

TESTIMONY BEFORE THE  
ENVIRONMENT, ENERGY AND NATURAL RESOURCES  
SUBCOMMITTEE OF THE HOUSE COMMITTEE ON GOVERNMENT OPERATIONS  
REGARDING  
NUCLEAR FUEL SERVICE, INC., WEST VALLEY, NEW YORK

PRESENTED BY  
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### Legislative Authority

The Nuclear Regulatory Commission (NRC) is an independent regulatory agency, created by the Energy Reorganization Act of 1974, as amended (42 USC Section 2011 et seq). The Commission's primary statutory mandate is the licensing and regulation of commercial nuclear energy in a way which insures the protection of the public health and safety and the common defense and security of the United States.

The Atomic Energy Act of 1954, as amended (42 USC Section 5801 et seq) established the class of nuclear materials and facilities which are subject to NRC authority. This statutory responsibility extends to the storage, reprocessing and disposal of spent fuel from commercial nuclear power plants. Also, the 1974 Energy Reorganization Act gave the NRC additional responsibility for licensing FRDA facilities to be used for the receipt, long term storage and disposal of high level nuclear waste.

Section 274 of the Atomic Energy Act, enacted in 1959, recognizes the interests of the States in the peaceful uses of nuclear energy and establishes a framework for Federal/State cooperation, with respect to certain aspects of nuclear regulation. According to Section 274(b), NRC is authorized to enter into agreements with the Governor of any state providing for the state's assumption of regulatory authority for byproduct, source and special nuclear materials in quantities not sufficient to form a critical mass. The State's program must be compatible with the

with the Commission's program and be adequate to protect the public health and safety. Under the provisions of 274(b), States entering into agreement with the NRC assume regulatory authority over commercial shallow land burial facilities located within the States.

#### Historical Aspects

One of the purposes of the Atomic Energy Act of 1954 was to facilitate the development of a commercial nuclear energy industry. Until that time, nuclear work was largely confined to the Atomic Energy Commission (AEC). When the nation embarked on a commercial nuclear program, a separate Division of Civilian Application was established in the AEC to regulate commercial applications and thereby protect the health and safety of the public. As time passed and the commercial nuclear program grew, the AEC's regulatory arm also grew. With the Reorganization Act of 1974, this group took the regulatory responsibility as the independent Nuclear Regulatory Commission.

When the commercial nuclear industry began to develop, there was a need for formal regulations so that important safety requirements could be stated clearly for all to understand and so that they could be given the force of law to ensure compliance. The AEC began to promulgate regulations for civil nuclear work in Title 10 of the Code of Federal Regulations. The AEC and now the NRC have issued and revised its regulations as knowledge has been gained and technology has advanced during the 23 years of civil nuclear work.

In the late 1950's, the State of New York undertook a program of nuclear development under the guidance of its Office of Atomic Development (OAD). The OAD has been succeeded by the Atomic Research and Development Authority (ARDA, in 1962), the Atomic and Space Development Authority (ASDA, in 1964), and now by the New York State Energy Research and Development Authority (NYSERDA, in 1976). The OAD acquired the 3,300-acre West Valley site and designated it the Western New York Nuclear Service Center. The OAD and ARDA engaged in a long series of negotiations with private industry and the AEC to develop its West Valley site. The negotiations and relations with the AEC involved both the promotional and regulatory functions of the AEC. In order to promote the development of commercial fuel reprocessing, the AEC provided design assistance and entered into an agreement to provide a base load of spent fuel for the proposed reprocessing plant. With that assurance, and the substantial support of the OAD, Nuclear Fuel Services (NFS) agreed to build and operate the reprocessing plant at the West Valley site.

The NFS reprocessing plant was designed in the early 1960's based on technology developed at federal plants. The plant was subject to the requirements contained in 10 CFR Part 50 as a production facility. Other pertinent regulations existed in 10 CFR Part 20 for controlling radiation exposure of personnel and release of radioactive materials to the environment, and in 10 CFR Part 70 for handling special nuclear material (such as plutonium and enriched uranium).

The development of regulations is an evolutionary process. Regulations change as we obtain better understanding of the issues and as there are technological advances to improve safety and reduce environmental impacts. Between the period of 1966 when NFS was first licensed to operate and 1972 when it shut down to make improvements and in the several years following the 1972 decision to shut down, some important modifications to regulatory policies and requirements relating to safety and protection of environmental values were developed.

It is apparent from regulatory actions and statements at the time the plant was designed that the West Valley operation was viewed as both a reprocessing center and as a waste repository. In a letter dated February 13, 1963, R. Lowenstein, AEC, to O. Townsend, ARDA, the AEC indicated certain responsibilities for perpetual care of the high level wastes separated from the irradiated fuel in the course of reprocessing which would have to be assumed by ARDA and the State of New York. The State provided appropriate assurances that these responsibilities would be met. The technology accepted for perpetual storage of the high level liquid wastes at NFS, i.e., as neutralized liquid in carbon steel tanks, and the technology for burial of other radioactive wastes at the NFS site was consistent with the practice at that time at AEC sites.

The design requirements for construction and operation of the NFS plant were consistent with the AEC regulations which had been issued up to that time. The seismic criteria applied to the design of the NFS structures were consistent with the existing building codes for reinforced concrete structures. The more conservative AEC seismic design criteria developed for reactors, and which were later applied to fuel reprocessing plants were developed and implemented over subsequent years, culminating in the publication of Appendix A to Part 100 in 1973. Reactors have been designed to meet these more conservative seismic design criteria as the criteria evolved from the mid-1960's on. The later commercial reprocessing plants at Morris, Illinois, and Barnwell, South Carolina, were designed to the more conservative seismic criteria.

Regulations governing release of radioactive materials to the environment and radiation exposure of personnel are contained in 10 CFR Part 20. Since 1970, Part 20.1 has included a specific statement that exposure of personnel and release of radioactive material to the environment should be kept as low as reasonably achievable below the limits specified in the regulations. Once the NFS plant began to operate, difficulties were encountered with radioactive releases and radiation exposures. Releases were kept within the regulatory limits specified in 10 CFR Part 20, but were close to limits and could not be considered as low as reasonably achievable. There was increasing AEC pressure on NFS to reduce radioactive releases during operation.

A similar situation prevailed with radiation exposures to plant workers. With operation, various deficiencies in plant design were revealed. NFS corrected many of these deficiencies as they went along. However, normal operational maintenance entailed radiation exposures to some of the plant staff which could be reduced through design changes. While NFS was generally able to keep radiation exposures to individuals within regulatory limits by hiring many temporary workers for maintenance work, good radiation safety practices dictated plant modifications be made to reduce the total personnel exposure at the plant.

In 1970, the Atomic Energy Commission decided that it was in the interest of the public health and safety to limit the quantity and mobility of high level waste stored onsite at commercial fuel reprocessing plants. Perpetual storage as liquid in tanks no longer appeared to be a practical solution to commercial high level waste management particularly since it would limit the extent to which a reprocessing plant site could be decommissioned after the end of its useful life. It was believed that disposal of high level wastes at a few federal repositories would reduce the social cost of perpetual care over that of maintaining the wastes at a number of reprocessing plant sites. Accordingly, 10 CFR Part 50 was amended by adding Appendix F to require that high level waste at reprocessing plants be solidified within five years after separation and shipped to a Federal repository within ten years after separation. This regulation was not made retroactive and therefore does not apply to

those liquid high level wastes currently stored at the NFS reprocessing plant site. It was noted at the time the regulation was issued that wastes being generated at the NFS plant prior to installation of waste solidification equipment would be subject to a further rule making proceeding.

The plutonium product stream from reprocessing plants was also affected by changes in regulations. Plutonium nitrate had previously been shipped as a liquid and subsequently transformed to a solid when fabricated into fuel. To minimize the risk of spills during shipment, regulations which were adopted in June 1974 and which will take effect in 1978, require that plutonium be converted to the solid form prior to shipment. Consequently, fuel reprocessing plants will now include a plutonium solidification facility.

In 1972, NFS advised the AEC that it planned to make modifications to its facility to increase maximum throughput by 100% and to improve plant operating efficiency. Because of the cumulative effect of the many changes to the facility which would be required, the AEC did not consider it acceptable to review the changes as simple amendments to the operating license. Rather, the AEC judged that NFS must apply for a new Construction Permit and Operating License so that the substantially revised facility, as proposed, would receive a comprehensive review with ample opportunity for the public to comment. NFS filed its initial application in 1973 for



plant modification and expansion. From that time until September 1976, the application was under intensive review by the NRC staff. The staff was performing the analytical work necessary to prepare its safety analysis report and environmental impact statement. During the course of the NRC review, NFS made substantial revisions to its application.

#### Status of the Plant and License Requirements

The NFS reprocessing plant is now inactive. The spent fuel storage pool is about two-thirds filled with light water reactor spent fuel. The mechanical and chemical process sections of the plant have been partially flushed and decontaminated in preparation for the modifications that were anticipated. The high level wastes from previous operations are in storage and are under continual surveillance. The low level waste treatment plant is periodically operated to treat waste water from the low level burial grounds or the retention lagoons. The NRC staff has made and continues to make frequent visits to the plant to confirm its safe status.

Based on currently available information, we conclude that storage of high-level liquid wastes in the current mode can be continued safely for a number of years until a longer term solution is developed and implemented. The tanks were designed and fabricated for a lifetime of at least forty years. The design of the tanks is far advanced over the design of those in which minor leakage has occurred at ERDA sites. The absence of leakage to date at NFS, recent inspection of tank corrosion coupons, tank temperature

and current chemical conditions support a conclusion that the tank will remain intact for at least its design lifetime. Furthermore, in the event a leak were to occur it would have little effect on the public because:

- a. The tanks stand within a separate steel liner and are encased in underground concrete vaults.
- b. Experience at ERDA sites indicates that leaks which develop in tanks containing neutralized wastes tend to be self-sealing. Salt crystals form at the crack and seal off or slow down leakage providing time for corrective action to be taken.
- c. Tank liquid waste contents can be pumped to adjacent spare tanks if a leak occurs.
- d. Soil surrounding the tank and vaults is notably impenetrable to water flow.

Thus, exposure to people off the 3300-acre site from a leak through the multiple containment barriers is highly unlikely. Notwithstanding our conclusion that storage of high level liquid wastes can be continued in a safe mode at NFS, NRC has taken additional steps to provide further assurance that the method of waste containment is safe. Specifically the staff has (1) contracted Lawrence Livermore

Laboratory to review structural adequacy of the tanks during earthquakes, (2) requested ERDA to perform a technical review of current information on tank integrity and to recommend if further tank investigations are needed, and (3) contracted Oak Ridge National Laboratory to evaluate the consequences of tank/vault failure during earthquakes and tornado. The staff will issue in about six months an interim safety evaluation report documenting the results of this work.

NFS and New York State ERDA are co-licensees under provisional facility license, CSF-1. In this arrangement NFS has operational responsibility for the activities ongoing at the site. NYSERDA's responsibilities include site ownership and the long-term care of high level wastes. The license, CSF-1, covers all of the activities associated with reprocessing of nuclear fuel, including conditions for protecting the health and safety of the public and employees. Since their decision in 1972 to suspend reprocessing operations, NFS has been providing surveillance of high-level waste and stored spent fuel. Some spent fuel has been received during this period, but none has been received for over a year. The license contains requirements to assure the safe management of the wastes and spent fuel, but does not cover details for future disposition of the site. On September 22, 1976, NFS announced its intention to withdraw from reprocessing.

Future Disposition of the Site and High Level Wastes

In NRC's opinion, the West Valley facilities might be suitable for nuclear operations of some sort. However, before NRC can take a firm position on future use, we would need specific information about proposed uses and would then have to conduct appropriate safety and environmental analyses. The adequacy of the existing facilities to withstand seismic forces is the foremost issue regarding resumption of reprocessing. The NRC, in anticipation of possible future uses of the facility, has elected to continue its independent review of the seismic adequacy of these facilities. When we have completed this review, it will help to clarify the issue and enable us to render more prompt judgment on the acceptability of alternate uses. Our structural analysis should be completed in mid-1977.

Although NRC does not have comprehensive criteria for decommissioning a facility of this type, work is currently underway with Battelle Northwest Laboratory to evaluate how best to proceed with decommissioning a reprocessing plant. We have just received a draft report from Battelle which is being evaluated.

The problem of ultimate disposal of the high-level wastes at NFS is a more complex problem. As was noted earlier, NFS was originally licensed to store the high level liquid wastes perpetually after chemical neutralization. With the changes in regulations in 1970 (10 CFR Part 50, Appendix

F), this is no longer permitted for new reprocessing plants. AEC committed to review the NFS situation as a special case and issue a separate rule. Although the review is underway, rulemaking has not been completed because the NFS waste is not similar to that proposed for new reprocessing plants for which solidification techniques are in advanced stages of development. It is similar to the waste generated by the weapons program which is more difficult to solidify. Waste processing technology being developed for the weapons program wastes is likely to be applicable in part to the NFS wastes. If so, duplication of effort and research and development costs will be minimized. The design life of the NFS storage tanks allows ample time to explore a range of adequate solutions to the problem.

It appears to NRC that solutions, i.e., development of technology and safety criteria should proceed in a stepwise fashion. It also appears that ERDA is the only organization with the technical experience and resources to deal with the problem of developing the technological alternatives for management of high level wastes and, therefore, should take the lead in this area. The issue of assigning financial responsibility for the disposition of the waste should not delay developing technical solutions. NRC has requested ERDA to take the lead in providing the technology applicable to solutions to the NFS high-level wastes problem. NRC will work with ERDA while developing the associated safety and environmental criteria for the technology.

A problem which has an important bearing on the final solution to the high-level waste issue is that it may not be feasible to remove all of the waste from the NFS high-level waste tank. The liquid in the large high-level waste tank has been chemically neutralized with sodium hydroxide. This neutralization has caused much of the radioactivity in the wastes to be precipitated in the form of insoluble silt or sludge. Because of the complex inner structure of the tank, removal of this sludge will be difficult. This issue and others will have to be dealt with and decisions made as research progresses and technology is developed.

As can be seen from the above discussion, there are many options that need to be explored, safety and environmental analyses conducted and technologies developed. Cost is one of many factors that needs to be analyzed by all those involved in the decisionmaking process as work progresses. We do not have at this time sufficient information which would enable us to estimate cost for (1) decommissioning this plant, (2) licensing alternative uses of the plant, or (3) disposal of the high level waste. We will, of course, be exploring-cost with all those concerned in making decisions about the future of the site.

#### The Low-Level Waste Burial Ground

In addition to activities associated with reprocessing and storage of high-level wastes on the West Valley site, NFS manages a commercial low

level waste disposal operation under a license granted by the State of New York. New York is an Agreement State and has authority to grant such licenses.

In March 1975, the NRC was informed of a water seepage problem at the West Valley, New York burial ground. The State noted increased levels of tritium in water samples taken from onsite monitoring stations. The source was traced to water seeping out of the caps of two trenches. The flow was estimated to be approximately 1 gallon per day. The seepage resulted from the compaction of waste in the trench and the filling up of the trench with surface runoff water and subsequent seepage through the low end of the trench. NFS diverted seepage to a holding lagoon. No significant increase in radioactivity has been detected offsite.

The site has remained closed since the surface water problem was discovered. It continues to be the subject of intensive study. Some of the agencies which have been or continue to be involved in these studies and site surveillance include USGS, EPA, NRC, NYS Geological Survey, NYS Department of Health and NYS Department of Environmental Conservation. NYSGS, NYSDEC and NFS have resident technicians at the site to monitor the situation from day-to-day.

The staff has reviewed the recently published EPA report "Summary Report on the Low-Level Radioactive Waste Burial Site, West Valley, New York

(1963-1975)". This report is based on data collected through 1975. Additional and more sophisticated data have been collected by NY State Agencies and others. In general, we agree with those conclusions in the EPA report which are supported by adequate data. These data indicate that movement of radionuclides from the site was mainly through surface water transport and "offsite dose levels appear to be insignificant". Discussions with NYS indicate that later data support these conclusions. With regard to geologic stability of the site, the EPA report does not provide quantitative evidence to support its conclusions. NRC believes that the ongoing studies which are being conducted by Federal and State agencies are needed to better understand the phenomena at West Valley and determine the most effective plan for ensuring the future integrity of the trenches. The NRC is providing analytical support to the USGS generic hydrogeology study, is planning to fund a surface water migration study of West Valley by Battelle Northwest Laboratories in cooperation with NYSGS, and will be including consideration of West Valley in its development of low-level waste disposal criteria.

In addition to the site specific issues associated with commercial waste disposal at West Valley, the staff, has devoted considerable effort and will continue to work to improve the regulation of commercial low level waste disposal. We recently sent to this committee a copy of a staff report which contains a number of significant recommendations for



improvement in commercial low level waste disposal. The recommendations are now before the Commission. As part of the deliberative process, the report is being published for public comment. The Task Force report addresses a number of recommendations made by the Committee on Government Operations in its June 1976 report on low level nuclear waste disposal. The Committee's report provided helpful guidance to the staff in developing the scope of the Task Force report.

Summary

There are several complex and interdependent problems which must be addressed in the NFS, West Valley case in order to:

- . determine the future disposition of the site and final disposal of stored high-level liquid wastes.
- . confirm that pending final disposition of the site and the wastes the current method of tank storage continues to be safe and the site is maintained under an appropriate level of surveillance.

The following parties are major participants addressing the issues:

- . NFS - Co-licensee with NYSERDA in operation of nuclear facilities at the West Valley site.
  
- . NYSERDA - Co-licensee with NFS in the West Valley facilities license.
  
- . USERDA - Principal developer of nuclear fuel cycle and waste management technology for the nation.
  
- . NRC - Regulates all of the West Valley nuclear facilities except for the low-level waste burial ground which is operated under State of New York license.

Based on a recently completed NRC staff analysis of the high-level waste situation at NFS, NRC concludes that:

- . The only reasonable way to proceed is to have developed and evaluated a set of comprehensive, specific alternatives for waste disposal which account for the unique site-specific problems of the case; the alternatives would be developed to the point where the costs and risks associated with each are determined.
  
- . ERDA should develop and evaluate the alternatives. This is necessary since ERDA and its contractors are the only organizations with the

extensive expertise and technical resources to do this work today. This approach recognizes that there is no unique solution to the waste disposition problem, but rather a range of solutions and costs. This approach also recognizes that meaningful regulatory criteria can only follow a study of alternatives which are realistic for the NFS waste problem.

Finally, the NRC is taking or will take in the immediate future the following steps to resolve the issues at the West Valley site:

- . Complete its seismic analysis which will be useful in assessing alternate uses of the site.
- . Complete additional studies related to performance of the high-level liquid waste tanks to assure their continued safety.
- . Continue its work on developing reprocessing plant decommissioning criteria.
- . Continue the NRC high priority national regulatory waste management program which includes developing generally applicable criteria for solid high-level waste performance, high-level waste repository performance and low-level waste burial ground performance.

- . In corporation with ERDA, initiate further studies relating to alternative technologies for final disposition of the high-level liquid wastes at NFS, taking into account the physical and chemical properties of the waste and the tanks in which it is stored, and develop associated safety and environmental criteria for the most promising alternatives.
  
- . Request the licensee to file an application for termination of its reprocessing license and a plan for decommissioning the plant taking into account possible alternative uses of the facility.
  
- . Continue to work with New York State and other Federal agencies in conducting studies to better understand phenomena relating to long term stability of the low-level waste burial ground and assist in assuring corrective action should it prove necessary.
  
- . Continue a high-level of surveillance and inspection to assure that the plant remains in a safe shutdown condition.