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## PD/P8-02: Tritium Management in the European Test Blanket Systems and Extrapolation to DEMO

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Through the planned experimental campaign on the Test Blanket Systems (TBS), ITER will be a unique technological platform to assess the performance of different breeding blanket concepts for DEMO and power reactors. Two European TBSs are going to be tested in ITER, based on HCLL (Helium Cooled Lithium Lead) and HCPB (Helium Cooled Pebble Bed) breeding blanket concepts. In both cases the TBM box is made of reduced activation ferritic martensitic steel (Eurofer), cooled-down by pressurized He at 8 MPa. While in HCLLTBS the slowly flowing Pb-16Li alloy acts as tritium breeder and neutron multiplier, the breeding material and neutron multiplier of HCPB-TBS are lithium ceramic and beryllium, respectively, both in form of pebbles.

One of the main objectives of the experimental campaign on TBSs is the efficient management and accurate accountability of tritium from its source, the TBM, up to its final delivery to the ITER inner fuel cycle system. Indeed, the data collected by the tritium accountability system, when processed by comprehensive modelling tools, will be one of the most relevant outcomes in support of the blanket design for DEMO and beyond.

This paper describes various aspects of HCLL and HCPB-TBS activities that have a direct impact on tritium management and then discusses their potential extrapolation to DEMO design. It includes:

- i) the baseline design of TBS sub-systems, also in light of new interface requirements coming from IO (ITER Organization), impacting the tritium management, with a focus on the components potentially DEMO relevant;
- ii) the baseline design of Tritium Accountability System, with a focus on the interface Tritium Accountability Stations (TAS) to be deployed in TBS;
- iii) an overview of tritium transport modelling activities aimed at the development of the predictive capabilities that will be validated through the TBM project and employed for DEMO design.

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