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FTP/P1-08: Preliminary Safety Analysis of the Indian Lead Lithium Cooled Ceramic Breeder Test Blanket Module System in ITER

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Safety analysis has been carried out for the safety licensing of Lead Lithium cooled Ceramic Breeder (LLCB) Test Blanket Module (TBM) system; INDIA's proposed prototype of DEMO blanket concept for testing in International Thermonuclear Experimental Reactor (ITER). A set of four reference accidents is identified for LLCB TBM System. Each accidental sequence begins with a Postulated Initiating Event (PIE) identified through Failure Modes and Effects Analysis (FMEA) at component level. The analysis address specific reactor safety concerns, such as passive removal of decay heat, pressurization of confinement buildings, vacuum vessel pressurization, release of activated products and tritium during these accidental events and hydrogen production from chemical reactions between lead-lithium liquid metal and beryllium with water. An in-house customized computer code is developed and through these deterministic safety analyses the prescribed safety limits are shown to be well within limits for Indian LLCB-TBM design and it also meets overall safety goal for ITER. This paper reports transient analysis results of the safety assessment.

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