

## **NCSX TOROIDAL FIELD COIL DESIGN**

M. Kalish, J. Rushinski, L. Myatt, A. Brooks, F. Dahlgren,  
J. Chrzanowski and W. Reiersen  
Princeton Plasma Physics Laboratory, PO Box 451, Princeton, NJ 08543  
mkalish@pppl.gov

The National Compact Stellarator Experiment (NCSX) is an experimental device whose design and construction is underway at the Department of Energy's Princeton Plasma Physics Laboratory (PPPL). The primary coil systems for the NCSX device consist of the twisted plasma shaping Modular Coils, the Poloidal Field Coils, and the Toroidal Field (TF) Coils. The TF Coils are D shaped coils wound from hollow copper conductor and vacuum impregnated with a glass-epoxy resin system. There are 18 identical, equally spaced TF coils providing 1/R field at the plasma. They operate within a cryostat and are cooled by LN<sub>2</sub> nominally to 80°K. Wedge shaped castings are assembled to the inboard face of these coils so that inward radial loads are reacted via the nesting of each of the coils against their adjacent partners. This paper outlines the TF Coil design methodology, reviews the analysis results and summarizes how the design and analysis support the design requirements.

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