



Contribution ID: 345

Type: Invited Oral

Status of the ITER Vacuum Vessel Manufacturing

Monday 5 June 2017 11:20 (20 minutes)

The ITER Vacuum Vessel (VV) has major functions of being the first confinement barrier and removing nuclear heating during fusion reaction of plasma. Also the VV provide mechanical support for all in vessel components such as Blankets, Divertors, In-vessel Coils, Diagnostics, etc. The VV has been designed as a fully welded torus-shaped, double wall structure with in-wall shielding (IWS) and cooling water between the shells in order to satisfy the main functions. Therefore in accordance with French regulation the VV and ports are classified as Nuclear Pressure Equipment due to presence of radioactive products in the plasma chamber and in water cooled structure. The VV procurements consist of five Procurement Arrangements (PAs) and four direct investments. The PAs have been signed for the fabrication of nine sectors (five sectors by the EU Domestic Agency (DA) and four sectors by the KO DA), IWS (IN DA), upper ports (RF DA), and equatorial & lower ports (KO DA) in 2008 to 2009. These direct investments are Field joint welding, Instrumentations, In service inspections, and Bellows.

Manufacturing design of VV regular sectors and upper/lower ports have been completed by industries with accommodation of requirements of the RCC-MR 2007 edition and approved by the VV project team and the Agreed Notified Body (ANB). The EU VV sectors are being manufactured by the EU DA with the consortium of Ansaldo, Mangiarotti, and Walter Tosto (AMW). Progress of poloidal segments of the first sector, Sector #5, is about 20 % and other sectors are progressing for manufacturing. The KO VV sectors are also being manufactured by the KO DA with the Hyundai Heavy Industry and progress is about 55 % for the first sector, Sector #6, and about 23 % for the second sector, Sector#1. IN DA with Avasarala Technologies Limited has completed manufacturing of In Wall Shield (IWS) of amount for about 2.5 sectors out of 9 sectors. Remaining of IWS is being manufacturing in order to complete it in end of 2018. Manufacturing of the first upper port stub extension of RF DA with MAN Diesel & Turbo has been completed and full factory acceptance tests have been completed under inspection of ITER organization (IO), related DAs and the ANB. All related manufacturing dossiers have been reviewed by the IO, related DAs/industries, and the ANB under established procedures. Other components for direct investment are under manufacturing design or procurements according to their planed schedule that will be introduced during presentation.

In this report, current progress of manufacturing, intermediate manufacturing results, major difficulties/issues with solutions, and future plan will be presented.

Eligible for student paper award?

No

Author: Dr CHOI, C.H. (ITER Organization)

Co-authors: Mr ALEKSEEV, A. (ITER Organization); Mr MARTIN, A. (ITER Organization); Mr MESTRIC, A. (ITER Organization); Mr GIRAUD, B. (ITER Organization); Mr BOUDOT, C. (ITER Organization); Mr KUZMIN, E. (Efremov Institute); Mr ZACCHIA, F. (F4E); Mr PATHAK, H. (ITER-India, IPR); Mr RAVAL, J. (ITER Organization); Mr MARTINEZ, J.M. (ITER Organization); Mr SA, J.W. (ITER Organization); Mr PEDROSA, N. (ITER Organization); Mr SAVRUKHIN, P. (Kurchatov Institute); Mr TEISSIER, P. (ITER Organization); Mr VERTONGEN, P. (ITER Organization); Mr LE BARBIER, R. (ITER Organization); Mr CHUNG, W.H. (ITER Korea, NFRI); Mr UTIN, Yu. (ITER Organization)

Presenter: Dr CHOI, C.H. (ITER Organization)

Session Classification: M.OA1: Experimental Devices I

Track Classification: Materials and fabrication