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SUBJECT: PEER REVIEW ON NSTX TEST CELL & PLATFORM GROUNDING

A successful peer review covering the NSTX Test Cell and Platform Grounding scheme was held on 12 January.

Attendees were as follows:

- R Borusovic
- G Labik
- B Mc Cormack
- M Ono
- S Ramakrishnan
- M Viola

Four chits were generated as follows:

Chit	Disposition	Action
1) The (existing) west ground bus bar gets its ground from the east wall. Do not connect floor bar to the west wall.	Disagree; disconnect existing east to west jumper and connect west wall bus to the floor bar.	WBS 5 (S Ramakrishnan) to include in Installation Procedure for Grounding.
2) Provide 18" x 18" x 1/2" copper plate at the center.	Agree; this is required to accept the various connections to the central "single point ground"	WBS 5 (S Ramakrishnan) to include in drawings and Installation Procedure for Grounding.
3) Check/ map the resistance of the various platform elements prior to grounding.	Agree; need to perform dielectric test on beam to beam and beam to column gaps prior to jumpering, as well as column to facility ground (through floor concrete).	WBS 5 (S Ramakrishnan) to include in Installation Procedure for Grounding.
4) Provide diagnostics/instrument ground bus on east wall, connected directly to central grounding plate.	Agree; will eliminate concern about noise due to potentials from power currents returning through the east-west floor bar.	WBS 5 (S Ramakrishnan) to include in drawings and Installation Procedure for Grounding.

It is noted here that, following the meeting, an inspection of the NSTX Test Cell revealed that the existing ground bus bars on the walls are 1/4" x 2". This is less than the 4" width discussed for the floor bars at the review. However, the 2" width is adequate. As indicated in the table below, the resultant 0.5 sq in cross section will not overheat under the worst case fault conditions (faults driven by the FCPC power supplies). Still, the 4" width shall be maintained for the floor bus to minimize the impedance.

	Cable	Bar	Bar	
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Cond resistivity @ 20C	1.73E-06	1.73E-06	1.73E-06	Ω -cm
Cond res temp coeff	0.00393	0.00393	0.00393	1/degC
Cond heat capacity	0.386	0.386	0.386	J/gm-degC
Cond density	8.89	8.89	8.89	gm/cc
Ambient Temperature	30.0	30.0	30.0	deg C
Max Current	120000.0	120000.0	120000.0	amp
Min ESW	0.080	0.080	0.080	sec
Max $\int i^2 dt$	1.15E+09	1.15E+09	1.15E+09	A ² -s
CSA	500.0			MCM
	0.4	1.0	0.5	sq in
	2.5335	6.4516	3.2258	sq cm
# Conductors	1	1	1	
Total CSA	2.5335	6.4516	3.2258	sq cm
Allowable Tmax	200.0	200.0	200.0	degC
Res per inch @ Tmax	2.96E-06	1.16E-06	2.32E-06	Ω
Thermal Capacitance per inch	22.1	56.2	28.1	Joule/degC-in
Adiabatic Temp rise per pulse	154.3	23.8	95.2	deg C

Presentation materials and chit forms are attached.

R Borusovic*
G Labik*
B Mc Cormack*
M Ono*
E Perry*
S Ramakrishnan*
M Viola*

NSTX File

* = w/o attachments