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[717] Neutron imaging investigations of the hydrogen distribution in nuclear fuel cladding tubes after simulated accidents

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The reaction of hot nuclear fuel rods with steam results in production of free hydrogen. The released part of this hydrogen provide the risk of hydrogen detonation The other part is absorbed in the fuel cladding tubes made of zirconium alloys. This is the more dangerous one because it can be result in an embrittlement of the cladding tubes and with it in a destruction of the tubes by thermos-shock if an emergency cooling is initiated. The paper presents results of neutron imaging investigations of cladding tubes after accident simulation tests. Hydrogen concentrations were determined quantitatively with a spatial resolution of better than 50 µm.

Theoretical Work

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