**PPPL Calculation Form**

Calculation # **NSTXU-CALC-11-03-00** Revision #**00** WP #, if any **1707**

(ENG-032)

Purpose of Calculation: (Define why the calculation is being performed.)

Stress Analysis of the ATJ Tiles and Supports

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

See attached report

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

See attached report

Calculation (Calculation is either documented here or attached)

See attached report

Conclusion (Specify whether or not the purpose of the calculation was accomplished.)

The Center Stack Tiles for the NSTX-CSU program are shown to be capable of withstanding the original GRD heat flux requirements using the prescribed ATJ graphite. The tile mounting scheme, consisting of T-bar supports for the CS Angle Section (CSAS) Tiles and the Inboard Divertor Horizontal (IBDhs) and Vertical (IBDvs) Tiles, and the tray support for the Center Stack First Wall (CSFW) Tiles is adequate to support the tiles against the anticipated thermal, eddy current and halo current loads with acceptable bolt loads.

Cognizant Engineer’s printed name, signature, and date

Kelsey Tresemer

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

Checker’s printed name, signature, and date

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 (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, insulation)

- Equipment Reliability (FMEA)

- Failure Effects on Surrounding Equipment

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.

**NOTE: 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.**