Contribution ID: **427**   Type: **Poster**

Profile Tolerances influence on Cryostat Base Section

Wednesday 7 June 2017 13:40 (2 hours)

The ITER cryostat—the largest stainless steel vacuum pressure chamber ever built which provides the vacuum environment for components operating in the range from 4.5k to 80k like ITER vacuum vessel and the superconducting magnets. The Cryostat is divided into four section, of which, Base section is most complex because of its web shaped structure sandwiched between two 60mm thick plates with stringent requirements in manufacturing tolerances. The required profile tolerance is 30(+10/-20) mm at weld locations and 20(+/-10) mm at other locations but during manufacturing, the tolerances are observed to be 60mm (+10/-50) mm at weld location and 50mm (+10/-40) at other locations. This increased profile tolerances are expected to affect the structural behaviour of Cryostat. The present paper discusses assessment of these tolerances on Cryostat Base Section using FEM software, Ansys. The increased profile tolerances on Base Section are applied using two different methods [2]. Maximum tolerance value was considered and five cases were identified to the complete effect of increased profile tolerances on Base section. Limit Load method [1] is used to analyze structural impact of these increased tolerances cases on Cryostat Base Section. The impacts of critical tolerances were discussed in the paper.

References

[1] Limit Load Analysis Method, ASME Sec VIII, Div 2
[2] ANSYS Theory of Reference v15
[3] Instructional Material Complementing FEMA 451, Design Examples, Seismic Isolation 15-7-53

Eligible for student paper award?

No

Author: Mr SANDHU, SARBJEET SINGH (ITER-India, Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India)

Co-authors: SHARMA, TARUN KUMAR (ITER-INDIA, INSTITUTE FOR PLASMA RESEARCH); Mr PADASALAGI, SHRISHAIL B (ITER-India, Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India); Mr PATEL, MAHESH (ITER-India, Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India); Mr GUPTA, GIRISH K (ITER-India, Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India); Mr BHARDWAJ, ANIL K (ITER-India, Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India); Mr PANDEY, MANISH K (ITER-India, Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India)

Presenter: Mr SANDHU, SARBJEET SINGH (ITER-India, Institute for Plasma Research, Bhat, Gandhinagar, Gujarat, India)

Session Classification: W.POS: Poster Session W

Track Classification: Materials and fabrication