

## Evaluation of Severe Accident Environmental Conditions Taking Accident Management Strategy into Account for Equipment Survivability Assessments

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### Abstract

This paper presents a methodology utilizing accident management strategy in order to determine accident environmental conditions in equipment survivability assessments. In case that there is well-established accident management strategy for specific nuclear power plant, an application of this tool can provide a technical rationale on equipment survivability assessment so that plant-specific and time-dependent accident environmental conditions could be practically and realistically defined in accordance with the equipment and instrumentation required for accident management strategy or action appropriately taken. For this work, three different tools are introduced; probabilistic safety assessment (PSA) outcomes, major accident management strategy actions, and accident environmental stages (AESs). In order to quantitatively investigate an applicability of accident management strategy to equipment survivability, the accident simulation for a most likely scenario in Korean Standard Nuclear Power Plants (KSNPs) is performed with MAAP4 code. The accident management guidance (AMG) actions such as the reactor control system (RCS) depressurization, water injection into the RCS, the containment pressure and temperature control, and hydrogen concentration control in containment are applied. The effects of these AMG actions on the accident environmental conditions are investigated by comparing with those from previous normal accident simulation, especially focused on equipment survivability assessment. As a result, the AMG-involved case shows the higher accident consequences along the accident environmental stages.