

PUBLIC COMMENTS ON THE APPROPRIATENESS OF DISCOUNTING DOSES TO FUTURE GENERATIONS

Commonwealth of Massachusetts LLW Management Board

The performance assessment process, as it has evolved in recent years and as detailed in the BTP, involves a complex, lengthy, and costly process. Yet it necessarily remains characterized by many uncertainties, and the results must ultimately reflect the use of considerable scientific and engineering judgment in many areas. Although the Nuclear Regulatory Commission has detailed acceptable mechanisms for dealing with the uncertainties from regulatory perspective, the **level of assurance** that the performance objectives will be met is a function of how thoroughly all of these uncertainties are addressed. The complexity, time, and cost of a performance assessment therefore is likely to be directly proportional to the degree of assurance and thoroughness demanded.

It is reasonable to ask where the point of diminishing returns lies with respect to the level of effort required to provide "adequate" assurance. Some method of "discounting potential doses" to future generations from a disposal site may be appropriate in an effort to balance potential risks and costs. This may be appropriate for not only weighing the cost of design and performance features against potential future risks, as the staff suggests, but for limiting the sophistication and complexity of performance assessments that are required, as well.

Although the Management Board staff does not have a specific mechanism to suggest for making this type of cost-benefit analysis, we believe that the objective is worthy of further consideration by NRC.

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The NRC has requested comments on the concept of discounting of future doses. Unfortunately, the published description of the concept is somewhat unclear, and we are not able to directly comment on it. We have, however, reviewed the concept of discounting of the **costs** of future health effects from a facility, in the context of an ALARA analysis and a comparison of alternative schemes, which had different short-term, long-term risk profiles. Our conclusion was that the concept of discounting is based on a number of unstated economic assumptions which are probably not valid for long terms (a hundred years or more).

At a deeper level, however, the assumption of dose-risk linearity at very low doses is also highly questionable, and it is this fact that probably leads to people's desire to discount long-term future doses. After all, the global population-dose assumption which was the basis of [the U.S. Environmental Protection Agency's] 40 CFR Part 191 high-level waste standard implies some 1000 health effects, but there are probably very few knowledgeable people who truly believe that such a consequence is credible. A risk-based standard, complemented by the sort of nonlinear dose-risk relationship that appears to be evolving in the scientific community, would automatically result in a kind of discounting of future doses.