

OFF-SITE RISK STUDY FOR THE THREE OPERATING
NUCLEAR POWER STATIONS IN TAIWAN

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ABSTRACT

A systematic study on the risk resulting from postulated accidents were performed for all the three operating nuclear power stations (NPSS) in Taiwan: Chinshan (CS) NPS/2x1775 MWt BWR, Kuosheng (KS) NPS/2x2894 MWt BWR, and Maanshan (MAS) NPS/2x2775 MWt PWR.

The study is based on source terms reported in WASH-1400 (1975) NUREG-2239 (1982), IDCOR program (1984), and NUREG-0956 (1986). For the KS NPS, additional study was made with the release categories defined by the plant specific probabilistic risk assessment (KS PRA, 1985).

Major part of the consequence evaluation was performed using the plume model based computer code CRAC2. Sensitivity studies were made for key input parameters. Calculations using the puff model based computer code EDM were also implemented for selected cases. The EDM results, with the effect of complex terrain taken into account, can be used to form correction (or reduction) factors for the CRAC2 results.

The calculated results include conditional values, expected values, and/or complementary cumulative distribution functions (CCDFs) of various concentrations, doses, risks, and health effects. The diminution in risk with improved estimation of source terms is discussed in detail.

Emergency planning for the three NPSSs was commented on the basis of protective action guide (NUREG-0396, 1978) and exposure risk guideline (IDCOR, 1984). Optimum evacuation schemes for the three NPSSs are proposed based on over two-hundred CRAC2 runs. Parameters considered include delay time/warning time, evacuation speed and distance, protective countermeasures, and weather conditions.