Checks for Calculation No: 2137-CALC-004 **Revision No: 0**

Title: Calculation of Power Cable Heating due to DC Current Pulsing to PF1B Coil

Component was checked against latest design

Per FDR design

All required load cases are included and current

Only one case per NSTX-U-RQMT-SRD-006-01: 21kA/0.95 second every 1200 seconds

Discuss method used in the calculation

Adiabatic temperature rise during pulse, exponential cooldown between pulses based on coil thermal resistance and capacitance.

Discuss how the calculation was checked (*)

Same method using checker's XL sheet (PF1B_Cable_Ampacity_Check.xls included herewith).

List issue identified and how they were resolved

No issues. Calculation is conservative because it used 1.0 sec ESW instead of 0.95 sec requirement.

Checker's name: C. Neumeyer

Technical Authority: Raymond A. Camp Digitally signed by Raymond A. Camp DN: cn=Raymond A. Camp, o=PPPL, ou=Power Systems Group, email=rcamp@pppl.gov, c=US Date: 2018.09.18 12:25:23 -04'00' (sign and date)

(*) independent calculations can be appended