UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CHAIRMAN

December 27, 1982

The Honorable Morris K. Udall
Chairman, Committee on Interior
and Insular Affairs
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Your letter to me dated October 1, 1982 cited Mr. Bender's recent comments concerning the use of probabilistic risk assessment (PRA) and asked for answers to three questions. Before responding to your questions, I would like to comment on the statements made in your letter.

I would first like to note that the section you have quoted from the January 18, 1979, Commission's statement on the use of risk assessment is substantially less than the Commission's response to the Lewis Committee Review. A few additional quotes will serve to amplify this. The Commission commented on the findings of the Lewis Report and said:

> "The Commission accepts these findings and takes the following actions:
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> .....
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> Accident Probabilities: The Commission accepts the Review Group Report's conclusion that absolute values of the risks presented by WASH 1400 should not be used uncritically either in the regulatory process or for public policy purposes and has taken and will continue to take steps to assure that any such use in the past will be corrected as appropriate. In particular, in light of the Review Group conclusions on accident probabilities, the Commission does not regard as reliable the Reactor Safety Study's numerical estimate of the overall risk of reactor accident.
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> .....
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> With respect to the component parts of the Study, the Commission expects the staff to make use of them as appropriate, that is, where the data base is adequate and analytical techniques permit. Taking due account of the reservations expressed in the Review Group Report and in its presentation to the Commission, the Commission supports the extended use of probabilistic risk assessment in regulatory decisionmaking."

The Commission also approved a directive which was sent from the Secretary of the Commission to the Executive Director for Operations on January 18, 1979. Some sections are particularly germane to answering your questions:

"Quantitative risk assessment techniques and results can be used in the licensing process if proper consideration is given to the results of the Review Group. The staff should use the following procedures regarding the use of quantitative risk assessment techniques and results pending development of further guidance:

....

Quantitative risk assessment techniques may be used to estimate the relative importance of potential nuclear power plant accident sequences or other features where sufficient similarity exists so that the comparisons are not invalidated by lack of an adequate data base....

The quantitative estimates of event probabilities in the RSS should not be used as the principal basis for any regulatory decision. However, these estimates may be used for relative comparisons of alternative designs or requirements provided that explicit considerations are given to the criticisms of those estimates as set forth in the Report of the Risk Assessment Review Group.

The RSS consequence model shall not be used as the basis for licensing decisions regarding individual nuclear power plant sites until significant refinements and sensitivity tests are accomplished. However, the consequence model may be used for relative comparisons provided that such estimates are not the primary basis for such reviews and provided that explicit consideration is given to the criticisms of the various elements of that model as set forth in the Report of the Risk Assessment Review Group."

The Commission went on in this memo to direct the staff to expand its use of probabilistic risk assessment:

"The staff shall give special attention to those activities identified by the Review Group as being especially amenable to risk assessment, i.e., dealing with generic safety issues, formulating new regulatory requirements, assessing and re-validating existing regulatory requirements, evaluating new designs, and formulating reactor safety research and inspection priorities."

Given the content of the Commission's statement on the Lewis Report and the directive to the Executive Director for Operations, the Commission believes that it holds essentially the same position on the use of PRA now as it had on January 18, 1979.

With regard to Mr. Bender's remarks appended to the September 15, 1982 ACRS letter, we agree with Mr. Bender that there are large uncertainties in the quantitative assessments of risk from nuclear power plant accidents. These uncertainties arise from several areas, including: (1) inadequacies

in the data base; (2) incomplete present knowledge of core melt phenomena, in-plant fission product transport, and containment performance; (3) the effect of unidentified systems interactions; (4) difficulties in quantitatively modeling human behavior; and (5) large uncertainties in the risk from external initiators. However, we believe that the data base is not as poor as implied by Mr. Bender; there are programs underway to develop a better understanding of core melt phenomena, containment performance, and fission product transport, and to improve the probabilistic assessment of external events.

Commissioner Gilinsky adds:

"My own views on the usefulness and the limitations of 'probabilistic risk assessment' and its use in the Reactor Safety Study are still pretty much as expressed in the (unanimously adopted) Commission statement of January 18, 1979. I am not at all in agreement with the current Commission's increasing tendency to view probabilistic risk assessment together with a quantitative 'safety goal' as a shortcut to regulatory decisionmaking. I am particularly concerned about resort to these calculational techniques in combination with sparse data to explain away the need for the traditional independent safety barriers which have been chosen on the basis of experience and engineering judgment. I have the impression that Mr. Bender and I are in philosophical agreement on these points. To cite one example that I find especially telling on the paucity of equipment reliability data, it was not until last year that full-scale tests were run on the large safety valves used to protect against excessive pressures in reactor coolant systems. And even these tests did not cover the full range of conditions to which such valves might be subject."

The majority of the Commissioners do not agree with his statement that the Commission is tending "to view probabilistic risk assessment together with a quantitative 'safety goal' as a shortcut to regulatory decisionmaking."

Commissioner Asselstine adds:

"Since I did not participate in the development of the Commission's view on the usefulness of the PRA methodology as given in the January 18, 197_ statement, I defer to my colleagues as to whether there has been a change in that view since then. I do believe that, with this Commission's consideration of a safety goal containing quantitative benchmarks for judging an acceptable level of risk, there is necessarily a greater emphasis on the use of the PRA methodology than would otherwise exist. Because of the wide spectrum of expert views on the ability of the PRA methodology to provide reliable estimates of the risk associated with the operation of nuclear reactors, I believe the basis for safety must continue to depend on compliance with our regulations and on the judgment of responsible individuals. On the latter, judgment is aided significantly

through systematic reviews and careful analyses of available information. I believe the PRA methodology has a role to play here, provided that the Commission adheres to its view of January 18, 1979, and provided that the concerns expressed by Mr. Bender and others are properly accounted for."

I trust that this has been responsive to your concerns.

Sincerely,

John F. Ahearne
Acting

cc: Rep. Manuel Lujan