

Checks for Calculation No: NSTXU-CALC-11-11-00

Revision No: 0

Title: Electromagnetic Load Calculation for CSA row 5 and row 6

Component was checked against latest design

All required load cases are included and current

Discuss method used in the calculation

The Workbench electric is used to build the models of CSA tile rows 5 and 6, and then the models are imported to the ANSYS APDL to calculate the halo current distribution through the tile for the electromagnetic halo forces, and also the eddy current distribution due to the plasma disruptions for the eddy current moments. The global background fields and dBdts are taken from Ark Brooks's calculation report NSTXU-CALC-11-08-00.

Discuss how the calculation was checked (*)

Based on my experience with the global modelling of NSTX-U tiles and bus bars, all the models are updated and all the assumptions look reasonable.

List issue identified and how they were resolved

Checker's name: Jiarong Fang

Technical Authority: _____ (sign and date)

(*) independent calculations can be appended

Minimum Requirements for Checking Calculations

1. Assure that inputs were correctly selected and incorporated into the design.
2. Calculation considers, as appropriate:
 - Performance Requirements (capacity, rating, system output)
 - Design Conditions (pressure, temperature, voltage, etc.)
 - Load Conditions (Electromagnetic (Lorentz Force), seismic, wind, thermal, dynamic)
 - Environmental Conditions (radiation zone, hazardous material, etc.)
 - Material Requirements
 - Structural Requirements (foundations, pipe supports, etc.)
 - Hydraulic Requirements (NPSH, pressure drops, etc.)
 - Chemistry Requirements
 - Electrical Requirements (power source, volts, raceway, and insulation)
 - Equipment Reliability (FMEA)
 - Failure Effects on Surrounding Equipment
 - Tolerance Buildup
3. Assumptions necessary to perform the design activity are adequately described and reasonable.
4. An appropriate calculation method was used.
5. The results are reasonable compared to the inputs.
6. Error bars (range) for inputs used, results / conclusions, assumptions, have been considered and are acceptable.

NOTE: IT IS THE RESPONSIBILITY OF THE CHECKER TO USE METHODS THAT WILL SUBSTANTIATE TO HIS/HER PROFESSIONAL SATISFACTION THAT THE CALCULATION IS CORRECT.

BY SIGNING CALCULATION, CHECKER ACKNOWLEDGES THAT THE CALCULATION HAS BEEN APPROPRIATELY CHECKED AND THAT THE APPLICABLE ITEMS LISTED ABOVE HAVE BEEN INCLUDED AS PART OF THE CHECK.