UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 29, 2022

Mr. Carlos Martinez, Site Manager
GE Hitachi Nuclear Energy
Vallecitos Nuclear Center
6705 Vallecitos Road
Sunol, CA 94586

SUBJECT: GENERAL ELECTRIC-HITACHI NUCLEAR ENERGY AMERICAS, LLC– ISSUANCE OF AMENDMENT NO. 25 TO FACILITY LICENSE NO. R-33 FOR THE NUCLEAR TEST REACTOR REGARDING RELEASE UNRESTRICTED LAND (EPID NO. L-2019-PMP-0108)

Dear Mr. Martinez:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 25 to Facility Operating License No. R-33 for the General Electric-Hitachi (GEH) Nuclear Test Reactor (NTR). This amendment consists of changes to the facility operating license and technical specifications (TSs) in response to GEH application dated February 16, 2015, supplemented by letters dated September 28, 2016, August 15, 2017, March 19, 2018, and March 20, September 4, and October 4, 2019.

The amendment changes the definition in TS 1.2.26, “Site,” for the NTR facility by removing reference to site acreage, revises the site and facility description stated in TS 5.1.1 and TS 5.1.2, and changes the noble gas release rate in TS Table 3-3, “Stack Release Rate Limits,” from 18 curies per week to 9 curies per week. The amendment also makes editorial changes that correct character, font, and spacing throughout the TSs and updates the “Contents” page numbering as a result of these changes. Additionally, the amendment adds horizontal lines in TS Tables 3-1, 3-2, 4-1, and 4-2, for readability. As a result of these changes, the NTR TSs, which are Appendix A to the license, are being reissued in their entirety. The amendment also revises License Condition 2.C.(3) to update the regulatory authority to withhold the plan from public disclosure and change the date of the NRC-approved Vallecitos Nuclear Center site-wide physical security plan.

The NRC staff's safety evaluation supporting Amendment No. 25 is enclosed. If you have any questions, please contact me at (301) 415-3724 or by electronic mail at Duane.Hardesty@nrc.gov.

Sincerely,

Signed by Hardesty, Duane
on 06/29/22

Duane A. Hardesty, Senior Project Manager
Non-Power Production and Utilization
Facility Licensing Branch
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-073
License No. R-33

Enclosures:
1. Amendment No. 25 to
   Facility Operating License No. R-33
2. Safety Evaluation

cc: See next page

cc:

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Test, Research and Training
Reactor Newsletter
Attention: Amber Johnson
Dept of Materials Science and Engineering
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

SUBJECT: GENERAL ELECTRIC-HITACHI NUCLEAR ENERGY AMERICAS, LLC– ISSUANCE OF AMENDMENT NO. 25 TO FACILITY LICENSE NO. R-33 FOR THE NUCLEAR TEST REACTOR REGARDING RELEASE UNRESTRICTED LAND (EPID NO. L-2019-PMP-0108) DATE: JUNE 29, 2022

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

GE-HITACHI NUCLEAR ENERGY AMERICAS, LLC

DOCKET NO. 50-073

NUCLEAR TEST REACTOR

AMENDMENT TO FACILITY LICENSE

License No. R-33
Amendment No. 25

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

A. The application for an amendment filed by GE-Hitachi Nuclear Energy Americas, LLC (the licensee), dated February 16, 2015, supplemented by letters dated September 28, 2016, August 15, 2017, March 19, 2018, and March 20, September 4, and October 4, 2019, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) Chapter I;

B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

C. There is reasonable assurance that (i) the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public;

E. This issuance of this license amendment is in accordance with 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of the Commission's regulations, and all applicable requirements have been satisfied;

F. Prior notice of this amendment was not required by 10 CFR 2.105, "Notice of proposed action," and publication of a notice of issuance for this amendment is not required by 10 CFR 2.106, "Notice of issuance."

2. Accordingly, the license is amended by reissuing the Technical Specifications as indicated in Attachment 2 to this license amendment, and paragraphs 2.C.(2) and 2.C.(3) of Facility License No. R-33 are hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment 25, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

   (3) Physical Security Plan

   The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved physical security plan, entitled "VNC Site Physical Security Plan," dated March 21, 2016, consists of documents withheld from public disclosure pursuant to 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days. Implementation shall include revision of the safety analysis report consistent with the safety evaluation.

FOR THE NUCLEAR REGULATORY COMMISSION

Joshua M. Borromeo

Digitally signed by Joshua M. Borromeo

Joshua Borromeo, Chief
Non-power Production and Utilization
Facilities Licensing Branch
Division of Advanced Reactors and NPUFs
Office of Nuclear Reactor Regulation

Attachments:
1. Changes to Amended Facility Operating License No. R-33
2. Changes/Replacement of Appendix A, "Technical Specifications"

Date of Issuance: June 29, 2022

ATTACHMENT TO LICENSE AMENDMENT NO. 25

FACILITY LICENSE NO. R-33

DOCKET NO. 50-073

Replace the following page of the Facility License No. R-33 with the revised page. The revised page is identified by amendment number and contains marginal lines indicating the area of change.

Remove	Insert
3	3

possess and use 2,000 curies of either activated solids as contained in but not limited to such items as encapsulating materials, structural material and irradiated components or as contained materials; (b) any byproduct materials necessary for purposes of instrument calibration and startup sources; (c) 10 curies of tritium for pulsed neutron sources; and (d) to possess, but not to separate (except for byproduct material produced as allowed for experiments), such byproduct material as may be produced by the operation of the reactor.

(4) Pursuant to the Act and Title 10 CFR Part 40, "Domestic Licensing of Source Material," to receive, possess and use 9.1 kg. of uranium and thorium as source material for experimental devices.

C. This License shall be deemed to contain and is subject to the conditions specified in Parts 20, 30, 40, 50, 51, 55, 70, and 73 of 10 CFR Chapter I, to all applicable provisions of the Act, and to the rules, regulations and orders of the Commission now, or hereafter in effect, and to the additional conditions specified below:

(1) Maximum Power Level

The licensee may operate the reactor at power levels not in excess of 100 kilowatts (thermal).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised by Amendment No. 22 through 25, are hereby incorporated in the License. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Physical Security Plan

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved physical security plan, entitled "VNC Site Physical Security Plan," dated March 21, 2016, consists of documents withheld from public disclosure pursuant to 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

(4) GE-Hitachi Nuclear Energy Americas LLC, as stated in the General Electric Company's (GE's) application dated January 19, 2007, and supplemented on January 25, 2007, February 23, 2007, March 2, 2007, March 26, 2007, May 16, 2007, May 18, 2007, June 4, 2007, July 6, 2007, and August 9, 2007, will abide by all commitments and representations previously made by GE with respect to the license. These include, but are not limited to, maintaining decommissioning records, implementing decontamination activities, and eventually decommissioning the facility.

ATTACHMENT TO LICENSE AMENDMENT NO. 25

FACILITY LICENSE FOR THE NUCLEAR TEST REACTOR

LICENSE NO. R-33

DOCKET NO. 50-073

Replace all of the pages of Appendix A, “Technical Specifications,” with the enclosed pages. The revised pages are identified by amendment number.

Remove	Insert
All	All

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 25 TO

FACILITY LICENSE NO. R-33

GENERAL ELECTRIC-HITACHI NUCLEAR TEST REACTOR

DOCKET NO. 50-073

1.0 INTRODUCTION

By application dated February 16, 2015 (Refs. 1 through 5), supplemented by letters dated September 28, 2016 (Refs. 6 through 9), August 15, 2017 (Ref. 10), March 19, 2018 (Ref. 11), March 20, 2019, (Ref. 32), September 4, 2019 (Ref. 37), and October 4, 2019 (Ref. 38), GE-Hitachi Nuclear Energy Americas, LLC (the licensee or GEH) submitted a license amendment request (LAR) to the U.S. Nuclear Regulatory Commission (NRC) under the provisions of Section 50.90, "Application for amendment of license, construction permit, or early site permit," of Title 10 of the *Code of Federal Regulations* (10 CFR) to amend the GEH Nuclear Test Reactor (NTR) technical specifications (TSs).

In the license amendment, the licensee proposes to:

- remove the site acreage from the NTR TSs by revising TS 1.2.26, "Site," definition,
- reduce the noble gas release rate in Table 3-3 "Stack Release Rate Limits" for TS 3.4.3.3 from 18 curies per week to 9 curies per week,
- update the site and facility description in TS 5.1.1 by removing vague wording, change the definition of "restricted area," and add a definition of "controlled area" in TS 5.1.2,
- make editorial changes to the GEH TSs to update the cover sheet, headers, and footers; correct "Contents" page numbering; add horizontal lines in TS Tables 3-1, 3-2, 4-1, and 4-2, and;
- revise the GEH NTR safety analysis report (SAR) to eliminate the specific reference to the VNC site acreage (i.e., "approximately 1600 acres"), to incorporate the changes to the TSs, bases, and incorporate a revised drawing depicting the GEH site boundary for the Vallecitos Nuclear Center (VNC).

Additionally, the licensee requests that License Condition 2.C.(3) of License No. R-33 (Ref. 33) be updated to reflect the current NRC-approved version of the consolidated physical security plan (PSP) and to update the regulatory authority to withhold the PSP from public disclosure. The current PSP, which was approved by the NRC during renewal of Materials License SNM-960 for GEH (Ref. 12) is applicable to the entire Vallecitos Nuclear Center (VNC) site, including both the materials license and the GEH NTR facility license.

2.0 REGULATORY EVALUATION

As required by 10 CFR 50.92, the NRC staff reviewed the licensee's amendment application, as supplemented, to ensure that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) activities proposed will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. The NRC staff considered the following regulatory requirements and guidance during its review of the proposed changes:

- Section 20.1101, "Radiation protection programs," of 10 CFR, which provides the regulatory requirements to develop, document, and implement a radiation protection program commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of Part 20, to use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA), and implement a constraint on air emissions of radioactive material to the environment, excluding Radon-222 and its daughters, such that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent in excess of 10 mrem (0.1 mSv) per year from these emissions.

- Section 20.1201, "Occupational dose limits for adults," of 10 CFR, which requires the licensee to control the occupational dose to individual adults.

  Section 20.1301, "Dose limits for individual members of the public," of 10 CFR, which provides the regulatory requirements to conduct operations so that the total effective dose equivalent to individual members of the public from the licensed operation is in compliance with the dose limits of Part 20.

- Section 20.1302, "Compliance with dose limits for individual members of the public," of 10 CFR, which provides the regulatory requirements to make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in Section 20.1301.

- Part 50, "Domestic Licensing of Production and Utilization Facilities," of 10 CFR, which provides the regulatory requirements for licensing of nuclear reactors.

- Section 50.36(a)(1) of 10 CFR, which requires that each applicant for a license authorizing operation of a production or utilization facility include in its application proposed TSs and include a summary statement of the bases or reasons for such specifications, other than those covering administrative controls, which shall not become part of the TSs.

- Section 50.36(b) of 10 CFR, which requires that the TSs be derived from the analyses and evaluation included in the safety analysis report. The Commission may include such additional TSs as the Commission finds appropriate.

- Section 50.36(c)(2) of 10 CFR, which requires the TSs to include limiting conditions for operation (LCOs), which are the lowest functional capability or performance levels of equipment required for safe operation of the facility.

- Section 50.36(c)(4) of 10 CFR, which requires TSs to contain design features of the facility such as materials of construction and geometric arrangements, which, if altered or modified, would have a significant effect on safety and are not covered in categories described in 10 CFR 50.36(c)(1), (2), and (3).

- Section 50.36(c)(5) of 10 CFR, which requires administrative controls relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.

- Section 50.54(p)(1) of 10 CFR, which states that the licensee may not make a change which would decrease the effectiveness of a physical security plan prepared under 50.34(c) or 10 CFR Part 73 without prior approval of the Commission and that a licensee desiring to make such a change is required to submit an application for amendment to the licensee's license under 10 CFR 50.90.

- Section 50.54(p)(2) of 10 CFR, which states that the licensee may make changes to the plans referenced in 10 CFR 50.54(p)(1), without prior Commission approval, if the changes do not decrease the safeguards effectiveness of the plan.

- Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions" of 10 CFR, which implements section 102 of the National Environmental Policy Act of 1969, as amended (NEPA), and sets forth regulations applicable to NRC's domestic licensing activities and related functions.

- Regulatory Guide (RG) 1.111-1977, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors" (Ref. 26), which, provides guidance on the assessments of potential annual radiation doses to the public resulting from routine releases of radioactive materials in gaseous effluents.

- NUREG-1537, Part 2, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Standard Review Plan and Acceptance Criteria," (Ref. 13), which provides guidance to NRC staff on performing on the conduct of licensing action reviews of applications to construct, modify, or operate a nuclear non-power reactor.

- American National Standards Institute/American Nuclear Society (ANSI/ANS)-15.1-1990, "The Development of Technical Specifications for Research Reactors" (Ref. 28), which provides guidance that identifies and establishes the content of TSs for research and test reactors.

3.0 TECHNICAL EVALUATION

This safety evaluation (SE) assesses the technical adequacy of the GEH LAR to verify compliance of the GEH application with the applicable regulatory requirements using NUREG-1537, Part 2, (Ref. 13) and the additional guidance, as applicable, for the development of TSs and for evaluating the dispersion of gaseous effluents, as listed in Section 2.0. The NRC staff's method of review includes an evaluation of the licensee's proposal against the applicable regulatory criteria, a review of the licensee's assumptions in combination with its use of an approved methodology for determination of dose from airborne radiation sources, and the NRC's staff independent analysis to confirm the results presented by the licensee. The chapters of NUREG-1537 referenced in the conduct of this review include: Chapter 2, "Site Characteristics," Chapter 11, "Radiation Protection-Program and Waste Management," Chapter 12, "Conduct of Operations," and Chapter 14, "Technical Specifications."

The NRC staff reviewed the LAR, as supplemented (Refs. 1 through 11, 31 through 34, 37, and 38), the GEH SAR submitted for license renewal on September 30, 1997 (Ref. 14), and the facility's annual reports (Ref. 15 through Ref. 21) for license R-33. The reactor performance and accident analysis methodology used in the 1997 SAR, as well as the radiation levels and results of samples at onsite and off-site monitoring stations provided in the GEH NTR annual reports formed part of the basis for this LAR.

3.1 **Background**

The NTR is described in Section 1.3 of the SAR (Ref. 14) as a heterogeneous, tank type reactor licensed to operate at 100 kilowatts (thermal). The core contains highly enriched uranium fuel that is graphite moderated and reflected. The core is cooled either by natural or forced flow of water circulated in a primary system constructed primarily of aluminum. The reactor coolant flows through an external heat removal and purification system. The reactor's experimental systems include a central sample tube, penetrations through and into the reflector, the reactor surfaces, and neutron beams and tubes from any of these facilities.

The VNC site is located at 6705 Vallecitos Road in Sunol, California. The VNC site is approximately 1,600 acres owned by GEH, located approximately 35 miles east-southeast of San Francisco, Alameda County, California. Figure 1 (Ref. 37) shows the overall VNC site boundary, which the licensee states is owned and operated by GEH. In its Request for Release of North Section of VNC Site (Ref. 34), the licensee stated that only 135 acres of the approximately 1,600-acre site is developed and used for the licensed activities of conducting nuclear power research, development, testing, and post irradiation examination of reactor fuel. The developed area is located within Area A shown on Figure 2 (Ref. 2). The combined acreage of Area A and Area B in Figure 2 is the same area shown as the proposed VNC site boundary shown in Figure 1. In Reference 37, the licensee proposes to replace Figure 2-5 in the NTR SAR with the diagram provided by Figure 1.

The VNC site has four co-located reactors on the site. The NTR, License No. R-33, is the only operating reactor on the VNC site, while two power reactors (the Vallecitos Boiling Water Reactor (VBWR), License No. DPR-1, and the Empire State Atomic Development Agency Vallecitos Experimental Superheat Reactor (EVESR), License No. DR-10) and one test reactor (GE Test Reactor (GETR), License No. TR 10) are currently in a SAFSTOR [Safe Storage] condition, in accordance with 10 CFR 50.82. All these facilities are located within Area A of Figure 2.

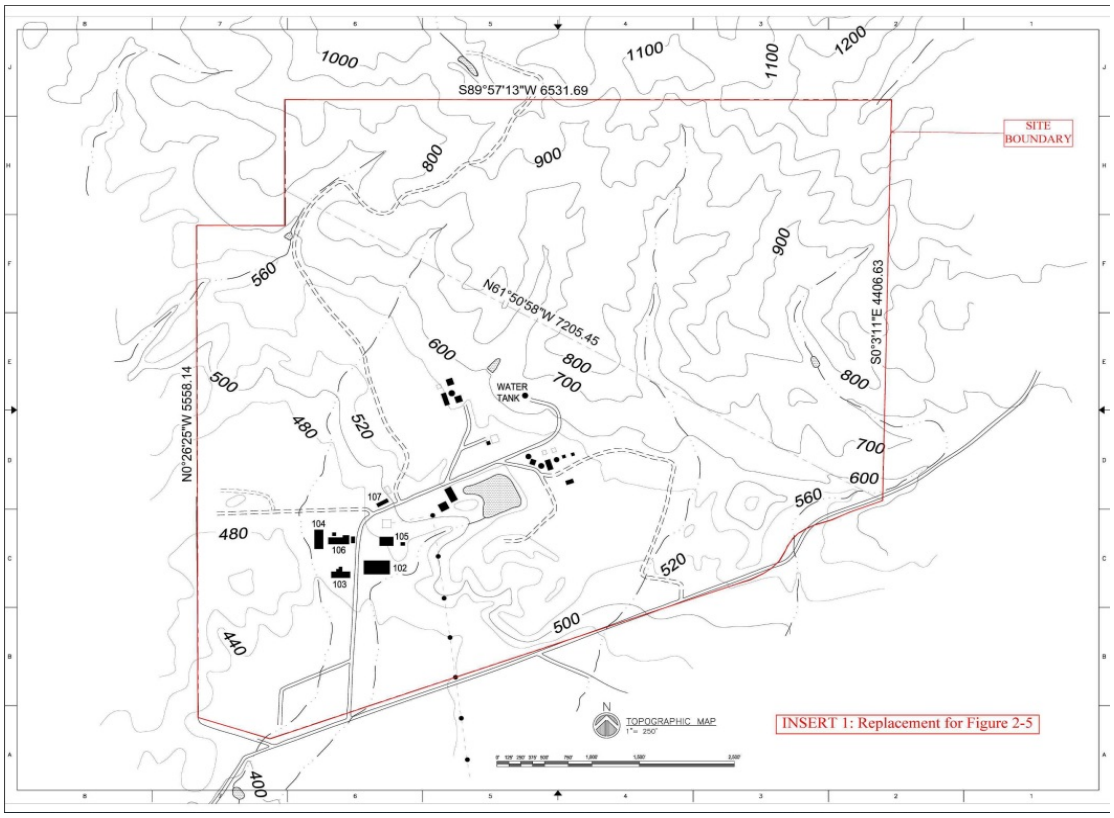

Figure 1 - Diagram of proposed GEH site boundary

Figure 2 - Overhead view of VNC Site Layout

3.2 **Related NRC Evaluations**

GEH previously requested to release the unused northern section of the VNC site (approximately 610 acres), shown as Area C1 and C2 in Figure 2, for unrestricted use (Ref. 34). Release of this land was approved on May 3, 2016, with respect to the VBWR (Docket No. 50-18), and the EVESR (Docket No. 50-183) under the 10 CFR 50.83, "Release of part of a power reactor facility or site for unrestricted use" (Refs. 22 and 25). As part of its review of the partial release, the NRC staff published an "Environmental assessment and finding of no significant impact" in the *Federal Register* on May 12, 2016 (Ref. 24), which concluded that a partial site release an approximately 610-acre parcel in the northern section of the approximately 1,600 acre VNC site for License Nos. DPR-1 (VBWR), R-33 (NTR), and DR-10 (EVESR), will not have any adverse environmental impact. Section 50.83 does not apply to the GEH NTR because it is a non-power reactor, but since the NTR is a research reactor and is co-located on the VNC site, the safety of releasing areas surrounding the NTR site were considered by the NRC staff in the partial release SE. The NRC staff confirmed by survey (Ref. 23) and inspection (Ref. 25) that the licensee correctly categorized the area as non-impacted.[1]

3.3 **Evaluation of the Proposed License Amendment**

3.3.1 **VNC Site and Facility Description**

The licensee states in its LAR (Ref. 5) that the VNC site boundaries have not changed since the property was purchased in 1956. A perimeter fence controls general public access to the site, and an entrance gate (approached by an access road over VNC property from Vallecitos Road) is guarded at all times to control the entrance and exit of personnel within the site boundaries and controlled areas of the site.

In the LAR, GEH proposes to change the definition of "Site" in TS 1.2.26 and in Section 2.0 "Site Characteristics" of the NTR SAR to eliminate the specific reference to the VNC site acreage. GEH also proposes to replace SAR Figure 2-5 "Topography Contour of Vallecitos Nuclear Center" with a diagram that clearly shows the VNC site boundary (Ref. 37). The proposed changes would allow the licensee to sell the released land to a non-GEH controlled entity. The licensee states that the current TS reference to "1600 acres" includes Area A (~400 acres), Area B (~570 acres) and Area C (~610 acres). Area B and Area C are outside the developed area for licensed operations of the four co-located reactor sites. According to the LAR (Ref. 1), Area B and C consist generally of undeveloped land, which is currently used for cattle grazing. The licensee also states that Area C has never been used for licensed activities. The LAR proposes no changes to Area B, which will continue to be retained by GEH.

NTR TS 1.2.26 describes the site as "[t]he area (approximately 1,600 acres) within the confines of the Vallecitos Nuclear Center (VNC) owned and operated by the licensee." The licensee proposes to amend the site definition in TS 1.2.26 as indicated below by the strikethrough typeface for the deletions and bold typeface for the added text.

1.2.26 Site

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[1] Regulation 10 CFR 50.2 defines non-impacted areas as areas with no reasonable potential for residual radioactivity in excess of natural background or fallout levels.

> The area ~~(approximately 1600 acres)~~ within the confines of the Vallecitos Nuclear Center (VNC) **site boundary** ~~owned and operated~~ **controlled** by the licensee.

In its LAR (Ref. 1), the licensee stated that, "The site acreage is not explicitly used in any of the analyses supporting the design and licensing basis of NTR." Additionally, because the land proposed for release (Area C of Figure 2) will still be owned by GEH until it is sold, but will not be part of the defined site boundary, the licensee proposed to further change the definition from "owned and operated" to "controlled" area to provide clarity (Ref. 37).

The NRC staff finds the proposed TS 1.2.26 definition is consistent with the American National Standards Institute/American Nuclear Society (ANSI/ANS) standard ANSI/ANS 15.1 1990 (Ref. 28) to provide uniform interpretation of terms and phrases associated with the facility and the guidance of Appendix 14.1 of NUREG-1537, Part 1 (Ref. 13) to provide definitions to clarify terms referred to in the TSs. Additionally. the NRC staff reviewed the VNC Radiological Emergency Plan (REP) (Ref. 39) and finds that the TS 1.2.26 definition for site is consistent with the definition for "site" in the REP in relation to emergency planning. The NRC staff also reviewed the evaluations of radiological consequences in NTR SAR for both routine and accident releases. These consequences are not based on the site definition, but on the minimum distance from the reactor to the posted site boundary of 488 meters (1600 feet), as defined in TS 5.1.2, which is discussed below.

The NRC staff also reviewed the licensee's proposed changes to the Section 5 facility design features specified in the NTR TS 5.1.1 and TS 5.1.2. In its LAR (Ref. 7 and 37), the licensee proposed to reword TS 5.1.1 and eliminate the following language: "*which is owned and controlled by the licensee.*" The licensee stated that the revised TS 5.1.1 clarifies the description of the location of the NTR.

The proposed TS 5.1.1 would state:

> The Nuclear Test Reactor (NTR) facility shall be located on the ~~site of the~~ Vallecitos Nuclear Center (VNC) **site** ~~which is owned and controlled by the licensee~~.

The NRC staff finds that the change to TS 5.1.1 is consistent with the change to TS 1.2.26 to eliminate conflicting terminology between "owned and operated" of TS 1.2.26 and "owned and controlled" in TS 5.1.1.

Additionally, the licensee proposed to change "restricted" area of the current TS 5.1.2 to "controlled" area and to add a new definition of the restricted area to TS 5.1.2 in relation to the Site and Facility description. The licensee stated (Ref. 37) that the changes to TS 5.1.2 are to match the revised definition in TS 1.2.26, correct the use of the controlled area terminology, and to clarify the description of the NTR restricted area. The licensee proposed changes to TS 5.1.1 and TS 5.1.2 are indicated below by the strikethrough typeface for the deletions and bold typeface for the added text.

The proposed TS 5.1.2 would state:

> The minimum distance from the reactor to the posted site boundary shall be approximately 488 meters (1600 feet). The **controlled** ~~restricted~~ area, as defined in 10 CFR Part 20 of the Commission's regulations, shall be the **area within the VNC site boundary. The restricted area, as defined in 10 CFR Part 20 of the Commission's regulations, is the NTR facility.**

Section 20.1003 of 10 CFR defines a controlled area as “an area, outside of a restricted area but inside the site boundary, access to which can be limited by the licensee for any reason.” Section 20.1003 of 10 CFR states that “restricted area means an area, access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. Restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area.”

The NRC staff reviewed the licensee’s proposed change to TS 5.1.2 and the site details in Section 1.3 and 2.1.1 of the licensee’s SAR (Refs. 5 and 14) for establishing these TSs. TS 5.1.2, which is part of TS 5.1, “Site and Facility Description,” specifies the general design features for the site description. Based on the description in the SAR and TSs, the NRC staff finds that “controlled area” is more appropriate than “restricted area” to describe the area within the confines of the VNC (e.g., the site boundary) because the purpose of the referenced area between the reactor and the site boundary is not for protecting individuals against undue risks from exposure to radiation and radioactive materials, but is an area inside the site boundary to which the licensee limits access. Additionally, the NRC staff finds that the portion of TS 5.1.2 that describes the feature which, if altered or modified, would have a significant effect on safety (i.e., the distance between the reactor and the posted site boundary) is not altered by this proposed change. Therefore, the NRC staff finds that the proposed changes to TS 5.1.1 and TS 5.1.2 are consistent with the guidance in Section 5.1 of ANS/ANSI-15.1 to establish design features and that the description meets the requirements of 10 CFR 50.36(c)(4) and are acceptable.

Based on its review, the NRC staff finds that TS 1.2.26, in combination with the “Site and Facility” description provided in TS 5.1.1 and 5.1.2, adequately describes the boundaries of the VNC. NTR reactor operations are limited to the area described in the1997 license renewal SAR (Ref. 14), and defined in TS 5.1.2, and is supported by the licensee’s analysis in the LAR (Refs. 2, and 10). The NRC staff concludes that the proposed NTR TS 1.2.26 is a site-specific definition unique to the VNC site that follows the guidance in ANS/ANSI-15.1 to provide a uniform interpretation of the term “site,” as used in the NTR TSs, and is acceptable.

Section 2.1 of the licensee’s SAR describes the geography and demography of the VNC site. In its LAR (Ref. 5), the licensee also proposed to update the 1997 SAR (Ref. 14) for the NTR. References to a specific acreage of the VNC site area would be deleted from the SAR. Also, Figure 2-5, “Topography Contour of Vallecitos Nuclear Center,” in the NTR SAR, would be updated to reflect the proposed site boundary. The LAR (Ref. 5) indicates that the properties surrounding the VNC site are primarily used for agriculture and cattle raising, with some residences, which are mostly to the west of the property. The nearest sizeable towns are Pleasanton, California, located 4.1 miles to the north-northwest, and Livermore, California located 6.2 miles to the northeast (Refs. 14 and 34).

The NRC staff from the Office of Nuclear Reactor Regulation, Office of Nuclear Material Safety and Safeguards, and Region IV Inspectors conducted onsite visits and a site inspection pertaining to this amendment on July 20-23, 2015 (Ref. 25). The NRC staff reviewed the information the licensee provided in the LAR and finds that the licensee’s description of the VNC site and of its use of the VNC areas provides a sufficiently detailed and accurate description of the VNC site and is consistent with NRC licensing documentation and inspection findings. Additionally, the NRC staff finds that there are no substantive changes to 1997 NTR SAR descriptions of the site characteristics, including geography, demography, nearby transportation, industrial, and military facilities. On this basis, the NRC staff finds that the updates to the VNC

site description in the TS and SAR, and the approved release (for unrestricted use) of the land with respect to co-located reactor facilities is consistent with the NUREG-1537 guidance that the SAR describe the geographical location and principal characteristics of the facility site (Section 1.3, 2.1, 2.4, and 2.5) and planned industrial, military, and transportation facilities and routes (Section 2.2). The NRC staff concludes the licensee's proposed geographical and demographic descriptions of the VNC site and its location are sufficiently accurate and detailed to provide the necessary bases for analyses presented in other chapters of the SAR and are acceptable.

3.3.2 **Meteorology**

VNC Site meteorology is described in SAR Section 2.3 (Ref. 14) and supplements to the LAR (Refs. 9 and 10). The LAR supplements contain recorded meteorological data at the Vallecitos location used to calculate atmospheric dispersion factors. The licensee calculated dispersion values for 16 sectors using the guidance in RG 1.111 in support of the LAR. Based on meteorological conditions at the site, the licensee's calculations for the LAR determined the most conservative atmospheric dispersion factor is in the southwest (SW) sector, 756 meters from the exhaust stack. The licensee evaluated the new atmospheric dispersion factors (2.2E-11 seconds per milliliter (sec/ml), and 5.9E-12 sec/ml) to the current atmospheric dispersion factor used for licensing in the SAR (Refs. 2, 5 and 14). The licensee determined that the current licensed atmospheric dispersion (3.48E-11 sec/ml) is larger and using it in dose calculations results in a more conservative (higher) dose for calculating exposure to individuals in uncontrolled areas. For additional conservatism, the licensee also used the closest proposed site boundary uncontrolled by the licensee of 510 meters (vs. the controlled area of 488 meters in TS 5.1.2) from the GEH exhaust stack in the northeast (NE) sector in its dose calculations.

Table 1 Atmospheric Dispersion Factors

GEH		
Northeast Sector	5.9E-12 sec/ml	510 meters
Southwest Sector	2.2E-11 sec/ml	756 meters
Current Licensed Value	3.48E-11 sec/ml	8,047 through 16,093 meters
NRC staff		
Northeast Sector	1.50E-10 sec/ml	510 meters

The NRC staff reviewed the metrological data in the LAR and finds that it reasonably compares to recent metrological conditions in Sunol, California available on the National Oceanic and Atmospheric Administration's website (https://www.noaa.gov/). The NRC staff independently calculated an atmospheric dispersion factor at 510 meters from the GEH exhaust stack, which is summarized in Table 1, along with the licensee's proposed dispersion factor. The NRC staff evaluated the LAR, as supplemented, (Refs. 2, 5, 9, and 10) and finds that, consistent with the guidance in NUREG--1537, Part 2, Section 2.3, the licensee provided sufficient meteorological information to support realistic analyses applicable to dispersion analyses for postulated airborne releases. Based on its review, the NRC staff finds the atmospheric dispersion factor of 3.48E-11 sec/ml is reasonable. Additionally, the NRC staff finds that use of the GEH factor for analyses is applicable and conservative in determining the dispersion of airborne releases of radioactive material to uncontrolled areas. The NRC staff finds that the meteorology and dispersion factors determined by the licensee provide reasonable assurances that releases of airborne effluents from the facility will not pose unacceptable radiation risks to the environment

or the public in compliance with 10 CFR Part 20 for protection against ionizing radiation resulting from activities conducted under the GEH license. Accordingly, the NRC staff concludes that the methods and assumptions, as applied by the licensee to releases from both normal reactor operations and postulated accidents at the NTR facility and the overall VNC site, are acceptable.

3.3.3 **Radiation Sources**

Airborne radiation sources are described in SAR Section 11.1.1.1 (Ref. 14) and in the LAR (Ref. 2). In its discussion of the proposed changes, the licensee states, in part:

> The TS amendment developed in support of the proposed land sale ensures that there will be no significant change in the types, or significant increase in the amounts, of any effluents that may be released offsite; nor will there be any significant increase in individual or cumulative occupational exposure.

TS 6.6.1, "Operating Reports (Ref. 7)," requires the licensee to submit an annual operating report to the NRC. The report is required, among other items, to include the following:

e. A summary of the nature and amount of radioactive effluents released or discharged to environs beyond the effective control of the owner-operator as determined at or before the point of such release or discharge.

f. Summarized results of environmental surveys performed outside the facility.

The licensee maintains four environmental air-monitoring stations around the site. Each station is equipped with a membrane filter, which is changed weekly and analyzed for gross alpha and gross beta-gamma. The licensee also measures alpha, beta and gamma activity on local vegetation. The licensee reported that there is no alpha, beta or gamma activity attributable to activities at the NTR facility found on or in vegetation in the vicinity of the site (Refs. 15 through 21).

In its SAR (Ref. 14), the licensee states that the radioactive noble gas isotope Argon-41 (Ar-41) is the predominant radionuclide emitted from the NTR reactor cell through the exhaust ventilation system. For its LAR (Ref. 10), the licensee used the COMPLY computer code to analyze noble gas releases, assuming the NTR ran continuously for a year at full power and using an assumed release limit for noble gas (Ar-41) of 8.7 Ci/week for a typical 30-hour operational week to calculate a theoretical annual dose to members of the public in uncontrolled areas. The licensee calculated an effective dose equivalent of 9.7 millirem per year (mrem/year). The licensee also measured ambient gamma radiation levels at environmental sample stations. These readings consistently show no departure from normal stable background radiation levels (Refs. 15 through 21).

Table 2 contains information the NRC staff compiled from its review of GEH NTR annual operating reports for the years 2011 through 2017 (Refs. 15 through 21). The NRC staff reviewed this information to assess the completeness of the history presented by the licensee and to ensure historical information was considered to evaluate the current radiological status of the facility. The NRC staff previously evaluated the radiological contribution to the site radiological effluents, occupational dose, and public dose from the three co-located reactors in SAFSTOR and found them acceptable in the NRC staff evaluation of partial site release pursuant to 10 CFR 50.83 (Ref. 22), and the related environmental report (Ref. 24) and

inspection report (Ref. 25). Only the results of environmental monitoring at the NTR are considered herein.

Table 2 – VTC Operating History, Radiation Levels and Sample Results

Year	Operating Time	Power Generation	Airborne releases		Dosimetry	
			Iodine-131	Noble Gases*	Occupational†	Offsite
2021	619 hours	2.52 MW-days	1.15E-05 Ci	1.30E+02 Ci	4.0 Person-Rem	Background
2020	687 hours	2.80 MW days	1.47E-05 Ci	1.37E+02 Ci	4.6 Person-Rem	Background
2019	695 hours	2.83 MW days	1.61E-06 Ci	1.54E+02 Ci	4.0 Person-Rem	Background
2018	719 hours	2.94 MW days	6.17.E-06 Ci	1.90E+02 Ci	4.3 Person-Rem	Background
2017	764 hours	3.18 MW-days	2.48E-06 Ci	1.99E+02 Ci	5.1 Person-Rem	Background
2016	701 hours	2.87 MW-days	1.80E-05 Ci	1.86E+2 Ci	4.4 Person-Rem	Background
2015	826 hours	3.38 MW-days	6.56E-06 Ci	2.83E+2 Ci	4.7 Person-Rem	Background
2014	874 hours	3.57 MW-days	3.14E-06 Ci	2.62E+2 Ci	4.8 Person-Rem	Background
2013	948 hours	3.89 MW-days	2.55E-06 Ci	2.50E+2 Ci	4.9 Person-Rem	Background
2012	846 hours	3.47 MW-days	7.10E-06 Ci	2.70E+2 Ci	4.8 Person-Rem.	Background
2011	1000 hours	4.11 MW-days	5.06E-06 Ci	2.71E+2 Ci	5.0 Person-Rem	Background

* - Noble gas activities recorded from the NTR stack integrate both background readings and the actual releases. Background readings may account for as much as 50 percent of the indicated release.
† - There were no reportable events or occurrences during the five years assessed that required notification to the NRC. Values represent collective radiation exposure for all workers while performing work at NTR.

The NRC staff reviewed the Table 2 data condensed from the licensee's annual reports and finds the applicant's summary of the airborne releases and measured doses resulting from radionuclides detected during normal operations in areas that could be occupied by facility staff and areas that could be occupied by the public to be in compliance with 10 CFR Part 20.

Specifically, the NRC staff finds that the measured occupational doses are compliant with the applicable 10 CFR 20.1201 requirements to control the occupational dose to individual adults to less than the annual limits[2]. The NRC staff also finds that the licensee's calculated dose equivalent of 9.7 mrem/year meets the 10 CFR 20.1101(d) constraint on air emissions of radioactive material to the environment such that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent in excess of 10 mrem (0.1 mSv) per year from these emissions. Additionally, in its review of the data of the NTR environmental monitoring station measurements, the NRC staff finds that the reported doses were below the 10 CFR 20.1301 limit of 100 mrem (1 millisievert) for individual members of the public.

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[2] The annual limit is the more limiting of a total effective dose equivalent equal to 5 rems (0.05 Sv) or the sum of the deep-dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems (0.5 Sv) and the annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities, which are a lens dose equivalent of 15 rems (0.15 Sv), and, a shallow-dose equivalent of 50 rem (0.5 Sv) to the skin of the whole body or to the skin of any extremity.

The NRC staff concludes that all expected radiation sources are addressed and that the methods and assumptions as applied by the licensee provide reasonable assurances that releases of airborne effluents from the facility and resultant doses can reasonably continue to be less than the applicable regulations and will not pose unacceptable radiation risks to the NTR personnel, environment, or the public and are acceptable.

3.3.3.1 Computational Methodology

In the GEH LAR and the licensee's response to RAI No. 3 (Refs. 2, and 10, respectively), the licensee evaluated the impact of gaseous stack releases with regard to the TS 3.4.3 limits. In its RAI response, the licensee proposed reducing the stack release rate limit for "All other (including Noble Gas)" from 18 Ci/wk to 9 Ci/wk in Table 3-3 of TS 3.4.3. The updated SAR analysis in Section 6.4 calculates the potential dose to the most exposed person in uncontrolled areas for the isotope group "All other (including Noble Gas)." The licensee stated in its RAI response (Ref. 10) that the reduced limit of 9 Ci/wk in Table 3-3 of TS 3.4.3 on air emissions was chosen for additional conservatism to ensure that no member of the public would be expected to receive greater than 10 mrem/year due to airborne radiation dose from the facility. The licensee stated that the reduced limit is 5 percent of the 10 CFR Part 20 Appendix B, Table 2, Column 1 concentration to take into account airborne releases from the entire VNC site and include the effects of NRC-licensed activity other than at NTR. The licensee analyzed whether the reduced limit satisfies 10 CFR Part 20 limits by calculating an annual dose using the COMPLY computer code independent of its atmospheric dispersion factor and determined that unrestricted operations at full power would produce 2,540 Ci and a corresponding annual dose of 9.7 mrem.

The NRC staff reviewed the licensee's proposed TS Table 3-3 limit of 9 Ci/wk on annual average stack release limits and the licensee's methodology, and independently verified the results (see Section 3.3.3.2 of this SE). The NRC staff finds that the TS Table 3-3 limit of 9 Ci/wk is consistent with the guidance in NUREG-1537, Appendix 14.1, Section 3.7.2, which states that a licensee should show that the proposed concentration limits and the potential doses from those concentrations comply with 10 CFR Part 20 for the maximum exposed member of the public. The NRC staff finds the licensee's proposed changes to TS Table 3-3 meet the 10 CFR 20.1101(d) constraint on air emissions of radioactive material to the environment such that an individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent in excess of 10 mrem (0.1 mSv) per year from these emissions. Additionally, the NRC staff finds that licensee's evaluation of the impact of gaseous stack releases meets the 10 CFR 20.1301 requirement that the total effective dose equivalent to individual members of the public from the licensed operation not exceed 0.1 rem (1 mSv) in a year. The NRC staff also finds the licensee's proposed change meets the 10 CFR 50.36(b) requirement that TSs be derived from the analyses and evaluation included in the safety analysis report. Based on this information, the NRC staff concludes that the proposed change to stack release rate limit for "All other (including Noble Gas)" in TS Table 3-3 will give reasonable assurance that the health and safety of the facility staff, the environment, and the public will be adequately protected and is acceptable.

3.3.3.2 NRC Confirmatory Calculations

The NRC staff compared the licensee's computational methodology in the NTR LAR (Ref. 2) to the 1997 license renewal SAR (Ref. 14) computational methodology previously approved by the NRC staff. Using the NRC derived dispersion value from Table 1 Atmospheric Dispersion

Factors," of this SE, the NRC staff calculated dose to an individual member of the public in uncontrolled areas.

The assumptions for the NRC calculations, which are comparable to those assumed by the licensee, are the following:

- Individual member of the public is in the NE sector
- Wind direction frequency of 25 percent in the NE sector
- Wind Speed is 1 mile per hour
- Distance is 510 meters from the NTR stack to the proposed site boundary
- Averaged moderately stable, slightly stable, and neutral atmospheric stability classes
- Unrestricted operation of 8,760 hours a year
- Full Power 100 kilowatts (thermal)
- Proposed TS limit of 9 Ci/wk
- Conversion values from 10 CFR Appendix B Table 2 Column 1

The NRC staff reviewed the GEH LAR, LAR supplement, response to RAI No. 3, and annual reports (Refs. 2, 9, 10, and 15 through 21, respectively). Based on this review, the NRC staff finds that Ar-41 is the principal noble gas released by the NTR. For years 2011 through 2017, the NTR operated less than 1,000 hours per year, equivalent to an average capacity factor of 10 percent. The NRC staff previously reviewed and accepted the computational methodology proposed by the licensee during license renewal (Ref. 14), in which, the licensee used a general fluid dynamics computer code (RALOC) to determine the atmospheric dispersion factor of 3.48E-11 sec/ml used in the SAR analysis. The NRC staff calculated (using the specific site data for the GEH facility and VNC site and conservative data for wind direction frequency (high in same direction) and wind speed (low speed)) that dose resulting from the Ar-41 radioisotope would not exceed 5 mrem over the course of a year.

The NRC staff reviewed the licensee's verification methodology, and finds that the licensee's methodology is consistent with the guidance in Chapter 11, "Radiation Protection Program and Waste Management" of NUREG-1537 (Ref. 13) to include the type and quantities of radionuclides, methods and locations of release, methods of assessing the potential doses to people in the unrestricted area, and methods of comparing the consequences of releases with the limits in 10 CFR Part 20. The NRC staff also finds that the results of its confirmatory calculations are in reasonable agreement with the licensee's calculations. On this basis, the NRC staff concludes the licensee's analysis methodology of airborne radiation sources and the computational results (see SE Section 3.3.3.1) are acceptable.

3.4 **Conduct of Operation**

In its response to the NRC staff's RAI (Ref. 10), the licensee states that VNC Procedure 5.2 requires the monthly collection of noble gas and particulate discharge records from the stack gas monitoring system. Reporting is completed and tracked by attaching a copy of the report to the compliance calendar completion report, which is also tracked on a monthly basis. TS 6.6.1, "Operating Reports," requires that the annual operating report include a summary of the nature and amount of radioactive effluents released or discharged to environs beyond the effective control of the owner-operator as determined at or before the point of such release or discharge. TS 6.7.3, "Records to be Retained for the Lifetime of the Reactor Facility," requires the licensee to keep a record of gaseous and liquid radioactive effluents released to the environs. Finally, TS 6.6.2, "Special Reports," requires the licensee to make a report to the NRC, not later than

the following working day, to be followed by a written report within 14 days that describes any release of radioactivity from the site above allowed limits.

The Section 6.0 TSs were reviewed and approved by the NRC staff during license renewal (Ref. 36), and the licensee did not propose any changes to these TSs in the LAR. Based on its review, the NRC staff finds these same TSs are applicable and important to the continued monitoring of radioactive effluents for compliance with NRC regulations. Given the licensee's proposed change to the "stack release limits (including noble gasses)" in TS Table 3-3, the NRC staff reviewed the specific annual reporting requirement related to radioactive waste releases and finds that they are consistent with the guidance provided in Section 12.5 and Section 12.6 of NUREG-1537 (Ref. 13) to provide the NRC a timely summary of the radioactive effluents, to provide special reports in the event of a violation of the limits, and that the types of records that will be retained by the facility and the period of retention is appropriate.

The NRC staff finds that the TS reporting requirements and the information in the licensee's annual operating reports provide reasonable assurance that the NTR will continue to comply with NRC regulations and are acceptable.

3.5 **Proposed Editorial Changes to Technical Specifications**

In the LAR, as supplemented (Refs. 1, 8, 10, and 11), the licensee requests that the NRC reissue all of the GEH NTR TSs. The licensee proposes the TS cover page and the document headers and footers be updated to reference the proposed Amendment 25. The licensee also proposes changes to character spacing, font and pagination (which includes corresponding updates to the page numbers in the table of contents page). The licensee also proposes changes to TS Tables 3-1, 3-2, 4-1, and 4-2 to modify column and row border lines to demarcate the separate table entries. Additionally, the licensee proposes changes to TS Table 3-3, TS 3.4.4 bases, and TS 5.1.2.

3.5.1 **TS Table 3-3 (Referenced by TS 3.4.3.2 and TS 3.4.3.3)**

In addition to the licensee's proposal to reduce the noble gas weekly discharge limit in TS Table 3-3, the licensee also proposed changes to improve the readability of TS Table 3-3 by removal of an extraneous interior line for the annual average limit for halogen and particulate.

The current TS Table 3-3 states:

Table 3-3

STACK RELEASE RATE LIMITS

Isotope Group	Annual Average
Halogen, > 8d T1/2	180 mCi/wk
Particulate, > 8d T1/2	
Beta-Gamma	870 microcuries/wk
Alpha	8.7 microcuries/wk
All other (including Noble Gas)	18 Ci/wk

The proposed TS Table 3-3 would state:

Table 3-3

STACK RELEASE RATE LIMITS

Isotope Group	Annual Average
Halogen, > 8d T1/2	180 mCi/wk
Particulate, > 8d T1/2	
Beta-Gamma	870 microcuries/wk
Alpha	8.7 microcuries/wk
All other (including Noble Gas)	**9 Ci/wk**

The NRC staff evaluated the change to the stack release limit for “All other (including Noble Gas)” and found it acceptable (see Section 3.3.3 of this SE). The NRC staff reviewed the proposed change to remove the interior horizontal border line in the “Annual Average” column of Table 3.3 and finds that the change clarifies that the limit of 180 mCi/wk applies to both halogens and particulate as a TS constraint on gaseous effluent releases. The NRC staff finds that the proposed change provides an acceptable particulate limit, consistent with NUREG-1537, Chapter 14 (Ref. 13), and that these TS limits are supported by an appropriate SAR analysis, which was reviewed and approved during license renewal (Ref. 36). Therefore, the NRC Staff concludes the change meets the 10 CFR 50.36(c)(2) requirement for every operating license for a nuclear reactor to include TSs that state the lowest functional capability or performance levels of equipment required for safe operation of the facility and is acceptable.

3.5.2 **Formatting Changes to Tables 3-1, 3-2, 4-1 and 4-2**

The licensee proposed changes to the borders for TS Table 3-1, TS Table 3-2, TS Table 4-1, and TS Table 4-2 to make the tables easier for the reader to understand (Refs. 7 and 11).

Currently, TS Table 3-1 “Reactor Safety System – Scram,” does not have horizontal lines separating the six systems listed in the table. Similarly, TS Table 3-2, “Reactor Safety System – Formation,” has no horizontal lines that separate the rows for the eight systems and related requirements listed in the table. The licensee proposed adding horizontal lines to both TS Table 3-1 and TS Table 3-2 to make it easier for the reader to distinguish between the reactor safety systems and the corresponding requirements.

Likewise, the current TS Table 4-1 “Surveillance Requirements of Reactor Safety System Scram Instruments,” does not have horizontal lines separating the six items listed in the table. Also, TS Table 4-2 “Surveillance Requirements of Reactor Safety System Information Instruments,” has no horizontal lines separating the eight items listed in the table. The licensee proposed adding horizontal lines to both TS Table 4-1 and TS Table 4-2 to make it easier for the reader to distinguish between the surveillance requirements.

The NRC staff reviewed the proposed format changes to TS Table 3-1, TS Table 3-2, TS Table 4-1 and TS Table 4-2 and notes that there are no changes to the technical information or requirements in the tables. The NRC staff finds that the proposed horizontal lines added to TS Table 3-1, TS Table 3-2 adds clarity and furthers comprehension of the corresponding “Condition,” “Trip Point*” or “Set Point,” and “Function” requirements for

each listed system. Similarly, the NRC staff finds that adding lines to separate the rows for each system in TS Table 4-1 and TS Table 4-2 adds clarity and furthers comprehension to cross-reference each listed reactor safety system to its corresponding “Surveillance,” and “Frequency*.” Based on its review, the NRC staff finds the changes to TS Table 3-1, TS Table 3-2, TS Table 4-1 and TS Table 4-2 acceptable.

3.5.3 **Typographical Error Corrections**

3.5.3.1 Change Roman numeral “I” to Arabic number “1”

The licensee proposed to correct a typographical error that occurs in several places in the current TSs. The current TSs use the Roman numeral “I” to represent the number “one” and the licensee proposed to instead use the Arabic number “1.” These changes are proposed for the following TS:

- TS 3.3.3.1 under TS 3.3, “Reactor Coolant System”
- TS 4.1.2 “Objective”
- TS 6.1.1, TS 6.1.2.3, and TS 6.1.2.4 under TS 6.1, “Organization and Staffing”
- TS 6.4.3 under TS 6.4, “Procedures”

The proposed corrections to the text for these TS are shown in bold below.

The proposed TS 3.3.3.1 would state:

> Above **0.1** kW the reactor shall be cooled by light water forced coolant. At or below 0.1 kW forced coolant flow is not required

The proposed TS 4.1.2 would state:

> To ensure that the reactivity limits of Specification **3.1** are not exceeded.

The proposed TS 6.1.1 states:

> The NTR shall be owned and operated by the licensee with management and operations organization as shown in Figure **6-1** or equivalent.

The proposed TS 6.1.2.3 would state:

> The **Level 1** manager (if utilized) is responsible for the routine safe operation and maintenance of the facility in accordance with the License, regulations and established written procedures. In the absence of this position, the **Level 1** Reactor Supervisor or the Facility Manager shall assume the **Level 1** manager responsibilities.

The proposed TS 6.1.2.4 would state:

> The **Level 1** Reactor Supervisor (if utilized) is the individual responsible for supervising the daily operations. In the absence of this position, the **Level 1** manager or the Facility Manager is responsible for supervising the daily operations.

The proposed TS 6.4.3 would state:

> Minor changes to the original procedures which do not change their original intent may be made by the Level 1 Reactor Supervisor or **Level 1** manager. These changes must be subsequently approved by the facility manager.

The NRC staff reviewed the proposed changes in numeration to the above stated TSs and finds that the technical information and requirements of these TSs are unchanged. Additionally, replacing Roman numeral “I” with the Arabic number “1”in the TS provides representation that is consistent with the numbering of the other NTR TSs. Therefore, the NRC staff concludes these changes are acceptable.

3.5.3.2 Adjust character spacing (remove an extra space)

The licensee proposed to correct a typographical error that occurs in TS 4.1.3.5 by removing an extra space between the value for the temperature (124) and the unit symbol of degrees (°). The proposed change to TS 4.1.3.5 is indicated using bold font.

The proposed TS 4.1.3.5 would state:

> The temperature coefficient of reactivity of the reactor primary coolant shall be verified to be negative above **124°F** whenever changes made to the reactor could affect the temperature coefficient.

The NRC staff reviewed the licensee’s proposed change to spacing in TS 4.1.3.5. The NRC staff finds that that the technical information and requirements are unchanged by deleting the space between “124” and the degree symbol (**°**). The NRC staff concludes that the removal of a space in TS 4.1.3.5 does not alter the intention or meaning of the TS requirement and is acceptable.

3.5.3.3 Duplicate TS 6.1.2.4

In its LAR, the licensee indicated that a prior amendment included a duplicate TS 6.1.2.4. The licensee proposed to delete the duplicate language, conform the pagination of that TS and NTR TS Section 6.0 (TSs 6.1.2.5 6.7), and revise the “Contents” page to reflect the new page numbering. Based on its review, the NRC staff finds that removal of the duplicate (identical) TS 6.1.2.4 and pagination changes in the TS Section 6.0 and the “Contents” page remove unnecessary text, accurately reflect the location of the referenced sections, and adds clarity to the NTR TSs. Therefore, the NRC staff concludes the changes are acceptable.

3.5.4 **Changes to TS Bases**

The regulation at 10 CFR 50.36(a)(1) states that a summary statement of the bases or reasons for such specifications, other than those covering administrative controls, shall also be included in the application, but shall not become part of the TSs. Consistent with 10 CFR 50.36(a)(1), the licensee submitted changes to TS Bases as part of the LAR (Ref. 1) to update the reasons for the proposed TSs. The proposed Bases follow the guidance provided in Appendix 14.1 to NUREG-1537, Part 1 (Ref. 3.1) and ANSI/ANS-15.1-2007 Additionally, the minor changes to the Bases do not alter the TSs.

3.6 **Changes to PSP License Condition**

The licensee proposed to reword License Condition 2.C.(3) in License No. R-33 to correct the misspelling of "public," correct outdated references related to withholding of the physical security plan (PSP) for the VNC site and update the version of the PSP (Ref. 38). The licensee did not propose any changes to the current NRC-approved VNC Site PSP in this LAR.

License Condition 2.C.(3) currently reads as follows:

(3) Physical Security Plan

> The licensee shall maintain and fully implement all provisions of the Commission's approved physical security plan, including changes made pursuant to the authority of 10 CFR 50.54(p). The approved security plan consists of the General Electric document, withheld from pubic disclosure pursuant to 10 CFR 2.790(d), entitled, "Security Plan for the Protection of Reactor Facilities," submitted by letters dated October 13, 1992, as amended by letter dated September 28, 1994, April 25, and June 26, 1996, and April 16, 1998, under License R-33.

The licensee's proposed license condition 2.C.(3) is:

(3) Physical Security Plan

> The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security plan, including amendments and changes made pursuant to the authority of 10 CFR 50.54(p). The approved physical security plan, entitled "VNC Site Physical Security Plan," dated March 21, 2016, consists of documents withheld from public disclosure pursuant to 10 CFR 73.21, "Protection of Safeguards Information: Performance requirements."

The GEH PSP describes the VNC site-wide security requirements for the reactor facility licensed under NRC License No. R-33, the activities and possession of materials licensed under NRC Materials License No. SNM-960, and Agreement State activities under the State of California license, CA-0017-01 at the GEH Vallecitos site. The previous version of the GEH PSP for the Vallecitos site was updated by the licensee to provide additional details for compensatory security measures required by NRC Confirmatory Order EA-14-144, dated April 22, 2015 (Ref. 33). The current GEH PSP, which applies to all facilities collocated on the GEH Vallecitos site, including the NTR, was approved during the renewal of the Material License No. SNM-960 (Ref. 40). The R-33 license is being updated now to reflect the applicable version of the NRC-approved site-wide PSP.

Based on the review of the information provided by the licensee, and as discussed above, the NRC staff finds that the licensee's proposed changes to License Condition 2.C.(3) are consistent with the 10 CFR 50.54 requirements for modifying the PSP with and without NRC approval; that the change from 10 CFR 2.790 to reference 10 CFR 73.21 is appropriate for the security-related, safeguards designation on the VNC Site Physical Security Plan," dated March 21, 2016 (Ref. 33); and that the proposed wording provides clarity for the PSP license condition. The NRC staff also finds that the proposed wording of the license condition is consistent with the corresponding license condition of other NRC-regulated research reactor facilities of similar design, operating characteristics, and site conditions. Therefore, the NRC staff concludes the proposed license condition 2.C.(3) is acceptable.

3.7 **Conclusion for Technical Evaluation**

The NRC staff reviewed the LAR submitted by GEH and finds the licensee appropriately justified the technical bases for the changes, as discussed in this SE, and that the proposed changes are acceptable. The NRC staff concludes that the proposed TS 1.2.26 alter the detail for defining the VNC "site" as required for continued safe operation and to ensure changes are known. The NRC staff finds that the change to TS Table 3-3 is consistent with the regulations for annual limits on intake given in Appendix B to 10 CFR Part 20. The NRC staff finds that the other editorial and format changes correct typographical errors, numeration, spacing, and reformat tables to improve readability of the TSs without altering the technical requirements of those TS. The staff found the proposed revisions to Chapters 2, 6, and 12 of the NTR SAR (Ref. 5) are appropriate and the amendment authorizes the licensee to incorporate the revisions in its SAR. On this basis, the NRC staff concludes that the proposed changes to the NTR TSs, NTR SAR, and GEH license condition 2.C.(3), as discussed in this SE, are acceptable.

4.0 ENVIRONMENTAL CONSIDERATION

The NRC regulations implementing NEPA (10 CFR 51.22(b)), states that no environmental assessment or environmental impact statement is required for any action when the category of action, for which the Commission has declared to be a categorical exclusion by finding that the action does not individually or cumulatively have a significant effect on the human environment, is met.

The issuance of this amendment involves changes to TSs and license requirements with respect to the installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20. The issuance of the amendment meets the definition of categorical exclusion in 10 CFR 51.22(c)(9) criteria as explained below:

(i) *The amendment or exemption involves no significant hazards consideration*; [10 CFR 51.22(c)(9)(i)]

Pursuant to 10 CFR 50.92(c), the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility, in accordance with the proposed amendment, would not:

(1) *Involve a significant increase in the probability or consequences of an accident previously evaluated* [10 CFR 50.92(c)(1)]; or

In its LAR (Refs. 3, 5, and 10), the licensee states that changes to TS stack release rate limits the release of noble gases (primarily Ar-41 at NTR) to below five percent of the 10 CFR 20, Appendix B, Table 2, Column 1 concentration. This is equivalent to 10 percent of the Appendix B effluent concentration limit for Ar-41 divided by 2 (to account for other VNC stack releases), and the resultant dose remains well within the regulatory limits of 10 CFR Part 20. This amendment does not change the safety limit or limiting safety system setpoints for the reactor. The shutdown margin and calculation methodology were not modified, and the shutdown margin requirement previously approved by the NRC is maintained. The proposed change to the stack release rate for noble gas reduces the allowable facility effluent release by 50 percent, which lowers the probability and consequences of any potential radiological release of noble gasses. All other analyses, including the accident analysis and its associated conclusions, remain

within the bounds of the previously approved SAR (Ref. 14). For these reasons, the NRC staff finds there is no significant increase in the probability or consequences of an accident previously evaluated.

(2) *Create the possibility of a new or different kind of accident from any accident previously evaluated* [10 CFR 50.92(c)(2)]; or

In Section 13 of the SAR (Ref. 14), the licensee analyzed the credible accident scenarios identified in NUREG-1537, Part 1 for the GEH NTR. The NRC staff previously found the results of these accident analyses to be acceptable when it renewed the license. The existing TS safety limit and limiting safety system setting are unchanged by this amendment, and the GEH NTR remains bounded by the previous accident analyses the NRC staff found acceptable when it renewed the license. The proposed change to reduce the LCO for noble gas by 50 percent does not change the lowest functional capability or the performance levels of equipment required for safe operation of the facility. Additionally, the proposed changes to the TS LCOs do not fundamentally change the manner in which the NTR is operated or change any accident sequence or potential accident release path from the facility. For these reasons, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

(3) *Involve a significant reduction in a margin of safety* [10 CFR 50.9]

The NTR TSs, as changed by the amendment, will continue to ensure the ability to safely operate the GEH NTR. As discussed in Section 3.0 of this SE, the proposed TS Table 3-3 includes a provision that would require licensee action sooner and provide a greater safety margin based on a lower control limit for noble gasses. The changes to the site and facility description of the controlled and restricted areas clarifies the areas to which access can be limited by the licensee and defines the area that must be controlled for radiological reasons. Because the facility personnel and the public health and safety will continue to be adequately protected, the amendment does not involve a significant reduction in the margin of safety for these reasons.

Based on the above, the NRC staff concludes that this amendment involves no significant hazards consideration.

(ii) *There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite* [10 CFR 51.22(c)(9)(ii)]; and

The proposed TS changes do not change the reactor source term or the fission products generated. The proposed change to TS Table 3-3 limits the amounts of any effluents that may be released offsite to half of the current TS limit. As discussed in Section 3.3.3 of this SE, the reduced limit in TS Table 3-3 on the stack release rate for noble gasses is chosen by the licensee to show additional conservatism in the licensee’s limit on airborne effluents from the facility. Also, the amendment does not change potential release paths from the facility. For these reasons, there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

(iii) *There is no significant increase in individual or cumulative occupational radiation exposure*. [10 CFR 51.22(c)(9)(iii)]

The amendment does not change the licensed power level or significantly alter reactor operations. The site perimeter (controlled area) basic configuration of the facility is unchanged from that approved previously by the NRC staff during license renewal (Ref. 36). Further, the amendment will specifically define the restricted area to which access is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials; place more conservative limits on airborne effluents; and, as discussed in Section 3.3.3 of this SE, will continue to adequately protect the facility staff, the environment, and the public from unacceptable exposure to radiation. Accordingly, the resultant occupational dose remains unchanged and well within the regulatory limits of 10 CFR Part 20. Furthermore, the amendment will not change existing administrative controls or the radiation protection program at the NTR for limiting individual or cumulative occupational radiation doses. Therefore, the NRC staff finds that there is no significant increase in individual or cumulative occupational radiation exposure.

The issuance of this amendment also involves changes to the format of the license and makes editorial, corrective or other minor revisions, including the updating of NRC approved references. The amendment updates NRC approved references in License Condition 2.C.(3) and makes editorial, corrective, and other minor revisions to the TS, which meet the eligibility criteria for categorical exclusion as set forth in 10 CFR 51.22(c)(10)(v).

In summary, the NRC staff has determined that the amendment involves no significant hazards consideration. There is no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and no significant increases in individual or cumulative occupational radiation exposure. The amendment also makes editorial, corrective, or other minor revisions to the TSs, updates License Condition 2.C.(3) to reflect the current NRC-approved version of the VNC site PSP, and updates the regulatory authority to withhold the PSP from public disclosure. Accordingly, the amendment meets the eligibility criteria for categorical exclusions set forth in 10 CFR 51.22(c)(9) and 10 CFR 51.22(c)(10)(v). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The NRC staff has concluded, on the basis of the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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6.0 REFERENCES

1. Caine, Thomas A., GE Hitachi Nuclear Energy, letter to the U.S. Nuclear Regulatory Commission, “Technical Specification Change to Support Potential VNC Site Land Sale,” License No. R-33, Docket No. 50-073, February 16, 2015, Agencywide Documents Access and Management System (ADAMS) Accession No. ML15048A008.

2. GE Hitachi Nuclear Energy, “Evaluation of the Proposed Change, Enclosure 1,” License No. R 33, Docket No. 50-073, February 16, 2015, ADAMS Accession No. ML15048A011.

3. GE Hitachi Nuclear Energy, “Technical Specification and Bases Page Markups, Enclosure 2,” License No. R-33, Docket No. 50-073, February 16, 2015, ADAMS Accession No. ML15048A010.

4. GE Hitachi Nuclear Energy, “Retyped Technical Specification and Bases Pages, Enclosure 3,” License No. R-33, Docket No. 50-073,” February 16, 2015, ADAMS Accession No. ML15048A007.

5. GE Hitachi Nuclear Energy, “Safety Analysis Report Page Markups, Enclosure 4,” License No. R-33, Docket No. 50-073,” February 16, 2015, ADAMS Accession No. ML15048A009.

6. Caine, Thomas A., GE Hitachi Nuclear Energy – “Supplement to Amendment 24 for the Nuclear Test Reactor Facility License R-33 to Support Potential VNC Site Land Sale.” September 28, 2016, ADAMS Accession No. ML16273A016.

7. GE Hitachi Nuclear Energy – Changes for NEDO-32765, “Technical Specifications for the Nuclear Test Reactor Facility License R-33,” Enclosure 1, Revision 2, September 28, 2016, ADAMS Accession No. ML16273A017.

8. GE Hitachi Nuclear Energy – NEDO-32765, “Technical Specifications for the Nuclear Test Reactor Facility License R-33,” Enclosure 2, Revision 2. September 28, 2016, ADAMS Accession No. ML16273A018.

9. GE Hitachi Nuclear Energy –002N4207-NP, “General Electric Nuclear Test Reactor Annual Average Dispersion Factor Adequacy Review,” Enclosure 4, Revision 1. September 28, 2016, ADAMS Accession No. ML16273A020.

10. Feyrer, Matt J., GE Hitachi Nuclear Energy, letter to the U.S. Nuclear Regulatory Commission, “Supplement 2 to Amendment 24 for the NTR Facility, License R-33, to Support Potential VNC Site Land Sale,” License No. R 33, Docket No. 50-073, August 15, 2017, ADAMS Accession No. ML17228A037.

11. Murray, Scott P., GE Hitachi Nuclear Energy, letter to the U.S. Nuclear Regulatory Commission, “GEH Nuclear Test Reactor (NTR) Technical Specification Changes,” March 19, 2018, ADAMS Accession No. ML18078A807.

12. U.S. Nuclear Regulatory Commission, “Safety and Safeguards Evaluation Report Renewal of Materials License SNM-960 for GE-Hitachi Nuclear Energy Americas, LLC, Vallecitos Nuclear Center, Sunol, California, Docket number 07000754,” March 21, 2016, ADAMS Accession No. ML17097A193.

13. U.S. Nuclear Regulatory Commission, “Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Standard Review Plan and Acceptance Criteria, NUREG-1537, Part 1 and Part 2,” February 1996, ADAMS Accession No. ML12251A353.

14. Murray, Ben M., “General Electric Nuclear Test Reactor Safety Analysis Report in Support of R-33 License Renewal Application,” Facility License No. R-33,” November 20, 1997, ADAMS Accession No. ML16250A246.

15. McConnell, Thomas J., “GE Hitachi Nuclear Test Reactor Annual Report No. 58 for the Year 2017,” March 30, 2018, ADAMS Accession No. ML18108A251.

16. McConnell, Thomas J., “GE Hitachi Nuclear Energy, Nuclear Test Reactor Annual Operating Report Number 57 for the year 2016,” March 31, 2017, ADAMS Accession No. ML17095A289.

17. Thomas, Daniel M., “GE Hitachi Nuclear Energy - Nuclear Test Reactor Annual Report No. 56; for the Year 2015,” June 24, 2016, ADAMS Accession No. ML16176A110.

18. Thomas, Daniel M., “GE Hitachi Nuclear Energy, Nuclear Test Reactor Annual Report No. 55 for the Year 2014,” March 30, 2015, ADAMS Accession No. ML15089A343.

19. Krause, Donald R., “GE Hitachi Nuclear Energy, Submittal of Annual Report for Nuclear Test Reactor (NTR), 2013, March 31, 2014, ADAMS Accession No. ML14093A189.

20. McFadden, Anthony E., “GE Hitachi Nuclear Energy, Nuclear Test Reactor Annual Report No. 53 for the Year 2012,” March 30, 2012, ADAMS Accession No. ML13092A100.

21. Krause, Donald R., “GE Hitachi Nuclear Energy, Submittal of 2011 Annual Report for the Test Reactor (NTR) at Vallecitos Nuclear Center in Sunol, California,” March 29, 2012, ADAMS Accession No. ML12093A345.

22. Parrott, Jack D., U.S. Nuclear Regulatory Commission, “Release of Non-Impacted North Section of Vallecitos Nuclear Center Site from U.S. Nuclear Regulatory Commission Licenses DPR-1 and DR-10 (Docket Nos. 50-18 and 50-183) (CAC NO. L53056),” May 3, 2016, ADAMS Accession No. ML16007A348.

23. Oak Ridge Institute for Science & Education, “Survey Report for the Independent Assessment of the GE-Hitachi Vallecitos Nuclear Center Non-Impacted Land Areas CI and C2, Sunol, California RFTA No. 15-007; Docket Nos. 50-18, 50-183, 50-70, 50-73 DCN 5273-SR-01-0,” October 19, 2015, ADAMS Accession No. ML15296A139.

24. U.S. Nuclear Regulatory Commission, “GE Hitachi Nuclear Energy; Vallecitos Nuclear Center, Partial Site Release (Environmental assessment and finding of no significant impact), *Federal Register*, Vol. 81, No. 92, May 12, 2016, pp. 29581-29584.

25. U.S. Nuclear Regulatory Commission, “NRC Inspection Report 050-00018/15-001; 050-00070/15-001; 050-00183/15-001,” October 30, 2015, ADAMS Accession No. ML15303A361.

26. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.111, “Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors,” July 1977, ADAMS Accession No. ML003740354.

27. Caine, Thomas A., “Revised Vallecitos Nuclear Center (VNC) Site Physical Security Plan,” August 19, 2015, ADAMS Accession No. ML15245A509.

28. American Nuclear Society, “ANSI/ANS 15.1-2007, The Development of Technical Specifications for Research Reactors,” 2007.

29. American National Standards Institute/American Nuclear Society, “ANSI/ANS 15.7-1977, Research Reactor Site Evaluation,” 1977.

30. Hardesty, Duane A., U.S. Nuclear Regulatory Commission, letter to Feyrer, Matt, GE Hitachi Nuclear Energy, “General Electric Hitachi – Request for Additional Information for License Amendment No. 24 of the General Electric Hitachi Nuclear Test Reactor License R-33 (CAC NO. MF5799),” February 9, 2017, ADAMS Accession No. ML16251A285.

31. Hardesty, Duane A., U.S. Nuclear Regulatory Commission e-mail to S. Murray (GE-Power): “Minor administrative changes not identified by GE,” March 13, 2018, ADAMS Accession No. ML18080A153.

32. Feyrer, Matt, “GE-Hitachi Nuclear Energy Americas, LLC - Submittal of License Amendment Request,” March 20, 2019, ADAMS Accession No. ML19079A194.

33. Caine, Thomas A. “Transmittal of GEH Responses to NRC RAIs and Revised Vallecitos Nuclear Center Site Physical Security Plan,” March 21, 2016, ADAMS Accession No. ML16117A560.

34. Murray, Scott, “GE Hitachi Nuclear Energy Americas LLC, Requests NRC Approval to Release for Unrestricted Use a Non-Impacted Portion of the North Section of Vallecitos Nuclear Center (VNC) Site Acreage,” April 24, 2015, ADAMS Package No. ML15114A436.

35. Not Used.

36. U.S. Nuclear Regulatory Commission, “Issuance of Amendment No. 21 To Facility License No. R-33 -General Electric Nuclear Test Reactor (TAC No. MA0226),” April 11, 2001, ADAMS Accession No. ML003775776.

37. Murray, Scott, “License Amendment Request – Nuclear Test Reactor (NTR) Facility Amendment 24, Supplement 3,” September 4, 2019, ADAMS Accession No. ML19247D270.

38. S. Murray (GE Power), E-mail S. Murray (GEH) to D. Hardesty (NRC), Re: Security plan License condition 2.C.(3) for the GEH NTR,” October 4, 2019, ADAMS Accession No. ML19276F516.

39. GE Hitachi Nuclear Energy, “Vallecitos Nuclear Center Reactor Facilities Radiological Emergency Plan,” June 2019, ADAMS Accession No. ML19207A493.

40. U.S. Nuclear Regulatory Commission, “Safety and Safeguards Evaluation Report Renewal of Materials License SNM-960 for GE-Hitachi Nuclear Energy Americas, LLC Vallecitos Nuclear Center, Sunol, California, ADAMS Accession No. ML17097A193.