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Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Docketing & Service Branch

Subject: Transmittal of Comments to 10CFR Part 61, "Licensing Requirement for Land Disposal of Radioactive Waste"

We are pleased to take this opportunity to comment on the proposed rule, 10CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste"

The attached comments are those of the Radwaste Systems Committee (ASME), chaired by Larry Reiter.

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REVIEW COMMENTS OF PROPOSED RULEMAKING

ON LAND DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE - 10CFR61

SUBMITTED BY

CODES AND STANDARDS SUBCOMMITTEE
RADWASTE SYSTEMS COMMITTEE
NUCLEAR ENGINEERING DIVISION OF
AMERICAN SOCIETY OF MECHANICAL ENGINEERS

1. PAGE 38084 - PARA. V, C - WASTE CHARACTERISTICS AND CLASSIFICATION

> "Stability should last long enough for the radioisotopes to decay to levels where they are no longer of concern from the migration standpoint."

What criteria determines the length of time migration concern?

2. PAGE 38087 - PARA. G - OPERATIONAL PHASE

> "At intervals specified in the license (the normal term for materials license is currently five years) the licensee would be required to submit a license renewal application."

Suggest that the site be provided a full term license with subsequent periodic reviews not subject to public hearing. The review should ascertain that the conditions supporting the full term license have not changed significantly.

Paragraphs 61.25 and 62.26 in the proposed regulation provide adequate assurance that licensee-originated changes will receive review by the Commission. New-found issues of national concern that are independently identified by the Commission can be applied on a national basis to the sites as such issues are identified and are not dependent on waiting for a renewal application.

3. PAGE 38087 - PARA. G - INSTITUTIONAL CONTROL BOARD

> "...surveillance to keep people off the site..."

The Institutional Control Board should have the prerogative to determine the extent of site access on a site specific basis.

4. PAGE 38086 - PARA. V, F - MANIFEST TRACKING SYSTEM

> "...to provide copies of the manifest to proceed and accompany shipments..."

The need for a manifest system to assure traceability of waste shipments from a generator through the transporter and finally to the disposal site, is recognized. We question the need for a copy of the manifest preceding the shipment for the following reasons:

1) The copy of the manifest accompanying the shipment will allow the transporter and disposal facility to verify the shipment content.

2) The expressed concern that a missing or delayed shipment would not be detected can be reconciled by other methods such as an independent transmittal of the manifest at the time of shipment or by telephone notification to the receiving facility at the time of shipment.

3) The requirement for the manifest to precede the shipment implies that the shipment should not leave until notification has been received by the shipper that the receiver has received said copy. This can result in a shipment sitting at the initiating site for an extended period while these notices go back and forth.

5. PAGE 38089 - PARA. 61.1(a) -

"...Commission issues licenses, for the disposal for others of radioactive wastes ... set forth in Part 20 of this chapter."

While 10CFR Part 20 covers the disposal of waste by an individual licensee, the quantities are limited to very low levels. The purpose and scope should be rephrased to allow an individual licensee to operate a burial site. The words "for others" and the last sentence to 61.1(a) should be deleted.

6. PAGE 38090 - PARA. 61.2 -

"Disposal" means ... facil ty."

Suggest: "Disposal" the placement of waste in a licensed land disposal facility for radioactive waste.

7. PAGE 38090 - DEFINITIONS

"Near surface" disposal facility means land disposal facility in which radioactive waste is disposed of in or within the upper 15-20 meters of the earth's surface."

It is suggested that this definition be changed to read as follows:

"'Near surface disposal facility' means disposal facility in which radioactive waste is disposed of in or within the upper 15-20 meters of the earth's surface or to whatever greater depth can be demonstrated as capable of meeting the required performance criteria and technical specification."

Rationale: The restriction in or within the upper 15-20 meters could prevent utilization of greater depths at locations where hydrogeological conditions and waste stability characteristics would allow this. The criteria of the proposed regulation are established to prevent exposure to the public by transmittal through ground water flow and to prevent exposure to the intruder. The establishment of an allowable depth should be made on a site-specific basis and with the objective that the criteria will be met. The unsubstantiated establishment of a nationwide depth limit is not in keeping with the logic used throughout the rest of the proposed regulation.

8. PAGE 38090 - PARA. 61.2 -

"Earth's surface" should be defined.

This could be the final surface elevation of the disposal site as used in the site closure and stabilization plan.

9. PAGE 38090 - PARA. 61.2 -

"Stability" should be defined.

It is a basis for separation of Class A and B waste.

10. PAGE 38090 - PARA. 61.3(a) -

Change: (...issued by the Commission pursuant to this part.)

to: (...issued by the Commission pursuant to this part or unless exemption has been granted by the Commission under Paragraph 61.6.)

Rationale: Paragraph 61.3(a) as written would prohibit transfer for land disposal of any radioactive waste to a nonlicensed person. This is overly restrictive and would force the shipment (to a licensed facility) of radioactive wastes that are not of a health or safety concern. The suggested addition to Paragraph 61.3(a) would allow determinations to be made by the Commission on a case-by-case basis where it could be demonstrated that health and safety concerns could be met by alternate disposal methods.

11. PAGE 38091 - PARA. 61.7(a)(1) -

"...uppermost 15 to 20 meters of the earth."

Suggest: Addition of sentence:

(Surface burial deeper than 20 meters may also be satisfactory.)

Rationale: Deeper surface burial may prove satisfactory relative to protection of the public and economics.

12. PAGE 38091 - PARA. 61.7(b)(1) -

"(b) Waste Classification and Near-Surface Disposal.
(1) Disposal of radioactive waste in near-surface disposal facilities has two primary safety objectives: prevention of migration of radionuclides, primarily through groundwater; and prevention of exposure to inadvertent intruders."

A paragraph change to include the following is proposed:

"...has the following safety objectives:

1) Minimize migration by surface and groundwater, and wind effects.

2) Keep personnel dose ALARA.

3) Keep environmental impact within specified limits."

13. PAGE 38091 - PARA. 61.7(b)(2) -

This paragraph states that for certain isotopes a maximum disposal site inventory will be established based on the characteristics of the disposal site.

Because this rule is site capacity and size limiting, criteria such as the isotopes, their maximum permissible inventory, and inventory limiting site characteristics should be established.

14. PAGE 38091 - PARA. 61.7(c)(3) -

Suggest that:

"During the period when the site closure..."

be changed to:

"During the period when the final site closure...".

15. PAGE 38092 - PARA. 61.13 -

It is not apparent what is required for "demonstration" or how analysis will be accomplished. This section should be clarified. This comment also applies to Paragraph 61.2(f)(i)(j). Once buried, the waste is no longer in the "possession" of the licensee.

16. PAGE 38094 - PARA. 61.24(b) -

"The licensee shall submit written statements under oath upon request of the Commission, at any time before termination of the license, to enable the Commission to determine whether or not the license should be modified, suspended or revoked."

It is suggested that this paragraph be deleted.

Rationale: The paragraph is very vague as to intent and method of implementation. It is not clear under what circumstances such an oath would be required and has a direct implication that the licensees are untrustworthy. There are certainly sufficient written transmittals required in

other paragraphs of the proposed regulation to obtain necessary documentation of deliberate falsification of information.

17. PAGE 38094 - PARA. 61.24(h) -

It is suggested that this requirement be deleted.

Rationale: This appears to be inconsistent with 10CFR2.105 which provides the applicant an opportunity to petition for a hearing on any additional requirements or conditions. The "...or thereafter..." is particularly onerous in that it permits the staff to bypass the rules of procedures as described in Part 2 of the chapter. The Commission already has methods to require immediate action by a licensee through either an Emergency Order or a Compliance Order.

18. PAGE 38094 - PARA. 61.25(a) -

It is suggested that this paragraph be changed to read:

> "...approval; (3) those features and procedures which may not be changed without 60 days prior notice to the Commission; and (4) changes that do not impact public health and safety can be made immediately with subsequent notification of the Commission in a timely manner. Features and procedures falling in paragraph (a)(3) of this section..."

Rationale: The necessity to make minor changes that do not impact on the public health and safety occurs routinely during the operation of a facility. The requirements in Paragraph 61.25(a) that no changes can be made without 60 days prior notice to the Commission, are overly restrictive.

19. PAGE 38095 - PARA. 61.29 -

The requirement that the licensee maintain responsibility for the disposal site for a minimum of five years is an open ended requirement. A specific time period should be set. Since this period may need to be extended or possibly shortened as determined by site specifics, it should be included in the site closure plan rather than the regulation.

As currently stated the criteria does not provide sufficient guidance to establish adequate funding. Since wastes will not be received during this period all funding must be derived from fees charged during operation. It is necessary for planning purposes to know the time period over which the licensee will be responsible.

20. PAGE 38096 - PARA. 61-51(7) -

This paragraph states that the disposal site shall be used exclusively for the disposal of radioactive waste. This seems to be unnecessarily restrictive. It should be acceptable to allow disposal of other waste types as long as there is no commingling of the waste types within a disposal facility. Once an acceptable disposal site has been found, maximum use of the site for the isolation/disposal of any environmentally dangerous materials whether they are radioactive or not should be provided.

21. PAGE 38096 - PARA. 61.51(a)(3) -

Remove the words "and improve". An acceptable site must meet site criteria. Improvements, if made, need not be mandatory.

22. PAGE 38096 - PARA. 61.51(a)(4) -

Replace "prevent" with "minimize".

23. PAGE 38096 - PARA. 61.51(a)(6) -

Replace "eliminate" with "minimize".

24. PAGE 38096 - PARA. 61.52(a)(4) -

"Orderly manner" needs further explanation. For example, "orderly manner" may mean like packages together or higher dose packages at the bottom elevations.

25. PAGE 38096 - PARA. 61.55(a)(7) -

"Accurately located" needs further explanation. For example, the drawings or calculations are independently verified, there is a record that the survey instruments have been recently calibrated, or the surveyor is licensed in the site's state.

26. PAGE 38096 - PARA. 61.55(a)(9) -

"Adequate" should be defined.

27. PAGE 38097 - PARA. 61.53(a) -

Suggest that the early warning of radionuclide migration must be given before the migration reaches site boundary.

28. PAGE 38097 - PARA. 61.55 AND TABLE 1 -

The waste classifications scheme presented here with the associated concentration limits presented in Table 1 would have a substantial impact on the nuclear power industry's waste disposal costs and hence, upon the cost of nuclear generated power.

The concentrations given in this Table are much more limiting than is necessary. In the study prepared for the USNRC by Ford, Bacon, & Davis Utah, Inc., "A Radioactive Waste Disposal Classification System," NUREG/CR1005, conservative radioactivity limits for various waste classes were established through detailed hazards analysis. The limits recommended in NUREG/CR1005 should be incorporated into 10CFR61 in place of the arbitrary values in Table 1.

An alternative method of determining the waste classification should be provided. Provisions for classification by external dose determination should be made. For cases where the types of isotopes of concern are known, this method would allow adequate classification. This alternate method would be particularly helpful for nuclear power plant trash. Generally, trash has a very low specific activity compared to the Class A limits. A determination of the radionuclide identity and concentration, as required by Part 20.311, would require the purchase and use of a portable spectrum analyzer. Instead, a contact dose rate measurement of the containerized trash could be made to show that the activities were below the Class A limits. Also, since a radwaste classification system is already established in 10CFR71, is it possible to tie the two systems together?

The logic behind the numbers selected for this table is not apparent. It would appear, for example, that carbon 14 which contains less than 0.8 microcuries per cc may be disposed of as segregated waste but that any concentration greater than 0.8, even if it is only a tiny increase, immediately requires that the disposer seek special permission from the government for disposal. The abrupt demarcation needs explaining so that the logic of it can be understood.

De Minimis Classification of Wastes

Section 61.55, Table 1, should consider a "de minimis" classification of wastes (i.e., wastes that would be considered of non-regulatory concern); we believe strongly that this should be addressed in the proposed 10CFR61 regulation. De minimis levels for uranium, technetium, plutonium, and neptunium should be stated. A de minimis or lower acceptable level for natural and depleted uranium should be stated; we recommend that a value of 0.035 percent natural and depleted uranium be set as a lower limit in Section 61.55, Table 1. Recent information received from Nuclear Regulatory Commission staff members reveals that proposals concerning de minimis levels for uranium are being prepared by the NRC staff that would establish multi-tiered acceptable levels for shallow-land burial of uranium wastes. One level proposed by the NRC would permit disposal of uranium wastes in an unlicensed burial ground (i.e., sanitary type). A second proposal would permit disposal in a shallow-land licensed burial site, and a third proposed level would permit disposal in a shallow-land licensed burial site which has a covenant in the title on the property. These multi-tiered NRC proposals are consistent with out recommended levels. We recommend that de minimis levels consistent with those proposed by NRC relative to ^{99}Tc and low-enriched uranium as residual contamination in smelted alloys

(Addendum to 10CFR Parts 30, 32, 70, and 150) also be stated. In this regard, we recommend that serious consideration be given to establishment of de minimis levels of 3.5 ppm ^{235}U, 5 ppm Tc, 0.01 ppb Pu, and 1 ppb Np.

In Section 61.55, Waste Classification, Table 1, we believe that the maximum concentration for alpha-emitting transuranic isotopes should be increased from the 10 nCi/g limit presently proposed to 100 nCi/g. Part of the rationale behind the 10 nCi/g limit is stated to be that this value has been imposed by DOE; however, DOE is at the present time seriously considering revision of DOE Manual Chapter 0511 to raise this limit to 100 nCi/g dated 7/30/81). The 10 nCi/g value is also inconsistent with the value of 100 nCi/g used by the Environmental Protection Agency in their proposed regulation 40CFR Part 91 for the disposal of spent fuel, high-level, and transuranic (TRU) wastes. This regulation states that TRU wastes containing more than 100 nCi/g of alpha-emitting TRU isotopes must have the same controls as are required for high-level wastes. We recommend that the 100 nCi/g limit be reflected in each of the columns 1-3 in Table 1. We also recommend that a limit of 100 pCi/cm^2 for transferrable surface contamination of alpha-emitting transuranic isotopes (not natural or depleted uranium isotopes) be imposed, consistent with the proposed revision to DOE Manual Chapter 0511.

Additionally, the value of 10 nCi/g is based on naturally occurring radium deposits. Radium is significantly more hazardous than ^{233}U or the transuranium nuclides when dissolved in water, as the MPC's for the soluble forms of these nuclides are about 100 times (1000 times for ^{233}U) greater than that radium. Thus, it would appear reasonable to set activity limits for alpha-emitting transuranic isotopes at 100 times greater.

The supplementary information in the NRC document also states that there is no need to increase this limit from the standpoint of achievability. Much of the waste presently stored as transuranic waste is segregated from low-level waste on the basis of waste origin since the 10 nCi/g limit is too low for accurate measurement and certification. However, segregation according to the 100 nCi/g limit could be achieved, eliminating expensive retrievable storage and deep geologic disposal of "suspect" transuranic waste.

Another concern is the footnote to Table 1 that refers to isotopes contained in metals, metal alloys, or permanently fixed on metal as contamination. The footnote, which states that "the values above may be increased by a factor of ten," should be modified to include concrete and other media that exhibit low leach rate behavior. An incentive should be provided to reduce the volume of wastes by incineration or metal smelting. These treatments may normally be avoided by waste generators since they would convert some low-level wastes into transuranic wastes. For example, a volume reduction of 30 by incineration of a waste containing 5 nCi/g would convert a low-level waste into a transuranic waste at 150 nCi/g. However, the residual ashes could be incorporated into concrete, glass, metal, etc. The leach rate of transuranic isotopes from these materials

is very low (i.e., many orders of magnitude lower than the untreated waste form). Thus, a combination of leach rate and transuranic content could be used to determine the disposal options for these waste forms.

Many of the nuclide concentrations limits may not provide a practical basis for classification. In many cases, the measurements are difficult and some are almost impossible. Perhaps the Commission would specify practical analytical methods acceptable for determining nuclide concentration.

Table 1, Footnote 4

a) The term "significant gamma radiation" should be defined.

b) How is radium treated? A value should be established.

c) The footnotes place a restriction on wastes containing chelating agents in concentrations greater than 0.1%. Is this limit intended to be 0.1% by weight or volume? This limit is too low, many agents were developed to decontaminate piping and equipment to reduce radiation levels to workers. A restriction on the solidified product of 0.1% might cause utilities to not use them because of the restriction on disposal and then let radiation levels rise.

29. PAGE 38097 - PARA. 61.58(a)(1) -

It is suggested that this paragraph be changed to read:

"...and of the Department of Transportation set forth in 49CFR Parts 171-179, as applicable. In the case of unpackaged (bulk) shipments, these must meet the requirements of 49CFR173.392."

Rationale: The proposed regulations should provide for the shipment of bulk (unpackaged) wastes under conditions that comply with Department of Transportation requirements for such wastes and that the wastes can meet the proposed Part 61 criteria when disposed of at the burial facility. A requirement on packaging would serve no useful purpose under these circumstances and should not be imposed.

30. PAGE 38097 - PARA. 61.56(a)(7) -

Suggest that this paragraph be changed to read

"...that does not significantly exceed atmosphere at 20 degress C."

31. PAGE 38098 - PARA. 61.56(b) -

"Stability for 150 years" needs to be modified to indicate what forms of proof are acceptable. Some metal, wooden, and concrete structures

can be shown to have maintained their "stability" for 150 years past. Very few of these are applicable to waste packaging. There is no way that deformation alone of the waste form can be a hazard to the public. The key requirement is to keep the waste from being dispersed, which is little affected by "slumping" or a "5%" deformation.

It is suggested that Paragraph 61.56(b)(1) be changed to read as follows:

> "Waste must have structural stability. A structurally stable waste form will maintain its general physical dimensions and form under the expected disposal conditions and factors such as the presence of moisture and microbial activity, and internal factors such as..."

Rationale: The requirement of withstanding a compressive load of 50 psi (more than 7,000 pounds per square foot) appears to be a very rigorous loading requirement and is above that available from many soils. If it is still felt that a numerical value is necessary, then consider one of these approaches:

- Make the compressive load requirement for the waste when buried no more than that of the surrounding soils at the site under consideration.
- Evaluate a structural approach recognizing that the waste is constrained by surrounding soil and other wastes. This could conceivably reduce the compressive load requirement by a tenfold magnitude and still have an adequate safety factor.

Similarly, requiring that the waste retain its form within 5% under loading is a very rigorous requirement and using the second potential approach listed above, could be eased or eliminated.

The 5% limitation on physical waste form is too restrictive for stable, solidified, structurally strong waste handling. If applied to the drum-container-liner outer dimensions rather than to the solidified waste itself. In this case, drums-containers-liners which are typically filled to 80% to avoid spills/splashing during the filling procedureprovide handling appurtenances and a clean surface for filling-transportation-burial actions. Once in the ground, these may be breached or oxidized in time, leaving the contained solidified and stable waste without effect on safety to the public or environs.

32. PAGE 38098 - PARA. 61.56(b)(2) -

"Non-corrosive liquid" should perhaps be changed to "liquid". If the intent of this article is to minimize corrosivity it should say so instead of setting arbitrary limits. Is the radioactivity in the liquid of any concern? Is there intent to limit the amount of "clean" water in the container?

33. PAGE 38098 - PARA. 61.56(b)(3) -

It is suggested that this paragraph be deleted.

Rationale: This is a very subjective statement and open to varying degrees of interpretation. Does this mean that filler material must be added to packages containing irregularly shaped solid objects? Or is it the intent of this article that all such objects should somehow be chopped, melted, or otherwise compacted? What forms are acceptable, i.e., ash, pellets, compressed trash? The goal of reducing the void spaces in a waste package is desirable and will be attained because of economic incentive independent of regulations.

34. PAGE 38098 - PARA. 61.57 -

These labeling requirements should be expanded, clarified, and made more specific.

35. PAGE 38100 - PARA. 61.82 -

Eliminate radioactive waste already disposed of and covered from NRC inspection requirement.