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Status of the ITER Cooling Water System Design

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ITER Cooling Water System (CWS) is designed to reject all the heat generated in the plasma and transmitted to the In-Vessel components through the Tokamak Cooling Water System (TCWS) to the intermediate closed loop Component Cooling Water System (CCWS) and then to the environment via the open Heat Rejection System (HRS).
The TCWS is designed to remove the total peak heat load of about 1100 MW and is divided into three Primary Heat Transfer System (PHTS) loops, two Chemical and Volume Control System (CVCS) units, a Draining and Refilling system (DR) and a Drying System (DY). The TCWS has a safety role for the primary confinement of radioactive inventory due to Activated Corrosion Product (ACP) and Tritium content in the water. The three PHTS are: Vacuum Vessel (VV PHTS), Integrated Blanket ELMs and Divertor (IBED PHTS) and the Neutral Beam Injectors (NBI PHTS). The VV PHTS has also the safety function to provide the decay heat removal functions even when the other PHTSs are not available during off-normal accidental events like LOCA, LOSP etc.
The paper describes the main design challenges faced and the changes that have been carried out to prepare the CWS final design phase.
The paper also reports the main functional requirements for the CWS considering the phased installation, commissioning and operation of the CWS from the preoperational activity to the First Plasma and eventually to the nuclear DT phase.
Detailed information will be also provided about the physical and functional interfaces between CWS and the main clients (e.g. Vacuum Vessel, In-Vessel Components, Diagnostics, Power Supply, Cryoplant etc.) with the progress on the integration the CWS to the other systems in the Tokamak Complex as well as in the other non-nuclear buildings.

Eligible for student paper award?

No

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