ITER is the first worldwide international experimental nuclear fusion facility, which aims to prove the physics and technological basis for future fusion power plants. One of the main objectives for ITER is its availability in order to deliver sufficient plasma time for the research programme. The inherent Availability target for ITER is 45% in DT-phase (25% for operational availability).

Test Blanket Modules play a key role in ITER. Helium Cooled Ceramic Breeder (HCCB) TBM is one of TBM concepts which were proposed by China. To reach the ITER inherent availability target, the HCCB TBS required to achieve basic plasma operation shall be designed to reach the inherent availability objective as 80% in H-phase and 75% in DT-phase. In order to achieve this objective, the RAMI (Reliability, Availability, Maintainability and Inspectability) approach should be applied to all ITER components during their design phase to reduce potential technical risks. The RAMI approach is the first stage of an Operational Risk Control Policy which makes it possible to have a better warranty that a device meets its requirements in terms of Availability, itself depending on Reliability & Maintainability.

HCCB TBM and its ancillary system are called HCCB Test Blanket System (TBS). The RAMI analysis was performed on the conceptual design of the ITER HCCB TBS in this paper. A functional breakdown was prepared in a bottom-up approach, resulting in the system being divided into 3 main functions, 1 support function, 14 sub-functions and 50 basic functions. These functions were described using the IDEF0 method. Reliability block diagrams were prepared to estimate the reliability and availability of each function under the stipulated operating conditions. The inherent availability of the HCCB TBS expected after implementation of mitigation actions was calculated to be 94.69% over 2 years. A Failure Modes, Effects and Criticality Analysis was performed with criticality charts highlighting the risk level of the different failure modes with regard to their probability of occurrence and their effects on the availability.

**Keywords:** RAMI; Availability; Reliability; ITER; TBM