RISK ANALYSIS OF POSTULATED PLUTONIUM RELEASES FROM THE EXXON NUCLEAR MIXED OXIDE FUEL PLANT AS A RESULT OF HIGH WINDS AND EARTHQUAKES

INTRODUCTION

The Nuclear Regulatory Commission has sponsored a program to estimate the potential hazard to the general population as a result of the impact of high winds and earthquakes on the Exxon Nuclear Mixed Oxide Fuel Plant at Richland, Washington. This paper outlines the procedures used in combining the results of various increments of analysis obtained in this study to produce a measure of risk. The risk measure presented in this paper is the probability per year that a high wind or earthquake will result in doses above specific levels (complementary cumulative distributions). The two organs, lungs and bone, were chosen for the dose exceedance probability calculations since these organs are significant and generally dominate the 50-year committed dose equivalents from inhalation. The doses were calculated for the population within an 80 km (50-mile) radius of the plant and for the nearest residence located downwind of the plant. Three tornado wind speeds, 150 mph, 190 mph, and 250 mph, and one earthquake event, 1.0g were evaluated for the analysis. Two earthquake events were reduced to one event since no significant plant damage was assessed for earthquakes of magnitude less than 1.0g peak ground acceleration.

TORNADO WIND SPEEDS

The estimated probabilities for the postulated tornado wind speeds were obtained from T. T. Fujita (Ref. 1). The frequency, F-scale, and associated