**High-Level Radiation Field Analysis Using Monte Carlo Simulation**

**in Kori Nuclear Power Plant Unit 1**

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The distribution of radiation field in a nuclear power plant is necessary for safe operation. This is important especially when applying the recent recommendations of the International Commission on Radiological Protection in publication 60 (ICRP 60, 1991). The recommendation has been followed by the inclusion of the radiation exposure in plants as an assessment of occupational exposure. It is evaluated by measurement or computational calculation.

The method by measurement is not enough to analyze the radiation field in whole working place but the computational calculations can make it possible. This paper is concerned with calculation of the neutron component of the radiation field inside containment building, in Kori unit 1, Korea.

High-level radiation field analysis was performed over two steps to increase the accuracy and to embody the complex structure of inside of the containment building. In the first step, radiation source term was calculated. The spectrum of neutron escaping from reactor vessel was calculated and the results were written at the outer wall of the reactor vessel to use as source for radiation field distribution calculation in the next step. In the second step, radiation field distribution was calculated by using the previously calculated source term with containment building simulation model. The neutron spectrum was calculated in the whole working place inside of the containment building. And the neutron spectra and fluence for selected six points considering occupational exposure are calculated and compared with the measured values for benchmarking.

The calculated effective multiplication factor is 1.002650.0002 with RMS error of 2.96%. The evaluated values for selected six points in the containment building were as follows; For the level of 20 ft, the evaluated maximum values at two points near the room and at one point in the room of the steam generator are 1.313103, 1.874103, and 1.002 neutrons/cm2sec, respectively. For the level of 44 ft, the evaluated maximum values are 4.587103, 4.579103 and 20.63 neutrons/cm2sec, respectively, these are the same trend as the level of 20 ft mentioned above.

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