

Parameter Study for Optimal PWR Spent Fuel Shipping Cask

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Abstract

The burnup effects and design parameters for optimal design of PWR spent fuel shipping cask were analyzed for various cases of PWR spent fuel shipping casks by using the HELIOS, MCNP-4/B, and CAPSIZE computer codes. The investigated parameters were burnup, cooling time, combinations of nuclides in the PWR spent fuel and shielding materials of shipping casks. The fuel compositions for burnup effects and design parameters of shipping casks were evaluated by HELIOS, MCNP-4/B and CAPSIZE codes, respectively. The results of the analysis show that the largest saving effect of the neutron multiplication factor due to burnup credit is 30 %. This is mainly due to the consideration of actinides and fission products in the criticality analysis. On the other hand, the evaluated maximum SLC(Specific Loading Capacity) of Fe-cask, Lead-cask and DU-cask were 0.2, 0.24 and 0.3, respectively.