

## **Preliminary Failure Mode and Effect Analysis on Chinese ITER Helium Cooled Solid Breeder Test Blanket Design Concept**

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### **Abstract:**

The complexity of the ITER TBM (International Thermonuclear Experimental Reactor Test Blanket Module) and the inventories of radioactive materials involved in its operation require a systematic approach to perform detailed safety analyses during the various stages of the project in order to demonstrate compliance with the safety requirements. In this article, A Bottom-Up methodology based on component level Failure mode and effect analysis (FMEA) has been applied to perform the safety analyses for Chinese ITER TBM design with helium-cooled solid breeder (HCSB) concept for testing in ITER device. The main purposes of the work are: to identify important accident initiators, to find out the possible consequences for the TBM deriving from component failures, identify individual possible causes, identify mitigating features and systems, classify accident initiators in postulated initiating events (PIEs), define the deterministic analyses which allow the possible accident sequences to be quantified, both in terms of expected frequency and radiological consequences, and consequently, to ascertain the fulfillment of ITER safety requirements. This paper summarizes the Preliminary FMEA analyses performed for Chinese ITER helium cooled solid breeder test blanket design concept.

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