

Additional Information on Hanford Tank Wastes

Introduction

The U. S. Nuclear Regulatory Commission (NRC) and its predecessor, the U. S. Atomic Energy Commission (AEC) have long established that radioactive hulls and other irradiated and contaminated fuel structural hardware are not encompassed in the definition of high-level waste.

Discussion

As communicated in the March 18, 2005 letter from the Department of Energy to the U. S. Environmental Protection Agency addressing the Hanford Tank and K Basin Wastes (CBFO:AMO:RP:KJB:05-0217:UFC5486), the Department has applied this policy in determining the cladding removal waste stored in two tanks (designated as tanks 241-AW-103 and 241-AW-105) at the Hanford Site are not high-level waste. The Department's March 18, 2005 letter stated "... This determination continues the position established by the Atomic Energy Commission in 1969 that cladding hulls (removed from spent fuel by mechanical rather than chemical means) are not HLW." The Department did not mean to communicate the NRC has drawn a distinction between processes that use chemical versus mechanical means to separate radioactive hulls from irradiated reactor fuel, since it is evident that the NRC never created such a distinction. Instead, the Department was communicating that a chemical process was used at the Hanford Site as opposed to a mechanical process used by some commercial reprocessing facilities to separate the radioactive hulls from irradiated reactor fuel. Radioactive hulls are the material encasing the irradiated reactor fuel and are sometimes referred to as cladding or coating materials. Applicable excerpts, from NRC and AEC policy statements regarding radioactive hulls and other irradiated and contaminated fuel structural hardware as not being encompassed in the high-level waste definition, are cited below.

This long standing policy was first discussed in the June 3, 1969 federal register in a proposed rule making¹. In this proposed rule making, the AEC proposed adding an Appendix D to Title 10 Part 50 of the code of federal regulation (CFR) in which the AEC stated:

"1. Public health and safety considerations relating to commercial fuel reprocessing plants do not require that such facilities be located on land owned and controlled by the Federal Government. Such plants, including the facilities for the temporary storage of high-level liquid radioactive wastes, may be located on privately owned property. (For the purpose of this statement of policy, "high-level liquid radioactive waste" means those aqueous wastes resulting from the operation of the first cycle solvent

¹ AEC, 1969, Siting of Commercial Fuel Reprocessing Plants and Related Waste Management Facilities; Statement of Proposed Policy, 10 CFR Part 50, 'Licensing of Production and Utilization Facilities', 34 FR 8712, Atomic Energy Commission, Washington, D.C., June 3, 1969.

extraction system and the concentrated wastes from subsequent extraction cycles in a facility for reprocessing irradiated reactor fuels.) ...

6. Radioactive hulls and other irradiated and contaminated fuel structural hardware may be disposed of by one of the following methods:

- (a) Disposal in the same manner as high-level wastes; or*
- (b) Disposal at a licensed waste burial facility located on land owned by the Federal Government or by a State government as required by § 20.302 of this chapter.” (at present 10 CFR 20.2002)*

After public comment, the AEC adopted this proposed statement of policy² in November of 1970:

“The text of the statement of policy set out below is the same as that published for comment on June 3, 1969, except for minor editorial changes and (1) the redesignation of the appendix as Appendix F of 10 CFR Part 50; (2) the revision of the definition of “high-level liquid radioactive wastes” in paragraph 1 of the appendix to clarify its application to fuel reprocessing systems other than solvent extraction; (3) the revision of paragraph 2 of the appendix to include a specification of AEC-approved solid waste form; (4) the inclusion of a statement in paragraph 4 of the appendix to indicate that the decontamination to be required upon decommissioning will be the subject of criteria which the Commission will develop in consultation with competent groups; (5) the deletion of the previously proposed paragraphs 6 and 7 of the appendix dealing with ultimate disposal of miscellaneous solid wastes generated at fuel reprocessing facilities in view of current AEC studies which the Commission anticipates may result in proposed amendments to its regulations identifying certain radioactive materials deemed unsuitable for disposal onsite or at licensed, privately owned land burial facilities; and ...”

The decision by the AEC in 1970 to delete paragraphs 6 and 7 from the appendix did not mean the Commission had modified its policy regarding radioactive hulls and other irradiated and contaminated fuel structural hardware being excluded from the definition of high-level waste. In announcing the decision to adopt this appendix, the AEC stated³:

“The proposed policy statement, as previously published, also included provisions designated as paragraphs 6 and 7 of the policy, which related to the disposal of radioactive hulls and other solid wastes resulting from

² AEC, 1970, Siting of Commercial Fuel Reprocessing Plants and Related Waste Management Facilities, 10 CFR Part 50, ‘Licensing of Production and Utilization Facilities’, 35 FR 17530, Atomic Energy Commission, Washington, D.C., November 14, 1970.

³ Ibid 2, 35 FR 175332

operation of fuel reprocessing plants. Since publication of the proposed policy, the Commission has undertaken studies in connection with the ultimate disposal of wastes contaminated with plutonium or other transuranium nuclides. The Commission anticipates that these studies may result in amendments to its regulations identifying certain radioactive materials deemed unsuitable for disposal at licensed, privately operated land burial facilities.”

As evident from this statement, the Commission was contemplating revising its regulations for disposal of wastes contaminated with plutonium or other transuranium nuclides, such as radioactive hulls, in land burial facilities.

Further evidence that the NRC has not modified its policy regarding radioactive hulls is found in the *Advanced Notice of Proposed Rulemaking; 10 CFR Part 60, Definition of High-Level Radioactive Waste*⁴, in which the Commission stated:

“As used in Appendix F, “high-level waste” thus refers to the highly concentrated (and hazardous) waste containing virtually all the fission products and transuranic elements (except plutonium) present in irradiated reactor fuel. The term does not include incidental wastes resulting from reprocessing plant operations such as ion exchange beds, sludges, and contaminated laboratory items, clothing, tools and equipment. Neither are radioactive hulls and other irradiated and contaminated fuel structural hardware within the Appendix F definition.”¹

¹ See 34 FR 8712, June 3, 1969 (notice of proposed rulemaking), 35 FR 17530 at 17532, November 14, 1970 (final rule).

The NRC has further reaffirmed its policy regarding the exclusion of radioactive hulls from the definition of high-level waste in denying a petition by the States of Washington and Oregon to revise the definition of high-level waste⁵. In addressing the classification of DOE reprocessing wastes at the Hanford and other sites, the Commission stated:

“At Hanford and other sites, questions have arisen regarding the classification of reprocessing wastes for which DOE must provide disposal. In the longstanding view of the Commission, these questions must be resolved by examining the source of the wastes in question. The reason for this is that when Congress assigned to NRC the licensing authority over certain DOE facilities for “high-level radioactive wastes,” the Congress was referring to those materials encompassed within the meaning of the term “high-level radioactive waste” in Appendix F of 10

⁴ NRC, 1987, *Advanced Notice of Proposed Rulemaking; 10 CFR Part 60, ‘Definition of High-Level Radioactive Waste’*, 52 FR 5992, U.S. Nuclear Regulatory Commission, Washington, DC, February 27, 1987.

⁵ NRC, 1993, *Denial of petition for rulemaking; 10 CFR Part 60, ‘States of Washington and Oregon: Denial of Petition for Rulemaking’*, 58 FR 12342, U.S. Nuclear Regulatory Commission, Washington, DC, March 4, 1993.

CFR Part 50. (For a full statement of this position, see the discussion presented in the Commission's advanced notice of proposed rulemaking, "Definition of High-Level Radioactive Waste" (52 FR 5993, February 27, 1987).) Accordingly, any facility to be used for the disposal of "those aqueous wastes resulting from the operation of the first cycle solvent extraction system, or equivalent ..." as HLW is defined in Appendix F to Part 50, must be licensed by the NRC. Most of the wastes storage tanks at Savannah River (South Carolina), West Valley (New York) and Hanford contain wastes that meet this definition, and the facilities to be used for disposal of these wastes are, therefore, potentially subject to NRC licensing jurisdiction.

However, when the Appendix F definition was promulgated, the Atomic Energy Commission specifically noted that the term HLW did not include "incidental" waste resulting from reprocessing plant operations, such as ion exchange beds, sludges, and contaminated laboratory items such as clothing, tools and equipment. Neither were radioactive hulls and other irradiated and contaminated fuel structural hardware encompassed by the Appendix F definition."

Conclusion

The above body of information testifies to the NRC (and its predecessor AEC) having established over the past 36 years a policy that excludes radioactive hulls (i.e. cladding) from the definition of high-level waste. The NRC (and its predecessor AEC) did not define the process used to separate radioactive hulls from irradiated reactor fuel. As stated earlier, the Department has applied this policy in determining the cladding removal waste stored in two tanks (designated as tanks 241-AW-103 and 241-AW-105) at the Hanford Site are not high-level waste.