

DOCUMENT RESUME

00191 - [A0751622]

Issues Related to the Closing of the Nuclear Fuel Services, Inc., Reprocessing Plant at West Valley, New York. March 8, 1977. 15 pp.

Testimony before the House Committee on Government Operations: Conservation, Energy and Natural Resources Subcommittee; by Monte Canfield, Jr., Director, Energy and Minerals Div.

Issue Area: Energy: Making Nuclear Fission a Substantial Energy Source (1608).

Contact: Energy and Minerals Div.

Budget Function: Natural Resources, Environment, and Energy (300).

Organization Concerned: Energy Research and Development Administration; New York: Energy Research and Development Authority; Nuclear Fuel Services, Inc.; Nuclear Regulatory Commission.

Congressional Relevance: House Committee on Government Operations: Conservation, Energy and Natural Resources Subcommittee.

The West Valley, New York, nuclear reprocessing plant operated by Nuclear Fuel Services, Inc., was the only commercial reprocessing facility operating in the United States. The plant was closed in 1972. While the Nuclear Regulatory Commission (NRC) believes that the waste tanks at West Valley are in good condition, estimating tank life is unpredictable. The waste tanks may not meet current NRC seismic criteria. Physical and chemical characteristics of the high-level waste sludge contained in the tanks are not completely known, and removal of the sludge presents a large problem. Technology is being developed for solidifying and disposing of nuclear waste, but such information will not be available for several years. It is unlikely that the West Valley plant will ever operate again because of: (1) substantial costs (\$615 million) needed to expand plant capacity and to meet NRC standards; and (2) the plant design may not be susceptible to modifications to lower radiation exposure to workers. No plans have been developed to decommission the West Valley Site; the State of New York is ultimately responsible for managing and disposing of radioactive waste. (RES)

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

FOR RELEASE ON DELIVERY
Expected at 9:30 a.m.
Tuesday, March 8, 1977

STATEMENT OF
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BEFORE THE
SUBCOMMITTEE ON CONSERVATION, ENERGY & NATURAL RESOURCES
HOUSE COMMITTEE ON GOVERNMENT OPERATIONS
ON
ISSUES RELATED TO THE CLOSING OF THE
NUCLEAR FUEL SERVICES, INCORPORATED
REPROCESSING PLANT AT WEST VALLEY, NEW YORK

Mr. Chairman and Members of the Subcommittee:

We welcome the opportunity to be here today to discuss with you our report on the issues related to the closing of the West Valley nuclear reprocessing plant operated by the Nuclear Fuel Services, Incorporated (NFS). The West Valley site was the only commercial reprocessing facility that operated in the United States. The site consists of a reprocessing plant, four high-level liquid storage tanks containing about 612,000 gallons of waste, a high-level burial ground containing about 100,000 cubic feet, and a low level burial ground containing about 2 million cubic feet of solid radioactive wastes. NFS ceased operations in 1972.

The issues surrounding nuclear reprocessing and waste management are both important and complex. Their satisfactory resolution involves analysis of complex social, political,

and institutional questions. We cannot, based on our work at West Valley, offer a comprehensive perspective on these issues nor can we offer definitive means of resolving many of the issues relating to the closing of this plant. We feel, however, that the results of our work deal with many of the aspects of these issues in sufficient depth to be useful to this Subcommittee and others in the Congress in deliberations on this important matter.

Let me briefly highlight some of the major observations contained in our report.

--While the Nuclear Regulatory Commission (NRC) believes that the waste tanks at West Valley are in good condition, estimating tank life is unpredictable. We believe more work needs to be done on a priority basis before a reasonable judgment can be made that the waste tanks are safe. Specifically, such work should consist of (1) reviewing quality assurance data to determine that proper techniques were used in constructing the tanks, (2) assessing the present condition of the tank vault system, and (3) assessing the characteristics of the soil surrounding the vault system.

--The waste tanks may not meet current NRC seismic criteria. It is not known whether the tanks would rupture in case of an earthquake of the magnitude

likely for the area. The structural integrity of the NFS tanks was questioned by AEC in 1970 because the design of the tanks--while supposedly meeting building code requirements at the time of construction--was not acceptable for its existing seismic requirements. These requirements have since been upgraded even more.

--The physical and chemical characteristics of the high-level waste sludge contained in the tanks at West Valley are not completely known. Without such knowledge it will be virtually impossible to select an appropriate removal and solidification process for this waste sludge. Removing the sludge from the tanks presents an immense problem, because of design obstructions in the bottom of the tanks.

--The Energy Research and Development Administration (ERDA) is developing technology for solidifying and disposing of nuclear waste. Information from ERDA's effort is not likely to be available for 2 to 5 years, nor is criteria under which NRC will approve long term management processes. Both of these efforts must be completed before decisions on NFS waste management alternatives are made.

--It is unlikely that the West Valley reprocessing plant will ever operate again because (1) of the substantial costs (\$613 million) to make the necessary modifications to expand the plant's capacity and to meet current NRC standards and (2) the plant design may not readily be susceptible to modifications which would lower the radiation exposures to workers to a level acceptable to NRC because certain routine maintenance operations require plant personnel to work in radioactive areas.

--To date, NFS and the New York Energy Research and Development Authority have not developed plans to decommission the West Valley site. Before such decommissioning plans can be prepared, NRC needs to develop decommissioning guidelines for reprocessing plants. NRC has been working on such guidelines for over 6 years, and does not know when they will be completed. It is important that guidelines be developed so that reliable cost estimates of decommissioning and long term perpetual maintenance of radioactive material at reprocessing plants such as West Valley can be developed.

Our observations directly relate to the three key questions now confronting the State of New York, NRC, and ERDA.

What can be done with the reprocessing plant and wastes? How much will it cost? Who will be responsible?

Before decisions can be made on what to do with the high-level liquid wastes, ERDA has to do years of additional research. Furthermore, before reprocessing plant and burial ground decommissioning plans can be developed, the State of New York will have to decide on the future use of the West Valley site, and NRC will have to develop decommissioning guidelines.

Because decisions have yet to be made on plant and site decommissioning, NFS cost estimates for waste disposal and decommissioning are not available. An ERDA contractor has estimated that the cost of waste disposal at NFS would range from \$58 million to \$567 million. The contractor study did not cover the cost of decommissioning the plant. However, the contractor has estimated that it would cost from \$19.7 million to \$65.7 million to decommission the Barnwell reprocessing plant. The estimates for waste disposal at NFS could be misleading because of the use of questionable cost data, errors in computations, and inconsistent pricing and computation methods. For example, estimated costs for two carbon steel tanks were about \$2 million; however, actual construction costs for similar tanks built by an ERDA contractor were \$6.5 million.

The key to estimating decommissioning costs is the decision on the future use of the West Valley site.

Returning portions of the reprocessing plant site to its natural condition would require completely dismantling the plant and decontaminating the site. The areas used for the high-level burial ground and the low-level waste burial grounds will require perpetual care, and thus preclude returning the other portions of West Valley to its original state.

By contractual agreement, the State of New York is ultimately responsible for managing the radioactive waste at the site, and for care and disposal of the wastes. However, the State maintains it is incapable of resolving the many technical issues without substantial assistance from the Federal Government.

The rest of my testimony will address what must be done before the NFS issues can be resolved. It will also discuss the question of who is responsible.

NFS NEEDS TO CONFIRM THE
SAFETY OF THE WASTE TANKS

From what is known about the high level waste tanks, NRC has concluded that they are in good condition and can store the waste for the foreseeable future. Although NRC is currently assessing the tanks' capability to withstand an earthquake of the intensity postulated for the area, we believe that more work is needed to confirm the safety of the tanks. For example, in April 1965 an accumulation of water in the

vault excavation area floated the concrete vaults, with the steel tanks inside them, out of the ground as much as 3 or 4 feet before they settled back to new positions. This placed high stresses on the concrete and reinforcing steel. Inspections of the vault now used for the spare tank revealed several cracks to the bottom of the vault and the roof. The bottoms of both vaults were resupported with concrete. At the time of the incident, the construction contractor concluded that all of the stress was placed on the vaults and not on the steel tanks inside. Although the contractor did not submit any inspection data or engineering analyses to support this conclusion, AEC agreed, and did not require any re-examination of the welds on the steel tanks.

We believe NRC should assess the condition of the vaults, in view of the vault floatation incident. In addition, NRC should assess the soil characteristics to determine whether it would contain the wastes in the event of a breach in the tank system.

NRC SHOULD ANALYZE THE HIGH-LEVEL LIQUID WASTE PROPERTIES

The high-level waste stored in one tank was "neutralized." Neutralizing the chemically acid waste permitted NFS to store the waste in tanks constructed from carbon steel, rather than more expensive stainless steel. Neutralization caused some of the radioactive materials--including most of the long-lived

plutonium and strontium 90--to precipitate out of the waste solution, settle on the tank bottom, and harden into a sludge. ERDA has estimated that about 30,000 gallons of sludge is on the bottom of the large waste tank. The properties of this sludge are not completely known; neither NFS nor NRC is planning to analyze the sludge at this time. Knowledge of the properties of this sludge is important to develop techniques for removing it and converting it to a form suitable for disposal.

We believe that NRC should attach priority to analyzing the NFS waste sludge properties.

NRC SHOULD DEVELOP NFS HIGH-LEVEL
LIQUID WASTE DISPOSAL CRITERIA

ERDA is now developing several alternative processes for disposing of high-level liquid waste. Before any of these processes could be selected for application to the NFS waste, however, NRC must establish waste performance criteria. NRC's only present criteria is that the liquid waste be converted into a dry solid form and be shipped to a Federal repository not later than 10 years after it is generated. However, NRC regulations exempted the NFS waste from this requirement because the technology for solidifying neutralized waste was not developed. NRC intends to establish NFS waste disposal criteria at some future time by means of its rulemaking procedure.

We believe NRC should establish this performance criteria on a priority basis to foster the development of technically and economically feasible waste disposal processes.

NFS WASTE RETRIEVAL AND
SOLIDIFICATION PROCESSES
HAVE NOT BEEN DEMONSTRATED

ERDA is conducting research on methods for extracting neutralized waste sludge from the bottoms of its own waste tanks. The research may have application to the sludge in the NFS waste tank. A prerequisite to determining if the waste sludge can be removed from the tank, however, is identifying its properties and assessing the condition of the steel tank. Removing all of the sludge from the NFS tank will be difficult if not impossible with processes now being considered, because of physical obstructions in the tank. Because of the long-lived radionuclides present, any residual sludge will present a separate problem in decommissioning the reprocessing plant site.

Perpetual tank storage of the NFS high-level liquid waste would not satisfy NRC and ERDA commitments to solidify wastes and dispose of them in a Federal waste repository. Several potential solidification technologies are under investigation, but none have yet been demonstrated. Each of these technologies requires additional research and development and will not be available for application to NFS waste for many years.

NRC should develop criteria for decommissioning the waste tanks.

DECOMMISSIONING THE NFS
PLANT AND BURIAL GROUNDS

The future use of the West Valley land is the key factor in selecting a decommissioning method. These methods vary from dismantling the facilities and completely cleaning up the area to continuous surveillance and a minimum removal of radioactivity. Costs of decommissioning the NFS reprocessing plant under any of the alternatives are not known at this time, nor can they be developed until NRC establishes decommissioning guidelines and the State of New York decides on the future use of the site.

Perpetual care of the high- and low-level solid waste burial grounds will be required for centuries because of the long-lived, highly toxic radionuclides buried there. Therefore, before proceeding with site decommissioning, it is important that long term care requirements be identified, remedial action be taken to correct known deficiencies at the low-level burial ground, and a sufficient perpetual care fund be established.

At the low-level burial site, there is a problem with water seepage from the surface of three burial trenches. NFS, with the State of New York's approval, has started a program to temporarily control this problem, and the State has contracted

for a study of long term control methods. Ten alternative methods identified to date would all require periodic equipment maintenance or replacement. The State's consultant has recommended further investigations before a decision is made on long term corrective actions.

The State of New York has required NFS to contribute to a fund to cover long term care of both the burial grounds and the high-level liquid waste. The balance of this fund is presently about \$2.9 million. It is obvious to us that the fund is wholly insufficient to cover the cost of remedial action at the burial sites, decommission the reprocessing plant, and either dispose of the high-level liquid waste, or perpetually store the waste at West Valley.

WHO WILL BE RESPONSIBLE?

Ultimate legal responsibility for care and disposal of the radioactive wastes at West Valley belongs to the State of New York. Although NFS is presently responsible for care of the facilities and wastes at West Valley, it can voluntarily surrender this responsibility to the State's Energy Research and Development Authority before its agreements with the Authority expire. This transfer would be conditional on the Authority finding that the facilities are in good condition. When NFS' agreements with the Authority expire on December 31, 1980, the transfer would take place, assuming NRC's approval.

We should point out that any readjustment of NFS' technical and financial responsibilities must have NRC approval, because it requires an amendment to the facility license. For this reason, it is possible that NRC could place further restrictions on the surrender; for example, additional storage facility requirements.

The New York Energy Research and Development Authority has asked ERDA to completely take over the West Valley site. ERDA has not accepted this request, but has agreed to discuss West Valley issues with the Authority.

It appears to us that, at a minimum, the Federal Government will have to provide technical assistance to New York to resolve the outstanding waste management issues at West Valley.

We are making a number of recommendations aimed at speeding up the decision-making process for finding acceptable solutions to the issues at West Valley. To assist in developing an appropriate waste disposal technology for the NFS waste we recommend that NRC

--Develop waste performance criteria.

--Develop criteria for decommissioning waste storage facilities so that the impact of residual sludge in the NFS tank can be evaluated.

- Identify alternative processes for NFS waste management and determine their technical and economic feasibility so that a recommended process can be developed and implemented.
- Characterize the physical and chemical properties of the high-level waste sludge.

Although the Commission is studying certain aspects of the condition of the high-level waste tanks, other studies are needed. We recommend that NRC

- Proceed on a priority basis in the current analyses to assess seismic integrity of the waste tanks.
- In its plans to determine tank life, include a review of the stress relieving data for assurance that the proper techniques were used.
- Assess on a priority basis the present condition of the vault system and the soil characteristics surrounding the vaults.

With regard to decommissioning the reprocessing plant and burial grounds, we recommend that NRC

- Require New York State to report its plans on the future use of the West Valley site.

--Prepare for Nuclear Fuel Services, Incorporated and New York State guidelines for decommissioning the reprocessing plant and site.

--Require Nuclear Fuel Services, Incorporated and New York State to submit a decommissioning plan.

--Require New York State to submit a plan for correcting problems at the low-level burial site.

--Require New York State to establish long term care requirements for the West Valley site.

Finally, we recommend that NRC and ERDA develop a policy on Federal assistance to New York State for the West Valley site.

A recent development may be important. On February 24, 1977, NPC proposed that the Federal Government increase its control over the disposal of low-level wastes by, among other things, requiring Federal ownership and federally administered perpetual care programs at low-level burial grounds. Adoption of the proposed policy may weigh heavily in future deliberations on who should bear how much of the technical and financial burden for disposing of the wastes and decommissioning the West Valley facilities and site.

This policy proposal raises a bigger issue concerning whether or not, and to what extent, the Federal Government should provide financial assistance to the nuclear industry

by taking over the cost of managing activities in the back end of the fuel cycle. I will be happy to discuss some of the implications of these issues during the question and answer period. However, I have not included them in this formal statement because this report was not intended to cover them.

Mr. Chairman, this concludes my prepared statement. We will be glad to respond to your questions.