



OFFICE OF THE SECRETARY

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

WM DOCKET CONTROL CENTER

November 27, 1985

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Action: Minogue, RES/Davis, Cys: Dircks Roe Rehm Stello GCunningham Denton Kerr, SP Fehringer, NMSS Prichard, RES Philips

MEMORANDUM FOR: William J. Dircks Executive Director for Operations FROM: Samuel J. Chilk, Secretary SUBJECT: STAFF REQUIREMENTS - NOTATION VOTE ON SECY-65-272 - REPORT ON THE ENVIRONMENTAL PROTECTION AGENCY'S ENVIRONMENTAL STANDARDS FOR HIGH-LEVEL RADIOACTIVE WASTE DISPOSAL

On September 19, 1985, the Commission (with all Commissioners agreeing) approved the proposed letter to EPA, as attached. Immediately following Commission approval, the ACRS requested that this matter be discussed with the Committee. On October 21, 1985, the Commission met with the staff, ACRS and others to discuss conflicting views.

Upon due consideration of the concerns expressed by the ACRS and the responses by the staff, the Commission reaffirmed releasing the letter to EPA.

The letter has been forwarded to the Chairman for his signature.

In addition, EDO is directed to submit to the Commission the rulemaking package which conforms 10 CFR Part 60 with the EPA Standard. The Commission also stresses the importance for the staff to clearly articulate, in the changes to Part 60, how we interpret the EPA's Standards and that the ACRS' concerns be addressed by clearly defining the basis for the assurance that adequate flexibility exists in the standards for their implementation. In particular, care should be taken to avoid any ambiguity in the application of probabilistic conditions placed on the post-closure containment requirements. (RES)

(EDO Suspense: 2/15/86)

WM Record File

406.3.3

WM Project

Docket No.

PDR

LPDR

Rec'd Off. EDO

Date 11-29-85

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RES JOB

TJB HIM

MRK JIS

JIG Fehringer

The Commission also agrees that the staff and the ACRS should interact with each other early in the process of developing the package on 10 CFR Part 60 as well as in future reviews of NRC activities under the NWPA so that valuable technical advice and input can be used in a timely manner by the Commission.

Chairman Palladino requested, in line with ACRS comments, that EDO accelerate its efforts to develop analytical methods to be used in making a determination that a licensee is complying with the EPA Standards. These methods should receive as broad an input and review as possible. (NMSS)

Attachment:

As stated

cc: Chairman Palladino
Commissioner Roberts
Commissioner Asselstine
Commissioner Bernthal
Commissioner Zech
OGC
OPE
ACRS



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

The Honorable Lee Thomas
Administrator
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dear Mr. Thomas:

On May 10 and 11, 1982 the Nuclear Regulatory Commission (NRC) submitted formal comments on the Environmental Protection Agency's proposed environmental standards for management and disposal of high-level radioactive wastes. Among other things, we stated our view that the proposed "assurance requirements" and "procedural requirements" contained in those proposed standards involved matters of implementation and thus went beyond the limits of EPA's jurisdiction.

In letters dated July 19 and August 15, 1984 Acting Chairman Roberts and Former Administrator Ruckelshaus, respectively, agreed that the staffs of EPA and NRC should attempt to develop modifications to 10 CFR Part 60 to incorporate the principles of EPA's proposed assurance and procedural requirements. EPA could then delete these requirements or make them applicable only to facilities not licensed by the NRC, eliminating any potential problems of jurisdictional overlap.

The NRC staff recently reported to the Commission several proposed changes to Part 60 which have been worked out by the NRC and EPA staff (text enclosed). Consistent with the provisions of the Administrative Procedure Act, the Commission will propose these changes for incorporation into Part 60 now that the final EPA high-level waste standards have been published. The NRC staff anticipates submittal of a rulemaking package, incorporating both these wording changes and other conforming amendments, to the Commission within 120 days.

The Commission appreciates the cooperation shown by the EPA staff in working to reach this agreement.

Sincerely,

Nunzio J. Palladino

Enclosure:
Proposed changes to
10 CFR Part 60

EPA ASSURANCE REQUIREMENTS AND
PROPOSED CHANGES TO PART 60

1.a. EPA Assurance Requirement:

(a) Active institutional controls over disposal sites should be maintained for as long a period of time as is practicable after disposal; however, performance assessments that assess isolation of the wastes from the accessible environment shall not consider any contributions from active institutional controls for more than 100 years after disposal.

(In Working Draft No. 8 "active institutional control" means: (1) controlling access to a disposal site by any means other than passive institutional controls, (2) performing maintenance operations or remedial actions at a site, (3) controlling or cleaning up releases from a site, or (4) monitoring parameters related to disposal system performance.)

b. Discussion:

The Commission's existing provisions (§60.52) related to license termination will determine the length of time for which institutional controls should be maintained, and there is therefore no need to alter Part 60 based on the first part of this assurance requirement.

The second part of this assurance requirement would require that "active" institutional controls be excluded from consideration (after 100 years) when the Commission assesses the isolation characteristics of a repository. The N.C. staff understands that remedial actions (or other active institutional controls) would not be relied upon under Part 60 to compensate for a poor site or inadequate engineered barriers. However, in the definition of "unanticipated events and processes," Part 60 expressly contemplates that, in assessing human intrusion scenarios, the Commission would assume that "institutions are able to assess risk and to take remedial action at a level of social organization and technological competence equivalent to, or superior to, that which was applied in initiating the processes or events concerned" (emphasis added). Therefore, it might appear at first blush that Part 60 is at odds with the draft EPA standards.

2.a. EPA Assurance Requirement:

(b) Disposal systems shall be monitored after disposal to detect any substantial and detrimental deviations from expected performance. This monitoring shall be done with techniques that do not jeopardize the isolation of the wastes and shall be conducted until there are no significant concerns to be addressed by further monitoring.

b. Discussion:

Part 60 currently requires completion of a performance confirmation program prior to repository closure, but does not require monitoring during the period following closure but prior to license termination. The Commission chose not to require post-closure monitoring because of doubts about the usefulness of such monitoring and because of fears that monitoring in or near a repository after closure could degrade repository performance. The type of monitoring envisioned by EPA does not involve direct monitoring of the repository itself (which might degrade repository performance). Rather, EPA proposes monitoring of such parameters as regional groundwater flow characteristics. The NRC agrees that such monitoring may, in some cases, provide desirable information beyond that which would be obtained in the performance confirmation program which Part 60 now requires to be continued until permanent closure. The NRC therefore proposes to require monitoring as an extension of performance confirmation, as appropriate, when such monitoring can be conducted without degrading repository performance.

c. Proposed Changes to Part 60:

Add to §60.21(c) a new ¶ (9) as follows:

(9) A general description of the program for post-permanent closure monitoring of the geologic repository.

Renumber the current ¶ (9) through (15) accordingly.

Revise §60.51(a)(1) to read:

(1) A detailed description of the program for post-permanent closure monitoring of the geologic repository in accordance with §60.144. As a minimum, this description shall:

- (i) identify those parameters that will be monitored;
- (ii) indicate how each parameter will be used to evaluate the expected performance of the repository; and
- (iii) discuss the length of time over which each parameter should be monitored to adequately confirm the expected performance of the repository.

3.a. EPA Assurance Requirement:

(c) Disposal sites shall be designated by the most permanent markers, records, and other passive institutional controls practicable to indicate the dangers of the wastes and their location.

b. Discussion:

No revisions to Part 60 are needed. §60.21(c)(8), 60.51(a)(2), and 60.121 contain equivalent provisions.

5.a. EPA Assurance Requirement:

(e) Places where there has been mining for resources, or where there is a reasonable expectation of exploration for scarce or easily accessible resources, or where there is a significant concentration of any material that is not widely available from other sources, should be avoided in selecting disposal sites. Resources to be considered shall include minerals, petroleum or natural gas, valuable geologic formations, and ground waters that are either irreplaceable because there is no reasonable alternative source of drinking water available for substantial populations or that are vital to the preservation of unique and sensitive ecosystems. Such places shall not be used for disposal of the wastes covered by this Part unless the favorable characteristics of such places compensate for their greater likelihood of being disturbed in the future.

b. Discussion:

Part 60 contains provisions equivalent to this assurance requirement in §60.122(c)(17), (18) and (19). Part 60 does not, however, address "a significant concentration of any material that is not widely available from other sources."

It is possible that the economic value of materials could change in the future in a way which might attract future exploration or development detrimental to repository performance. The NRC proposes to add an additional potentially adverse condition to Part 60 related to significant concentrations of material that is not widely available from other sources. As with the other potentially adverse conditions, the presence of such a condition would require an evaluation of the effect of the condition on repository performance as specified in §60.122(a)(2)(11), but would not preclude selection of a site for repository construction. (It should be noted that DOE's siting guidelines contain an identical provision in 10 CFR 960.4-2-8-1.)

c. Proposed Changes to Part 60:

Add a new § (18) to §60.122(c) as follows:

(18) The presence of significant concentrations of any naturally-occurring material that is not widely available from other sources.

Renumber the current § (18) through (21) accordingly.



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

WM DOCKET CONTROL
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December 2, 1985

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Cys: Dircks
Roe
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Stello
Davis
Minogue
Denton
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Kerr, SP
Fehringer, NMSS
EDO R/F

The Honorable Lee Thomas
Administrator
U.S. Environmental Protection Agency
Washington, D.C. 20460

Dear Mr. Thomas:

On May 10 and 11, 1982 the Nuclear Regulatory Commission (NRC) submitted formal comments on the Environmental Protection Agency's proposed environmental standards for management and disposal of high-level radioactive wastes. Among other things, we stated our view that the proposed "assurance requirements" and "procedural requirements" contained in those proposed standards involved matters of implementation and thus went beyond the limits of EPA's jurisdiction.

In letters dated July 19 and August 15, 1984 Acting Chairman Roberts and Former Administrator Ruckelshaus, respectively, agreed that the staffs of EPA and NRC should attempt to develop modifications to 10 CFR Part 60 to incorporate the principles of EPA's proposed assurance and procedural requirements. EPA could then delete these requirements or make them applicable only to facilities not licensed by the NRC, eliminating any potential problems of jurisdictional overlap.

The NRC staff recently reported to the Commission several proposed changes to Part 60 which have been worked out by the NRC and EPA staff (text enclosed). Consistent with the provisions of the Administrative Procedure Act, the Commission will propose these changes for incorporation into Part 60 now that the final EPA high-level waste standards have been published. The NRC staff anticipates submittal of a rulemaking package, incorporating both these wording changes and other conforming amendments, to the Commission within 120 days.

The Commission appreciates the cooperation shown by the EPA staff in working to reach this agreement.

Sincerely,

Nunzio J. Palladino
Nunzio J. Palladino

Enclosure:
Proposed changes to
10 CFR Part 60

WM Record File
406.3.3

WM Project _____
Docket No. _____
PDR _____
LPDR _____

(Originated by NMSS)

Distribution:
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EPA ASSURANCE REQUIREMENTS AND
PROPOSED CHANGES TO PART 60

1.a. EPA Assurance Requirement:

(a) Active institutional controls over disposal sites should be maintained for as long a period of time as is practicable after disposal; however, performance assessments that assess isolation of the wastes from the accessible environment shall not consider any contributions from active institutional controls for more than 100 years after disposal.

(In Working Draft No. 8 "active institutional control" means: (1) controlling access to a disposal site by any means other than passive institutional controls, (2) performing maintenance operations or remedial actions at a site, (3) controlling or cleaning up releases from a site, or (4) monitoring parameters related to disposal system performance.)

b. Discussion:

The Commission's existing provisions (§60.52) related to license termination will determine the length of time for which institutional controls should be maintained, and there is therefore no need to alter Part 60 based on the first part of this assurance requirement.

The second part of this assurance requirement would require that "active" institutional controls be excluded from consideration (after 100 years) when the Commission assesses the isolation characteristics of a repository. The staff understands that remedial actions (or other active institutional controls) would not be relied upon under Part 60 to compensate for a poor site or inadequate engineered barriers. However, in the definition of "unanticipated events and processes," Part 60 expressly contemplates that, in assessing human intrusion scenarios, the Commission would assume that "institutions are able to assess risk and to take remedial action at a level of social organization and technological competence equivalent to, or superior to, that which was applied in initiating the processes or events concerned" (emphasis added). Therefore, it might appear at first blush that Part 60 is at odds with the draft EPA standards.

The "remedial action" is not, however, the same in the two documents. The EPA standards have in mind a planned capability to maintain a site and, if necessary, to take remedial action at a site in order to assure that isolation is achieved. The staff agrees that such a capability should not be relied upon. The extent to which corrective action may be taken after an unanticipated intrusion occurs is an entirely different matter. The Commission may wish to consider, for example, the extent to which the application of the limited societal response capability assumed by the rule (e.g., sealing boreholes consistent with current petroleum industry practice) could reduce the likelihood of releases exceeding the values specified in the EPA standards, or could eliminate certain hypothetical scenarios such as systematic and persistent intrusions into a site.

The NRC and EPA staffs are in substantive agreement that planned remedial capabilities should not be relied upon for repository safety, and agree that the wording below should be proposed for public comment. The EPA staff may provide comment on this wording to help clarify the distinction between expected societal responses versus planned capabilities for remedial actions.

c. Proposed Changes to Part 60:

Add definitions to §60.2 as follows:

"Active institutional control" means: (1) controlling access to a site by any means other than passive institutional controls, (2) performing maintenance operations or remedial actions at a site, (3) controlling or cleaning up releases from a site, or (4) monitoring parameters related to geologic repository performance.

"Passive institutional control" means: (1) permanent markers placed at a site, (2) public records and archives, (3) government ownership and regulations regarding land or resource use, and (4) other methods of preserving knowledge about the location, design, and contents of a geologic repository.

Add a new §60.114 as follows:

§60.114 Institutional Controls

Neither active nor passive institutional controls shall be deemed to assure compliance with the overall performance objective set out at § 60.112 for more than 100 years after disposal. However, the effects of institutional controls may be considered in assessing, for purposes of that section, the likelihood and consequences of processes and events affecting the geologic setting.

2.a. EPA Assurance Requirement:

(4) Disposal systems shall be monitored after disposal to detect any substantial and detrimental deviations from expected performance. This monitoring shall be done with techniques that do not jeopardize the isolation of the wastes and shall be conducted until there are no significant concerns to be addressed by further monitoring.

b. Discussion:

Part 60 currently requires completion of a performance confirmation program prior to repository closure, but does not require monitoring during the period following closure but prior to license termination. The Commission chose not to require post-closure monitoring because of doubts about the usefulness of such monitoring and because of fears that monitoring in or near a repository after closure could degrade repository performance. The type of monitoring envisioned by EPA does not involve direct monitoring of the repository itself (which might degrade repository performance). Rather, EPA proposes monitoring of such parameters as regional groundwater flow characteristics. The staff agrees that such monitoring may, in some cases, provide desirable information beyond that which would be obtained in the performance confirmation program which Part 60 now requires to be continued until permanent closure. The staff therefore proposes to require monitoring as an extension of performance confirmation, as appropriate, when such monitoring can be conducted without degrading repository performance.

c. Proposed Changes to Part 60:

Add to §60.21(c) a new ¶ (9) as follows:

(9) A general description of the program for post-permanent closure monitoring of the geologic repository.

Renumber the current ¶ (9) through (15) accordingly.

Revise §60.51(a)(1) to read:

(1) A detailed description of the program for post-permanent closure monitoring of the geologic repository in accordance with §60.144. As a minimum, this description shall:

- (i) identify those parameters that will be monitored;
- (ii) indicate how each parameter will be used to evaluate the expected performance of the repository; and
- (iii) discuss the length of time over which each parameter should be monitored to adequately confirm the expected performance of the repository.

Add to §60.52(c) a new ¶ (3) as follows:

(3) That the results available from the post-permanent closure monitoring program confirm the expectation that the repository will comply with the performance objectives set out at §60.112 and §60.113; and

Renumber the current ¶ (3) as ¶ (4).

Add a new §60.144 as follows:

§60.144 Monitoring After Permanent Closure

A program of monitoring shall be conducted after permanent closure to monitor all repository characteristics which can reasonably be expected to provide material confirmatory information regarding long-term repository performance, provided that the means for conducting such monitoring will not degrade repository performance. This program shall be continued until termination of a license.

Include in the Supplementary Information of the Federal Register notice proposing these changes the following paragraph:

Part 60 currently requires DOE to carry out a performance confirmation program which is to continue until repository closure. Part 60 does not now require monitoring after repository closure because of the likelihood that post-closure monitoring of the underground facility would degrade repository performance. The Commission recognizes, however, that monitoring such parameters as regional groundwater flow characteristics may, in some cases, provide desirable information beyond that which would be obtained in the performance confirmation program. The proposed requirement for post-permanent closure monitoring requires that such monitoring be continued until termination of a license. The Commission intends that a repository license not be terminated until such time as the Commission is convinced that there is no significant additional information to be obtained from such monitoring which would be material to a finding of reasonable assurance that long-term repository performance would be in accordance with the established performance objectives.

3.a. EPA Assurance Requirement:

(c) Disposal sites shall be designated by the most permanent markers, records, and other passive institutional controls practicable to indicate the dangers of the wastes and their location.

b. Discussion:

No revisions to Part 60 are needed. §60.21(c)(8), 60.51(a)(2), and 60.121 contain equivalent provisions.

4.a. EPA Assurance Requirement:

(d) Disposal systems shall use several different types of barriers to isolate the wastes from the environment. Both engineered and natural barriers shall be included.

b. Discussion:

The staff considers that Part 60 already requires use of both engineered and natural barriers. Nevertheless, in order to avoid any possible confusion regarding the provisions of §60.113(b), the staff proposes to add additional clarifying language to §60.113.

c. Proposed Changes to Part 60:

Add a new ¶ (d) to §60.113 as follows:

(d) Notwithstanding the provisions of (b) above, the geologic repository shall incorporate a system of multiple barriers, both engineered and natural.

In the Supplementary Information of the Federal Register notice proposing these changes include the following:

Questions might arise regarding the types of engineered or natural materials or structures which would be considered to constitute barriers. The Commission notes that §60.2 now contains the definition: "'Barrier' means any material or structure that prevents or substantially delays movement of water or radionuclides." Thus, the Commission considers that the new paragraph to be added to §60.113 will confirm the Commission's commitment to a multiple barrier approach as contemplated by Section 121(b)(1)(B) of the Nuclear Waste Policy Act.

5.a. EPA Assurance Requirement:

(e) Places where there has been mining for resources, or where there is a reasonable expectation of exploration for scarce or easily accessible resources, or where there is a significant concentration of any material that is not widely available from other sources, should be avoided in selecting disposal sites. Resources to be considered shall include minerals, petroleum or natural gas, valuable geologic formations, and ground waters that are either irreplaceable because there is no reasonable alternative source of drinking water available for substantial populations or that are vital to the preservation of unique and sensitive ecosystems. Such places shall not be used for disposal of the wastes covered by this Part unless the favorable characteristics of such places compensate for their greater likelihood of being disturbed in the future.

b. Discussion:

Part 60 contains provisions equivalent to this assurance requirement in §60.122(c)(17), (18) and (19). Part 60 does not, however, address "a significant concentration of any material that is not widely available from other sources."

It is possible that the economic value of materials could change in the future in a way which might attract future exploration or development detrimental to repository performance. The staff proposes to add an additional potentially adverse condition to Part 60 related to significant concentrations of material that is not widely available from other sources. As with the other potentially adverse conditions, the presence of such a condition would require an evaluation of the effect of the condition on repository performance as specified in §60.122(a)(2)(ii), but would not preclude selection of a site for repository construction. (It should be noted that DOE's siting guidelines contain an identical provision in 10 CFR 960.4-2-8-1.)

c. Proposed Changes to Part 60:

Add a new § (18) to §60.122(c) as follows:

(18) The presence of significant concentrations of any naturally-occurring material that is not widely available from other sources.

Renumber the current § (18) through (21) accordingly.

6.a. EPA Assurance Requirement:

(f) Disposal systems shall be selected so that removal of most of the wastes is not precluded for a reasonable period of time after disposal.

b. Discussion:

EPA's concept of "removal" is significantly different from "retrieval" in Part 60. EPA wants to preclude disposal concepts such as deep well injection for which it would be virtually impossible to remove or recover wastes regardless of the time and resources employed. For a mined geologic repository wastes could be located and recovered, albeit at great cost, even after repository closure. EPA therefore considers that a repository complies with this assurance requirement, and no revision to Part 60 is needed.

DEC 23 1985

MEMORANDUM FOR: R. F. Fraley
Executive Director
Advisory Committee on Reactor Safeguards

FROM: William J. Dircks
Executive Director for Operations

SUBJECT: RESPONSE TO ACRS COMMENTS ON EPA HLW STANDARDS (FOLLOW-UP
ITEMS FROM 306th and 307th ACRS MEETINGS)

In letters dated October 16 and November 14, 1985, David A. Ward transmitted to Chairman Palladino the comments of the ACRS regarding the high-level radioactive waste standards published by the Environmental Protection Agency (EPA) on September 19, 1985. As the NRC staff understands, these comments can be summarized as follows:

1. In comparison with other risks, the standards are unduly restrictive.
2. Because the standards are so restrictive, and because of the probabilistic nature of the standards, it will be very difficult, if not impossible, for the NRC to determine compliance with the standards in a licensing review for an actual repository.
3. The standards contain internal inconsistencies (e.g., the dose limits during repository operations are slightly different for licensed and unlicensed repositories) and the standards do not incorporate the latest ICRP recommendations regarding doses to individual organs.

Regarding the first item above, the ACRS has stated that the level of risk allowed by the EPA HLW standards is much lower than that allowed by other standards for radiological and non-radiological hazards. However, the staff has found that under certain reasonable scenarios and assumptions (e.g., the size of the population at risk) the EPA standards can be shown to be comparable to other standards now in place for other nuclear activities, as we discussed in our presentation to the ACRS on November 8, 1985. Since the risks allowed by the EPA standards can be viewed in such widely different ways, the staff has concentrated on the achievability of the standards rather than on comparisons with the risks allowed by other standards.

The ACRS is concerned that the low level of allowable risk, combined with the probabilistic nature of the standards, will make the standards difficult to implement in an actual repository licensing review. Previous NRC contractor

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studies (documented in NUREG/CR-3235) demonstrated (1) that analytical techniques exist, or are under development, to evaluate potential releases from a geologic repository, and (2) that repository sites can likely be found for which repository performance can be demonstrated to be in compliance with the EPA HLW standards. The NRC staff will further develop its views regarding its ability to implement the EPA standards in the rulemaking package currently being prepared to incorporate the EPA standards into Part 60.

Regarding inconsistency within the standards, the NRC staff recognizes that EPA has, for pragmatic reasons, chosen to maintain consistency with other existing EPA standards including the uranium fuel cycle and drinking water standards. This has resulted in internal inconsistencies within the EPA HLW standards which, while not desirable, do not appear to endanger public health and safety nor to pose inordinate costs or difficulties for implementation of the standards by the NRC. In the NRC staff's view, a general overhaul of EPA's radiation protection standards would be needed to adopt the revised ICRP recommendations and to promote consistency between (and within) standards. The NRC staff would support such an initiative by the EPA.

The ACRS also recommended: (1) acceleration of NRC staff efforts to develop analytical methods for evaluating repository performance and (2) that a consensus be sought, possibly through rulemakings, on these methods as they are developed. With respect to the first recommendation, we note that, in a meeting on October 24, 1985, we briefed the ACRS Subcommittee on Waste Management on our HLW program plan and described how we have allocated resources to each major program element. As we described in this briefing, a major program element is development of licensing assessment methodologies; we believe this represents an aggressive effort. We will continue to seek ways to accelerate licensing assessment methodology development and still meet other requirements of the Nuclear Waste Policy Act and Commission priorities. As stated in our October program briefing, we look forward to receiving Subcommittee comment on our program strategies and specific feedback on the tradeoffs we have made among program elements in allocating resources and setting schedules. With respect to the second recommendation, the staff agrees that rulemaking may prove to be an appropriate means of developing consensus regarding certain aspects of the staff's analytical methods. We note that the staff has an on-going effort to identify licensing

issues and to seek early resolution through such means as public review and comment on technical positions developed by the staff. We will continue to pursue early resolution of licensing issues using technical positions and, as appropriate, rulemakings.

As suggested by the staff requirements memorandum for SECY-85-272, the staff would appreciate an opportunity to discuss the staff's proposed conforming amendments relating to proposed implementation procedures with the ACRS in the near future.

(Signed) Jack W. Roe

William J. Dircks
Executive Director for Operations

*See previous concurrence

EDO
WJDircks
12/ /85

FC	:WMRP	:WMRP	:WMRP	:DWM	:DWM	:NMSS	:NMSS
AME	:DFehring*	:RBoyle*	:HMiller*	:MJBell*	:RBrowning*	:DMAusshardt*	:JGDavis



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

Bernero for Appropriate Action
(EDO Signature)

cys: Stello
Taylor
Thompson
Blaha
Murley, NRR
Beckford, RI
Jordan, AEO
Scinto, OGC
Central File

May 3, 1989

The Honorable Landis W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Zech:

SUBJECT: PROPOSED WASTE CONFIDENCE DECISION BY THE WASTE CONFIDENCE
REVIEW GROUP

During its ninth meeting, April 26-28, 1989, the Advisory Committee on Nuclear Waste (ACNW) met with members of the NRC Staff to discuss the preliminary draft of the proposed Waste Confidence Decision (see reference) by the Waste Confidence Review Group. This matter was also a subject of discussion during a meeting held on April 19, 1989 by an ACNW Working Group.

On August 31, 1984, the NRC issued a final decision on what has come to be known as its "Waste Confidence Proceeding." The current review is an update of that assessment, and a significant feature in this latest review is the incorporation of the changes brought about by the Nuclear Waste Policy Amendments Act of December 1987.

On the basis of our discussions on this matter, we offer the following comments:

1. We believe the present report appears to be technically sound, and in this assessment, we endorse both the expanded application of the generic approach to the majority of nuclear power plants and the incorporation into the proceedings of a more realistic timetable for the availability of a licensed repository and an extended time interval for the storage of spent fuel.
2. We continue to have concerns about the ability of the NRC staff to confirm that the repository complies with the probabilistic standards developed by the U.S. Environmental Protection Agency. The explanations given in the proposed Waste Confidence Decision on how this is to be accomplished do not illuminate the process nor do they provide convincing arguments that it can be accomplished.

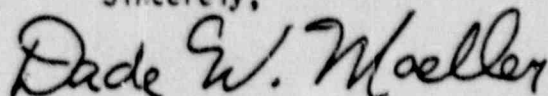
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The Honorable Lando W. Zech, Jr. - 2 -

May 3, 1989

The report also needs organizational and editorial changes to enhance the ease with which it can be read and assimilated.

Sincerely,

A handwritten signature in cursive script that reads "Dade W. Moeller".

Dade W. Moeller
Chairman

Reference:

Memorandum dated April 17, 1989 from Robert M. Bernero, Director, Nuclear Material Safety and Safeguards, to Dade Moeller, Chairman, ACNW, transmitting Preliminary Draft of Waste Confidence Review Group Proposed Waste Confidence Decision (PREDECISIONAL)



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

July 3, 1989

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

Dear Chairman Carr:

SUBJECT: ACNW REVIEW OF NRC COMMENTS ON DOE SITE CHARACTERIZATION PLAN

During its twelfth meeting, June 28-30, 1989, the Advisory Committee on Nuclear Waste (ACNW) completed its review of the Site Characterization Analysis (SCA) being prepared by the NRC staff on the Site Characterization Plan (SCP) developed by the U.S. Department of Energy (DOE) for the proposed high-level waste (HLW) repository at Yucca Mountain. During this meeting, the Committee had the benefit of discussions with staff members from the NRC and DOE. This matter was also a subject for discussion during the sixth through eleventh meetings of the ACNW, as well as during an ACNW Working Group meeting on April 19, 1989. During the seventh meeting, February 21-23, 1989, we had discussions and interactions with representatives from the State of Nevada's Nuclear Waste Project Office. The Committee also had the benefit of the documents referenced.

In approaching this task, the Committee assigned the responsibility for reviewing specific subject categories in the SCA to individual ACNW consultants. These consultants met with members of the NRC staff for in-depth discussions and then served as leaders for reviews of the assigned subject categories during the eleventh and twelfth meetings of the Committee. Throughout our reviews, we have interacted with the NRC staff on a continuing basis, and many of our comments are the culmination of this iterative process.

As a result of our review, we have reached certain conclusions and want to offer specific recommendations concerning the SCP and/or the SCA. Our more significant comments deal with:

- the absence in the SCP of statements addressing the systematic and early identification and evaluation of potentially disqualifying features at the Yucca Mountain Site;
- the apparent lack of sufficient attention to the limitations and uncertainties in the Yucca Mountain data bases, and the associated difficulties in demonstrating that the repository will comply with the Environmental Protection Agency (EPA) standard (40 CFR Part 191, "Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes"); and

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July 3, 1989

Delays by DOE in implementing satisfactory quality assurance (QA) programs.

Our specific comments follow:

1. Although the SCP is an action plan for site characterization, we believe that a much stronger focus should be placed on early detection of potentially disqualifying features. The SCA is not sufficiently emphatic in its critique of the lack of such a focus. We believe that the SCA should point out the need in the SCP for an integrated section of the plan that explicitly addresses the activities leading to an evaluation of characteristics of the site directly related to disqualifying features (e.g., groundwater travel time) as stated in the regulations.
2. Uncertainties and limitations in the data used to justify conclusions will be the center of most contentions. Since the ability to resolve these uncertainties experimentally may well be beyond the practicality of the program, planning for their management is required. We recommend that the NRC staff strengthen its treatment of this topic in the SCA.

As was briefly discussed with the Commission during our meeting on April 27, 1989, we believe that the NRC staff should encourage DOE to develop a scoping Level 2 (Release Estimate) probabilistic risk assessment (PRA) for the proposed Yucca Mountain repository. Such a PRA should be useful in defining those parameters that are critical to the adequate performance of the proposed facility, and would help to set priorities for the accompanying investigations.

Subsequent to our discussions with the Commission, we were pleased to learn that DOE plans to begin conducting in 1990 or 1991 probabilistic system performance assessments for the proposed repository. We recommend that the NRC allocate resources sufficient to develop the expertise necessary to conduct an adequate, independent evaluation of the probabilistic system performance assessments that will be submitted by DOE as part of its application for a construction permit for the proposed repository.

The Committee was told by the NRC staff (and this view was supported by one of our consultants) that the DOE staff may have considerable difficulties in generating a complementary cumulative distribution function (CCDF) for the site and, if this is the case, they may not be able to demonstrate the required compliance with the EPA standard. This difficulty in demonstrating compliance could represent a disqualifying feature for the proposed repository location. We urge that this concern be addressed in the SCA.

3. We believe that the NRC staff has been extremely tolerant of the delays by DOE in establishing a satisfactory QA process by the Office of Civilian Radioactive Waste Management (OCRWM) for

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the Yucca Mountain project. Although one of the Objections in the SCA being prepared by the NRC staff addresses this matter, we believe that this troublesome issue should be promptly resolved since continued absence of approvable QA systems will increase the burden on the participants in licensing processes when qualification of data is at issue.

4. Additional comments on selected topics include:

- a. Because the Calico Hills formation is intended to serve as a barrier between the radioactive waste and the underlying saturated zone, some form of compromise must be reached between maintaining this formation as a barrier and drilling into or exploring within it to determine its critical characteristics. The NRC staff should include in the SCA a recommendation that DOE be definitive on how they will obtain the data necessary to determine the characteristics of the Calico Hills formation.
- b. Because of the significance of the waste package in the containment of the associated radionuclides, it is important that decisions be made soon on the materials to be used in fabricating the waste packages and the manner in which they are to be sealed. Such information is essential in considering possible interactions between the packages and the repository materials with which they will be in contact. Consideration of these interactions will require determination of the specific chemical composition of the repository water, and the SCA should reflect this concern.
- c. One of the key parameters in determining the adequacy of the proposed site is the rate of groundwater flow. In this regard, the NRC staff should emphasize in the SCA the need to obtain information on whether matrix or fracture flow (or a combination of the two) will govern water movement.
- d. Current concerns with the location of the Exploratory Shaft Facility (ESF) pertain to its distance from faults and the appropriateness of the samples it will yield in providing data that are representative of the proposed repository location. We believe the SCA should emphasize the need for the application of a comprehensive range of techniques (e.g., subsurface mapping, geophysical surveys) to the study of this problem.

In the development of the Title I design for the ESF, the DOE staff was supposed to have provided a conceptual approach for construction of the facility. Reviews by the NRC staff (and ACNW consultants) indicate that this was not the case. The staff should ensure that the SCA states that before DOE proceeds further with the Title II design, which will provide

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additional details on the proposed ESF, DOE should promptly address the errors and deficiencies in the Title I design.

- e. We believe that consideration should be given to extending the geoscience (hydrology, geology, geophysics) investigations to a distance sufficient to provide data on conditions within the region surrounding the site. Some of the existing investigations appear to be too limited in their geographical coverage. For example, because of the importance of the potential of volcanism, such an extension would appear mandatory to ensure that these studies have the potential for uncovering any disqualifying features.
- f. A range of alternative conceptual models will be used in conducting performance assessments for the repository. In our opinion, there are two problems associated with these models, namely, they are incomplete and they are not integrated. The SCP should be constructed so as to provide data that identifies the correct model, rather than merely confirming the preferred model. Since modeling is essential in determining the performance of the proposed repository and for uncovering potential disqualifying features, these deficiencies must be corrected. Such determinations should be scheduled as early as possible in the site characterization process, and this should be reflected in the SCA.
- g. The potential for natural resources in the area and the scenarios that are to be considered relative to possible human intrusion (some of which are related to exploration for such resources) need to be given more attention. A much more thorough assessment of potential mineral resources, including petroleum, should be required in the SCP, and the SCA should indicate this need.

With respect to human intrusion, the Committee notes that guidance on this matter is provided in EPA standard 40 CFR Part 191. We support the NRC staff recommendation that the DOE staff should consider this guidance in the development of the CCDF for the site.

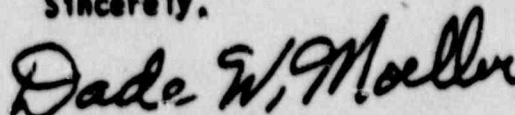
- h. The NRC staff has apparently accepted the lack of details in the SCP on test procedures and schedules for various site analyses since these are to be provided in the Study Plans being prepared by DOE. This places an increased burden for reviewing the Study Plans on the NRC staff. We recommend that the NRC staff note this problem in the SCA and that enhanced details of the characterization program be included in the periodic progress reports that will be submitted by DOE to supplement the SCP.

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5. The SCA methodology and its basis are sharply focused on the individual sections of the SCP. Nevertheless, it might be useful if the NRC staff would produce an addendum that, among other items, contains those comments related to global or generic matters. For example, we believe that a useful comment in such a section would be to urge DOE to recognize that the licensing process and any decisional activities connected with it are adversarial. We also believe that this characteristic of the licensing proceedings should encourage DOE to ensure that its technical arguments are as much beyond challenge by responsible scientists as reasonable. The context of the SCA should be responsive to this need.

We trust these comments will be helpful in the development of the Site Characterization Analysis. In closing, we want to acknowledge and thank staff members of both the NRC and DOE for their cooperation and support during our review. All the people with whom we have interacted have been helpful and responsive to our questions.

Sincerely,



Dade W. Moeller
Chairman

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- Letter dated June 1, 1989 from John J. Kearney, Edison Electric Institute, to C. P. Gertz, Yucca Mountain Project Office, DOE, regarding DOE Site Characterization Plan
11. Letter dated May 3, 1989 from P. Loux, Nevada Agency for Nuclear Projects, Waste Project Affairs, to C. Gertz, , DOE Yucca Mountain Project Office, Subject: State of Nevada Preliminary Comments on the Site Characterization Plan for the Yucca Mountain Candidate High-Level Nuclear Waste Repository Site