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Load Follow Performance of KNGR Using an Extended Mode-K Control Logic

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Abstract

The load-following capability of KNGR (Korean Next Generation Reactor) is evaluated in this paper. During load maneuverings, in KNGR, an extended Mode-K control system controls the core power and the axial power distribution simultaneously with operator control of the boron concentration. Input signals to the Mode-K logic are the measured core temperature mismatch and the ASI (Axial Shape Index). The load follow performance of KNGR is evaluated by using an NSSS (Nuclear Steam Supply System) analysis code, KISPAC-1D. Numerical simulations for an equilibrium cycle show that the Mode-K control system provides satisfactory performance for both scheduled daily load follow and grid follow operations. Core temperature as well as ASI was successfully controlled and all the NSSS systems worked as they were designed.