

An Optimal Fuel Management Method Based on CANDU In-Core Detector Readings

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Abstract

An optimal refueling simulation method, considering the actual core state of a Canada deuterium uranium 600 MWe (CANDU 6) reactor, has been developed. The channel powers are provided by power mapping using in-core detector reading. The objective of the optimization is to maintain the reference core performance during refueling simulation, while satisfying the operation limits of channel and bundle powers. The optimization process consists of two stages: i) elimination of candidate refueling channels by several constraints and ii) selection of refueling channels by a direct search method. The developed fuel management method has been applied for refueling simulation for CANDU-6 reactor, and the results are compared with the plant operation data. It is found that the developed method could be used as a fuel management tool for CANDU-6 reactors.