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MINUTES OF THE 15TH MEETING OF THE
ADVISORY COMMITTEE ON NUCLEAR WASTE
DECEMBER 20, 1989
BETHESDA, MD

The 15th meeting of the Advisory Committee on Nuclear Waste was convened by Chairman Dade W. Moeller at 8:30 a.m., Wednesday, December 20, 1989, at 7920 Norfolk Avenue, Bethesda, Maryland.

[Note: For a list of attendees, see Appendix I. ACNW members, Drs. William J. Hinze, Dade W. Moeller, and Martin J. Steindler were present. ACNW consultants, Drs. Melvin W. Carter and David Okrent were also present.]

The Chairman, Dr. Dade W. Moeller, said that the agenda for the meeting had been published. He also identified the items to be discussed. He stated that the meeting was being held in conformance with the Federal Advisory Committee Act and the Government in the Sunshine Act, Public Laws 92-463 and 94-409, respectively. He also noted that a transcript of some of the public portions of the meeting was being made, and would be available in the NRC Public Document Room at the Gelman Building, 2120 L Street, N.W., Washington, D.C.

[Note: Copies of the transcript taken at this meeting are also available from the Ann Riley & Associates, Ltd., 1612 K Street, N.W., Washington, D.C. 20006.]

I. CHAIRMAN'S REPORT (Open)

[Note: Mr. Raymond F. Fraley was the Designated Federal Officer for this portion of the meeting.]

Dr. Moeller announced that Dr. Forrest J. Remick was sworn in as an NRC Commissioner on December 1, 1989, Mr. James Taylor was named the new Executive Director for Operations, and Mr. Victor Stello has permanently joined the U.S. Department of Energy (DOE) as the principal Deputy Assistant Secretary for Defense Programs.

Dr. Moeller also announced that the Office of Civilian Radioactive Waste Management, DOE, has announced a reassessment of their HLW repository program. This has resulted in a delay in the expected start of repository operations from the year 2003 to 2010.

Dr. Moeller noted that the Committee comments on the establishment of a blue ribbon panel on volcanism at Yucca Mountain have been referred to DOE in a letter from Mr. Robert Browning,

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Director, Division of High-Level Waste Management (HLWM), to Mr. Russo, dated December 4, 1989.

Dr. Moeller described a number of recently issued documents and reports that the Committee may want to comment on. He also mentioned that Mr. Browning has responded to the Committee comments on Anticipated Processes and Events (APEs) and Unanticipated Processes and Events (UPEs).

Dr. David Okrent asked whether it is within the ACNW charter to perform a review and evaluation of the overall United States policy with regard to timing and method of high-level radioactive waste disposal which would include an examination of practices in other countries? Mr. Fraley replied that it is within the purview of the Committee, since the Committee is authorized to look at any matters that are of concern from a safety standpoint. Dr. Moeller noted that an ACRS/ACNW Fellow is currently conducting a review of high-level waste policies, procedures and standards within other countries.

II. REEVALUATION OF THE ENVIRONMENTAL PROTECTION AGENCY (EPA) STANDARDS FOR HIGH-LEVEL WASTE DISPOSAL (Open)

[Note: Ms. Charlotte Abrams was the Designated Federal Officer for this portion of the meeting.]

Mr. Daniel Fehringer, NMSS, was the NRC presenter and was assisted by Mr. Robert Bernero, Director, Office of Nuclear Material Safety and Safeguards. During the presentation by the NRC staff, Mr. Dan Egan, EPA, was asked to provide clarification to several points of discussion. Following the presentation by NRC staff, Mr. Steven Gomberg, DOE, presented the DOE perspective of the topic.

Mr. Fehringer began his presentation with an acknowledgment of questions sent to the NRC staff from the ACNW prior to the presentation. He categorized the questions under four headings which are: 1) remand and reissue of the EPA standards, 2) Science Advisory Board (SAB) recommendations, 3) form of the EPA standards, and 4) implementation of the standards. With regard to the first category, the ACNW question was: Has EPA addressed the court's concerns in the NRC staff's view? Mr. Fehringer stated that the NRC staff had not yet seen the text of the standards, only a working draft. Although the working draft lists options for resolving the court's concerns, the NRC staff is not aware of which option EPA will choose.

Mr. Fehringer addressed the Committee's question on how the NRC staff will comment on the revised standards. According to Mr. Fehringer, there is currently an informal process whereby the EPA develops working drafts and circulates those drafts among interested federal agencies. The NRC staff expects a second working draft from the EPA soon. At that time the staff will prepare written comments for the record and will submit those comments to the Commission prior to releasing them to the EPA. Following that step the EPA will publish the proposed standards for public comment and the NRC staff will again comment in writing for the record.

In the second category of questions the Committee wished to know if the SAB of the EPA would review the revised standards. According to Mr. Fehringer the EPA does not plan to solicit another review of the standards by the SAB. In discussions later in his presentation, Mr. Egan confirmed that this was correct. Advice and review will come instead from the public review and comments. The SAB is not being requested to comment, according to Mr. Egan, because the EPA sees the revision of the rule in response to the court mandates as requiring only modest changes. The EPA will be using the previous comment record, which includes the SAB's comments, as support.

Mr. Fehringer stated that, in 1985, the SAB recommended that there be a substantial relaxation of the EPA standards, such as to increase the table of radionuclide release limits by a factor of 10 and change the wording of the standards to say that there should no more than a 50% chance that those release limits should be exceeded. The EPA did relax the standards to some degree, but not to the degree that the SAB recommended.

A lengthy discussion ensued in which Dr. Okrent discussed the recommendations of the SAB and problems with the stringency of the standards. Dr. Okrent stated that the SAB also recommended that unless the EPA could demonstrate that a quantitative probabilistic criterion was workable, they should use another method, such as deterministic. Although the EPA did relax the standards, the SAB still questioned the practicality of a quantitative criterion due to the large uncertainties that would be involved. Dr. Okrent also reviewed some of the historical background to the earlier version, including comments on the EPA standards by Advisory Committee on Reactor Safeguards (ACRS) letters, as well as related reviews published

in NUREG CR-3235, NUREG CR-3964, and NUREG CR-3111. He recommended that the Committee question why the staff appears to be "overtly or implicitly endorsing the EPA standard," due to an inadequate set of alternatives specified in SECY 89-319. His interpretation of the SAB recommendations was that the SAB was concerned that the EPA standards were asking that whatever was taken out of the ground, or its by-products, be put back into the ground with less health effects than what it originally had or, in other words, requiring less release limits than the original product.

Mr. Bernero added some clarification of the NRC staff's position. He stated that the staff had identified some deficiencies in their paper on the standards. The high-level standard, in his words, is a premise and a promise. The premise is that one assumes that radiation will be cancer producing throughout the future, and the promise is that persons living in the area of the repository in the future will not suffer more radiation exposure than permitted today. He went on to say that in addition to questioning the stringency or utility of probabilistic assessment, the Commission is questioning the deterministic performance objectives stated in 10 CFR Part 60 and asking how implementable are they and are they equivalent to the EPA standards.

Mr. Bernero stated that the staff believes that there are sites available that can meet the EPA standards in spite of the uncertainties. This is based upon the screening and analyses done for the environmental assessments of the original nine proposed sites. He conceded that these generic performance assessments were not the equivalent of doing a site specific performance assessment, and only site characterization can provide a complete performance assessment.

Dr. Steindler questioned that if the generic analyses conducted during the generation of the environmental assessments on the nine original sites showed the standards not to be unduly stringent, then was a CCDF generated? If so, according to Dr. Steindler, are these analyses meaningful if the site analysis and the CCDF were eventually based on a generic site with guesses and uncertainties in the numbers applied?

Mr. Bernero acknowledged that a defensible regulatory basis is not yet established, but supported the standards as usable and not overly stringent. He further stated that some stringency

will provide a margin for the uncertainties, which he acknowledged are large.

Mr. Fehringer discussed the uncertainties with respect to a generic analysis and stated that EPA believed that the standards are set high enough to allow for those uncertainties. He stated that he believes that there would be less uncertainties involved in the analysis of a specific site than there are in a generic analysis. This assumption of less uncertainties at a specific site was questioned by Dr. Okrent as being without basis.

Mr. Egan was called upon to clarify the EPA position. He stated that in working draft one, and potentially in draft two, a generic quantification of ALARA was or may be inserted. This would be done to attempt to specify how conservative the standards must be and to reduce uncertainties in the assessment of long-term releases. He added that the EPA thinks that the engineered barrier requirements stated in 10 CFR Part 60 fully satisfy any concern EPA would have about the application of ALARA to the engineering aspects of the site. He further stated that EPA is "strongly considering" using ALARA to apply only to engineered portions of the system.

Dr. Moeller stated his pleasure with the switch in the standards from organ dose limits to the effective dose equivalent, and asked if the release limits were adjusted to reflect this change. Mr. Egan replied that at this time they did not see a need for any changes in the release limits and this would be stated in the next working draft.

Dr. Steindler again posed the question of whether an analysis can be done to demonstrate compliance with the standards.

Dr. Okrent pointed out that perhaps the NRC staff is being asked to answer questions that should be the responsibility of the DOE and EPA. His concern was implementation of the standards and Mr. Robert Browning, Director, HLWM, also replied that the main point of the SECY paper is to question if the standards are implementable. Mr. Browning went on to point out that the job of the DOE is to demonstrate that they can meet the standards and, if they see difficulty in implementing the standards, it is their responsibility to notify EPA of that problem.

Under the heading "form of the EPA standards," Mr. Fehringer discussed a Committee question regarding the wisdom of incorporating a risk aversion factor within the standards. Mr. Fehringer explained further that the EPA conducted generic analyses for several repositories in different geologic media and calculated CCDF's for each of those. On this basis, they concluded that a HLW repository could be designed and built to meet their standards. Therefore, they believe the standards are acceptable.

The last category of Committee questions was on the subject of implementability of the standards. Mr. Fehringer first addressed the question of how uncertainties will be handled in an analysis of repository performance. For many uncertainties the staff does not recognize a need to select either the mean or the median value for use in producing the distribution function, but feels that they have the technical capability to include the entire range of values in the uncertainty analysis. Mr. Fehringer pointed out that for analysis of compliance with the groundwater protection and individual protection requirements the mean or the median, whichever is larger, should be selected.

Dr. Steindler asked if validation of compliance was possible and on what basis NRC will decide a facility is licensable. In response, Mr. Fehringer listed four steps to establish licensability. These are: 1) examination of the components of the analysis, 2) identification of the cause of the uncertainty, 3) identification of what may be causing the standards to be violated, and 4) after identifying the problem areas, examination of their basis. Finally, the decision will be made based upon "reasonable assurance." Dr. Steindler expressed concern that by this method the applicant has no idea whether after years of work he has an "acceptable" site. Mr. Bernero interjected that this is where rulemakings will come in to assist the applicant in knowing what is expected of him in order to demonstrate compliance.

Mr. Bernero further explained that the EPA standards are not intended as a rigid line, but as a reasonable estimate or to provide reasonable assurance, rather than a bounding analysis, that the level of isolation described by the CCDF will be met. Mr. Fehringer added that where uncertainties are involved, different arguments on different views will have to be heard along with the bases for those views to determine what may be the most reasonable explanation or view. He argued that, although

there will never be complete certainty, the role of a licensing board will be to listen to arguments and come to a decision. In addition, 10 CFR Part 60 includes a list of favorable conditions which represent beneficial factors which would be considered in an analysis of the site.

Dr. Moeller stated what he sees as the basic problem with the standards is the lack of a hierarchical structure in which the basic goal is stated in qualitative terms, then that qualitative goal is quantified with numerical limits. In other words, if properly constructed, each surrogate for implementing the basic goal and each lower level will never set a more restrictive goal than the original goal.

Mr. Fehringer gave the explanation that, for the sake of simplification, EPA chose to depend upon the calculation of curies released to provide a simpler analysis and in doing so also added a degree of conservatism.

An additional Committee question was on how scenarios would be screened. In his response, Mr. Fehringer laid out a four-step process for construction and screening of scenarios for construction of the CCDF. They are: 1) identification of all potentially disruptive processes and events, 2) screening of these on the basis of likelihood and/or consequence, 3) taking the processes and events that remain and combining them into scenarios, and finally, 4) screening of scenarios by the same criteria as the screening of initial events. The NRC staff will have to determine whether scenarios will have to be developed for subsystem requirements in Part 60 or whether events and process are to be considered independently. On this matter the rule in his estimation can be read either way.

The use and definition of various terms by EPA were also the subjects of questions. Mr. Fehringer gave what the staff interpreted as a definition of the EPA term "undisturbed performance" to be "performance following any likely natural event that might occur," and stated that the staff had requested that the EPA improve and/or revise that definition. In the discussion of the equivalency of the terms, "likely," "undisturbed performance," and "anticipated processes and events (APEs)," Mr. Fehringer pointed out that the terms serve different purposes, with "undisturbed performance" defining conditions for which groundwater protection and individual protection standards must be met, and "anticipated processes and events" defining in Part 60 the conditions for which the

engineered barrier objectives must be achieved. If the NRC and EPA staffs cannot mutually concur in acceptable definitions to serve the purposes of both the EPA rule and 10 CFR Part 60, then they would propose a third term be added to Part 60.

A final question dealt with the terms "reasonable expectation" in the EPA standards and "reasonable assurance" in Part 60 and Subpart (a) of the EPA standards. The staff does not see a difference in stringency in the two terms, but acknowledges that the terms are used for different types of decisions. "Reasonable assurance" in the EPA standards is used for the operating period standards; the term "reasonable expectation" was coined by the EPA for the post-closure standards, because they involve different periods of time. Mr. Bernero stated that, to EPA, "complete assurance" may represent a high level of confidence; "reasonable assurance" is described as the mean value and is a way of taking uncertainties into consideration; "reasonable expectation" is associated with the median value, but, if interpreted as a mean value, it adds additional conservatism.

The presentation by the NRC Staff was followed by a presentation from Mr. Steven Gomberg, DOE, who presented DOE's ideas on the implementation of the EPA standards. Mr. Gomberg stated that the probabilistic aspect of the standards requires performance assessments to be performed to enable some prediction of the post-closure operation of the engineered and natural barrier systems. To the DOE this involves 1) calculating the probability of releases to the accessible environment, 2) evaluating scenarios for APEs and UPEs, 3) developing conceptual models, and 4) incorporating the deterministic analyses. He acknowledged that both EPA and NRC recognize the importance of qualitative assessments in the licensing process.

He also outlined the steps DOE will take in conducting the performance assessments. These are: 1) identify all significant processes and events, 2) develop a set of scenarios based on the effects of these processes and events on repository performance, 3) calculate the probability of releases for each scenario and combine those into a CCDF, 4) evaluate the uncertainties considered in the CCDF, and 5) compare the CCDF with the EPA standards. In order to do this, the DOE will have to collect the "best available data" from the site and then perform bounding calculations and incorporate expert judgment and peer review.

In response to a question by Dr. Moeller as to whether the NRC staff will review or approve DOE's performance assessments or develop their own independently and compare theirs to those of the DOE, Mr. Gomberg stated that NRC will stay abreast of progress in the development of DOE's performance assessments and that this process had begun with the Site Characterization Plan. Mr. Browning also stated that NRC will do independent analyses in order to understand and be better able to question the DOE results.

DOE has established performance assessment working groups and will be conducting calculational exercises. As part of this task they will conduct preliminary calculations, estimating consequences and probabilities for selected scenarios and incorporating that information into a preliminary CCDF. They will also be developing codes and models for the key scenarios and conducting sensitivity analyses. Strategies for validation of models will be developed, but they acknowledge the need for heavy reliance on expert judgment and peer reviews.

Tentative dates for DOE production of preliminary performance assessments are: April 1990, for a preliminary series of expected case calculations; possibly July 1990, for releases for disturbed cases; and possibly by the end of 1990, a preliminary CCDF. All of this will be retested when data begin to come in from site technical assessments.

With respect to the EPA standards, Mr. Gomberg said that the DOE believes that they can do what is required to perform the proper calculations and assess compliance but, due to the uncertainties involved and the difficulties in quantifying scenarios, they may not be able to perform a defensible calculation. For example, he cited the difficulty with defending the probability of an initiating event if there is no record of occurrence in the geologic record for the area of study. He stated that, although the DOE will provide the best information available, they feel that "no site would meet a very strict interpretation of the EPA rule." As a additional comment, Mr. Gomberg stated that one way to resolve potential problems is to encourage NRC and EPA to interact to make sure their regulations are not inconsistent.

Additional concerns expressed by Mr. Gomberg, and expressed earlier in the meeting by ACNW Members and consultants, were that the release limits in Table 1 of the EPA Standards are overly conservative, that there are inconsistencies in EPA and

NRC terminology, and that the incorporation of human intrusion into the overall CCDF may not be a true measure of the site performance. With respect to the difficulties with terminology, he cited problems with the definition of "undisturbed performance" versus "anticipated processes and events," and "reasonable assurance" versus "reasonable expectation." With respect to the problems with the Table 1 release limits, Mr. Gomberg cited carbon 14 as an example of a radionuclide for which it would be difficult, based on Table 1, to show compliance.

During the meeting Dr. Moeller read from a letter of May 30, 1989, from Richard E. Sanderson, EPA, to Mr. Russo, DOE, in which EPA stated that, "EPA generally agrees with the proposed characterization plan" of DOE. The letter further stated that "we believe it [the characterization plan] will provide the necessary data to analyze compliance with EPA standards for the disposal of high level radioactive waste." This was interpreted by the Committee as an EPA endorsement of the DOE site characterization plan.

Dr. Moeller followed-up the presentations with discussions on what the Committee's report to the Commission would include. He reiterated his concerns with respect to the lack of a hierarchical structure to the standards and the NRC regulations. Dr. Steindler commented that based upon working draft 1 of the EPA revised standards, he believes that it will not be possible to demonstrate compliance. He further stated his concerns with failure of the standards and the staff, in their comments, to describe how uncertainties will be treated. Dr. Hinze urged that the broad uncertainties be identified by the DOE soon through the prioritization of studies. Dr. Okrent stated that he thinks the SECY paper does not provide a adequate set of alternatives for consideration. He again referred to the stringency of the standards and suggested that one alternative would be to clearly state that quantitative criteria are only a part of what should be considered.

III. EXECUTIVE SESSION (Open)A. Reports, Letters and Memoranda

The Committee completed letters on the following subjects:

1. Comments on EPA's Proposed Revisions of High Level Waste Standards (Letter to Chairman Carr dated December 21, 1989)
2. Program Plan for the Advisory Committee on Nuclear Waste (ACNW) (Letter to Chairman Carr dated December 29, 1989).

B. Other Actions, Agreements, Assignments and Requests1. ACNW Program Plan

The Committee discussed a program plan for ACNW activities during the four-month period of January through April 1990. A report (see above) was sent to Chairman Carr on December 29, 1989.

2. ACNW Future Activitiesa. Hanford Waste Tanks

During the briefing on EPA standards, Mr. Bernero noted that a petition for rulemaking is expected relating to the identification and separation of the waste contents in the Hanford waste tanks, similar to the West Valley Demonstration Project. Mr. Bernero recommended that the Committee should consider this matter at an appropriate time and agreed to provide the related correspondence to the Committee.

b. Tectonic Models

Dr. Hinze requested that an ACNW staff member attend an upcoming meeting on the DOE Technical Assessment Review (TAR) and provide a summary report to the Committee.

c. Geophysics at Yucca Mountain

The Committee agreed that the "white paper" on the exploration of the geophysical aspects at Yucca Mountain, to be published by DOE/USGS, should be considered for review by the Committee.

d. Repository Site Study Plans

The Members expressed interest in the manner through which the NRC staff selects Study Plans for review. A briefing should be scheduled during the January or February meeting for the purpose of hearing the NRC staff's approach to Study Plans reviewed and deciding what Study Plans the Committee desires to review.

e. Meeting with the EDO

The Committee agreed to invite the EDO to a future meeting for a discussion of items of mutual interest, such as, the basis for indefinite deferral of staff activities related to the definition of "substantially complete containment".

3. Future Meeting Schedules

The Committee agreed to hold full Committee meetings in January, February, March, and April, 1990. Further, it was agreed that working group meetings will be scheduled during this period to help the Committee complete their planned activities.

C. Future Activities

Appendix II summarizes the tentative agenda that were proposed for future meetings of the Committee.

The 15th ACNW meeting was adjourned on December 20, 1989 at 4:45 p.m.

APPENDIX I
15TH ACNW MEETING MINUTES
DECEMBER 20, 1989

MEMBERS

Dr. William J. Hinze

Dr. Dade W. Moeller

Dr. Martin J. Steindler

CONSULTANTS

Dr. Melvin W. Carter

Dr. David Okrent

APPENDIX I - ATTENDEES (CONT'D)

NRC STAFF AND CONTRACTORS

J. Kotra
R. Bernero
L. Wolf
C. Kelber
P. McLaughlin
E. Lois
K. Kalman
W. Brown
S. Spector - CNWRA

U.S. GEOLOGICAL SURVEY

G. Roseboom

U.S. ENVIRONMENTAL PROTECTION
AGENCY

D. Egan
. Bunton

DOE STAFF AND CONTRACTORS

R. Wallace, Jr.
C. Macaluso
C. Pflum, SAIC
J. Boak
E. Regnier
P. Austin, SAIC
S. Gomberg

PUBLIC

B. Sadauskos - SERCH
A. Muir - ICF Technology
P. Krishna - Battelle
J. Parry - NWTRB
Helminglin - The P.
RadioactiveExchange
A. Goldin - SC&A

APPENDIX II
FUTURE AGENDA

January 24-26, 1990 (tentative agenda)

Meeting with the EDO (Open) - The Committee will invite the EDO to discuss the bases for indefinitely deferring the planned NRC staff action regarding the definition of "Substantially Complete Containment" and other items of mutual interest.

Selected Study Plans (Open) - The Committee will review and comment on selected Study Plans relating to the HLW repository site characterization. Study Plans on (1) Evaluation of the Location and Recency of Faulting Near Prospective Surface Facilities and (2) Characterization of the Yucca Mountain Quaternary Regional Hydrology (tentative) are expected to be ready for review.

Meeting with DLLWM Director (Open) - Mr. Richard Bangart, Director, DLLWM, will discuss the overall strategy of low-level waste projects and how they form a coherent program to ensure safety. The Committee will also complete a report on the management and disposal of Low-Level Radioactive Waste.

Storage of Spent Nuclear Fuel (Open) - The Committee will be briefed by the NRC staff on the storage of spent nuclear fuel in NRC approved casks at civilian nuclear power plant sites (final rule for review and comment).

American Society for Testing and Materials (Open) - The Committee will be briefed on the radioactive waste activities (waste management, disposal, and transportation) of ASTM.

Use of Metric System (Open) - The Committee will complete its consideration of proposed comments regarding the use of the metric system of units.

Committee Activities (Open) - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate.

February 21-23, 1990 (tentative agenda)

Technical Position on Seismic Hazards (Open) - The Committee will be briefed by the NRC staff on the draft Technical Position on Methods of Evaluating the Seismic Hazard at a Geological Repository, including the concept of the 10,000 year cumulative slip earthquake.

APPENDIX II - 15TH ACNW MINUTES

Meeting with the Commissioners (Open).

- Report on West Valley Trip
- Report on trip to CNWRA
- Discuss ACNW Report on Implementation of EPA Standards
- Other Items of Mutual Interest

Monitored Retrievable Storage (MRS) Review Commission Recommendations (Open) - The Committee will be briefed by representatives of MRS Commission on their report on the need for an MRS.

Schedule for NRC/DOE Projects (Open) - The Committee will be briefed on the current schedule for NRC/DOE projects related to the high-level waste repository, including an update of recent DOE schedule changes.

Technical Position on Soil Erosion (Open) - The Committee will discuss the DLLW Technical Position on Soil Erosion and protection for uranium mill tailing sites.

Meeting with the Chairman of the LLW Committee of the Conference of State Radiation Control Program Directors (Open) - The Committee will discuss problem areas in the LLW field with Mr. Dornsife, Chief, Division of Nuclear Safety, Department of Environmental Protection, Commonwealth of Pennsylvania.

Mixed Wastes (Open) - The Committee will be briefed by the NRC staff on the technical aspects of criteria for the treatment, storage and disposal of mixed radioactive and hazardous wastes.

Radioactive Contamination Following Decommissioning (Open) - The Committee will discuss and possibly comment on the implementation of a policy regarding the criteria for acceptable residual levels of radioactive contamination following decommissioning.

Committee Activities (Open) - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate.

March 21-23, 1990 (tentative agenda)

Pathfinder Atomic Power Plant Dismantlement (Open) - The Committee will be briefed on the related dismantlement Safety Evaluation Report prepared by the NRC staff.

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Technical Position on Waste Forms (Open) - The Committee will be briefed by the NRC staff on modifications to the Technical Position on LLW Stabilization/Waste Forms.

EPA Radiation Protection Programs (Open) - The Committee will be briefed by representatives of EPA on their other Radiation Protection Program excluding the high-level waste standards activities.

White Paper on Geophysics (Open) - The Committee will review and comment on the DOE/USGS white paper on integration of the geophysics aspects of the repository SCP.

DOE Technical Assessment Review (Open) - The Committee will review and comment on the DOE Technical Assessment Review (TAR). The TAR deals with the assessment of "no name fault" at the ESF sites.

Status of Proactive Work (Open) - The Committee will be briefed by the NRC staff on the status of proactive work in the Division of HLWM (technical positions and rules).

Committee Activities (Open) - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate.

April 26-27, 1990 (tentative agenda)

Technical Position on LLW Shipment Manifest System (Open) - The Committee will review and comment on the Technical Position on LLW Shipment Manifest System.

BEIR V Report (Open) - The Committee will request a briefing on the BEIR V Report, Health Effects of Exposure to Low-Levels of Ionizing Radiation. In anticipation that the BEIR V Report could result in some modifications for the health effects and risk coefficients used in NUREG/CR-4214, "Health Effects Models for Nuclear Power Plant Accident Consequence Analysis", the NRC staff has initiated a project to develop any modifications that might be necessary for the risk models currently in use.

Regulatory Guide for License Applications (Open) - The Committee will review and comment on the Regulatory Guide.

APPENDIX II - 15TH ACNW MINUTES

Design Basis Accident Dose Limits (Open) - The Committee will review design basis accident dose limit for the HLW repository in the preclosure phase.

International Programs on Radioactive Waste Disposal (Open) - The Committee will meet with Mr. Harold Denton to discuss international programs on radioactive waste disposal.

NRC Research Program (Open) - The Committee will discuss the NRC research program on radwaste with Mr. N. E. Todreas, Chairman, RES Advisory Committee.

Committee Activities (Open) - The Committee will discuss anticipated and proposed Committee activities, future meeting agenda, and organizational matters, as appropriate.

APPENDIX III - OTHER DOCUMENTS RECEIVED

A. Meeting Handouts from ACNW Staff and Presenters

AGENDA ITEM

- 1 1. Implementation of EPA HLW Standards, dated December 20, 1989, by Fehringer (viewgraphs)
2. Memorandum for ACNW Members from Major, dated December 19, 1989, re Staff Response to the List of Questions Concerning the EPA HLW Standards, with attachment
3. SECY-84-320, NRC Staff Comments to Environmental Protection Agency on the Science Advisory Board Report on Proposed EPA Standard for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Waste (40 CFR Part 191), dated August 16, 1984
4. 40 CFR Part 191 Implementation by Steve Gomberg, DOE, undated (viewgraphs)

APPENDIX III - 15TH ACNW MINUTES

APPENDIX III (CONT'D)

B. Meeting Notebook Contents Listed by Tab Number

TAB

1.

1. Opening remarks by ACNW Chairman
2. Items of Current Interest

2.

3. Status Report on SECY-89-319, December 20, 1989
4. Chronology of ACRS/ACNW Comments on EPA Standards
5. 40 CFR Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes"
6. 10 CFR Part 60, Subpart E - Technical Criteria
7. Memorandum for ACNW Members from Fraley, dated October 23, 1989, Implementation of EPA High-Level Nuclear Waste Disposal Standards
8. Memorandum for ACNW Members from Fraley, dated November 14, 1989, re ACNW Meeting on December 20, 1989, with attachments
9. List of Items from Dr. Moeller for the December 20, 1989, ACNW Meeting on the EPA High-Level Waste Standard, dated November 8, 1989
10. Memorandum for ACNW Members from Major, dated November 28, 1989, re Commission Briefing on the NRC Staff's Reevaluation of the EPA High Level Waste Standards
11. Memorandum for ACNW Members from Abrams, dated December 11, 1989, re Dr. Okrent's Comments on EPA HLW Standards and SECY-89-319, with attachments
12. Memorandum for ACNW Members/Staff from Major, dated December 12, 1989, re ACRS Comments on Implementation of the Safety Goal Policy, with attachments

3.

13. Status Report on ACNW Program Plan, December 20, 1989
14. Memorandum for Remick and Moeller from Carr, dated November 6, 1989, re Division of Responsibilities Between the ACRS and ACNW, with enclosure
15. Memorandum for Roberts from Fraley, dated August 24, 1989, re Request for Information on ACNW, with attachment
16. Draft memorandum for Carr from Fraley, dated December 14, 1989, re Program Plan for the ACNW [OUO]

APPENDIX III - 15TH ACNW MINUTES

TAB

4. 17. List of Items Proposed for ACNW Review (Draft #1)
18. Memorandum for Fraley from Blaha, dated December 12, 1989, re Proposed Agenda Items for the ACRS and the ACNW, with attachment

APPENDIX IV - ACNW LETTER REPORTS/MEMORANDA

1. Comments on EPA's Proposed Revisions of High Level Waste Standards (See Attachment 1).
2. Program Plan for the Advisory Committee on Nuclear Waste (ACNW) (See Attachment 2).



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555

December 21, 1989

The Honorable Kenneth M. Carr
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Carr:

SUBJECT: COMMENTS ON PROPOSED REVISIONS OF EPA'S HIGH-LEVEL WASTE
STANDARDS

During its 15th meeting on December 20, 1989, the Advisory Committee on Nuclear Waste met with the NRC staff and representatives from the Department of Energy (DOE) and the Environmental Protection Agency (EPA) for additional discussions pertaining to the Standards for a high-level waste (HLW) repository currently being revised by EPA. We previously discussed this matter with a representative from EPA during our 14th meeting on October 11-13, 1989 and the ACNW or its predecessor, the ACRS, have had continuing interactions with the NRC staff on the matter over the past several years. We also had the benefit of the documents referenced.

On the basis of these discussions, we continue to doubt that compliance with the EPA standards can be demonstrated for a specific repository site, even recognizing the caveats included in the standard, such as the "reasonable assurance" phrase that allows for certain flexibilities in the interpretation of probabilistic analyses. If the construction of a Complementary Cumulative Distribution Function clearly demonstrates compliance with the EPA Standards, then the need for interpreting the "reasonable assurance" phrase is removed. If, as is more likely, demonstration of compliance is not clear, it will be necessary to have a definitive understanding of how the NRC staff plans to interpret the wording in the EPA Standards that:

Proof of the future performance of a disposal system is not to be had in the ordinary sense of the word in situations that deal with much shorter time frames. Instead, what is required is a reasonable expectation, on the basis of the record before the implementing agency, that compliance with 191.13 (a) will be achieved.

The preferred alternative in the plan as outlined in SECY-89-319 for implementation of the EPA Standards calls for the NRC staff to resolve the major problems concerning implementation of Section 191.13 (a) through rulemaking. It is not clear to us, however, how

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such rulemaking would resolve the uncertainties in applying probabilistic techniques, nor is it clear that this method represents the best approach for coping with problems that are, in the main, a result of what we consider to be an unacceptable set of standards.

We believe that the NRC staff in SECY-89-319 has not provided the Commission an adequate range of alternatives. One such alternative that we recommend would be that the Commission object to the EPA Standards on the basis that:

1. There are no obvious ways for demonstrating compliance of any specific repository site with the Standards. In this sense, the Standards may be unrealistic.
2. The Standards are also overly stringent and inconsistent. There is strong evidence that they will be wasteful of resources with little commensurate benefit.

The EPA Standards are internally inconsistent, in that lower level quantitative limits are more stringent than upper level qualitative goals. Thus far we have been provided no information to convince us that less stringent Standards would not provide adequate protection of the public health and safety. The NRC subsystem performance criteria have the potential for imposing even more stringent requirements on the repository.

While EPA has attempted to justify the added conservatisms as a means for allowing for uncertainties, we fail to understand the logic of this approach. Resolution of the problems of uncertainties would best be pursued through site characterization and performance assessment. The latter process, in particular, can be used to reveal where and to what degree uncertainties exist, and can provide guidance on where additional and better data are needed.

To resolve these issues, we recommend that the NRC staff be more aggressive in dealing with EPA. The task of the NRC staff, as we interpret it, should be to ensure that the EPA Standards are scientifically sound, consistent, and readily subject to interpretation and implementation. With the EPA in the process of revising their Standards, and DOE having announced an overall reassessment of its HLW program, this would appear to be an opportune time for the NRC to undertake these initiatives.

We will be pleased to discuss these matters with you in additional detail, if you desire.

Sincerely,

Dade W. Moeller
Dade W. Moeller,
Chairman

December 21, 1989

References:

1. SECY-89-319, "Implementation of the U.S. Environmental Protection Agency's High-Level Waste Disposal Standards," dated October 17, 1989
2. EPA Working Draft 1 of 40 CFR Part 191, dated June 2, 1989, "Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes"
3. 40 CFR Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes"