



Karlsruher Institut für Technologie

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Aushang

Institut für Neutronenphysik und Reaktortechnik (INR)

Leiter: Prof. Dr.-Ing. Robert Stieglitz

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Datum: 20.11.2023



Einladung zum Seminar über „Nukleare Energieerzeugung“

Zeit: Montag, **4. Dezember 2023**, 11:00 Uhr

Ort: Karlsruher Institut für Technologie, Hermann-von-Helmholtz-Platz 1
76344 Eggenstein-Leopoldshafen, INR, Bau 521, Kolloquiumsraum (R. 302)

Referent: Herr Onur **Murat**, Karlsruher Institut für Technologie, INR

Titel: Improved Analysis of the Short-Term Station Blackout Accidents of the Peach Bottom Unit-2 Reactor with ASTEC Including Radiological Impact and Statistical Analysis with JRODOS

Abstract:

After the severe accident at Fukushima, the importance of BWR design and related structures and their contribution to the severe accident progression has increased. Fuel channel boxes, absorber crosses, water rods, and smaller primary containment design of the BWR have been considered in the ASTEC code to increase the knowledge of BWR design and associated models. The previously developed ASTEC model for Peach Bottom Unit-2 was updated to include modern GE14 10x10 fuel assemblies with realistic fission product inventories. The CASMO5 code predicted the fission product inventory and burnup for GE14 10x10 fuel assemblies based on real plant data obtained from the ENRESA samples. The most anticipated transient scenario i.e. station blackout (SBO) for the BWR design was selected. First, a Short-Term Station Blackout (ST-SBO) analysis was performed to compare the impact of the old and new fuel assembly designs and secondly, a short-term station blackout with a stuck open safety relief valve (ST-SBO SOSRV) was considered for modern fuel assemblies. The scatter of corium ejection amounts between the considered scenarios showed the importance of the design of the bottom head and the penetration points in BWRs. In both cases, failure of the drywell head flange and release of radionuclides to the environment occurred. Radiological analysis using JRODOS was performed for both cases and the statistical analysis and the number of records in the considered cities around the Peach Bottom Plant showed the distribution over the region and the risk factors of the populated cities. The collaborative use of three codes in this study allows users to identify the fission product inventory with CASMO5 and investigation of the severe accident scenario with ASTEC and identifying radiological impact of the released radioactive isotopes to the environment with JRODOS code.

gez. R. Stieglitz

Hinweis: Alle auswärtigen Besucher des Seminars werden gebeten, ihren gültigen Personalausweis oder Reisepass mitzubringen

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