ACNWR-0185

July 2, 2002

The Honorable Richard A. Meserve
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: THE HIGH-LEVEL WASTE PROGRAM RISK INSIGHTS INITIATIVE

During the 134th meeting on April 16, 2002, the Advisory Committee on Nuclear Waste (ACNW) heard a presentation from the NRC staff concerning the high-level waste (HLW) risk insights initiative. The staff described why and how it is developing risk insights, and how it may use and document those insights. The staffs of the NRC and the Center for Nuclear Waste Regulatory Analyses (CNWRA) plan to document results of this initiative in a joint report by the end of fiscal year (FY) 2002; the Committee would like the opportunity to review that report before it becomes final.

The Committee was pleased to learn of the staff's HLW risk insights initiative. The initiative was presented as a ranking exercise to assess the importance of key technical issue (KTI) agreements[1]. The stated objective of the initiative is to enhance communication and integration among staff members. The Committee has, in many of its reports, advocated the value of risk assessment tools in providing context and perspective for safety issues. Thus, the principle of using risk insights to aid communication and integration of safety issues is considered extremely sound.

**CONCLUSIONS AND RECOMMENDATIONS**

The Committee reached two conclusions from the presentation concerning the HLW risk insights initiative. The first is that as a communication and integration exercise, the staff was very successful in bringing information and issues before different groups to increase awareness of the issues and develop "state of knowledge" perspectives on their importance. The second conclusion is that this exercise was not based on risk analyses and, therefore, is inappropriately labeled as a "risk" initiative."

[1] The NRC has engaged the U. S. Department of Energy (DOE) in a KTI resolution process as part of the agencies' prelicensing interactions regarding the proposed HLW repository site at Yucca Mountain, Nevada. DOE has agreed to provide specific information during the prelicensing phase to address some 293 agreements pertaining to these KTIs and Integrated Sub-Issues (ISIs).

The absence of a common set of criteria (a risk measure) and an analytical process for ranking the importance of various KTI agreements produced results that were inconsistent internally as well as with past practice in the development of risk insights. Although the staff has benefitted from this valuable communication exercise, we caution the staff with regard to how it portrays and uses the project results. In its white paper on Risk-Informed, Performance-Based Regulation (RIPB), the NRC defined risk insights as "the results and findings that come from risk assessments." Considering the legacy meaning of "risk," especially within the NRC, characterizing a communication exercise as a method for developing risk insights could cause considerable confusion and miscommunication. The Committee believes it is important to sustain the analytical and quantitative character of risk assessment and risk results.

The Committee concurs with the staff that the exercise should be repeated. The Committee recommends that the staff should employ traditional methods of risk assessment to derive the desired risk insights. Should the staff only want the communication benefit of the exercise, it should be scoped and labeled accordingly.

**BACKGROUND**

The ACNW has frequently encouraged the NRC staff to use performance assessment (PA) to develop risk insights in its HLW KTI program, including establishing the relative importance of the KTIs. This advice reflects our belief that developing and using risk insights is an essential ingredient for a risk-informed regulatory program. For example, the primary objective of our vertical slice review of the NRC staff's sufficiency comments and issue resolution program was to evaluate whether the NRC/DOE prelicensing issue resolution agreements and sufficiency comments were logical, defensible, and focused on the most risk-significant issues (ACNW report dated September 28, 2001, to Richard A. Meserve, Chairman, NRC). However, in the September 2001 report, the Committee conveyed that we could not discern whether the staff used its Total-System Performance Assessment computer code and other PA information to focus its sufficiency review on the most risk-significant issues. The staff's risk insights initiative, and its plans to repeat the exercise using risk assessment techniques, are steps in the right direction toward addressing our concern.

**NRC APPROACH AND INTERIM RESULTS**

The staff's initiative involved asking members of the various KTI teams to rank the KTI agreements in importance as high, medium, or low, along with the reasons for their ratings. The PA staff and other technical staff were also asked to rank the agreements for each of the KTIs. The staff then documented the composite results and developed a bar chart to graphically display the divergences in the responses obtained from the KTI and PA staffs. The staff did not constrain participants to using the same evidence or criteria as a basis for their rankings. Consequently, some participants assigned a high importance ranking to potentially contentious issues in any licensing hearing. Other participants ranked an issue as having low importance if it was classified as "closed" or "closed-pending." Still other participants considered only those agreements related to the waste package to be of high importance, because of the dominating effect of the waste package on repository performance. The remaining participants assigned importance rankings on the basis of the importance of the

various issues for demonstrating the capability of a multiple-barrier, a requirement in the NRC's HLW regulations in Title 10, Part 63, of the *Code of Federal Regulations* (10 CFR Part 63).

Because participants used criteria other than a common risk metric (such as "important to dose") to assign the rankings, the composite results cannot be treated as true, risk-based insights in an analytical sense. It is unclear how extensively participants relied on importance to dose as a criterion for assigning rankings, or on quantitative information from sensitivity analyses or TPA analyses. Consequently, the staff needs to study the composite results of the first exercise very carefully to understand the full implications before issuing the report later this year.

The Committee is extremely interested in how the staff employs risk assessment tools to implement a risk management strategy; thus, we are anxious to follow the HLW risk insights initiative and look forward to reviewing the next exercise.

Sincerely,

**/RA/**

George M. Hornberger
Chairman