

## OSCAAR DEVELOPMENT AND APPLICATIONS

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### **ABSTRACT**

A computer code system OSCAAR has been developed at the Japan Atomic Energy Research Institute (JAERI) for use in probabilistic safety assessments of nuclear reactors in Japan. After participating in the international comparison exercise organized by CEC and NEA/OECD, our efforts are mainly made upon the verification and validation of the individual modules and the whole OSCAAR system.

As part of the verification study, uncertainty and sensitivity analysis with OSCAAR is being performed to provide information on the range of the uncertainty associated with the PSA level 3 outputs, and identify the important variables that contribute most to the uncertainty of the predicted outputs. Within two types of uncertainty involved in accident consequence assessments, the study on the stochastic uncertainty has been first undertaken. The meteorological sampling scheme appropriate for the trajectory dispersion model in OSCAAR has been developed for use in accident consequence assessments. Then, the stochastic uncertainties associated with the meteorological sampling scheme have been quantified.

The preliminary study on the subjective uncertainty has been also performed to address the uncertainties in the predicted consequences caused by the uncertainties in the values of the input parameters. The primary objective of this preliminary study was to establish the systematic methodology of implementing the uncertainty and sensitivity analysis using OSCAAR. The secondary objectives were to estimate the uncertainties associated with the risk of early health effects predicted by OSCAAR and to identify the important parameters that contribute most to the uncertainty of the predicted risk of early health effects. Some of the results of this study will be described in the paper.

For the validation of OSCAAR, the OSCAAR modules have been applied to the Dose Reconstruction scenarios of the BIOMASS Theme 2 organized by IAEA. Recent applications of the code system will be also briefly described, in particular, to the level 3 PSA for internal events of a BWR model plant in Japan.