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

January 15, 1993

MEMORANDUM FOR: The Chairman
Commissioner Rogers
Commissioner Curtiss
Commissioner Remick
Commissioner de Planque

FROM: James M. Taylor
Executive Director
for Operations

SUBJECT: RECEIPT OF DRAFT OF ENVIRONMENTAL PROTECTION AGENCY'S STANDARDS FOR REPOSITORIES OTHER THAN YUCCA MOUNTAIN

In 1985, the U.S. Environmental Protection Agency (EPA) finalized environmental radiation protection standards for disposal of high-level radioactive wastes (HLW) and transuranic wastes (TRU). However, in 1987 a Federal court found deficiencies in two portions of EPA's standards - the individual and groundwater protection standards - and remanded the standards to EPA for further consideration. In 1992, Congress passed two laws dealing with EPA's standards. The Energy Policy Act directed EPA to develop one set of HLW standards specifically for the Yucca Mountain site, based upon and consistent with findings and recommendations of the National Academy of Sciences (NAS). (A copy of EPA's correspondence with the NAS regarding the scope of the Academy's review is enclosed.) Separately, the Waste Isolation Pilot Plant Land Withdrawal Act reinstated all of Subpart B of EPA's 1985 standards except the two sections found deficient by the Federal court in 1987. EPA is directed to issue, by April 1993, final regulations that address the court's concerns in the 1987 remand. In conformity with the Energy Policy Act provision, neither the reinstatement nor EPA's amendments in response to the Federal court remand would apply to a repository at Yucca Mountain. However, the reinstated regulations and EPA's remedies for the remanded sections would apply to any HLW disposal site other than those characterized under Section 113(a) of Public Law 97-425, which at the current time is only the Yucca Mountain site. They would apply to any disposal facility for commercially-generated "greater-than-Class C" that contains wastes defined by EPA as "transuranic." Thus, there is a potential for NRC enforcement of these standards, even though they do not apply to a repository at Yucca Mountain.

EPA has prepared proposed amendments to its Spent Nuclear Fuel, HLW and TRU regulations to address the Federal court's remand decision. Those proposed amendments have been transmitted to the Office of Management and Budget for its review, and copies have also been provided to the NRC staff. Copies of the proposed amendments are enclosed for the Commissioners' information. The principal features of EPA's proposed amendments are the following:

1. The time period for application of the individual and groundwater protection standards would be extended to 10,000 years from the 1,000-year period of the 1985 standards.

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XA

2. The dose limit for protection of the maximally-exposed individual would be revised from 25 mrem/yr (whole body) and 75 mrem/yr (any organ) to 15 mrem/yr (committed effective dose).

3. The groundwater protection standards would limit radionuclide concentrations in groundwaters outside the controlled area to the drinking water standards in effect at the time when compliance is demonstrated. EPA is soliciting public comments regarding the merits of a non-degradation requirement for "especially valuable ground water."

4. Applicability of the individual and the groundwater protection requirements would continue to be limited to "undisturbed performance," which is defined to exclude human intrusion and unlikely natural disruptions.

5. Compliance with the groundwater protection criteria of these standards would also constitute compliance with EPA's Safe Drinking Water Act and Underground Injection Control regulations.

6. EPA will not offer an opinion as to whether repository disposal constitutes "underground injection" under the Safe Drinking Water Act.

7. EPA will not respond to comments on the Congressionally reinstated portions of its standards (i.e., the probabilistic "containment requirements" and the qualitative "assurance requirements").

EPA's proposed standards have been transmitted to the Office of Management and Budget for its review, but have not been made publically available. Accordingly, this memorandum and its enclosures will be treated by the staff as "predecisional" information. Staff is currently reviewing EPA's proposed standards to determine if there is a need to comment on this proposal.

James M. Taylor
Executive Director
for Operations

Enclosures:
1. EPA letter to National Academy
2. EPA's proposed non-Yucca standards

cc: SECY
OGC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DEC 8

Dr. Peter Myers
Staff Director, Board on
Radioactive Waste Management
National Research Council
National Academy of Sciences
2101 Constitution Avenue, NW
Washington, DC 20418

Dear Dr. Myers:

On November 19, 1992, I sent you a letter requesting the National Academy of Sciences (NAS) to send the Environmental Protection Agency (EPA) a proposal to study three issues outlined in the 1992 Energy Policy Act. I am sending this letter to give you a clear sense of the questions EPA would like answered so that your study can be of the most use to us. We have framed specific questions and approaches in an attempt to take the most advantage of your technical and scientific expertise. As you know, EPA, as the administrative agency responsible for setting the standards for the Yucca Mountain site, must exercise its own discretion and apply its own expertise before reaching any final decisions for those standards, but will do so based upon and consistent with your findings.

Some questions and approaches that would be helpful to us to have examined are included in the list below:

(1) Whether a health-based standard based upon doses to individual members of the public from releases to the accessible environment (as that term is defined in the regulations contained in subpart B of part 191 of title 40, Code of Federal Regulations, as in effect on November 18, 1985) will provide a reasonable standard for protection of the health and safety of the general public?

It would be helpful to EPA's subsequent standard development if this assessment examined the comparative effectiveness of an individual dose standard, a collective dose standard, and other types of limits a standard for Yucca Mountain might include. In addition, it would be helpful for the assessment to consider specifically the implications and anticipated results of an individual dose standard, including an analysis of the total collective dose levels (summations in person-rem of non-truncated individual doses) likely to result from the application of different individual dose standards at Yucca Mountain. When evaluating possible individual dose limits, we would note that past EPA actions have considered a range of from 1 to 25 mrem/year. It would also be helpful if the assessment would clearly indicate the intended form of the individual dose standard that might be used

CONCURRENCES								
SYMBOL	6602J	6602J	6602J					
SURNAME	[illegible]	[illegible]	[illegible]					
DATE	11/30/92	11/30/92	11/30/92					

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(i.e., probabilistic (risk), deterministic, expected value, maximum individual, average of the critical population group, etc). Related issues that the panel may want to consider include:

- The uncertainty in the relationship between the individual and collective dose.

- The impact of different time periods of assessment for the standard and the relationship of time period to individual dose, collective dose, or other types of limits the standard might impose.

- Whether a defined "static biosphere" assumption is desirable to make a dose (or risk) standard workable. If so, what should be the nature of that assumption?

- The protectiveness of an individual dose standard, a population dose standard, or other types of limits the standard might impose in light of the possibility of natural or human-initiated disruptive events.

(2) Whether it is reasonable to assume that a system for post-closure oversight of the repository can be developed, based upon active institutional controls, that will prevent an unreasonable risk of breaching the repository's engineered or geologic barriers or increasing the exposure of individual members of the public to radiation beyond allowable limits?

This question seems intended to look at the effectiveness of active institutional controls as a method of protection at a Yucca Mountain repository. It could be approached through an examination of different types of active control systems and their cost, since cost is a factor in determining the long term viability of any active control system. The Academy could first determine the types of intrusive events that could take place at the Yucca Mountain site, then evaluate the effectiveness of various types of active institutional controls to mitigate these events. Some possible issues to consider include:

- Natural and human-initiated disruptive events.

- The types of actions that fall within the definition of "active institutional controls" and what credit for prevention or remediation should be given these actions.

- The historical record of institutional controls to prevent problems at other disposal sites.

- The durability of active institutional controls over various time periods, and how society can assure continuous control for those periods.

(3) Whether it is possible to make scientifically supportable predictions of the probability that the repository's engineered or geologic barriers will be breached as a result of human intrusion over a period of 10,000 years?

In answering this question EPA hopes that the panel can arrive at an unambiguous definition of "scientifically supportable predictions of the probability." This would be particularly helpful as we proceed to a rule promulgation consistent with the NAS findings. Some possible issues to consider include:

- For perspective, how does the human intrusion case compare to making a "scientifically supportable prediction of the probability" of naturally occurring disruptive events over 10,000 years?

- Whether the determination of a "scientifically supportable prediction of the probability" is dependent on the probability value, and, if so, what is that relationship?

- Can scientifically supportable predictions result from calculations based on simplifying assumptions about future human behavior made to reduce uncertainty?

EPA expects that the Academy's proposal will include provisions for public meetings and substantive opportunity for public input. As stated in the 1992 energy legislation the proposal must also include an expected completion date of December 31, 1993

We look forward to working with you on these issues, and realize that the precise questions and approaches you consider may be changed or augmented depending on the results of your studies. For discussion of any desired clarification of these issues you should contact Mr. J. William Gunter, Director of the Criteria and Standards Division in this Office. He can be reached at (202) 233-9290.

Sincerely,

/s/ Nuerman for

Margo T. Oge
Director, Office of Radiation
and Indoor Air

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DRAFT DATED: December 21, 1992

ENVIRONMENTAL PROTECTION AGENCY

40 CFR 191

ENVIRONMENTAL RADIATION PROTECTION STANDARDS FOR THE MANAGEMENT AND DISPOSAL OF SPENT NUCLEAR FUEL, HIGH-LEVEL AND TRANSURANIC RADIOACTIVE WASTES

AGENCY: Environmental Protection Agency

ACTION: Proposed Rule

SUMMARY: The U.S. Environmental Protection Agency (EPA) is proposing certain environmental standards for the disposal of spent nuclear fuel, high-level and transuranic radioactive wastes (40 CFR 191.15 and Subpart C). EPA is also proposing an additional provision to the Agency's Underground Injection Control Programs regulations make clear that compliance with 40 CFR Part 191, Subparts B and C, will constitute compliance with regulations under the Federal Safe Drinking Water Act (SDWA) (40 CFR 144.31(a)).

EPA originally promulgated these standards in 1985 pursuant to the Agency's authorities and responsibilities under the Nuclear Waste Policy Act, as amended (42 U.S.C. 10101 et seq.), the Atomic Energy Act, as amended (42 U.S.C. 2021(h) and 2201), and § 2(a)(6) of Reorganization Plan No. 3 of 1970 (5 U.S.C. Appendix at 1343). In 1987, following a legal challenge, the U.S. Court of Appeals for the First Circuit (hereinafter referred to as "the First Circuit" or "the court") remanded Subpart B of the 1985 standards to the Agency for

further consideration. Recently enacted legislation known as the Waste Isolation Pilot Plant Land Withdrawal Act (WIPP LWA), however, reinstates the 1985 disposal standards except "the three aspects of sections 191.15 and 191.16 of such [standards] that were the subject of the remand ordered in Natural Resources Defense Council, Inc. v. United States Environmental Protection Agency, 824 F.2d 1258 (1st Dir. 1987). The new law directs EPA to issue final disposal regulations by April 30, 1993, and specifies that such regulations shall not be applicable to the characterization, licensing, construction, operation or closure of any site required to be characterized under § 113(a) of Public Law 97-425, the Nuclear Waste Policy Act of 1982.

Today's proposal represents the Agency's response to this legislation and to the issues raised by the court pertaining to individual and ground-water protection requirements. In so doing, EPA is not revisiting any of the regulations reinstated by the WIPP LWA. After the Agency considers comments received on today's proposal, it will take final action in the form of amendments to Part 191 of Title 40 of the Code of Federal Regulations.

DATE: Public hearings on this proposed rule will be held _____. Comments on the proposed rule should be received on or before _____. As discussed below, the scope of today's proposal is strictly limited to proposed 40 CFR 191.15 and

Subpart C and does not extend to other portions of 40 CFR Part 191. Accordingly, comments should be similarly limited in scope.

ADDRESS: Comments should be submitted, in duplicate, to: Docket No. R-89-01, Air Docket, Room M-1500 (LE-131), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460. Materials relevant to this rulemaking are contained in Docket No. R-89-01, located in Room 1500 (first floor in Waterside Mall near the Washington Information Center), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460. The docket may be inspected between 8:30 a.m. and 12:00 noon and between 1:30 p.m. and 3:30 p.m. on weekdays. As provided in 40 CFR Part 2, a reasonable fee may be charged for photocopying docket materials.

Single copies of the Draft Background Information Document and the Economic Impact Analysis for this action may be obtained by writing to: Waste Standards and Risk Assessment Branch, Criteria and Standards Division, Mail Code 6602J, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency, Washington, D.C. 20460 or calling (202) 233-9310.

FOR FURTHER INFORMATION CONTACT: Ray Clark or Caroline Petti; telephone number (202) 233-9310; address Criteria and Standards Division, Mail Code 6602J, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency, Washington, D.C. 20460.

SUPPLEMENTARY INFORMATION: Radioactive wastes are the result of governmental and commercial uses of nuclear fuel and other radioactive material. Today's action addresses standards which pertain to the disposal of spent nuclear fuel, high-level, and transuranic radioactive wastes, referred to hereinafter as simply "waste" which is also defined in 40 CFR 191.12(b), unless specifically noted otherwise. (The Agency has issued, under these and separate authorities, standards to cover uranium mill ta ngs (40 CFR Part 192 and 40 CFR Part 61) and plans to issue standards to cover low-level radioactive wastes, to be codified at 40 CFR Part 193.)

Fissioning of nuclear fuel in nuclear reactors creates what is known as "spent" or irradiated nuclear fuel. Sources of spent nuclear fuel include: 1) fuel discharged from commercial nuclear power plants; 2) fuel elements generated by government-sponsored R&D programs, universities and industry; fuels from experimental reactors [e.g., liquid metal fast breeder reactors and high-temperature gas-cooled reactors]; 4) U.S. Government-controlled nuclear weapons production reactors; and 5) naval reactor fuels and other U.S. Department of Defense reactor fuels. Most spent fuel is currently being stored in water pools at reactor sites where it is produced.

Spent nuclear fuel from defense reactors is routinely reprocessed to recover unfissioned uranium and plutonium for use in

weapons programs. Most of the radioactivity goes into acidic liquid wastes that will later be converted into various types of solid materials. These highly radioactive liquid or solid wastes from reprocessing spent nuclear fuel have traditionally been called "high-level" wastes. If it is not to be reprocessed, the spent fuel itself becomes a waste. Only one commercial spent fuel reprocessing facility--the Nuclear Fuel Services Plant in West Valley, New York--ever operated in the United States and it was closed in 1972. No commercial spent fuel is being reprocessed in the United States at this time. High-level wastes derived from reprocessing activities are presently stored on Federal reservations in South Carolina, Idaho, and Washington and at the Nuclear Fuel Services Plant in New York.

Transuranic wastes, as defined in this rule, are materials containing elements having atomic numbers greater than 92 in concentrations greater than 100 nanocuries of alpha-emitting isotopes, with half-lives greater than twenty years, per gram of waste. Most transuranic wastes are items that have become contaminated as a result of activities associated with the production of nuclear weapons (e.g., rags, equipment, tools, and contaminated organic and inorganic sludges). These wastes are currently being stored on Federal reservations in Colorado, Idaho, Nevada, New Mexico, Ohio, South Carolina, and Tennessee, and Washington.

History of Proposed Action

Under authority derived from the Atomic Energy Act of 1954, as amended (AEA) (42 U.S.C. 2021(h) and 2201(b) et seq.), and Reorganization Plan No. 3 of 1970 (5 U.S.C. Appendix at 1343), EPA is responsible for developing generally applicable environmental standards for protection of the general environment from radioactive material.

In December 1976, the Agency announced its intent to develop Federal guidance for the management and disposal of radioactive wastes. Among EPA's first activities in developing this guidance was a series of public workshops, conducted in 1977 and 1978, in order to gain a better understanding of public concerns and issues associated with radioactive waste disposal. EPA proposed "Criteria for Radioactive Wastes" in 1978 but withdrew the proposed criteria in 1981 because the many different types of radioactive wastes made the issuance of generic disposal guidance impractical.

Nevertheless, regulatory development efforts continued and on December 29, 1982, EPA published a proposed rule titled, "40 CFR Part 191, Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes" (47 FR 58196). Shortly thereafter the Nuclear Waste Policy Act of 1982 was enacted which directed that EPA utilize its existing authority to promptly promulgate waste standards pursuant to the AEA. EPA responded and on September 19, 1985, EPA issued final

"Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes" at 40 CFR Part 191 (50 FR 38066).

In March 1986, a number of States and environmental groups filed petitions for review of the rule. The petitions for review were consolidated in the First Circuit.

The court issued its ruling on July 17, 1987. NRDC v. EPA, 824 F. 2nd 1258 (1st Cir. 1987). The court vacated and remanded:

(1) the Individual and Ground-Water Protection Requirements (§§ 191.15 and 16) for further consideration of their inter-relationship with Part C of the SDWA and for further explanation of the 1,000-year time frame for the requirements;

(2) the Ground-Water Protection Requirements (§ 191.16) for insufficient notice and comment; and

(3) the rest of 40 CFR Part 191 even though all but the two sections listed above were either unchallenged or upheld.

On rehearing, the government requested reinstatement of all sections except the two sections specifically identified as problematic by the court; i.e., §§ 191.15 and 191.16. In September 1987, the court reinstated the management and storage standards (Subpart A) but left the entirety of the disposal standards (Subpart B, which includes §§ 191.15 and 191.16) in remand. (NRDC v. EPA, Nos.85-1915, 86-1096, 86-1097, 86-1098 (1st Cir.), order dated September 23, 1987.)

On October 30, 1992, the WIPP LWA was enacted, Public Law 102-486, S.1671, Conf. Rep. 102-1037. Besides setting the terms and conditions for the Department of Energy's (DOE) activities at the WIPP, the new law contains numerous provisions pertinent to EPA's role in overseeing DOE's activities at the WIPP, including implementation of the 40 CFR Part 191 disposal standards. Specifically, the new law reinstates all of the disposal standards issued by the Agency in 1985 except the individual and ground-water protection requirements which were the basis of the above-described remand in NRDC v. EPA. WIPP LWA, § 8. Further, the WIPP LWA requires the Agency to issue final disposal standards within six months of its enactment, April 30, 1993. The new law also provides an extensive role for EPA in reviewing and approving various DOE activities at the WIPP including a requirement than EPA certify whether the performance of the WIPP repository will meet the final 40 CFR Part 191 standards (once completed).

Accordingly, the next step in the evolution of 40 CFR Part 191 is occurring today. As contemplated by the WIPP LWA, EPA is addressing the court remand of the 1985 version of 40 CFR §§ 191.15 and 191.16 and proposing a new § 191.15 and a new Subpart C. This proposal represents the Agency's response to the WIPP LWA and to the issues raised in the court remand.

One final point is important. Under the WIPP LWA and a separate statute also enacted in October 1992, the "Energy Policy Act of 1992"

(Pub. L. 102-486), these reinstated and proposed standards (40 CFR Part 191, Subparts B and C) will not apply t any disposal site characterized under the § 113(a) of the Nuclear Waste Policy Act of 1982 (NWPA) (Pub. L. 97-425, 42 U.S.C. 10101 et seq). Those sites, which at this time is only Yucca Mountain, Nevada, will be subject to separate EPA rulemakings which are yet to be promulgated.

Objective and Implementation of Today's Proposed Action

Under authorities established by the AEA, Reorganization Plan No.3 of 1970, and the WIPP LWA, the Agency is proposing certain generally applicable environmental standards for spent nuclear fuel, high-level and transuranic radioactive wastes. As noted above, the WIPP LWA reinstates the effectiveness of the provisions of 40 CFR Part 191 not specifically found problematic by the First Circuit. Accordingly, the scope of today's proposed rulemaking is strictly limited to the provisions of the 1985 standards specifically found problematic by the court--the individual and ground-water protection requirements in §§ 191.15 and 191.16. Today's proposal does not address leaves the balance of the 1985 standards, which remain unchanged. The Agency is proposing to replace §§ 191.15 and 191.16 of the 1985 standards with revised individual and ground-water protection requirements, as described below.

When the revisions in today's proposal are finalized and promulgated as amendments to 40 CFR Part 191, the Nuclear Regulatory

Commission (NRC) and the DOE will be responsible for implementing and enforcing these standards through appropriate regulations or procedures. EPA, under the authority of the WIPP LWA, will be responsible for certifying compliance at the WIPP and will be promulgating criteria for this certification of compliance under a separate rulemaking.

Today's proposed rule applies to disposal of spent nuclear fuel, high-level and transuranic radioactive wastes. In accordance with the WIPP LWA, the proposed rule does not apply to the characterization, licensing, construction, operation, or closure of any site required to be characterized under § 113(a) of the NWPA. The NWPA established a process for selecting and developing potential repositories for disposal of spent nuclear fuel and high-level radioactive waste.

Although developed primarily through consideration of mined geologic repositories, today's proposed rule applies to disposal of waste by any method, with one exception. The standards do not apply to ocean disposal or disposal in ocean sediments. Disposal of high-level waste in this manner is prohibited by the Marine Protection, Research and Sanctuaries Act of 1972, as amended (33 U.S.C.A. 1401 to 1445). If the law is ever changed to allow such disposal, the Agency would need to develop appropriate regulations.

Also today's proposed disposal standards do not apply to waste disposal which occurred before the effective date of the 1985

standards. The provisions of the disposal standards are intended to be met through a combination of steps involving site selection, disposal system design, and operational techniques, e.g., engineered barriers. Therefore, it is appropriate that these disposal standards apply to only disposal occurring since the standards were originally promulgated in 1985 so that they can be taken into consideration in devising the proper selection of controls.

As a related action, the Agency is also proposing an addition to the SDWA underground injection control (UIC) program provisions found in 40 CFR 144.31(a). This revision is intended to define the relationship between Part 191 and the UIC program by establishing that compliance with Subpart C of 40 CFR Part 191 constitutes compliance with the SDWA requirements, and the UIC program requirements, not to endanger underground sources of drinking water consistent with this Part to the extent that such a requirement may apply to a given waste disposal system.

It is important to emphasize that today's proposal does not address Subpart A or the portions of 40 CFR Part 191 which were reinstated by the WIPP LWA; it is strictly limited to the abovedescribed individual and ground-water protection proposals (40 CFR 191.15 and Subpart C) and associated definitions. Thus, EPA will not respond to comments on Subpart A or the reinstated portions of 40 CFR Part 191.

Description of the Proposed Actions

The Agency's proposed actions are described in this section.

Definitions

The Agency is proposing to add several terms, delete several terms, and make changes to several others including:

(1) The addition of a new term, "radioactive material," which means materials with half-lives greater than twenty years and that are subject to the Atomic Energy Act. There may arise circumstances where radioactive materials not presently classified as spent nuclear fuel, high-level, or transuranic wastes are managed or disposed of with these wastes. For instance, NRC recently issued a final rule requiring disposal of "greater-than-Class C" low-level radioactive wastes in a deep geologic repository unless disposal elsewhere has been approved by the Commission (See 54 FR 22578 codified at 10 CFR Part 61). "Greater-than-Class C" wastes are wastes which exceed certain radionuclide concentrations specified by the NRC (10 CFR Part 61). The Agency's proposed definition of radioactive material is intended to ensure that contributions to the radiation dose received by individual members of the public and impacts on ground water from "greater-than Class C" or any other radioactive materials managed or disposed with spent nuclear fuel, high-level and/or transuranic radioactive wastes are covered by the rules proposed today.

1st option - status quo approach pursue

w/n Remand?

OPTIONS FOR DEALING WITH EPA
(Highlighted options are preferred)

Issue No. 1 -- Technical achievability basis. ✓ - Release limits

No

Option 1 -- Limit our comments to recommendations for comparisons with other risks and standards. ✓

**Option 2 -- Informally develop comparisons and provide them to EPA. - "nudge" EPA ✓

Option 3 -- Drop it.

Issue No. 2 -- Jurisdictional matters. ✓

**Option 1 -- Continue to object to assurance requirements, guidance for implementation and compliance demonstration criteria.

No (except for ~~[illegible]~~ provisions)

Option 2 -- Recommend that the Chairman raise the issue with Administrator Riley.

Option 3 -- Drop it.

Issue No. 3 -- Probabilistic format.

**Option 1 -- Continue to recommend adoption of quasi-deterministic alternative. Develop example compliance analyses. - → bucket approach

No

Option 2 -- Recomment adoption of a constant risk limit, i.e., the acceptable size of a release would be inversely proportional to its probability.

Option 3 -- Recommend adoption of a single release limit, e.g., "No credible release shall exceed _____."

Option 4 -- Accept 1985 formulation.

Issue No. 4 -- Stringency. ✓

**Option 1 -- Continue to urge comparisons with other risks and standards, but leave specific arguments about stringency to DOE.

No

Option 2 -- Recommend better evaluations of achievability and critique EPA's technical support.

Option 3 -- Do our own analyses of achievability.

** = staff preferred option

Issue No. 5 -- Population impacts basis.

No **Option 1 -- Continue to defer to EPA on this issue. Recognizing that NRC would have to confront if achievability argument advances.

Option 2 -- Recommend individual protection basis.

Option 2a -- As an addition to the current standards.
Option 2b -- As a replacement.

Option 3 -- Endorse current basis.

Issue No. 6 -- Release limit format.

No **Option 1 -- Recommend retention of release limits. → much easier compliance determination

Option 2 -- Recommend replacement by dose or risk limits.

Issue No. 7 -- 10,000-year period of concern for containment requirements.

No **Option 1 -- Continue to endorse a 10,000-year cut-off.

Option 2 -- Recommend a longer period of evaluation. rely on qualitative language of Part 60 to ensure repository "doesn't just fall apart at >10,000"

Issue No. 8 -- Time period for individual and groundwater criteria.

Yes **Option 1 -- Continue to recommend that EPA demonstrate necessity or achievability.

Option 2 -- Endorse either 1,000 or 10,000 year period. - no basis

Issue No. 9 -- Dose limit for individual protection.

No **Option 1 -- Continue to recommend 25 mrem/yr pre-closure and 10 mrem/yr post-closure. } related to reliance on institutional controls argument

Option 2 -- Recommend 25 mrem/yr.

Issue No. 10 -- As Low as Reasonably Achievable (ALARA).

No **Option 1 -- Continue to object to any explicit ALARA requirement. - Repository already is

Option 2 -- Accept an ALARA criterion.

Can EPA be trusted to scope h.i. scenarios properly? Probably not - leave it to NRC for implementation via Part 60

Issue No. 11 -- Human intrusion.

NO

**Option 1 -- Treat human intrusion like any other potential disruption. (Perhaps expand on Part 60 specifications later.) decline what will be assumed - EPA agrees

AGW -Option 2 -- Recommend development of separate standards for human intrusion. use institutional controls ~~for dec~~

Option 3 -- Develop criteria for Part 60 and recommend that EPA limit its standards to naturally-induced releases. - hard to sell to EPA

Issue No. 12 -- Undisturbed performance. Working Draft 3 - means only undisturbed

No

**Option 1 -- Accept "undisturbed performance" for application of individual and groundwater protection requirements.

Option 2 -- Recommend "anticipated performance." — minority staff view

Option 3 -- Recommend development of individual and groundwater protection requirements for the full range of credible releases.

Issue No. 13 -- Reasonable expectation. (cf. Pt. 60 - reasonable assurance)

No

**Option 1 -- Use current terms and declare them to be identical.

Option 2 -- Urge EPA adoption of "reasonable assurance." because "reasonable assurance" has tried/true legal status

Option 3 -- Use "reasonable expectation" in Part 60.

(see discussion in uncertainty paper)

Issue No. 14 -- Institutional controls.

**Option 1 -- Specify in Part 60 the degree of reliance that is allowable.

No

Option 2 -- Accept EPA's limitations on reliance on institutional controls. (controls disappear after 100 yrs.) - in jurisdictional assurance objection requirements

Option 3 -- Recommend that EPA allow more reliance.

Issue No. 15 -- Monitoring.

NO

Option 1 -- Recommend that EPA back off of its assurance requirement.

Option 2 -- Require post-closure monitoring as EPA specifies.

Option 3 -- Require post-closure monitoring until license termination.

**Option 4 -- Specify in Part 60 any monitoring requirements to be imposed. (not under license - but as a condition for termination of a license)

EPA - convinced that Pt. 60 has no monitoring

Issue No. 16 -- Multiple barriers. — EPA currently has an assurance requirement — requires engineered natural barriers.

No **Option 1 -- Leave well enough alone.

Option 2 -- Recommend that EPA require substantive multiple barriers -- especially for WIPP.

Issue No. 17 -- Guidance for Implementation. (Appendix)

NO **Option 1 -- Recommend deletion of guidance. — Primarily on jurisdictional grounds but also on drilling frequency

Option 2 -- Recommend that EPA provide detailed guidance -- especially for acceptable methods for estimating probabilities. (We would probably have to develop this guidance for EPA.)

Issues considered crucial to NRC's ability to implement the standards: None. We should continue to argue that the 1985 standards were workable, although with difficulty, and that our comments are aimed at easing potential problems rather than correcting an unworkable situation. — Probabilistic framework -

Short-term actions needed:

1. Develop risk comparisons and informally transmit to EPA.

2. Develop example calculations showing how compliance with quasi-deterministic standards could be demonstrated.

(3-bin)

* workable means staff can arrive at a compliance decision even if the stringency/achievability aspects of the standard mean that decision will always be in the negative

STATUS OF EPA'S HLW STANDARDS

Background

-In July, 1987, a Federal Court remanded EPA's HLW standards for further consideration. The bases for the remand were:

-Inadequate explanation for different time periods for different parts of the standards (1,000 vs 10,000 years).

-Inadequate explanation for different protection levels in groundwater and individual protection standards (4 vs 25 mrem/yr).

-Inadequate opportunity for public comment on groundwater protection standards.

-EPA has decided to consider additional revisions when the standards are reissued.

-EPA has released four "working drafts" of its standards. The NRC staff has formally commented on Drafts 2 and 3. Informal comments were provided on the other two.

-NRC has repeatedly raised concerns about the fundamental technical basis underlying the containment requirements of the standards and urged a comparison with risk levels used as a basis for other safety standards. An objection to EPA's "assurance requirements" has also been raised based on jurisdiction.

-EPRI has hosted several workshops for discussion of EPA's working drafts.

-NRC staff has met four times with EPA to discuss specific issues of concern to the NRC and potential regulatory language to address those issues.

-EPA has promised to provide EPA's revised technical support documents to the NRC for review before seeking approval of the Office of Management and Budget for publication of proposed standards.

Status

-EPA has completed specific regulatory language for the standards which responds to previous NRC staff comments regarding the clarity of EPA's standards. The NRC staff is satisfied that EPA's language adequately addresses the NRC staff's concerns. (NRC staff concerns about the technical basis underlying EPA's standards have not yet been addressed.)

-EPA has offered the NRC staff an opportunity for an early review of portions of the technical support for the standards. The NRC staff intends to provide comments to EPA by Sept. 4. (The most substantive portions of EPA's technical support have not yet been received for review. The staff plans to prepare recommendations for the Commission on the acceptability of the revised standards and the technical basis when this review is complete.)

-EPA has asked its Science Advisory Board to review the status of scientific

Enclosure 5

information about the potential for gaseous radionuclide releases, including Carbon-14, from an unsaturated zone repository. The SAB met in June and in August, and will meet again in September to discuss a draft report on this subject.

-DOE commissioned seven items of technical work to be done to support development of EPA's HLW standards. Early drafts of the reports from those seven projects were provided to NRC and EPA for review. Because of the preliminary nature of these analyses, only informal NRC staff comments have been provided to EPA. Although NRC did not always agree with DOE's rationale, staff did not object to the general concepts proposed by DOE in most cases. The final reports of DOE's projects have now been completed, and the staff will observe a review by the National Academy of Sciences to be conducted Sept 23-24.

-In an August 12, 1992, letter to EPA, DOE reiterated its position that the HLW standards are unnecessarily conservative and reflect an unusually low level of risk when compared to other risks accepted by society. The staff has recently addressed this issue of stringency in an August 10, 1992, response to Commissioner Curtiss which indicates that annual individual risks, although strongly dependent on site-specific factors, are generally consistent with other EPA and NRC standards, including the NRC's safety goals for power plants.

Evaluation

-EPA staff has generally been very willing to consider NRC staff comments and recommendations. EPA is expected to adopt several improvements to the wording of its standards. NRC staff concerns about jurisdictional matters have not been addressed, as discussed below.

-EPA does not believe its standards are overly stringent. As noted, EPA intends to provide comparisons with the level of stringency imposed by other standards, but will not generally revise the release limits of the 1985 standards. NRC should continue to urge EPA to provide such risk comparisons to gain acceptance by the public and the technical community.

-It is unclear what EPA will do about the release limit for gaseous carbon-14. Some EPA staff members are searching for technical arguments that could be used to support retention of the 1985 release limit.

-To date, EPA has not been prepared to discuss jurisdictional issues. Several new features of EPA's working drafts deal with implementation or enforcement of EPA's standards, and the NRC has previously objected to such requirements or guidance on jurisdictional grounds.