroeder
J Hoy (DOE)
R Kaita
S Kaye
J Levine
J Malsbury
B Montgomery (MIT)
G Neilson
M Ono
M Peng
E Perry
G Pitonak (DOE)
S Ramakrishnan
J Sinnis
J Spitzer
T Todd (MAST)
M Williams
R Wilson

NSTX File