

EUROPEAN TEST BLANKET ANCILLARY EQUIPMENT UNIT DEVELOPMENT

T. Ilkei¹, O. Bede¹, S. Madeleine², A. Aiello³, T. Baross¹, B-E. Ghidersa⁴, G. Grunda¹,
P. Hajek⁵, D. Keller², L. Kosek⁵, B. Mészáros¹, D. Nagy¹, J. Németh¹, F. S. Nitti³,
Sz. Tulipán¹, J. Wagrez²

¹ Association EURATOM-HAS, KFKI-RMKI, PO Box 49, 1525 Budapest, Hungary

² CEA-Cadarache, IRFM, 13108 St. Paul lez Durance, France

³ ENEA FPN-FISING, C. R. Brasimone 40032 Camugnano (Bologna), Italy

⁴ KIT, IRS, Postfach 3640, 76021 Karlsruhe, Germany

⁵ Nuclear Research Institute Řež plc, Husinec- Řež 130, 250 68 Řež, Czech Republic

Corresponding author: tamas.ilkei@rmki.kfki.hu

During the first 10 years of ITER operation two European Test Blanket Modules (TBM's) will be tested in the same time in each test campaigns. Between the 4 campaigns the used TBM's have to be replaced by new ones quickly and safely. The two EU TBM's will be installed in equatorial ports #16 in a common Port Plug Frame.

Between TBM Port Plug and the outer walls of the port cell the TBM System contains 3 divider locations, where the supply pipes and wires will be connected and disconnected due to the exchange of TBM's. These interfaces determine the following groups of components: Port Plug with the two TBM Sets, Pipe Forest, Ancillary Equipment Unit (AEU) and Port Cell Accessories. The latter consists of components which are not removable.

This paper presents the recent results of the biggest removable component, the AEU development. The subsystem components are located inside the AEU, which ensures the quick and reliable removal and transport of these port cell components. Thanks to the possible separation of the system on the outer side of the bioshield, AEU can be removed just after the beginning of shutdown without the opening of bioshield. The removal is necessary for its maintenance in the Hot Cell Building, and in order to free the access in the Port Cell for remote Port Plug handling operations.

The moving of AEU will be realised by the Air Transfer System of Equatorial Transfer Cask via the same trajectory inside the Tokamak Building. Therefore the outer dimensions of AEU are consistent with those of the Transfer Cask.

The initiative concept of AEU frame structure was very similar to the preliminary design of the Cask but the self weight was already too high. Hence a significant structure optimisation work, based on FEM analyses has been implemented. The concept of support structure has been changed, and the weight appreciably has been decreased.

In the next step the layout of subsystem components and routing of pipes has been developed taking into account the maintainability requirements of components and an additional function of AEU. It will be also the basic support of remote handling equipment, which will be deployed to the Port Interspace for pipes connection and disconnection operations.