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RISK ASSESSMENT FOR EMERGENCY PLANNING RELATED TO NUCLEAR WEAPONS ACCIDENTS

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[redacted]

be defined as the diameter of a unit density sphere where terminal velocity (fall rate) is equivalent to that of the particle being evaluated. The Roller Coaster results indicate that the particle size distribution in an aerosol cloud resulting from a low order detonation of a nuclear weapon is not log-normal as might be expected, but rather appears to be skewed. It should be noted that the size distribution in Figure 2-1 represents only those particles associated with plutonium. Therefore, the inertial properties of the airborne plutonium (fall rate, respirability, etc.) would be expected to behave accordingly.

[redacted] Table 2-4 presents a particle size fractionation derived from the Roller Coaster data which is assumed to be a reasonable representation for predicting atmospheric dispersion and ground deposition of an aerosol cloud resulting from a nuclear weapon accident. It is recognized that for specific accidents, depending upon the nature of the detonation as well as various factors in the accident environment, significant differences in the size distribution might occur. Nonetheless, for purposes of a generic assessment of accident consequences, the distribution represented in Table 2-4 should provide an adequate characterization.

TABLE 2-4

[redacted] ASSUMED PARTICLE SIZE DISTRIBUTION FOR NUCLEAR WEAPON ACCIDENTS

[redacted]

Size Range Aerodynamic Diameter (μ)	Fraction of Total Plutonium Aerosol in Indicated Size Range
<1.0	0.02
1.0 - 3.0	0.04
3.0 - 10.0	0.12
10.0 - 30.0	0.24
30.0 - 100	0.42
>100	0.16

[redacted]