THE CONCEPTUAL DESIGN OF THE EU TEST BLANKET SYSTEMS

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In the frame of the F4E Grant F4E-2008-GRT-09, the TBM Consortium of Associate (TBM-CA) worked in 2009-2010 on the conceptual design of the two European Test Blanket Systems (TBS) that is under development in the European Fusion Programme. These concepts are the Helium Cooled Pebble Bed (HCPB) [1] and the helium Cooled Lithium Lead (HCLL) [2]. The TBM-CA is a partnership among six Associations (CEA, CIEMAT, ENEA, KIT, NRI-Czech Republic and RMKI-HAS) that joint their expertises to form an integrated team for the design, validation and manufacturing of the TBS. The Grant consisted in more than 200 single deliverables mainly dedicated to develop the conceptual design and the integration in ITER of the two TBMs and of their auxiliary systems, like the Helium Cooling Systems, the PbLi Loop, the Tritium Extraction/Removal Systems and the Coolant Purification Systems. Part of the Grant addressed also the definition of the TBM testing Programme identifying tests and experiments and in parallel tools and methods to extrapolate the gained results for the design of the breeding blanket of the future DEMO reactor. Other topics were the System Engineering and the Configuration Management and the preliminary Safety report.

The paper presents an overview the results of this work and in particular the status of development of the conceptual design will be described and discussed.

[1] F. Cismondi and al., Design update, thermal and fluid dynamic analyses of the EU-HCPB TBM in vertical arrangement, Fusion Engineering and Design, 84(2009) 607-612.

[2] J-F, Salavy et al., The HCLL TBM: Present reference design, System Integration in ITER and R&D needs, Fusion Engineering and Design 83 (2008) 1157–1162.