NSTX

NSTXU-CALC-53-04-00

TF Cabling from the Rectifiers to SDS

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PPPL **PRINCETON PLASMA PHYSICS LABORATORY**

PROCEDURE No. ENG-033 Rev 4 Attachment 1

PPPL Calculation Form

Calculation # **_NSTXU-CALC-53-04_____** Revision # **_0_** WP #, if any _ **1540** (ENG-032)

Purpose of Calculation: (Define why the calculation is being performed.)
The TF circuit is to be changed from four parallels to eight parallels to meet the upgrade requirement of 130kA. Three 1/c-750 mcm cables are proposed to be used per pole in FOUR power supply branches of the TF circuit for the run from the Rectifiers to the Safety Disconnect Switches. The attached spreadsheet shows the temperature rise of the cable and establishes the adequacy of the design.

References (List any source of design information including computer program titles and revision levels.)

1. General Requirements Document: NSTX_CSU-RQMTS-GRD Revision 3
2. PPPL Calculation # 10-03 : Design Point Spreadsheet by C. Neumeyer
3. Control Wiring Diagram : B-4F1005 Sheet 1501U

Assumptions (Identify all assumptions made as part of this calculation.)

1. Assumed a 5% unbalance in the current sharing of the three cables.
2. Assumed a 25% unbalance in the current sharing of the eight branches
3. Cable thermal properties taken from NEC Table

Calculation (Calculation is either documented here or attached)
Attached

Conclusion (Specify whether or not the purpose of the calculation was accomplished.)
Three – 750mcm 1/c cables are adequate to meet the requirements of pulsing the TF once every 1200 seconds

Cognizant Engineer's printed name, signature, and date
R. Ramakrishnan

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I have reviewed this calculation and, to my professional satisfaction, it is properly performed and correct.

Checker's printed name, signature, and date

S. Ramakrishnan

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