



Department of Energy

Washington, DC 20585

March 12, 1990

Mr. J-P. Olivier
Head, Radiation Protection
and Waste Management Division
Nuclear Energy Agency
Organization for Economic
and Cooperative Development
38, Boulevard Suchet
75017 Paris
France

Dear Mr. Olivier:

In response to the OECD/NEA's January 31, 1990, letter and as a follow-up to my telex dated February 16, 1990, the U.S. Department of Energy (DOE) is transmitting the U.S. Nuclear Regulatory Commission's (NRC) comments on the Radioactive Waste Management Committee (RWMC) draft document, "Collective Opinion on Safety Assessment." Please note that the NRC has offered for the RWMC's consideration a general assessment of the document in addition to specific comments on the document contents.

Should you have any questions regarding the comments provided, please contact me or Seth Coplan of the Nuclear Regulatory Commission.

Sincerely,

Thomas H. Isaacs
Associate Director for External
Relations and Policy
Office of Civilian Radioactive
Waste Management

Enclosure

cc:
Seth Coplan, NRC

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PDR WASTE PDC
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ADD: Seth Coplan ltr. Encl.
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NRC GENERAL COMMENTS ON
OECD/NEA 20.12.1989 DRAFT COLLECTIVE OPINION REPORT
ENTITLED "DISPOSAL OF RADIOACTIVE WASTE: TECHNICAL
APPRAISAL OF SAFETY ASSESSMENT METHODOLOGIES

The NRC has two basic disagreements with the draft Collective Opinion Collective Opinion in the areas of modelling and model validation.

- (1) The document states that models are available for treating the key processes affecting performance (page 10). The NRC believes that the document should recognize that some of these models may be so conservative as to be impractical for use in performance assessments of some actual sites. Thus, further model development is needed in some key areas. For example, the NRC is not aware of models capable of adequately treating processes such as engineered barrier performance or unsaturated groundwater flow in a fractured medium.
- (2) The document states that "sufficient validity of many models used in safety assessments has been established" (pages 13-14). The NRC believes this overstates the current state-of-the-art of model validation. The document should discuss more fully the basic reality of long-term performance assessment model validation which is that it will likely not be possible to empirically test the ability of models to predict long-term repository performance.

In view of these disagreements, the NRC staff cannot fully support the conclusions presented on page 15 of the report. Specifically, the NRC staff questions whether reliable safety assessment methodologies exist today to predict, with the accuracy implied, the maximum impacts which a repository would have on human health and the environment, especially in the very near future. It is important to bear in mind that there are great uncertainties inherent in projecting far into the future and in modelling complex heterogeneous natural systems. Also, the use of safety assessment methodologies in making decisions on repository safety will depend on the ability to acquire and evaluate data on specific sites. However, the NRC staff does believe that existing safety assessment methodologies can be used to provide a basis for society to decide if proposed radioactive waste disposal systems are acceptable, and that they can provide a sufficient level of safety for present and future generations, so long as the uncertainties noted above are considered in these decisions.

The NRC staff believes that the draft CO requires substantial revision, both in the overall tone of the text and in its content. The NRC recommends that the document include a discussion of the probabilistic nature of predicting repository performance thousands of years into the future, and of the safety standards to be used to evaluate predicted performance.

Specific comments are provided on the following two pages.

NRC SPECIFIC COMMENTS ON
OECD/NEA 20.12.1989 DRAFT COLLECTIVE OPINION REPORT
ENTITLED "DISPOSAL OF RADIOACTIVE WASTE: TECHNICAL
APPRAISAL OF SAFETY ASSESSMENT METHODOLOGIES

Page 8: What type of information is provided by Safety Assessments and how should it be interpreted. Item 1 under second full paragraph; The statement "Calculated consequences (does) from waste repositories are normally estimated to occur only under unlikely circumstances involving a severe disruption" is incorrect. Most repositories will release some radioactivity without severe disruption.

Page 9: What is the present status of Safety Assessment methodologies? First paragraph; Include the following as a category of investigation;

- The chemical interactions and
- The natural and human initiated processes and events that could potentially disrupt the repository.
- The effects on man

Page 9: Third paragraph - third line; It should be noted that the U.K. could take issue with the statement "there is almost unanimous consensus," since there are some in the United Kingdom who disagree with the scenario approach.

Page 9: Fourth paragraph - second bullet; This is an over statement. Please modify to read as follows;

- To identify the interactive processes between the waste, the barrier materials and the natural geologic medium for the range of external circumstances that can occur;

Page 10: Scenario development: First full paragraph; Please note that the U.K. may request some recognition of "simulation" approaches.

Page 11: First paragraph; First sentence; second line; change "basis" to base underlying

Page 11: Second paragraph: First sentence; change "an substantial to "a substantial

Page 11: Consequence Calculations Third full paragraph - third line - first word; Please define usage of the word "meaningful" - as boundary estimates? (Discussion focusing on the applicability of existing models was omitted in the "Modelling" section.)

Page 11: Sixth full paragraph; A final paragraph focusing on "probability estimation" should be added to the section entitled "Consequences Calculations."

Page 13: First full sentence; The term "net uncertainties" is unclear.

Page 13: First full sentence - fourth line; Please change to read as follows;

". conservatively chosen scenarios models, . . . "

Page 13: What is being done to build confidence in Safety Assessments? paragraph - Line 12; In reference to the sentence "Model validation is comprised ," we can't compare directly for what counts; i.e., long-term release. Some discussion on this point is needed.

Page 14: Contents of subtitle; An added conclusion on "Probability Estimation" is needed.

Page 14: Fifth paragraph; This paragraph on "sufficient validity of many models" overstates the present situation.

Page 15: Final paragraph - lines 6 through 12; The two sentences ". the opinion that reliable safety assessment . . . far future. Accordingly, and future generations." is overstated.