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Seminarium Zakładu Energetyki Jądrowej i Analiz Środowiska (UZ3) Departament Badań Układów Złożonych (DUZ)

Wtorek: **24.05.2022**
11:30

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FMEA and reliability studies for the HTTR Vessel Cooling System

Abstract:

The Vessel Cooling System (VCS) of High Temperature Engineering Test Reactor (HTTR) is an engineered safety system located in the cavity around the Reactor Pressure Vessel (RPV). VCS operates under both normal and accident conditions, with specific cooling functionalities. During the normal operation, it cools the concrete wall surrounding the RPV. Under accident conditions, it is to remove the residual heat from the core and RPV, as well as to protect the concrete shielding from overheating. In this research, the lifetime reliability and availability of VCS have been analysed. The system Fault Trees and Reliability Block Diagrams have been created based on the results from the Failure Mode and Effect Analysis (FMEA). Normal operation and emergency conditions have been analysed, assuming different requirements for the system operation. The VCS reliability for cooling the concrete wall around the RPV in normal operation has been calculated. Then, its availability to remove the residual heat after Loss of Forced Cooling has been simulated. The results of this work contribute to the safety and profitability analysis of the foreseen cogeneration plants with High Temperature Gas-cooled Reactors.

Serdecznie zapraszamy
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