HYDRAULIC CHARACTERIZATION OF THE FULL SCALE DIVERTOR CASSETTE PROTOTYPE

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In the frame of the activities related to ITER divertor R&D, ENEA C.R. Brasimone was in charge by Fusion For Energy (F4E) to perform the assembly, the hydraulic tests and the theoretical simulation of the hydraulic behaviour of the full scale divertor cassette prototype.
The objectives of these activities were aimed at the assembling of the three Plasma Facing Components (PFCs) onto the cassette body and to investigate the thermal-hydraulic behaviour of the full-scale divertor cassette both under steady state conditions and during draining and drying operational transient. In particular, the steady state tests were focused on finally check whether the hydraulic design of the divertor components is able to ensure a uniform and proper cooling for the PFCs, with acceptable pressure drop; whilst the transient ones were aimed at defining proper procedures for draining and drying the divertor cassette as well as for refilling it with water.
The paper presents the activity related to the integration of the PFCs onto the cassette body, including both the mechanical attachment and hydraulic connection and the results of the steady state and transient hydraulic experimental test campaigns performed at ENEA C.R. Brasimone. These results are compared to the relevant theoretical predictions obtained at the Department of Nuclear Engineering of the University of Palermo by a numerical analysis performed adopting the RELAP5 Mod3.3 thermal-hydraulic system code.