Applicability of Point Reactor Kintetic Equations for Subcriticality Monitoring

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Abstract

Conventional digital reactivity meter is based on a simple principle to solve inverse point reactor kinetic equations and thus the system can be installed even on a PC. It is desirable to use a simple system as much as possible. From this point of view, feasibility was studied for a conventional digital reactivity meter to be used as a subcriticality monitor. There are a few difficulties to be solved for a digital reactivity meter to be used for subcriticality monitoring. For example, the applicability of the point reactor kinetic equations must be verified for the system where neutron distribution is dependent on the subcriticality. Form this point of view, a numerical investigation was made for the applicability os the point reactor kinetic equations for the subcriticality monitoring.

Unified Nodal Method for Transient Analytic Function Expansion Nodal Calculations

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Abstract

The unified nodal method (UNM) for transient analytic function expansion nodal(AFEN) method solution to two-group diffusion equation in rectangular geometry is newly formulated. The performance of the new UNM is examined through the solution to the OECD/NEA PWR transient problem designated A1. It is shown that the UNM for the transient AFEN calculations outperform the popular transverse integrated nodal methods (TINM) like the nodal expansion method (NEM) and the analytic nodal method (ANM) in prediction accuracy at the sacrifice of the computational time.