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HITACHI

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Mr. Chris Ryder, Project Manager
Fuel Manufacturing Branch
Division of Fuel Cycle Safety
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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

December 7, 2009

Subject: Response to Renewal of Materials License SNM-960 - Requests for
Additional Information Dated November 18, 2009

References: 1) SNM-960, Docket 70-754
2) SNM 960 License Renewal Application – D. W. Turner, 9/30/09
3) Telecon and e-mail between NRC NMSS staff and GEH – D. W.
Turner, 11/18/09
4) Telecon between C. Ryder and GEH – D. W. Turner, 12/1/09

Dear Mr. Ryder:

The GE Hitachi (GEH) facility in Sunol, California hereby submits the requested information in support of our SNM License Renewal Application. This information, along with revisions to the renewal application is being provided in response to your November 18, 2009 e-mail (Reference 3) and as we discussed by phone on December 1, 2009. (Reference 4). Attachment 1 provides our response to each RAI and Attachment 2 provides the revised License Renewal Application pages.

Please contact me on (925) 862-4344 if you have any questions or would like to discuss this matter further.

Sincerely,

D. W. Turner, Manager
Vallecitos Nuclear Center

Attachments 1-2

cc: DWT-2009-05
P. Habighorst, USNRC NMSS

NRC Acceptance Review Notes

RAI 1

The application has incomplete and unclear statements. Several chapters mention equipment, human actions, and responsibilities that are important to safety, yet the meaning of important to safety is not apparent. Equipment that is important to safety is ambiguous. Are the lead windows safety systems? Hot cell walls? Manipulators and the seals around their penetrations? Cask docks at each hot cell? Air forklift? Cranes to unload the casks from trucks? Other than a general list of equipment on pages 11.4 and 11.5, the application lacks a discussion of such equipment and human actions. 70.22(a)(7) requires that an applicant describe the equipment and facilities that will be used by the applicant to protect health and minimize danger to life or property.

GEH Response

Equipment and facilities important to safety are described in several locations in the application. For example, in addition to the equipment described on pages 11.4 and 11.5 additional equipment is described as follows:

- Section 1.2.3.3 describes the liquid waste treatment facility
- Section 4.3.2 has a table of the airborne control hoods and enclosures
- Section 4.3.3 describe the particulate filters
- Section 4.4 describes particulate air samplers
- Section 4.10.2 describes respiratory protection equipment
- Section 4.11 has a table of radiation detection instrumentation
- Table 4.1 is a list of ventilation equipment
- Section 5.3.2.2 describes the criticality accident alarm system
- Section 7.6.1 and 7.6.2 describe the fire detection and alarm system
- Section 7.8 describes the fire suppression system

However, additional information regarding the shielded enclosures is not provided. As a result, Chapter 1, Section 1.2.3.2 "General Services Operations" is revised by adding a bullet as follows:

Inspection, use and storage of irradiated special nuclear material is performed in specially designed shielded enclosures equipped with remote handling capabilities, and as required, shielded viewing windows and shielded air locks.

RAI 2

The licensee should quantify the plutonium in the irradiated fuel, because plutonium is SNM. 70.22(a)(4) requires the applicant to give name, amount, and specifications (including the chemical and physical form and, where applicable, isotopic content) of the special nuclear material the applicant proposes to use.

GEH Response

For clarification, the irradiated special nuclear material described in Chapter 1, Section 1.2.2 "Type, Quantity and Form of Licensed Material" is consistent with the definition of spent nuclear fuel in 10CFR72:

Spent nuclear fuel or spent fuel means fuel that has been withdrawn from a nuclear reactor following irradiation, has undergone at least one year's decay since being used as a source of energy in a power reactor, and has not been chemically separated into its constituent elements by reprocessing. Spent fuel includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies.

This material is not readily separable and there is no mechanism or plans to remove or recover the transuranic materials. After use in a power reactor, the ratio of fissile uranium to plutonium in spent fuel is dependant on burn-up, initial fuel loading, and reactor utilization, etc.. The quantity of plutonium at VNC is documented in internal records and is reported in NMMSS.

For reference and reviewer familiarization, the uses of each category is described below:

- [REDACTED] kilograms of U-235 contained in uranium enriched to a maximum enrichment of less than or equal to 10%, for authorized activities. The material may be in the form of irradiated special nuclear material with its attendant byproduct and reactor-produced transuranics,
 - If unirradiated, this material is typically in the form of ceramic pellets or other forms as an intermediate step in fuel manufacturing process. VNC's analytical activities on this material may change its form. This material may be returned in whole or in part to the manufacturer.
 - If irradiated, this material is typically delivered to VNC in the form of Spent Nuclear Fuel rods or segments. VNC's analytical activities on this material may change its form. This material is mostly stored at Vallecitos pending the Federal Government's ability to accept the permanent storage of greater than class C waste.
- [REDACTED] of U-235 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,
 - This provision exists on the SNM-960 license primarily as a contingency for the transfer of the NTR (License R-33) core to the SNM-960 license were there to be a problem with NTR either physically or from a licensing standpoint. It is likely to be used only incident to NTR decommissioning or refueling. The SNM-960 license would possess the material from the NTR core prior to its transfer to DOE.
- [REDACTED] of U-235 in any unirradiated form,

This material is typically used for reference standards or as described under the first item for fuel manufacturing analytical support.

- [REDACTED] of Plutonium in a contained or sealed form in addition to the irradiated quantities, and

Typically used for reference standards and instrument check sources

- [REDACTED] U-233 in any form. Typically used for reference standards and instrument check sources

RAI 3

Chapter 1.1, Facility and Process Description

The application states that the primary purpose of the VNC site is the measurement and engineering evaluation and support of light water reactor fuels, fuel materials, components, and inspection tools. But description of the processes, such as the movement of materials, and the equipment to handle material, are vague. 70.22(a)(2) requires an applicant to state the general plan for carrying out the activity. 70.22(a)(7) requires the applicant to describe the equipment and facilities which will be used to protect health and minimize danger to life or property (such as handling devices, working areas, shields, measuring, and monitoring instruments). 70.22(a)(8) requires an applicant to discuss proposed procedures to protect health and minimize danger to life or property.

GEH Response

As indicated in Chapter 1, Section 1.1.4, the operations authorized by this license consist of receiving small quantities irradiated low-enriched (less than or equal to 10 weight percent U-235) special nuclear material and performing a variety of tests (mechanical, nuclear and chemical) on the material for purposes of improving the design of nuclear fuel and the functioning of utilization facilities. These tests may also be performed as basic research.

As a result, there is no defined consistent process, however, a typical fuel testing campaign is described by revising Chapter 1, Section 1.1.4 with the underlined text as follows and adding a typical fuel examination flow diagram as shown in attachment 2.

1.1.4 PROCESS DESCRIPTION

The operations authorized by this license consist of receiving small quantities of irradiated special nuclear material, and performing a variety of tests (mechanical, nuclear and chemical) on the material for purposes of improving the design of nuclear fuel and the functioning of utilization facilities. These tests may also be performed as basic research. The majority of this activity takes place in the Shielded Enclosures (also referred to as Hot Cells) with additional analysis of sub-sets of the material being used in various laboratories, more lightly shielded hot cells and radiography facilities. Handling of the material is conducted with remote handling techniques such as master-slave manipulators, through used of heavily shielded

containers, or through reduced sample size. Most of the analysis centers around Boiling Water Reactor fuel and cladding, with a minor amount of focused on other fuel types. This analysis may focus on a leaking rod, a new fuel design, increased burn-up, or other inquiries. A single campaign typically contains several rods, some of which are of primary concern and others analyzed as a reference or control standard.

A typical analysis campaign will take between 12 to 18 months. The following description is typical for one of these campaigns, but may include other steps or omit some of these items.

Additional information regarding licensed activities and operations is provided in Chapter 1, Sections 1.2.3.1 and 1.2.3.2.

The procedures used to protect health and minimize danger to life or property are described in Chapter 11, Section 11.5.

See RAI 1 response for additional information regarding equipment and facilities.

RAI 4

Chapter 4, Radiation Safety

The application describes a robust radiation protection program that has been in effect for many years. Yet the application lacks a description of the amount of material, the radiation hazards, how the material is processed, the number of staff who handle the material, and a flow chart of the process. 70.22(a)(2) requires that the application discuss the activity for which the special nuclear material is requested, the place at which the activity is to be performed, and the general plan for carrying out the activity. 70.22(a)(8) requires an applicant to discuss proposed procedures to protect health and minimize danger to life or property.

GEH Response

As described in Chapter 1, Sections 1.1.4, (revised, see discussion under RAI 3) 1.2.3.1, and 1.2.3.2, VNC operations support spent nuclear fuel evaluations and storage and involve potential radiation hazards from all forms of radiation (alpha, beta, gamma and neutron). Of these, the primary hazard is from gamma radiation that could cause an external exposure.

See RAI 3 response for additional information regarding process description. The number of persons handling licensed material varies as required by the type of activity.

The procedures used to protect health and minimize danger to life or property are described in Chapter 11, Section 11.5.

RAI 5

Chapter 6, Chemical Safety

The application states that hazard evaluations are performed on operations within the site where the potential exists for hazardous chemicals to be used in such a manner that they could affect the nuclear and industrial safety program. The application lacks discussion of how chemicals are used in the fuel evaluations to ensure that the fuel can be handled safely. Lack are specific chemicals, the quantity of each chemical, and the means to ensure the use of chemicals does not create potential conditions that adversely affect the handling of licensed nuclear materials. 70.22(a)(7) requires the applicant describe the equipment and facilities, such as the working areas. 70.22(a)(8) requires an applicant to discuss proposed procedures to protect health and minimize danger to life or property.

GEH Response

There are no chemicals incident to or produced from licensed materials. Chemicals are used for the laboratory operations described in Chapter 1, Section 1.2.3.1. Typically, this involves laboratory scale quantities of less than one liter total.

See RAI 1 response for additional information regarding equipment and facilities.

The procedures used to protect health and minimize danger to life or property are described in Chapter 11, Section 11.5.

Additional documentation supporting compliance with OSHA and EPA (and their State of California equivalent agencies) regulations are maintained at the facility and submitted to those agencies per their requirements.

RAI 6

Chapter 10, Decommissioning

The application states that the current Decommissioning and Closure Plan is dated July 2, 2009, and was originally submitted to the NRC on February 17, 1982. References are vague. No distinction is made between the certification, revised annually, required for a licensee that is self-guaranteeing decommissioning funds, and the plan, revised tri-annually, where both decommissioning process and the cost estimate are documented. §70.22(a)(9) states that, as provided by §70.25, certain applications for specific licenses part must contain a proposed decommissioning funding plan or a certification of financial assurance for decommissioning.

GEH Response

As described in the license renewal application cover letter dated September 30, 2009 the most recent certification of financial assurance for decommissioning funding was provided to NRC on March 19, 2009. The certification of this type of financial assurance (e.g. parent guarantee) is provided annually per 10CFR70.25(f)(2) and Appendix A to 10CFR30.

Also as described in the license renewal application cover, an updated Decommissioning and Closure Plan and revised cost estimate were provided to NRC

on July 2, 2009. These cost estimates are adjusted every three years per 10CFR70.25(e).

RAI 7

Chapter 11, Management Measures

Though management measures are typically in the context of an Integrated Safety Analysis (ISA), which is not required for the VNC complex, VNC nonetheless, makes vague commitments. For example, the application states that VNC commits to apply management measures on a continuing basis to ensure safety systems are available to perform their function when needed and that preventive maintenance will be done on equipment that is important to safety, yet a discussion about the frequency of preventive maintenance is lacking. Management measures will be applied in a graded approach, without making specific statements about what is meant by graded. Then describe preventive maintenance and graded approach that your comment asks about. §70.22(a)(8) requires an applicant to describe proposed procedures to protect health and minimize danger to life or property.

GEH Response

Chapter 11, Section 11.1.1 is revised to read as follows:

VNC commits to apply Management Measures to ensure safety systems are available and able to perform their function when needed.
(delete words "on a continuing basis")

Chapter 11, Section 11.1.2 is revised to read as follows:

VNC applies Management Measures as described in this chapter.
(delete words "in a graded approach")