

A Handbook for Value-Impact Assessment

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Operated by
Battelle Memorial Institute

Prepared for
**U.S. Nuclear Regulatory
Commission**

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Manuscript Completed: December 1983
Date Published: December 1983

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Prepared for
Division of Risk Analysis
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
NRC FIN B2386

$$\text{Avoided Public Dose} = \left[\text{Core-Melt Frequency} \times \text{Dose Conversion Factor} \right]_{\text{Status Quo}} - \left[\text{Core-Melt Frequency} \times \text{Dose Conversion Factor} \right]_{\text{After Action}}$$

If the ratio method is being used, the analysis for public health is complete at this step. If the net-benefit method is being used, the analyst should proceed to the next subsection.

3.2.2 Monetary Valuation of Health Effects

This subsection is not divided into descriptions of limited, intermediate, and major efforts; rather, it contains general guidance.

Monetary valuation of health effects is a difficult and controversial subject about which there is no consensus. A variety of approaches have been suggested and a wide range of numerical values have been estimated as monetary equivalents for each kind of health effect.

In evaluating the health effects of radiation exposure, a basic point of reference is the numerical value of \$1000 per person-rem, which appears in the NRC's Policy Statement on Safety Goals (U.S. NRC 1983a, quoted in Section 2.1.2 of this handbook) and in 10 CFR 50, Appendix I as a benefit-cost guideline. The Safety Goals specify that the value is in 1983 dollars and that the guideline is for evaluation during a two-year period for possible subsequent use as "one consideration in decisions on safety improvements." The Safety Goals state further, "The benefits as measured by an incremental reduction of societal mortality risks in terms of person-rem averted should be compared with the reasonably quantifiable costs of achieving that benefit."

The numerical value of \$1000 per person-rem has been questioned, and lower values, on the order of \$100 per person-rem, have been considered. (See for example, Appendix A of NUREG-0880, U.S. NRC 1982; Voillequé and Pavlick 1982; and Benjamin and Strip 1982.) Values higher than \$1000 per person-rem have also been proposed in some contexts, particularly where early fatalities resulting from a reactor accident are concerned.

Given the problematic nature of this issue, the debate about the numerical value of \$1000 per person-rem is likely to continue. The best guidance for the analyst is to use a range of values in the analysis so that the sensitivity of the results to different numerical values can be assessed and presented. However, one of the values used in the analysis should be \$1000 per person-rem. In any event, the conversion factor used in the net-benefit formula must always be explicitly stated.

An alternative approach, which has some advantages as well as some drawbacks, is to consider a more detailed accounting for health effects. This can