# Optimization of The Axially Variable Strength Control Rods with Simulation Optimization for The Power Maneuvering for Pressurized Water Reactor

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## Abstract

In this research, the optimization of the axially variable strength control rods (AVSCRs) is performed to provide the AVSCRs with optimal performance for the power maneuvering for PWRs. The optimization objectives are minimizing AO variation and power deviation from target value during the power maneuvering. And the objective functions for the optimization are relationship between AO variation(or power deviation) and worth shape of the AVSCRs. However, in this case, analytic objective function does not exist and the response for input can only be evaluated by computer simulation. Therefore the simulation optimization methodology is used. A typical 100-50-100%, 2-6-2-14h pattern of daily load-follow power maneuvering is adopted in this work based on the demand pattern in Korea. The optimization result shows that the optimized AVSCR has good performance on the AO control and the violation of the AO target boundary during the power maneuvering is minimized, and consequently the AO is regulated well within the AO target band during the power maneuvering.