

APR 28 1992

EPA MINUTES

- 1 -

MEMORANDUM FOR: James L. Blaha  
Assistant for Operations  
Office of the Executive Director  
for Operations

FROM: Robert M. Bernero, Director  
Office of Nuclear Material Safety  
and Safeguards

SUBJECT: MINUTES OF MEETINGS WITH ENVIRONMENTAL  
PROTECTION AGENCY STAFF

Enclosed are the minutes of the March 13 and March 27 meetings between the staffs of the Nuclear Regulatory Commission and the Environmental Protection Agency (EPA). Because the Commissioners' assistants have frequently voiced interest in our interactions with EPA, they may wish to receive copies of these documents. Please distribute as appropriate.

EPA now expects to have the technical support for its standards available for NRC staff review in May or June, and to have the proposed standards ready for publication in the Federal Register in late June or July. The staff plans to review EPA's technical support documents within about 30 days of receipt. The staff will then inform the Commission of its views regarding the adequacy of EPA's standards and the supporting documentation.

(Signed) Robert M. Bernero

Robert M. Bernero, Director  
Office of Nuclear Material Safety  
and Safeguards

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As stated

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MINUTES

EPA/NRC Meeting on HLW Standards

March 27, 1992, OWFN

<u>Attendees:</u>	EPA	NRC
	W. Gunter	J. Youngblood
	T. McLaughlin	M. Federline
	F. Galpin	R. Ballard
	J. Gruhlke	J. Holonich
	W. Russo	S. Coplan
	C. Petti	D. Fehringer
	K. Rogers	W. Reamer

**Background:** Four previous meetings between EPA and NRC staffs have discussed technical issues and related NRC concerns regarding potential difficulties in implementing EPA's HLW standards. EPA is trying to address NRC concerns by drafting new language for its standards.

**Discussions:** 1. EPA's summary of the previous (3/13/92) meeting was agreed to with only minor editorial revisions.

2. EPA presented the enclosed text for the standards and Federal Register preamble. For section 191.12, discussions identified only one potential revision: modify paragraphs (b)(2) and (d)(2) to read ". . . resulting from any one of a set of mutually exclusive scenarios . . ." With this addition, EPA and NRC staff's agreed that the enclosed text adequately captures the NRC's proposed "three-bucket" concept, as well as the collective dose alternative requested by DOE.

In the guidance for implementation section (Appendix C), the NRC staff requested that the last sentence referring to scenario likelihood be revised to read ". . . greater than about one chance in 10,000 . . ."

In the remainder of the guidance for implementation section, the NRC staff requested deletion of references to "the implementing agency" in locations that refer to DOE actions for a licensed repository.

The NRC staff suggested that the paragraph dealing with multiple models be reworded to read:

When there are multiple models applicable to the performance assessment or significant uncertainties in the distribution of parameter values, the Agency assumes a spectrum of experts, including experts independent of DOE the--licensing--and implementing-agencies, will be consulted by DOE to assist in evaluating the adequacy of models and values used in a

performance assessment assist in determining which model(s) or value(s) is most appropriate. For licensed facilities, the Agency assumes that NRC will give attention to the full record before it in making a licensing decision.

For the suggested new definitions, the NRC staff recommended deletion of the phrase "or time other than 10,000 years" from the definition of "collective effective dose."

In the Federal Register preamble language, the NRC staff suggested that "consequence" of releases be changed to "size" of releases. Also, "is likely to be greater" should be changed to "may be greater."

The NRC staff will further review the enclosed text and will inform EPA of any additional recommendations for revisions.

The NRC staff provided additional discussion of its concerns about the "technical achievability" basis for EPA's standards, and reiterated its view that acceptance within the technical community is not likely unless comparisons with other radiation protection standards and other risks are provided. EPA indicated that such comparisons are being developed, and will be included in the Supplementary Information accompanying EPA's proposed rule.

EPA will ask its Science Advisory Board (SAB) to review information about the travel time and retardation mechanisms related to gaseous carbon-14 transport at an unsaturated site. EPA plans to propose its standards this summer. If results from the SAB review are not available at the time of proposal, EPA might consider deferring proposal of a specific release limit for carbon-14. In such a case, the proposed rule would indicate that the standard for gaseous release is RESERVED. EPA also indicated that publication of proposed standards in the Federal Register might not occur until July or possibly after the results of the SAB review.

Conclusions: EPA and NRC staffs are very close to agreement on the wording of most of EPA's HLW standards. The NRC staff suggested and EPA agreed that prior to meeting again, EPA should prepare a complete draft with preamble which contains all revisions resulting from NRC/EPA meetings. Another meeting will be scheduled when this revised draft is available. NRC indicated that its evaluation of EPA's technical support for the standards would be an important part of its decision on approval of the EPA standards. NRC emphasized that it will not be able to recommend acceptance of EPA's standards to the Commission until the NRC staff has reviewed the technical support for the standards, including comparisons with other radiological risks and radiation protection standards.

**PROPOSED ALTERNATIVE TO 40 CFR 191 CONTAINMENT REQUIREMENTS****191.12 Containment Requirements**

Disposal systems shall be designed to comply with subsection (a), (b), (c) or (d) of this section.

(a) Disposal systems for radioactive waste shall be designed to provide a reasonable expectation, based upon performance assessments, that the cumulative releases of radionuclides to the accessible environment for 10,000 years after disposal from all significant processes and events (including both natural and human-initiated processes and events) that may affect the disposal system shall:

(1) Have a likelihood of less than one chance in 10 of exceeding the quantities calculated according to Table 1 (Appendix A); and

(2) Have a likelihood less than one chance in 1,000 of exceeding ten times the quantities calculated according to Table 1 (Appendix A).

(b)(1) Disposal systems for radioactive waste shall be designed to provide a reasonable expectation, based upon performance assessments, that the cumulative releases of radionuclides to the accessible environment for 10,000 years after disposal from all significant processes and events (including both natural and human-initiated processes and events) that may affect the disposal system shall have a likelihood of less than one chance in 10 of exceeding the quantities calculated according to Table 1 (Appendix A).

(2) Disposal systems for radioactive waste shall be designed to provide a reasonable expectation that the release of radionuclides to the accessible environment for 10,000 years after disposal resulting from any mutually exclusive scenario that may affect the disposal system and is sufficiently credible to warrant consideration shall not exceed ten times the quantities calculated according to Table 1 (Appendix A).

(c) Disposal systems for radioactive waste shall be designed to provide a reasonable expectation, based upon performance assessments, that the cumulative releases of radionuclides to the accessible environment for 10,000 years after disposal from all significant processes and events (including both natural and human-initiated processes and events) that may affect the disposal system shall:

(1) have a likelihood of less than one chance in 10 of causing more than 25,000 person-rem (250 person-sieverts) collective effective dose per unit of waste as defined in the Notes to Table 1 (Appendix A); and

(2) have a likelihood of less than one chance in 1,000 of causing more than 250,000 person-rem (2,500 person-sieverts)

collective effective dose per unit of waste as defined in the Notes to Table 1 (Appendix A).

(d)(1) Disposal systems for radioactive waste shall be designed to provide a reasonable expectation, based upon performance assessments, that the cumulative releases of radionuclides to the accessible environment for 10,000 years after disposal from all significant processes and events (including both natural and human-initiated processes and events) that may affect the disposal system shall have a likelihood of less than one chance in 10 of causing more than 25,000 person-rem (250 person-sieverts) collective effective dose per unit of waste as defined in the Notes to Table 1 (Appendix A).

(2) Disposal systems for radioactive waste shall be designed to provide a reasonable expectation that the release of radionuclides to the accessible environment for 10,000 years after disposal resulting from any mutually exclusive scenario that may affect the disposal system and is sufficiently credible to warrant consideration shall not cause more than 250,000 person-rem (2,500 person-sieverts) collective effective dose per unit of waste as defined in the Note# to Table 1 (Appendix A).

(e) Compliance assessments need not provide complete assurance that the requirements of 191.12(a), (b), (c) or (d) will be met. Because of the long time period involved and the nature of the events and processes of interest, there will inevitably be substantial uncertainties in projecting disposal system performance. 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 finding of reasonable expectation by the implementing agency, on the basis of the record before it, that compliance with 191.12(a), (b), (c) or (d) will be achieved.

#### **Appendix C--Guidance for Implementation of Subparts B and C**

*Scope of Compliance Assessments.* Sections 191.12(a) and (c) require the implementing agencies to evaluate compliance through performance assessments as defined in 191.01. Such performance assessments need not consider categories of events or processes that are estimated to have less than one chance in 10,000 of occurring over 10,000 years.

Evaluation of compliance with sections 191.12(b)(1) and (d)(1) need not consider categories of events or processes that are estimated to have less than one chance in 100 of occurring over 10,000 years. Sections 191.12(b)(2) and (d)(2) require the implementing agency to evaluate mutually exclusive scenarios which are sufficiently credible to warrant consideration. Such evaluations will be warranted at a likelihood greater than one chance in 1,000 over 10,000 years if the potential for releases is

dominated by a single release scenario. Consideration will be warranted at a likelihood greater than one chance in 10,000 over 10,000 years if there is the potential for releases from more than one scenario at probabilities near this value.

Compliance with Sections 191.12(a), (b)(1), (c) or (d)(1). Sections 191.12(a), (b)(1), (c) and (d)(1) require the implementing agency to evaluate the likelihood of processes, events or sequences of processes and events leading to radionuclide releases which exceed the indicated limits. The implementing agency should establish the likelihood of these categories of events or processes based upon current scientific knowledge regarding previous occurrences. In cases where there have been no previous occurrences or occurrences have not been frequent enough to be statistically significant, "likelihood" is the predicted probability of future occurrence based upon scientific judgment. "Likelihood" does not refer to uncertainties in projections of probabilities and sizes of releases or to the level of confidence with which the probability of a release must be projected.

Whenever practicable, the implementing agency will assemble all of the results of the performance assessments to determine compliance with 191.12(a), (b)(1), (c) and (d)(1) into a "complementary cumulative distribution function" that indicates the cumulative probability of exceeding various levels of cumulative release. When the uncertainties in parameter values are considered in a performance assessment, the effects of the uncertainties considered can be incorporated into a single such distribution function for each disposal system considered. A disposal system may be considered to be in compliance with 191.12(a), (b)(1), (c), and (d)(1) if this single distribution function meets the requirements of 191.12(a), (b)(1), (c) and (d)(1), respectively.

When there are multiple models applicable to the performance assessment or significant uncertainties in the distribution of parameter values, the Agency assumes a spectrum of experts, including experts independent of the licensing and implementing agencies, will assist in determining which model(s) or value(s) is most appropriate.

## 191.01 Definitions

"Collective effective dose," as used in §191.12, means the sum, over 10,000 years, of the annual committed effective doses received by all members of the public in the reference biosphere. It includes committed effective doses which begin at anytime within 10,000 years following disposal and is without regard to dose, dose rate, distance from the original site of the disposal facility, or time other than 10,000 years.

"Reference biosphere" means a biosphere in which, for 10,000 years after disposal, (a) major population relocations or emergencies have not occurred, (b) the size of the world's total population is 10 billion, and (c) other factors of human characteristics and behavior affecting estimates of radiation exposure and its effects are assumed to be as today; this includes level of knowledge, technical capability, human physiology, nutritional needs, societal structure, and access to pathways of exposure. It does not include geologic, hydrologic, or climatic conditions.

"Scenario" means any hypothetical future sequence of processes and events (including both natural and human-initiated processes and events).

**DRAFT****191.13 Assurance requirements.**

(g) In selecting and designing disposal systems, estimates of potential radionuclide releases to the accessible environment resulting from undisturbed performance beyond 10,000 years after disposal shall be considered.

Supporting Language in the Preamble

*Extended Time Consideration.* Today's proposal includes an additional assurance requirement. It would require the implementing agency to evaluate and consider disposal system performance over time frames beyond 10,000 years.

Substantial amounts of radioactivity will remain in a disposal system well beyond 10,000 years. The consequence of releases of certain long-lived radionuclides (e.g., alpha-emitting radionuclides) is likely to be greater in the period beyond 10,000 years than in the period prior to 10,000 years. However, the uncertainty in estimating disposal system performance beyond 10,000 years limits the usefulness of applying quantitative regulatory limits on those releases. Nevertheless, some assurance is needed that radionuclide releases and their effects in the period immediately after 10,000 years will not be greatly increased. The Agency believes that this provision will allow for appropriate consideration of longer time periods in the siting and development of disposal systems without requiring results of these uncertain calculations to meet a specific quantitative test.

**SUMMARY OF THE MEETING BETWEEN STAFF MEMBERS  
OF THE NUCLEAR REGULATORY COMMISSION AND THE  
ENVIRONMENTAL PROTECTION AGENCY  
REGARDING THE REISSUANCE OF 40 CFR PART 191**

March 13, 1992

Following opening remarks by Joe Youngblood, Director of the NRC's Division of High-Level Waste, and Bill Gunter, Director of EPA's Criteria and Standards Division, Bill Russo of EPA presented an overview of EPA's current technical work and the currently conceived contents of the forthcoming Background Information Document.

Discussion then was opened to outstanding technical issues.

- ▶ **The >10,000-year assessment.** Discussion centered on the implementability of this requirement and its provisions and placement. It was decided that it would be moved from the containment requirements and placed into the assurance requirements. NRC prefers that the issue be handled under the National Environmental Policy Act.
- ▶ **The three-bucket approach.** EPA presented alternative language for consideration which would put a qualitative boundary between the second and third buckets. NRC will consider it for further discussion.
- ▶ **Guidance: Compliance with §§191.12(a) and (b)(1).** NRC would prefer removal of the "multiple models" guidance or at least changed to reflect the applicant rather than the implementing agency.
- ▶ **Guidance: Future States.** NRC thought that the language in the 2/3/92 draft NPRM was not specific enough and prefers a more static biosphere. NRC had suggested a strictly static biosphere where everything was held constant except that world population would rise to 10 billion. EPA felt this was too restrictive and NRC offered to make another attempt for EPA's consideration.
- ▶ **Reasonable expectation.** Discussion centered on each agency's interpretation of reasonable expectation *vis-a-vis* reasonable assurance and the fact that NRC had stated cognizance of the difference between a repository and an operating facility in its preamble to 10 CFR Part 60 and that there is no practical difference between the two terms. NRC offered to supply documents discussing this issue. It was decided to keep the matter under consideration.
- ▶ **Truncation prohibition.** The possible implementation problems with the wording of the 2/3/92 draft NPRM was discussed and general agreement was reached that improvements could be made that could avoid the possible jurisdictional and technical problems, *viz.*, placing the truncation restrictions in a definition. NRC offered to work on possible language.

The meeting was adjourned following an agreement to meet again in the vicinity of March 27.