

Abstract Submitted  
for the DPP06 Meeting of  
The American Physical Society

Sorting Category: 5.6.1 (C)

**Structural Analysis of the Ignitor Load Assembly\*** A. BIANCHI, Ansaldo, Italy, B. PARODI, A. CUCCHIARO, ENEA, Italy, R. FROSI, A. PIZZUTO, G. RAMOGIDA, F. BOERT, KM, Germany, H.G. WOBKER, B. COPPI, MIT — The structural analysis of the IGNITOR machine Load Assembly has been completed taking into account the friction coefficients at the interfaces between its main components. A Finite Element ANSYS model was used to analyze the non-linear mechanical behavior of the structure. The calculation shows stresses within the allowable limits at the operating temperature. Interlaminar shear stresses values on the insulators of the toroidal field coils have been validated by the results of tests performed by Ansaldo. The non-linear analysis takes into account both the in-plane and the out-of-plane loads. Under normal operating conditions the assumed friction coefficient on the wedging surfaces is adequate to assure the structural stability of the Load Assembly. Furthermore, once unloaded, the structure comes back without any permanent deformation. The safety factors of the average shear stresses against the insulation shear rupture strength at the beginning of Ignitor life is always greater than 3, while at the end of life this is reduced to about 2 because of the degradation of mechanical properties due to the neutron dose. Keys of proper dimensions between the 30° extension of the C-clamps modules have been adopted to assure structural stability.

\*Sponsored in part by ENEA of Italy and by the U.S. DOE.

Prefer Oral Session  
 Prefer Poster Session

B. Coppi  
coppi@mit.edu  
MIT

Date submitted: 22 Jul 2006

Electronic form version 1.4