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Burnup Credit in the Swedish Interim Storage Facility (CLAB)

In the Swedish Facility for Interim Storage of Spent Nuclear Fuel (CLAB) the criticality safety analysis is based on the assumption that the fuel is fresh. The criticality safety criterion $k_{eff} < 0.95$ is met during normal and accident conditions if the enrichment in the fuel is less than 4.2% U235. This is valid for both PWR- and BWR-fuel. For BWR-fuel credit for integral burnable poison is required.

The Swedish nuclear power utilities have plans to increase the enrichment in the fuel above 4.2 % U235. In order to be able to store fuel with enrichments above 4.2% U235 burnup credit has to be used in CLAB.

Burnup requirements for the fuel in CLAB with enrichments up to 5% U235 were developed for the limiting BWR- and PWR-fuel types taking into normal and accident conditions, uncertainties and other effects.

The study shows that burnup credit is an acceptable way to control the reactivity in CLAB for both BWR- and PWR-fuel with enrichments up to 5% U235 using a minimum set of nuclides, actinides only. If selected fission products also are credited more margin is achieved.