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A New Perspective into Root-Cause Analysis and Diagnostics

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Abstract

A critical review of diagnostic and root-cause analysis methods, developed in nuclear, chemical process, aviation industries, was made. Based on this review, the insights into both off-line and on-line diagnostics, and also root-cause analysis are presented from a new perspective. This perspective may be applied for various purposes, including real-time on-line process diagnosis, root-cause analysis of reactor scrams, diagnosis of severe accidents, or situation identification of an on-going emergency at a nuclear site.

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Applicability of CHF Correlations Relevant to External Vessel Cooling for In-Vessel Corium Retention

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Abstract

In-Vessel Corium Retention through External Vessel Cooling (IVR-EVC Concept) has been suggested as one of the most effective measures for the interruption of severe accident progression. Through the considerable experiments and analytical devotes, the real applications of this concept into operating and advanced nuclear power plant have been discussed and investigated. In the evaluation of the IVR-EVC concept, one of the most important items in the heat transfer from reactor vessel to flooded water is the critical heat flux at the outer vessel surface. Therefore, experimental works considering various scales have been conducted to identify the critical heat flux and the underlying mechanism. In this paper, the suitable critical heat flux equation for the evaluation of the IVR-EVC concept has been identified considering the Korean Next Generation Reactor and large-scale experimental conditions.