POLICY ISSUE
(Information)

August 19, 1988 — SECY-88-238

For: The Commissioners

From: Victor Stello, Jr.
Executive Director for Operations

Subject: NRC LICENSING OF THE DISPOSAL OF HIGH-LEVEL HANFORD DEFENSE WASTES

Purpose: To inform the Commission of the status of the staff's review of the Final Environmental Impact Statement (FEIS) on the disposal of Hanford wastes.

Discussion: The U.S. Department of Energy (DOE) issued an FEIS entitled "Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes," DOE/EIS-0113, in December 1987. The staff reviewed the FEIS to evaluate DOE's response to the U.S. Nuclear Regulatory Commission's (NRC's) comments on the Draft Environmental Impact Statement (DEIS), (see SECY 86-266, September 8, 1986). The staff's review focused on the disposal of high-level tank waste, since these are the only wastes over which NRC has potential licensing jurisdiction.

DOE published a Record of Decision (53 FR 12449, April 14, 1988) implementing the "preferred" alternative presented in the FEIS. Under this alternative, DOE will proceed with the disposal of the twenty-eight double-shell tank wastes. The "preferred" alternative provides a strategy for separating the double-shell tank wastes into high-activity and low-activity fractions. The high-activity fraction would be encapsulated in borosilicate glass and disposed of in a geologic repository. The low-activity fraction would be solidified in a cement-based grout and disposed of near-surface at the Hanford site.

DOE's "preferred" alternative also defers disposal decisions on certain classes of wastes, including the wastes in the one hundred and forty-nine single-shell tanks, until additional information is obtained to support

Contact:
Chad Glenn, LLRB
492-0567

those decisions. DOE anticipates that a Supplemental Environmental Impact Statement (SEIS) will be prepared before any decision is made about the disposal of single-shell tank wastes.

Section 202(4) of the Energy Reorganization Act of 1974 (ERA) gives the Commission licensing authority over any facilities expressly authorized for the long term storage or disposal of defense high-level wastes (HLW). The ERA does not define HLW, but HLW was defined in the Commission's regulations (10 CFR Part 50, Appendix F) at the time the ERA was passed. The Appendix F definition refers to the source of a waste, rather than the concentration of radionuclides in the waste. In Appendix F, HLW was defined as "those aqueous wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuels." In the view of the NRC staff, the Appendix F definition of HLW is the appropriate one for determining which Hanford wastes are subject to NRC licensing authority (see SECY-86-328, November 7, 1986). Contrary to the staff's view, DOE employs a concentration-based definition for HLW rather than NRC's source-based definition. Consequently, DOE and NRC may have a different view of what wastes are HLW.

At Hanford, the question of NRC licensing authority has been further complicated by the mixing of wastes from various sources over the years. This mixing has changed the original characteristics of the wastes. Consequently, double-shell tank wastes consist of reprocessing wastes commingled with wastes from other sources. Therefore, additional consideration needs to be given to reprocessing wastes which have been commingled with wastes from other sources, or which have received further processing after separation from irradiated reactor fuel, in order to determine how, or if, mixing has changed the classification of tank wastes.

The principal issue identified by the staff in its review of the FEIS concerns the classification of tank wastes. NRC addressed the classification of tank wastes in its

comments on the DEIS. In its comments on the DEIS, NRC stated that "if DOE believes that subsequent processing of the tank waste may have altered the classification of some of the materials being stored, more detailed waste classification information would be necessary to support that view." The staff is presently evaluating the various waste streams at Hanford and DOE's plans for processing that waste to establish whether any change in waste classification is warranted. The staff's position on the classification of reprocessing waste and NRC regulatory authority over Hanford defense HLW is summarized in Enclosure 1.

In the FEIS, DOE responded to NRC's DEIS comment by stating that "it is inappropriate at this time to describe the single-shell tank waste as high-level waste as defined in the Nuclear Waste Policy Act of 1982 (NWPA). At present there is no approved numerical value or values of radioactivity level that would lead DOE to the conclusion that wastes in the single-shell tank would be classified as highly radioactive." This statement implies, contrary to the position presented by the staff, that NWPA and radioactivity levels, rather than source, might be used to determine whether NRC has licensing jurisdiction. Radioactivity levels could be employed, of course, in determining whether disposal methods permitted under 10 CFR Part 61 might be appropriate and acceptable - but these levels would not affect the issue of licensability.

On June 9, 1988, the staff met with DOE to gain a better understanding of DOE plans on the disposal of waste in the twenty-eight double-shell tanks. As a result of this meeting, NRC and DOE agreed that: (1) the phosphate/sulfate wastes in two of the twenty-eight tanks are clearly low-level waste, since these wastes were never associated with reprocessing of irradiated reactor fuel; (2) the neutralized current acid waste in two other tanks, which consists predominantly of reprocessing wastes, is high-level waste; and (3) further discussion would be needed to determine the classification of the waste in the remaining twenty-four double-shell tanks. Meeting minutes were developed and signed by NRC and DOE, documenting these points.

After this meeting, the staff forwarded a letter (Enclosure 2) to DOE summarizing NRC's current position on the disposal of the double-shell tank wastes. The staff will continue to work with DOE to resolve outstanding questions on the classification of tank wastes and NRC licensing authority over the disposal of these wastes.

The Office of the General Counsel concurs in the discussion of "high-level waste" and has no legal objection to the approach being followed by staff in dealing with DOE on this matter.

Victor Stello, Jr.
Executive Director
for Operations

Enclosures:
1. Rationale for staff position
2. NRC letter to DOE

DISTRIBUTION:
Commissioners
OGC
OI
OIA
GPA
REGIONAL OFFICES
EDO
ACRS
ACNW
ASLBP
ASLAP
SECY

ENCLOSURE 1

RATIONALE FOR NRC REGULATORY AUTHORITY

In 10 CFR Part 50, Appendix F, high-level radioactive waste (HLW) was defined in terms of the source of the material rather than its radionuclide concentration. Specifically, HLW was defined as "those aqueous wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuels." As used in Appendix F (and hence in the Energy Reorganization Act of 1974), "HLW" refers to the waste containing virtually all of the fission products and transuranic elements (except plutonium) present in the 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. Incidental wastes generated in the further treatment of HLW would also, under the same reasoning, be outside the scope of the Appendix F definition.

The NRC staff considers incidental wastes to include those wastes that result from the further processing of HLW for the purpose of enhancing the HLW product (e.g., volume reduction) or removing non-radioactive materials that were added to the HLW for improved processing and/or subsequent storage (e.g., the addition of alkaline materials to neutralize acidic HLW). The NRC would consider the resultant wastes to be incidental wastes if a diligent effort is made to remove, to the extent practicable, transuranic elements and fission products from the material so that the resultant wastes are essentially decontaminated from a radiological standpoint.

At DOE's Savannah River Plant, acidic HLW is neutralized, causing virtually all transuranic radionuclides and some fission products to precipitate. The remaining liquid is then processed further to remove cesium and strontium from the liquid. The decontaminated liquid is then evaporated to produce a decontaminated salt (salt cake). Thus, the decontaminated salts resulting from the processing of the Savannah River HLW were considered by the NRC to be non-HLW or "incidental wastes" resulting from the further processing of liquid HLW, and the sludges and cesium and strontium are considered HLW.

The proposal made by DOE in the Hanford "Final Environmental Impact Statement" (FEIS) departs from the philosophy used at Savannah River. At Hanford, "low-activity waste" is any waste where concentrations of radionuclides do not exceed the Class C limits of 10 CFR Part 61. It is not clear that such wastes would receive any additional processing for removal of radionuclides. Instead, the low-activity fractions of the Hanford wastes would be candidates for grouting and subsequent disposal in a shallow land burial facility. It appears from the Hanford FEIS that these "low-activity" wastes are not a result of further processing of HLW and, therefore, would not obviously fall within the concept of incidental wastes.

Section 202 of the Energy Reorganization Act of 1974 (ERA) gives the NRC licensing authority over facilities authorized for the express purpose of subsequent long-term storage of HLW. Since it is not obvious that the "low-activity" wastes at Hanford are incidental wastes resulting from the further processing of HLW, they remain HLW. Thus, even though DOE intends to dispose of these wastes in a near-surface facility (and this may be technically prudent), that facility would be subject to NRC licensing, if authorized pursuant to Section 202 of the ERA.

ENCLOSURE 2

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

JUL 11 1988

Michael J. Lawrence, Manager
U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

Dear Mr. Lawrence:

As you are aware, NRC and DOE staffs met on June 9, 1988 to discuss DOE's plans to dispose of double-shell tank wastes and NRC concerns with respect to the classification of waste in these tanks. I have enclosed the signed meeting minutes for your information.

As a result of this meeting, NRC gained a better understanding of the classification of wastes in the twenty-eight double-shell tanks. First, DOE and NRC staff agreed that the phosphate-sulfate waste (PSW), presently stored in two tanks at Hanford, is clearly low-level waste since it does not arise from reprocessing of spent fuel. Second, it was established that two double-shell tanks contain neutralized current acid waste (NCAW) from reprocessing, and these wastes are high-level waste. Third, it was agreed that additional meetings would be necessary to reach a consensus on the classification of wastes in the remaining twenty-four double-shell tanks.

I think it may be difficult to proceed without NRC and DOE agreement on the definition for high-level waste. As you know, the NRC position is that the definition in 10 CFR Part 50, Appendix F is the applicable definition for determining whether or not a particular waste stream is high-level waste. I believe DOE and NRC consensus on this point is necessary to provide an adequate foundation for future discussion on this matter. Recently, I also had the opportunity to discuss my concerns with Tom Hindman, Director of DOE's Defense Programs.

I have instructed my staff to arrange for a second meeting with your staff and DOE Headquarters staff in order to resolve the outstanding issues relating to the disposal of radioactive wastes at Hanford. If you have any questions concerning this letter, please do not hesitate to contact me.

Sincerely,

Hugh L. Thompson, Jr., Director
Office of Nuclear Material Safety
and Safeguards

Enclosure:
As stated

cc: T. Hindman, DOE

NRC - DOE MEETING

ON DISPOSAL OF HANFORD DEFENSE WASTES

Date: June 9, 1988

Time: 2:00-5:00 PM

Location: 4B11-NRC White Flint Bldg., Rockville, MD

List of Attendees: See Attachment 1

Summary: NRC and DOE staff met to discuss disposal plans for the Hanford double-shell tank wastes. The meeting objectives were as follows:

1. To provide an opportunity for DOE to present information on their plans to dispose of double-shell tank wastes within the scope of the Hanford Defense Waste-Environmental Impact Statement (HDW-EIS).

2. To provide an opportunity for the DOE to present information on their plans to dispose of Hanford phosphate-sulfate wastes (PSW) from N-Reactor decontamination.

3. To provide an opportunity for NRC to discuss their views and concerns with DOE.

4. To identify possible future interactions between NRC and DOE.

DOE's presentation (Attachment 2) identified six different waste streams that it intends to process at Hanford for disposal. These include: (1) phosphate-sulfate waste (PSW); (2) plutonium finishing plant waste; (3) cladding removal waste; (4) neutralized current acid waste; (5) double-shell slurry feed; and (6) double-shell slurry.

DOE indicated that it intends to initiate processing of the PSW in July 1988 by grouting and disposing of the grout in a shallow land burial facility at Hanford. The PSW wastes are a result of primary loop decontamination of N-Reactor and ion-exchange wastes. DOE indicated that these wastes have been segregated from other Hanford wastes and are clearly low-level wastes. NRC agrees with DOE that these wastes are low-level wastes. NRC staff indicated that it sees no reason why DOE could not proceed to dispose of these wastes as scheduled.

DOE intends to treat the neutralized current acid wastes (NCAW) as high-level waste. Cesium would be removed from the supernate and combined with sludge containing strontium and other precipitated radionuclides and then vitrified into borosilicate glass for eventual disposal in a geologic repository. DOE

indicated that the treated supernate would be mixed with grout and disposed of as low-level waste.

DOE indicated that it intends to treat the remaining four categories of wastes as non-high-level waste and to pretreat as necessary and dispose of them via the grout facility. Both NRC and DOE staff concluded that more discussions are needed to clarify the classification of wastes in the remaining four categories. DOE extended an invitation to the NRC staff to visit the Hanford site and view the project facilities that are currently in place. Additional discussions on waste classification could take place at that time.

The NRC reiterated that the source-based definition set forth in 10 CFR Part 50, Appendix F is the applicable definition for determining whether or not a particular radioactive waste stream is high-level waste.

D. M. Smith 7/5/88.

for Ronald E. Gerton
U. S. Department of Energy

Regis R. Boyle 6/28/88

Regis R. Boyle
U. S. Nuclear Regulatory Commission