



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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LICENSEE: General Electric Company
Vallecitos Nuclear Center
Pleasanton, CA

SUBJECT: SAFETY EVALUATION REPORT: APPLICATION DATED APRIL 21, 1989,
REVISION DATED DECEMBER 9, 1992 AND SUPPLEMENT DECEMBER 8,
1993, RE RENEWAL

DISCUSSION AND BACKGROUND

The General Electric Company (GE) has been engaged in nuclear energy work at Vallecitos Nuclear Center (VNC) (then called Vallecitos Atomic Laboratory) since the mid-50s. On September 14, 1966, the U.S. Atomic Energy Commission granted Special Nuclear Materials License SNM-960 to cover all activities involving uranium and plutonium. GE has applied for renewal of License SNM-960 with the intent of continued operation under the broad license concept. The current and proposed licensed special nuclear material activities and possession limits are reduced as compared to VNC's past authorizations. The NRC has reviewed this application with associated addenda and information submitted by GE for license renewal support. The review focuses on GE's safety-related functions and administrative controls as used at VNC to assure adequate health and safety protection to GE personnel, the public, and the environment.

SCOPE OF REVIEW

The safety review of the licensee's request included an evaluation of its applications dated March 27, 1989 (letter dated April 21, 1989), as fully revised December 1, 1992 (letter dated December 9, 1992), and supplemented by page changes dated December 3, 1993 (letter dated December 8, 1993), and discussions with Region V staff. Review comments were provided to the licensee and a site visit was made on October 4, 1993, to discuss comments and site operations. Both Headquarters and regional personnel were present at the site visit.

A. LICENSE CONDITIONS

License Conditions 1 through 9 identify the location and possession quantities and limits, while License Condition 10 identifies the safety, safeguards, and transportation portion of the license. These conditions contain the following possession limits:

Vallecitos Nuclear Center

- U-235 50 kilograms enriched to less than or equal to 10 percent for authorized activities. The material may be in the form of irradiated special nuclear material with its attendant byproduct and reactor - produced transuranics.
- U-235 4 kilograms enriched to more than 10 percent for authorized activities. The material may be in the form of irradiated special nuclear material with its attendant byproduct and reactor-produced transuranics.
- Plutonium 100 grams contained or in a sealed form in addition to the irradiated quantities.
- U-233, 100 grams in any form.

B. ACTIVITIES

The renewed license will authorize GE to continue research and development activities, irradiated fuel and component examinations, and continue support services for reactor development. More specifically, the following activities will be authorized:

Product Processing Operations

Assembly, modification, cleaning and repair of unirradiated encapsulated experimental assemblies.

Laboratory Operations

- Chemical - Analysis of the chemical and isotopic composition, concentration and behavior of special nuclear materials by wet chemistry and physical measurement techniques.
- Metallurgical - Physical analysis and testing of physical and metallurgical properties of special nuclear materials.
- Physics and Health Physics - Measurements of radiation and its effects on instruments and on the structure and composition of materials.
- Hot Laboratories - Post-irradiation examination, testing and analysis of fuel elements and materials in shielded enclosures by remote manipulative techniques; research and development and/or pilot plant activities.
- Research and Development - Including but not limited to the above.

General Services Operations

- Equipment Maintenance and Engineering - Design, fabrication and testing of equipment containing special nuclear materials and maintenance of such equipment.
- Storage - Storage of special nuclear materials other than wastes in shielded containers and/or at locations as applicable and in designated general purpose storage areas.
- Transportation and Transfer - Inspection of packaging and preparation for shipment and/or transfer of special nuclear materials.
- Decontamination - Decontamination of equipment and facilities.

Waste Treatment

- Liquids - Concentration of the radioactive constituents of liquid wastes by evaporation, chemical treatment, sedimentation, filtration and ion exchange; agglomeration and packaging of concentrates and discharge of processed effluents.
- Solids - Packaging and storage of wastes contaminated with or containing non-reclaimable special nuclear materials, excluding direct burial in soil.

C. Management Organization

All Vallecitos Nuclear Center activities are conducted under the management of General Electric Nuclear Energy (GE-NE). They are as follows:

- Vallecitos & Morris Operations (V&MO)
- Fuel Engineering
- Nuclear Services & Projects Department

The Manager, V&MO is responsible for regulatory compliance at VNC and reports to the Vice President and General Manager, GE-NE. Industrial safety is provided for VNC by the Industrial Safety and Hygiene function located in San Jose, California.

Vallecitos & Morris Operations has replaced the Irradiated Processing Operation and all license activities take place under the auspices of V&MO. Nuclear Services & Projects Department only deals with State material and not SNM. Fuel Engineering operates in Building 103 and performs analytical and research and development functions for GE-NE using laboratory quantities of SNM.

The Manager, V&MO, has been delegated in writing, the responsibility to act as the Chief Executive Safety Officer for all VNC operations involving radioactive materials.

The Vallecitos Technological Safety Council (VTSC) has been established as a site-wide evaluation function with responsibility for management evaluations and reviews of VNC activities, including the Nuclear Safety function. Regulatory Compliance, under the authority of V&MO, performs in the following functional areas:

- Criticality Safety
- Emergency Preparedness and Response
- Nuclear Material Safeguards
- Physical Security
- Transportation and Materials Distribution
- Industrial Safety and Hygiene Function
- Environmental Safety Function
- Radiation Safety
- Nuclear Safety Compliance and Review
- Licensing
- Radiological Engineering
- Training

D. Technical Qualifications

The Criticality Safety component is responsible for providing authoritative professional advice and counsel and for measuring the effectiveness of the criticality control program. The functions exclude direct responsibility for operations and individuals are independent of specific area managers. The Criticality Safety component has at least one technically trained person with a bachelor's degree in science or engineering and three years experience in the nuclear field with one year directly relevant to criticality safety. The manager of the Criticality Safety component has at least five years experience in a comparable field. An exemption had been previously granted based upon the type of activities at the facility. This exemption is stated in the following safety license condition:

S-7. Exemptions to the requirements of 10 CFR 70.24, "Criticality Accident Requirements," are hereby granted pursuant to 10 CFR 70.24(d). The exemptions are granted in accordance with Section 5.9, "Monitor Alarm System," of Appendix A of the application as follows:

1. The following areas are exempted from monitor alarm requirements:

- a. Areas where SNM is stored in locations within the United States provided that the SNM is fully packaged as for transport in containers meeting all of the general license requirements of 10 CFR 71 or in containers owned by the General Electric Company and certified for transport under the provisions of 10 CFR 71 in accordance with the conditions of a certificate of compliance authorizing delivery of such containers to a carrier for Fissile Class I transport,

- b. Building 102 storage pool,
 - c. For each area in which is stored one (1) shipment of packages containing special nuclear material licensed pursuant to 10 CFR 71 for transport outside the confines of the Vallecitos Nuclear Center insofar as the requirements of Section 70.24 pertain to the material contained in such shipments,
 - d. For each area where there is not more than one "safe batch" (as defined in Section 3.11 of Appendix A of the application) of finished reactor fuel rods or assemblies, under conditions which protect against rearrangement of fuel bearing portions into more reactive configurations,
 - e. For each area which meets the requirement of a "subcritical area" as defined in Section 3.14 of Appendix A of the application.
2. Exception to the maximum preset alarm point of 20 millirems per hour specified in 10 CFR 70.24 is granted for areas described in Section 5.9.3 of Appendix A of the application provided that the maximum preset alarm point does not exceed 500 millirems per hour.

The Radiation Safety component reports to Regulatory Compliance which in turn is authorized to assure compliance by the V&MO. The application provides the qualifications for the Manager of Vallecitos & Morris Operations (V&MO), Manager of Regulatory Compliance, Senior Licensing Engineer, Radiological Engineer, and Radiation Monitoring. These qualifications are deemed adequate to provide for radiological safety at VNC.

E. Administrative Procedures

Written procedures

The licensee has committed that operations will be conducted in accordance with procedures. These procedures are approved by the Vallecitos Technological Safety Council. In order to further consolidate the application of procedures at this site the following license condition applies:

S-9 The licensee shall establish, maintain, and follow written procedures for carrying out safety related activities. The procedures shall be approved and updated every two years.

Inspection

The licensee has committed to periodic inspections and audits by the Vallecitos Technological Safety Council of the site safety and compliance program performance. All activities involving special nuclear material are inspected by the Radiation Safety component on a continuing basis. Operational health and safety standards are reviewed biennially.

Training

Radiation protection training includes training of the requirements contained in 10 CFR Parts 19 and 20. All personnel receive training prior to working in radioactive materials areas or radiation areas. Training is provided annually by the Radiation Safety component.

F. Radiation Safety

Activities involving the use of radioactive materials or SNM follow designated procedures. Radioactive materials are manipulated and examined within "hot cells" or stored within shielded storage areas.

Control of Personnel Exposure

The licensee has issued personnel dosimeters capable of detecting gamma, beta, and x-ray radiation. Neutron detection capability is available when appropriate. Primary dosimeters are worn in a manner to record the most representative exposure. The licensee provides a bioassay program that includes whole body counting and urinalysis. Whole body counting is provided at least annually. Urinalysis may be performed on a routine or on a job-by-job basis. The licensee has committed to keeping personnel contamination below 200 dpm/100 cm² alpha.

Airborne Activity

The licensee has committed to providing HEPA filter systems for 0.3-micrometer particles that are 99.95 percent efficient. They further committed not to exceed the concentrations specified in 10 CFR 20 Appendix B. In addition, an environmental sampling program provides indicators that would cause a reduction in release levels if sampling identifies a reconcentration of materials. Therefore, the following condition shall continue:

S-8 Pursuant to 10 CFR 20.106(b), the licensee is hereby authorized to release radioactive materials in accordance with Section 8.9, "Airborne Effluent Control," of Appendix A of the application.

Instrument Calibration

Portable monitoring instruments are calibrated upon initial acquisition, after major maintenance, and at least annually. Fixed gamma area monitors are source checked at least annually. In addition, the licensee has committed to maintain control charts for system performance on all laboratory instruments used for counting health physics samples.

Radioactive Waste Disposal

The licensee has committed to collecting and solidifying all potential contaminated liquid wastes. Solid wastes are accumulated at each location where radioactive materials are handled. The licensee has established a Waste Handling Facility (WHF). This facility implements waste volume reduction methods. Solid waste materials are stored in the site radioactive materials

storage facility. Limits are established to provide criticality safety for an infinite array of waste storage drums. To ensure that contaminated equipment is released according to the NRC guidelines, the following condition shall continue:

S-4 Release of equipment or materials for unrestricted use shall be in accordance with the attached "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," April 1993.

G. Nuclear Criticality Safety

The licensee has reduced the possession limits of their license for plutonium and U^{235} . These materials are in the form of contaminants and "hold-up" in glove boxes and other equipment that is no longer used but being stored for future disposal. All U^{235} is generally in the form of irradiated fuel samples except for some standards. Accordingly, the criticality risk at this site remains low due to material configuration and location.

The licensee has committed to have a Criticality Safety component that provides procedures for area managers, notifications, analysis, advice and verification, and review of computation methods. Records of criticality control analyses are maintained. The Radiation Safety component is responsible for inspecting each criticality area on an ongoing basis to assure compliance with criticality control procedures. Actual operations are inspected by the Criticality Safety component to determine that operations conform to the physical situations on which criticality limits calculations have been based.

The licensee has committed to a training program for new employees in criticality safety and plant operating and emergency procedures prior to their working with special nuclear materials in a criticality limit area. The criticality control training program is approved by the Criticality Safety component. A written test is completed by each employee taking the course with refresher training provided annually.

The licensee has provided for a criticality monitoring system and assures that no transfers of fissile materials between criticality limit areas are permitted unless the system is operable.

H. Environmental Protection

In accordance with 10 CFR 51.21, the staff has prepared an assessment of environmental impacts for continuing operations. The Environmental Assessment was prepared in December 1993. This assessment supports a Finding of No Significant Impact which was published in the Federal Register on January 19, 1994.

I. Emergency Planning

The licensee has established procedures that are to be followed in the event of emergencies or accidents involving potential or actual radiation hazards. The procedures also address such events as fires, unauthorized entry, and injury. The licensee holds periodic exercises to test the performance of emergency planning. Both onsite and offsite response functions are exercised.

J. Decommissioning

The licensee has provided decommissioning and financial assurance documents which are acceptable in meeting regulatory requirements as stated in 10 CFR 70.25.

K. Safeguards

Safeguards license conditions that had been previously maintained in a separate safeguards amendment have been incorporated into the renewal. These license conditions are stated as follows:

SG-1.0 PHYSICAL PROTECTION REQUIREMENTS

SG-1.1 The licensee shall not possess or use at the Vallecitos Nuclear Center special nuclear material in quantities specified in 10 CFR 73.1(b)(1) until a detailed plan as described in 10 CFR 70.22(h) of 10 CFR Part 70 has been submitted, and approved by the Nuclear Regulatory Commission.

SG-2.0 FACILITY OPERATION

SG-2.1 Notwithstanding those sections within 10 CFR Parts 70 and 74 which establish requirements for licensees authorized to possess unirradiated special nuclear material (SNM) in quantities exceeding one effective kilogram, the licensee may follow the applicable requirements of 10 CFR Parts 70 and 74 as though only authorized to possess less than one effective kilogram of SNM, provided that the licensee does not possess at any one time unirradiated SNM in quantity equal to or greater than one effective kilogram.

SG-2.2 A Fundamental Nuclear Material Control Plan which addresses the material control and accounting requirements of 10 CFR Sections 70.51, 70.57, and 70.58; or Section 74.31; or Sections 74.51, 74.53, 74.55, 75.57, and 74.59, as appropriate, shall be submitted to and approved by the Nuclear Regulatory Commission prior to increasing the actual holdings of unirradiated SNM under License SNM-960 beyond one effective kilogram.

L. Transportation

A transportation license condition that had been previously maintained in a separate safeguards amendment has also been incorporated into the renewal. That license condition is stated as follows:

T-1.0 TRANSPORTATION SECURITY

T-1.1 The licensee shall not import, export, transport in a single shipment, or take delivery of a single shipment free on board at the point where it is delivered to an agent or carrier, quantities of special nuclear material as specified in 10 CFR Part 73.1(b)(2) until a detailed plan as described in 10 CFR 70.22 (g) of 10 CFR Part 70 has been submitted, and approved by the Nuclear Regulatory Commission.

M. Compliance History

The licensee's inspection and enforcement record since the last renewal was reviewed. There have been two violations during this license period that did not result in any impact on the safety of the workers or general public:

- a. Inspection 70-754/90-01, May 21-24, 1990:
 - Failure to calibrate continuous dose-rate area monitors in the hot cell facility as required by Section 8.2 of Appendix A of the license.
- b. Inspection 70-754/88-01, March 22-30, 1989:
 - Failure to hydrostatically test SCBAs as required by Section 7.5 of the Radiological Contingency Plan.

The proposed renewal of the license was discussed with Region V staff, and there was no objection to the issuance of the license as described in the VNC application and the proposed supplement.

CONCLUSION AND RECOMMENDATIONS

Upon completion of the safety review of the licensee's application, the staff has concluded that the activities to be authorized by the renewal of SNM-960 to VNC, will not constitute any undue risk to the health and safety of the public.

Based on the discussion above, it is recommended that the license be renewed for a 5-year period in accordance with the application, supplement, and subject to the recommended conditions.

Principal Contributor
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