Comprehensive Study of Lattice Cell Calculations for Thorium Based Fuel Cycle in Light Water Reactors using SRAC Code

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The designers of the innovative reactors have proposed a number of approaches to increasing resource efficiency. Adding thorium, a fertile material, to the fuel is considered in this report. Under this approach, a large portion of the reactor output is produced by fissioning of the ^{233}U resulting from neutron capture by thorium, which results in reduced requirements for naturally-occurring fissile uranium (^{235}U). The proliferation potential of the light water reactor fuel cycle may be significantly reduced by utilization of thorium as a fertile component of the nuclear fuel. The concept of using Th-^{233}U as fuel has been applied to an existing LWR design as compare with another fuel cycles (UO_2 and MOX). SRAC code is extensive used to investigate the lattice cell problem.