



5X-980806-CLN-01

**TO: DISTRIBUTION**  
**FROM: C NEUMEYER**  
**SUBJECT: TEST CELL CABLE/WIRING/TRAY DESIGN, MINUTES OF MEETING**

Following points were discussed at the meeting held 8/5/98 concerning issues related to cable/wiring on NSTX:

1) S Ramakrishnan reiterated the procedure by which cog engineers are to communicate cable/wiring requirements to WBS 5, such that WBS 5 can develop an integrated and consistent design, including appropriate physical cable/conduit layout, documentation, and installation procedures.

2) S Ramakrishnan noted that the communication of requirements to WBS 5, and the design of the cable/wiring scheme by WBS 5, was nearly complete for the WBS 6 (process control, synchronization) and WBS 31 (vps) and 35 (gas) systems. WBS 32 (water) has provided some initial input. Inputs are still to be generated for WBS 6 (networks, his), and WBS 33 (bakeout). For these systems, the implementation scheme mentioned in 1) above will be followed.

3) For diagnostics, it was recognized that special treatment is required because of the evolutionary nature, use of existing equipment (with existing documentation), and spartan budget. It was agreed that all in-vessel sensors (including all magnetic diagnostics, t/c's, langmuir probes, etc.) will follow the full procedures outlined in 1). However, for other diagnostics systems, the following approach will be taken...

- the provision of ac power, and the wiring of the WBS 6 interface to the required racks will follow the full procedures outlined in 1).

- wiring from racks to diagnostic equipment will be documented as deemed appropriate by WBS 4 based on state of existing documentation. In most cases it is anticipated that the existing documentation will be marked up. However, specific cable routes and length requirements will still need to be determined in order to effect the installation. This will be the responsibility of WBS 4.

- wiring from racks to diagnostic equipment will be run in general purpose diagnostic cable trays provided for, and reserved for use by, WBS 4.

- WBS 4 will work with WBS 5 to determine requirements for the general purpose diagnostic cable trays, which will then be designed by WBS 5. It is expected that the design will more or less follow the scheme presently shown in conceptual fashion on the test cell GA drawing.

- in order to finalize the design of the above, the location of the diagnostic racks needs to be finalized. C Neumeyer has taken the action to expedite this.

4) For NBI, since NBI is an upgrade and most wiring will be located somewhat away from the machine, this can be dealt with later.

5) There are four distinct electrical classes of cable/wiring/instrumentation which will exist in the test cell as follows

Class I - common with test cell/machine/building ground

Class II - common with diagnostics single point ground

Class III - common with center stack casing

Class IV - common with outer vacuum vessel

Cable/wiring/instrumentation falling in the last two classes requires isolation from ground rated for 2kVDC operation and 5kVDC test. The racks related to this equipment operating at elevated potential will be supplied ac power via isolation transformers, and will interface with the I&C system via fiber optics. The cable/wiring will be run in insulated tray/conduit, and the two classes will not be intermingled with the other classes or with each other.

The cable/wiring associated with the first two classes will be run in metallic tray/conduit, but the two classes will not be intermingled with the other classes or with each other.

6) Since magnetic diagnostics are associated with classes II, III, and IV, the VME crates and fiber optic driver modules associated with same which transmit signals from the test cell to the Sky real time control system in the FCPC junction area will have to be provided in triplicate. Per R Marsala the present design does not include this (nor the budget). However, during the meeting it was noted that this will not be a problem until CHI operations comes into play, prior to which time the center stack casing and outer vv will both be grounded during operations.

7) Following the meeting the writer discussed the RF situation with E Fredd, who was not able to attend. Based on this discussion the situation for RF will be similar to that described in 3) above for the diagnostics.

cc:

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NSTX File