

**TO: DISTRIBUTION**  
**FROM: C NEUMEYER**  
**SUBJECT: TF OPERATION WITH COOLING ABSENT FROM TURN 6**

A meeting was held today to review the impact of issues related to TF operation with cooling absent from turn 6, which has a water leak.

Following were present:

A. Brooks            J. Chrzanowski    L. Dudek    H. FanM. Kalish    M. Ono  
C. NeumeyerA. Von Halle            M. Williams

H.M. Fan presented the results of an ANSYS run which was used to estimate the insulation shear stress resulting from a condition where one turn is at a different temperature than its neighbors. An insulation shear stress of approx. 2ksi was calculated with a  $\Delta T$  of 20C between turns. Although it was noted that compressive forces exist between turns, it was decided not to take credit for this due to the fact that it varies with time and location as the coil goes through its heating/cooling cycle under the subject condition.

It was previously noted by C. Neumeyer, taking the data from the NSTX R&D Report 13-970430-JHC by J. Chrzanowski, that the average insulation shear failure stress of the TF inner leg bundle insulation (CTD-112P material w/o Kapton) was as follows, w/o compression:

Case	Average Failure Stress (psi)
All 25 samples	2808
6 samples tested at 100C	2381
19 samples tested below 100C (typically at $\approx$ 20C and 60C)	2942

A. Brooks presented the results of a thermal simulation which simulates water cooling of all turns except one which is radially cooled by its neighbors through the turn insulation. With cooling water flows at their present rates but with cooling absent from one turn, the cooling of the uncooled turn clearly completes within a 10 minute period. It was further noted that the peak temperature differential between turns is limited to 70% of the peak temperature of the turns.

cc: E Baker            M Bell            D Gates            R Hatcher            R Marsala            M Ono  
S Ramakrishnan            A Von Halle M Williams            NSTX File

