



ANALYSIS OF THERMAL HYDRAULIC PROCESSES DURING DIFFERENT OPERATION MODES OF WENDELSTEIN 7-X

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ABSTRACT

Fusion is the energy production technology, which could potentially solve problems with growing energy demand of population in the future. Wendelstein 7-X (W7-X) is an experimental stellarator facility currently being built in Greifswald, Germany, which shall demonstrate that in the future energy could be produced in such type of fusion reactors. This paper presents the model of W7-X target modules cooling system and plasma vessel, developed with RELAP5 code. The analysis of loss-of-coolant accident (rupture of the 40 mm target cooling pipe) during “baking” (no-plasma operation), normal and “hot linear” operation mode were performed. The performed analysis allowed to investigate the processes in cooling system and to evaluate the increase of pressure in plasma vessel during different operation modes of W7-X experimental fusion reactor.

Keywords: Wendelstein 7-X, cooling system, plasma vessel, RELAP5