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

Wtorek: **06.04.2021**
11:30

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Characteristic of Depressurized Loss of Forced Cooling Accident in High Temperature Engineering Test Reactor

Abstract:

The High Temperature Engineering Test Reactor (HTTR), designed and operated by the Japan Atomic Energy Agency (JAEA), is considered as a heat power source for the first-of-a-kind commercial electricity and hydrogen production system. The cogeneration plant with HTTR is built to demonstrate the safety and operability of the foreseen nuclear-chemical installations with the High Temperature Gas-cooled Reactors (HTGRs). The safety demonstration includes probabilistic analysis aiming at the identification of the potential initiating events and probability calculation for the accident scenarios and consequences. The Depressurized Loss of Forced Cooling (DLOFC) is of interest because of its potential to pose concerns in terms of thermal damage of the fuel and the coolant plate outside the reactor. Depending on the plant response after the DLOFC accident, there exists some risk for the release of the fission products into the environment. This work is focused on the characteristic of DLOFC in terms of the potential accident progression. Different scenarios were identified and described based on the Event Tree analysis, thus contributing to the further Probabilistic Risk Assessment (PRA). Due to the innovative safety concept of HTGRs, the modified traditional PRA approach must be utilized most effectively in terms of safety objectives. This work presents the preliminary study on an innovative format for the traditional PRA methodology to assess the frequency of DLOFC accident and various scenarios of its progression that are determined by the availability of the required safety systems.

Serdecznie zapraszamy
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