

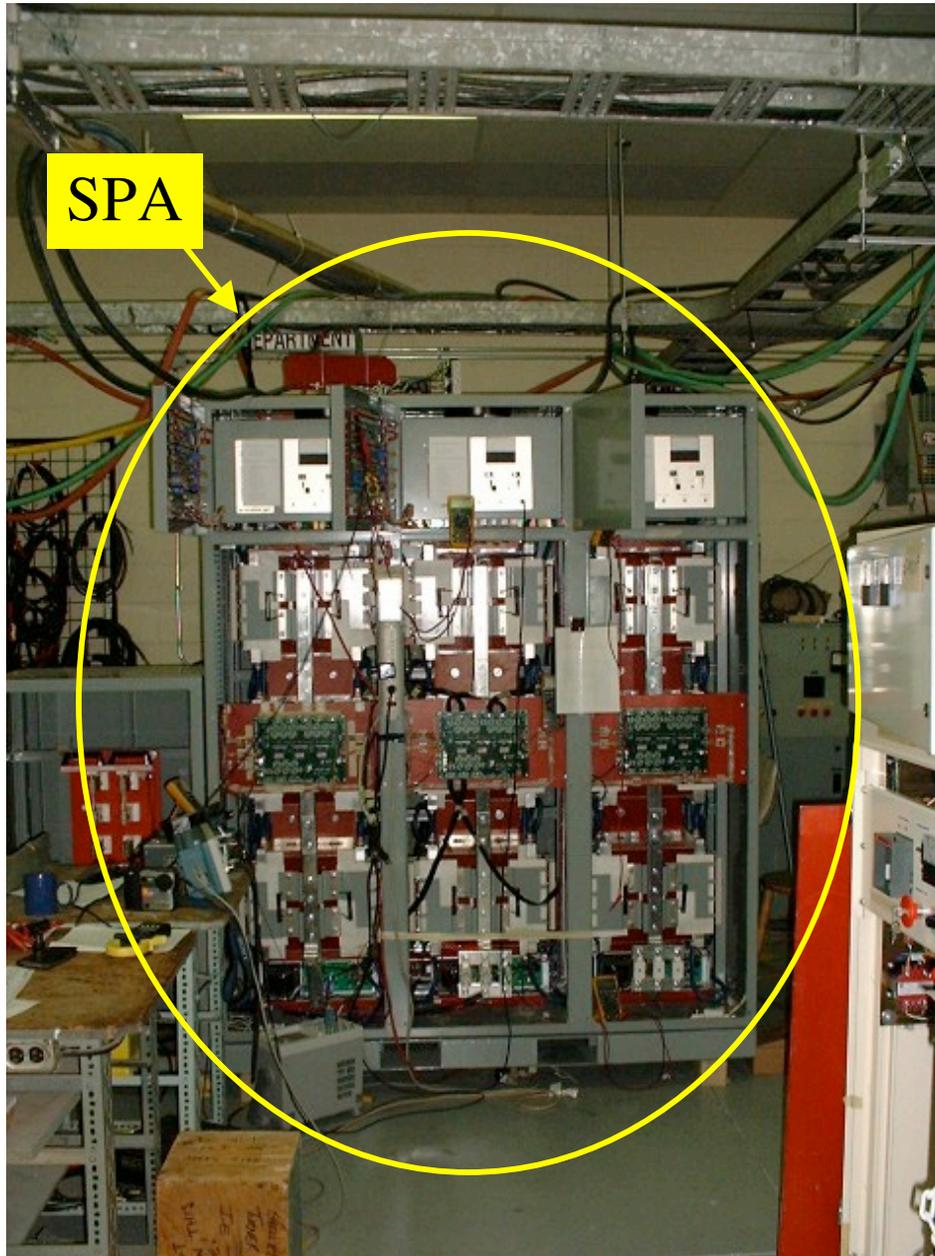
Status of Engineering Tasks

- SPA
- PF1a coil
- PF1a/PF1b supports
- TF joint

NSTX Team Meeting

C Neumeyer

10/14/4



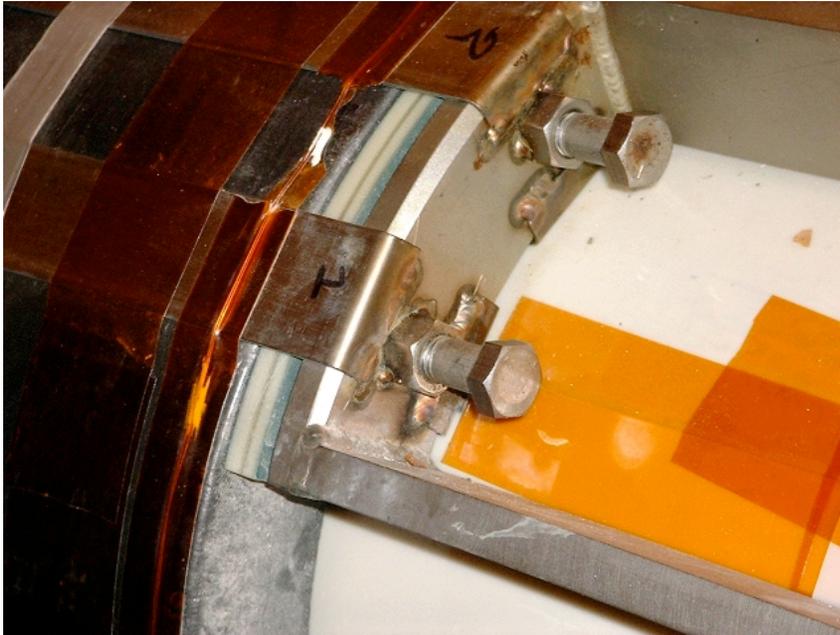
SPA

- SPA now in shipment from Canada
- Room being cleared At FCPC
- FDR on SPA installation on Friday
- Commissioning plans being developed



PF1a Coil

- New 24kA-20 turn coil in fabrication
- Dimensions to be published, slightly different than previously reported

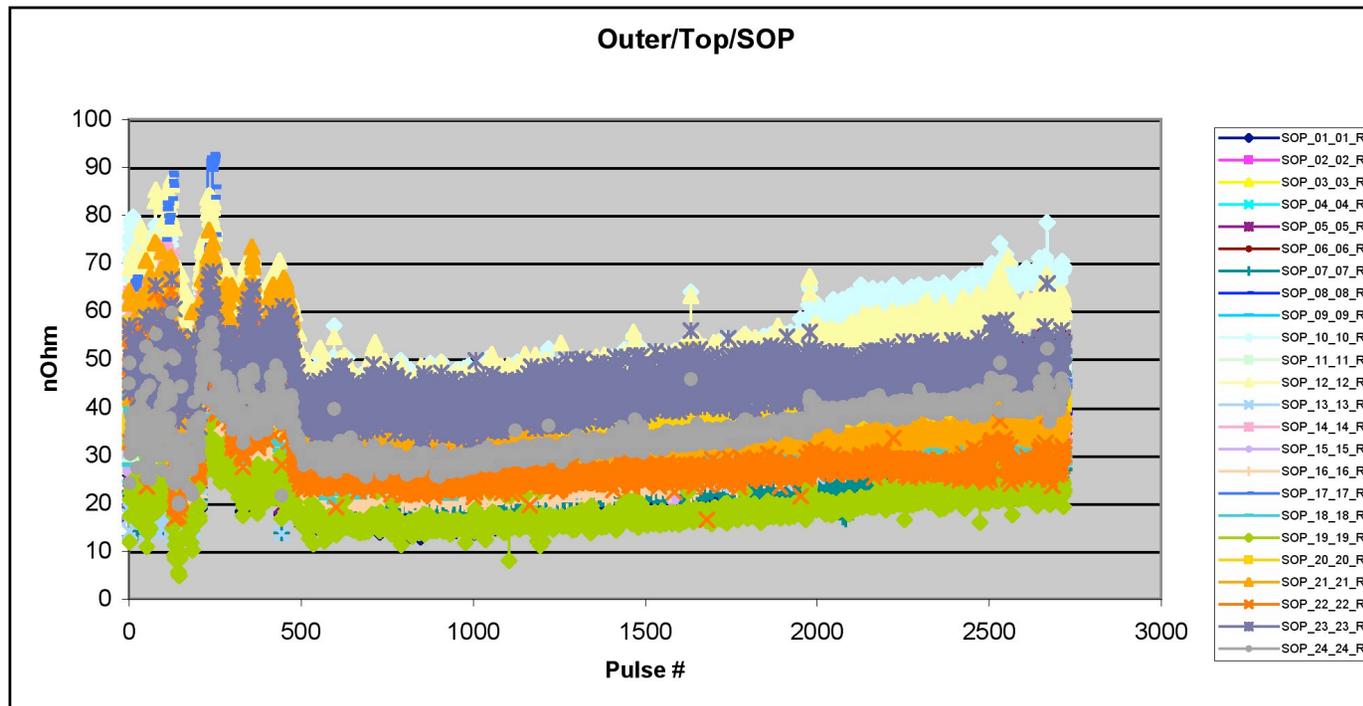


PF1a/1b Supports

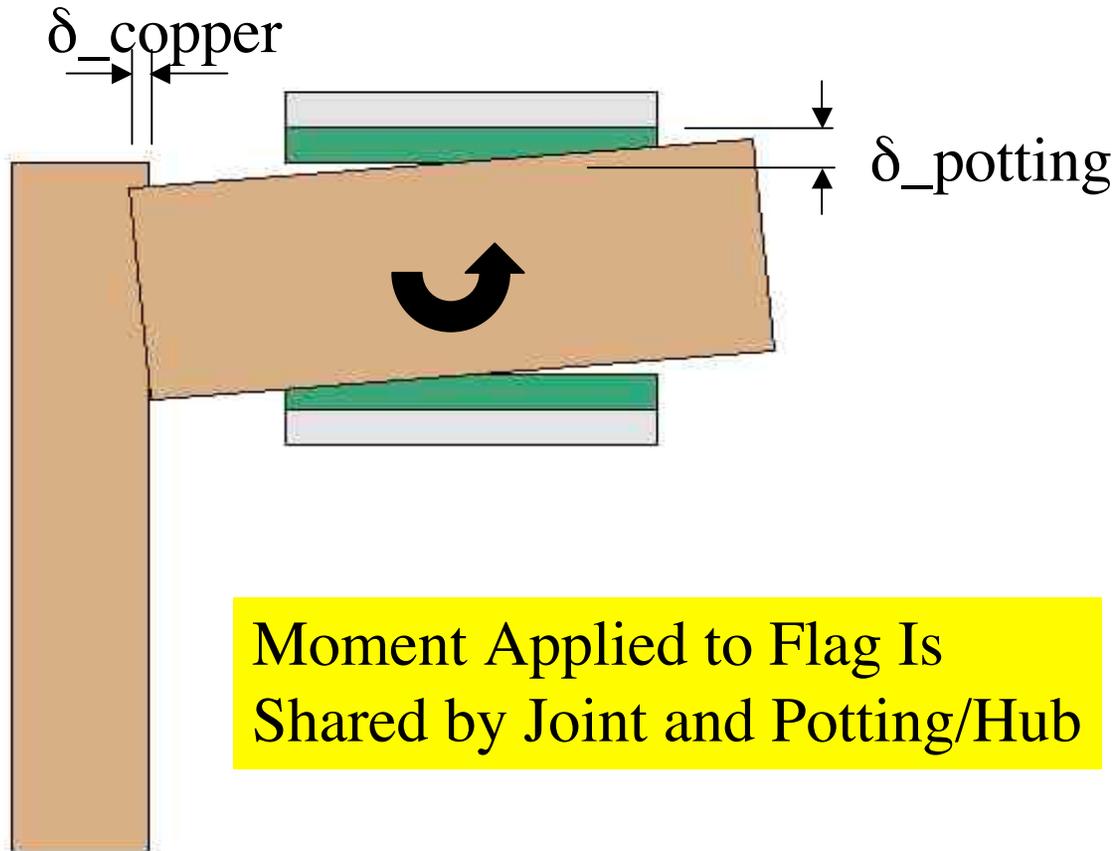
- New design being developed
- Will restore rated current capability in PF1a and PF1b



TF Joint

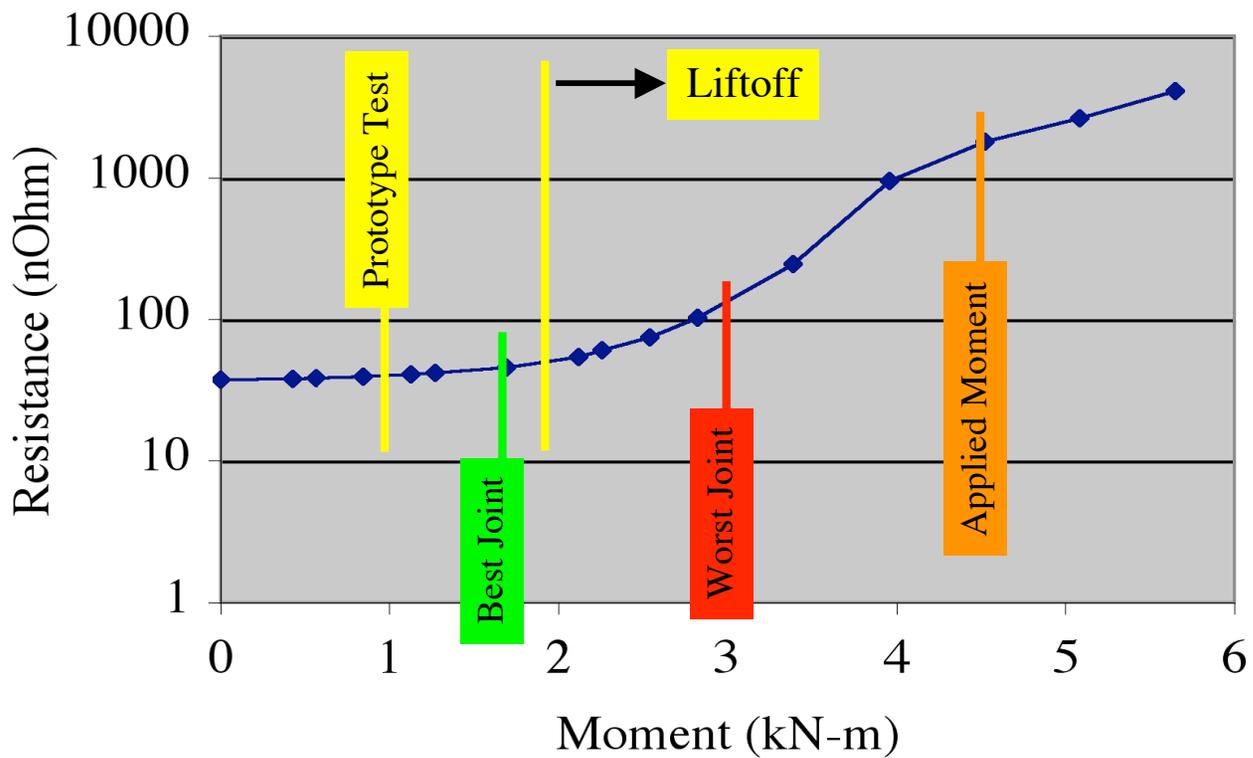


- Deterioration of Joint Resistance Occurred During Last Run
- Root Cause Traced to Defective Flag/Box Potting

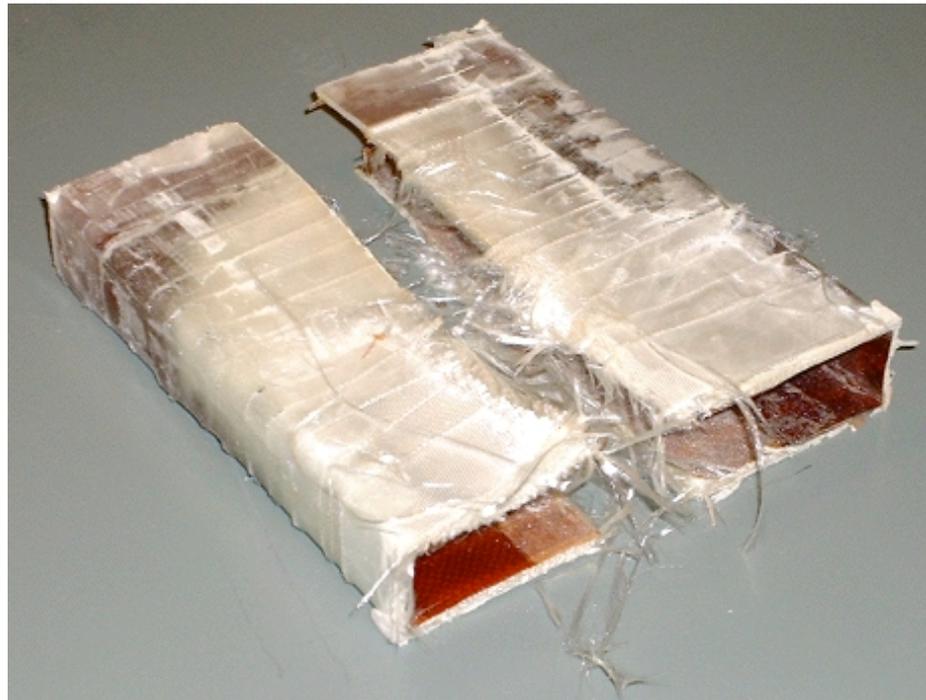


Moment Applied to Flag Is
Shared by Joint and Potting/Hub

Apparent Joint Resistance vs. In-Plane Moment



- Resin fill was minimal due to...
 - gel time of chosen resin too short
 - Kapton over flag ballooned out and blocked passages
 - Process not optimized, in general



Trials Now Underway To Solve Potting Problems



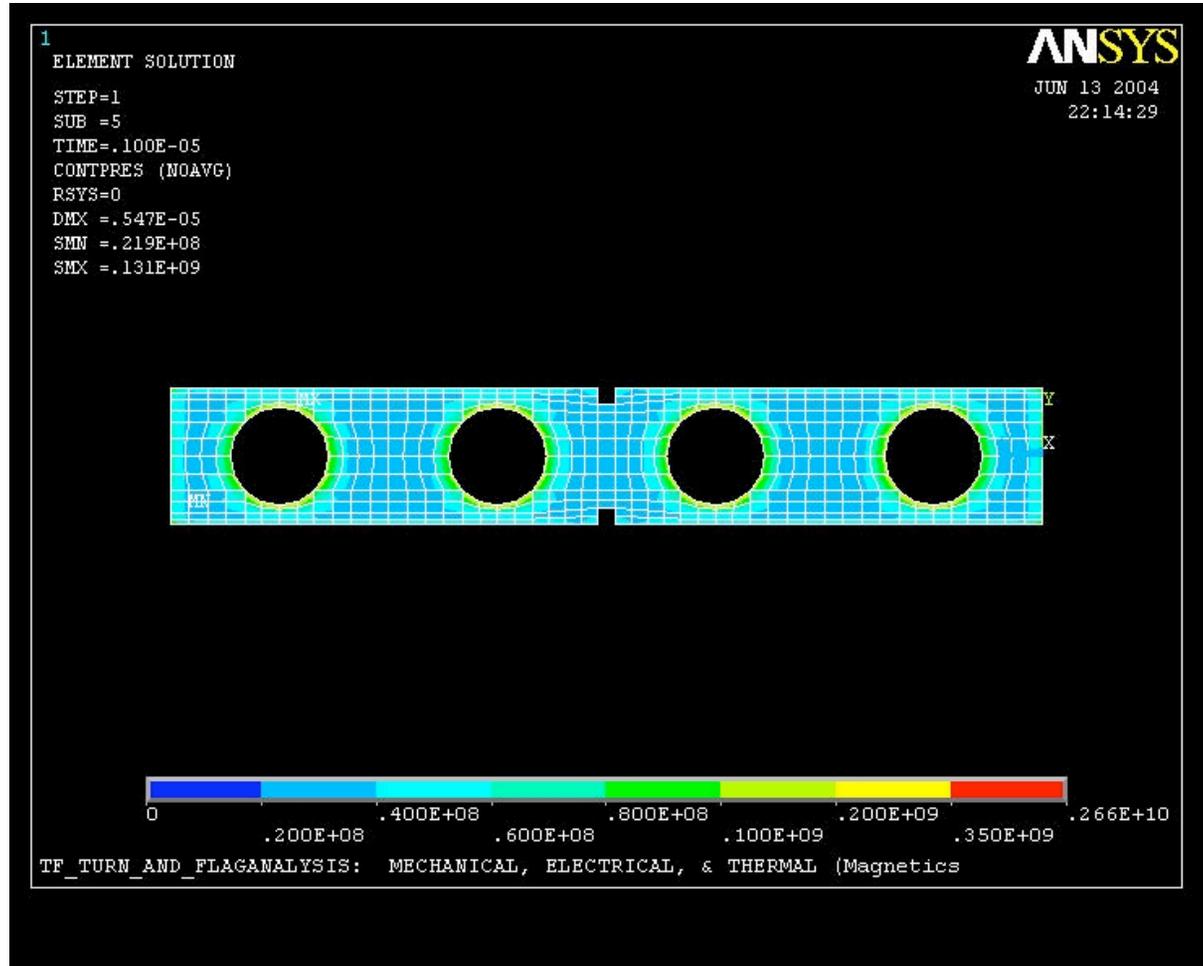
Renewal of Contact Surfaces Now Underway



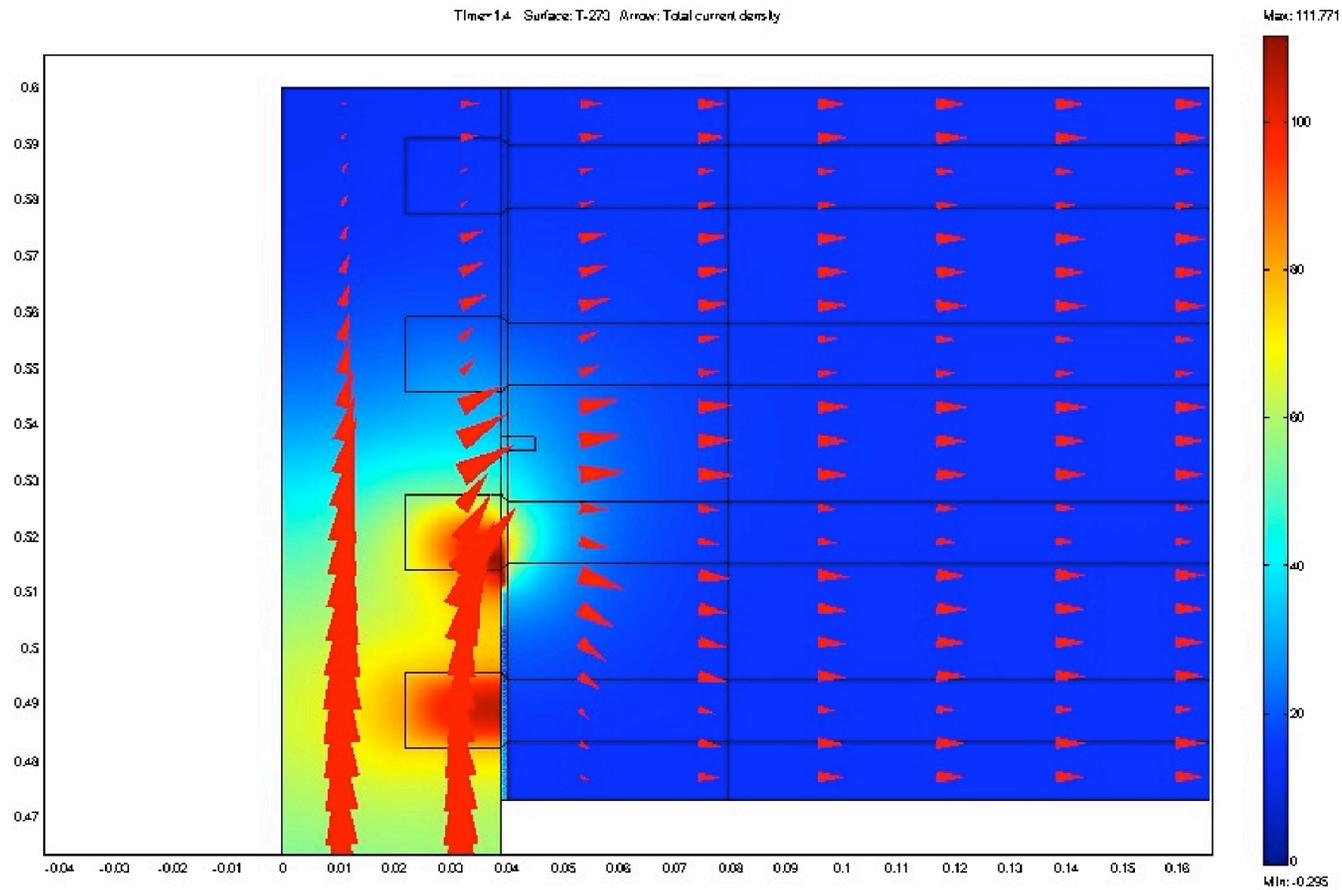
New Analysis Sheds More Light On Joint Behavior

- NASTRAN Structural Analysis Uses Finer Mesh at Joint
 - Provides input as to moment on flag for different cases
- ANSYS Analysis Uses Fine Mesh Model Including Effects of Holes and Inserts
 - Applies specified moment and predicts current distribution and voltage probe reading
 - Being upgraded to calculate temperature distribution using transient thermal analysis
- FEMLAB Analysis 2d and 3d
 - Applies specified moment and predicts current distribution and voltage probe reading
 - 2d transient thermal analysis
 - Being upgraded for 3d transient thermal analysis

ANSYS Pressure Distribution, Zero Moment (3d model)



FEMLAB End of Flat Top Result (2d Model)



Operations During Next Run Period

- Developing influence matrix to use for PSRTC real time calculation of in-plane and out-of-plane moments as a function of I_{tf} and $I_{oh/pf}$'s
 - initially based on finite element analysis
 - ultimately based on data mining (worst case joint)
- Exact prescription for limiting values remains TBD