



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

April 11, 2022

Mr. Matt Feyrer, Site Manager
Vallecitos Nuclear Center
GE Hitachi Nuclear Energy
6705 Vallecitos Road
Sunol, CA 94586-8524

SUBJECT: GE HITACHI NUCLEAR ENERGY - NRC INSPECTION REPORT
050-00018/2022-001, 050-00070/2022-001, AND 050-00183/2022-001

Dear Mr. Feyrer:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on March 15-17, 2022, at your Vallecitos Nuclear Center in Sunol, California. The inspection covered the following shutdown reactors under the subject licenses, Vallecitos Boiling Water Reactor (VBWR), General Electric Test Reactor (GETR), and Empire State Atomic Development Associates Incorporated Vallecitos Experimental Superheat Reactor (EVESR). The NRC inspectors discussed the results of this inspection with you and members of your staff on March 17, 2022. The inspection results are documented in the enclosure to this letter.

During this inspection, the NRC inspectors examined activities conducted under your licenses as they relate to public health and safety, the environment, and to confirm compliance with the Commission's rules and regulations, as well as with the conditions of your license. Within these areas, the inspection consisted of the examination of selected procedures and representative records, tour of the reactors and supporting equipment, independent radiation surveys, and interviews with personnel. Within the scope of the inspection, no violations were identified and a response to this letter is not required.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC's Website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

M. Feyrer

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If you have any questions concerning this inspection report, please contact Stephanie Anderson at 817-200-1213, or the undersigned at 817-200-1249.

Sincerely,



Signed by Warnick, Gregory
on 04/11/22

Gregory G. Warnick, Chief
Decommissioning, ISFSI, and Operating
Reactors Branch
Division of Radiological Safety and Security

Docket Nos. 050-00018; 050-00070;
050-00183
License Nos.: DPR-1; TR-1; DR-10

Enclosure:
Inspection Report 050-00018/2022-001;
050-00070/2022-001; 050-00183/2022-001

GE HITACHI NUCLEAR ENERGY - NRC INSPECTION REPORT 050-00018/2022-001;
050-00070/2022-001; 050-00183/2022-001 - DATED APRIL 11, 2022

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GE Test Reactor ListServ

ADAMS ACCESSION NUMBER: ML22090A216

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**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket Nos.: 050-00018; 050-00070; and 050-00183

License Nos.: DPR-1; TR-1; and DR-10

Report Nos.: 050-00018/2022-001; 050-00070/2022-001; and 050-00183/2022-001

Licensee: GE Hitachi Nuclear Energy

Facility: Vallecitos Boiling Water Reactor (VBWR)
GE Test Reactor (GETR)
ESADA Vallecitos Experimental Superheat Reactor (EVESR)

Location: 6705 Vallecitos Road
Sunol, California

Inspection Dates: March 15-17, 2022

Inspectors: Stephanie G. Anderson
Senior Health Physicist
Decommissioning, ISFSI, and Operating Reactors Branch
Division of Radiological Safety & Security

John P. Reynoso
Health Physicist
Decommissioning, ISFSI, and Operating Reactors Branch
Division of Radiological Safety & Security

Accompanied By: Geoffrey B. Miller, Deputy Director
Division of Radiological Safety & Security

Scott A. Morris, Regional Administrator
Region IV

John W. Lubinski, Director
Office of Nuclear Material Safety and Safeguards

Approved By: Gregory G. Warnick, Chief
Decommissioning, ISFSI, and Operating Reactors Branch
Division of Radiological Safety & Security

Enclosure

EXECUTIVE SUMMARY

GE Hitachi Nuclear Energy

NRC Inspection Report 050-00018/2022-001; 050-00070/2022-001; and 050-00183/2022-001

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of licensed activities being conducted at the three permanently defueled reactors at the Vallecitos Nuclear Center. In summary, the licensee was conducting these activities in accordance with site procedures, license requirements, and applicable NRC regulations. Within the scope of the inspection, no violations were identified.

Decommissioning Performance and Status Review at Permanently Shutdown Reactors and Class III Research and Test Reactors

- The licensee conducted annual inspections and audits of the three shutdown reactors in accordance with regulatory, license, and procedure requirements. The licensee adequately implemented an organization that reflected the shutdown reactors license requirements and adequately managed the workload to support the shutdown reactors activities. (Section 1.2)

Occupational Radiation Exposure at Permanently Shutdown Reactors

- The licensee conducted its radiation control program in accordance with the license conditions and regulatory requirements. (Section 2.2)

Report Details

Summary of Plant Status

The GE Hitachi Nuclear Energy Americas, LLC (GEH or Licensee) continued to maintain the three shutdown reactors, Vallecitos Boiling Water Reactor (VBWR), General Electric Test Reactor (GETR), and Empire State Atomic Development Associates Incorporated Vallecitos Experimental Superheat Reactor (EVESR) in a possession-only, safe storage (SAFSTOR) condition, with no fuel remaining in the reactors or spent fuel pools. The condition of SAFSTOR is a decommissioning alternative in which the licensee is authorized to maintain the facility in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated to levels that permit release for unrestricted use within 60 years of permanent cessation of operations. Licensees who choose the SAFSTOR option must meet all NRC financial and safety regulations, both prior to and during the SAFSTOR period.

On April 24, 2015 (ADAMS Accession Nos. ML15114A437 and ML15114A438), the licensee submitted a request for a partial site release of approximately 610 acres of non-impacted property on the northern section of Vallecitos Nuclear Center (VNC) site, for unrestricted use pursuant to Title 10 *Code of Federal Regulation* (CFR) 50.83(b). The NRC approved the partial site release of 610 acres by letter dated May 3, 2016 (ADAMS Accession No. ML16007A348). The property continues to remain under the ownership of GEH.

On December 15, 2015, the licensee submitted a request for license continuance under 10 CFR 50.51(b) for reactor licenses DR-10 and TR-1 (ADAMS Accession No. ML15349A045). That request was approved by letter dated January 2, 2019 (ADAMS Accession No. ML18352A450). The licensee also submitted a request on July 10, 2015 (ADAMS Accession No. ML15195A088) for an alternate decommissioning schedule as described in 10 CFR 50.82(a)(3) and 50.82(b)(4)(i), using the exemption criteria of 10 CFR 50.12.

On May 16, 2017, the NRC staff issued a request to GEH for additional information on the structural integrity of the reactor buildings and how the integrity would be ensured during the extended decommissioning period, in order to assess whether the request would result in undue risk to public health and safety (ADAMS Accession No. ML17138A121). The licensee responded to this request by letter dated July 31, 2017 (ADAMS Accession No. ML17212B019).

Based on this response and a site visit conducted by NRC on September 13, 2017, the NRC determined that certain additional information must be provided by GEH to show how the licensee is ensuring the confinement of residual radioactivity associated with the shutdown reactors at the VNC and evaluating and monitoring the long-term physical safety of the reactor structures. The NRC requested more detailed information by letter dated January 18, 2018 (ADAMS Accession No. ML17312B359). On March 28, 2018 (ADAMS Accession No. ML18087A384), GEH provided a response indicating that it would provide an interim status report for the hydrological and structural analyses in approximately 6 months and anticipated completing the actions within approximately 12 months, which would be March 2019. On May 31, 2018 (ADAMS Accession No. ML18151A861), GEH submitted a partial response to the request for additional information. On October 23, 2018 (ADAMS Accession No. ML18296A159), GEH provided an interim status report on the efforts to respond to the two remaining requests for additional information. On March 28, 2019 (ADAMS Accession No. ML19087A221), GEH provided the response for some of the requested additional information and provided a schedule for submitting the remaining hydrological and structural analysis needed to support the exemption request for an alternate decommissioning schedule.

On November 15, 2019 (ADAMS Accession No. ML19319B845), GEH provided its final response on the request for additional information. By letter dated March 16, 2020 (ADAMS Accession No. ML20071G411), the NRC staff requested additional information for EVESR and GETR to make an independent assessment regarding the acceptability of the proposed exemptions. The licensee responded to that request for additional information by letter dated July 15, 2020 (ADAMS Accession No. ML20197A011). Also, on July 15, 2020 (ADAMS Accession No. ML20174A114), NRC staff requested additional information for the VBWR to make an independent assessment regarding the acceptability of the proposed exemptions.

On March 19, 2021 (ADAMS Accession No. ML19304B459), the NRC staff submitted a SECY paper to the Commissioners, SECY-21-0033, "Request for an exemption from the decommissioning schedule requirements for shutdown reactors at GE Hitachi Vallecitos Nuclear Center." In the SECY paper, there were two options for the Commission's consideration. Option 1 was to approve a 10 CFR 50.12 exemption from the applicable decommissioning schedule requirements of 10 CFR 50.82(a)(3) and 10 CFR 50.82(b)(4)(i) for the EVESR and GETR and delegate to the staff only the authority to grant or deny such an exemption for the VBWR based on GEH's demonstration of the VBWR's continued structural integrity. Option 2 was to deny the exemption request for all three shutdown reactors at the VNC. The NRC staff recommend approving Option 1, a 10 CFR 50.12 exemption from the applicable decommissioning schedule requirements of 10 CFR 50.82(a)(3) and 10 CFR 50.82(b)(4)(i) for the EVESR and GETR and to delegate to the staff the authority to grant or deny such an exemption for the VBWR based on the licensee's demonstration of the VBWR's continued structural integrity.

On August 6, 2021 (ADAMS Accession No. ML21218A110), the Commission disapproved the staff's recommendation to grant GEH an exemption of 10 CFR 50.12, to extend the decommissioning schedule for EVESR, GETR, and VBWR and instead approved a denial of the request under Option 2. On August 25, 2021 (ADAMS Accession No. ML21237A064), GEH requested to withdraw its exemption request for the shutdown reactors from an alternate decommissioning schedule. By letter dated October 12, 2021 (ADAMS Accession No. ML21258A042), the NRC staff sent a letter to GEH accepting the withdraw of the exemption request and reviewed the requirements from 10 CFR 50.82 that apply to the decommissioning of the shutdown reactors at the VNC. By letter dated November 11, 2021 (ADAMS Accession No. ML21315A005), GEH provided a high-level description and timeline for the process of decommissioning VBWR, EVESR, and GETR facilities.

1 Decommissioning Performance and Status Review at Permanently Shutdown Reactors (71801) and Class III Research and Test Reactors (69002)

1.1 Inspection Scope

The inspectors reviewed the licensee's control and oversight of the three shutdown reactors.

1.2 Observations and Findings

a. Status and tours of the shutdown reactors

1. Vallecitos Boiling Water Reactor

Vallecitos Boiling Water Reactor is a possession-only reactor under License No. DPR-1, Amendment 21. It was a 50-megawatt (MW) power reactor that achieved full power operations in 1957, after receiving its Construction Permit No. CPPR-3 on May 14, 1956. It was shut down on December 9, 1963, for an extended period of time and subsequently was deactivated. All fuel has been removed from the facility.

The possession-only facility license DPR-1, License Condition 4 states in part, that there should be an audible control device maintained on the doors to the containment building. In addition, License Condition 5 authorizes GEH to dispose of component parts or devices from the VBWR facility in accordance with the provisions of 10 CFR Part 20. The licensee removed extensive components from the facility between October 2007 and November 2008. All reactor systems have been removed except for the reactor vessel. The licensee monitors the water level weekly in the reactor vessel and the inspectors confirmed the water level to be at approximately 37.5 inches of water, since the licensee took recent actions to drain some of the water from the vessel for inspection activities.

The inspectors toured the facility with licensee representatives. The inspectors confirmed there was an audible control device functioning on the manual doors to the containment building that provided an alarm at the 300-area alarm panel and at the Central Alarm Station. The inspectors observed that the roll-up door was secured, which was installed in place of the equipment hatch. The inspectors entered the basement level to observe the condition and integrity of the retired facility. The inspectors noted various humidity and temperature sensors had been removed for annual maintenance checks in the facility. The inspectors observed multiple crack formation throughout the containment building. The cracks are being monitored by the licensee to determine growth rate. During the inspection, the inspectors did not identify any standing water on the floor of the basement. The sump pump was in operation at the time of the inspection, and any water that is collected in the basement of VBWR is pumped to the VBWR transfer tank, then ultimately transferred to the onsite waste evaporator plant for processing.

2. ESADA Vallecitos Experimental Superheat Reactor

The ESADA Vallecitos Experimental Superheat Reactor (EVESR) is a possession-only reactor under License No. DR-10, Amendment No. 7. The EVESR was a light water moderated, steam cooled, superheat, experimental research reactor that used slightly enriched uranium dioxide as fuel. It operated at a maximum of 17 MW thermal and was initially licensed in 1963. It achieved full power operation in 1964, and was shut down on February 1, 1967, and subsequently deactivated. All fuel and other special nuclear material had been removed and shipped offsite. In addition, a significant amount of equipment used to operate the reactor, such as nuclear instrumentation, piping, pumps, and valves has been removed.

The inspectors toured the facility with licensee representatives. The inspectors confirmed there was an audible control device functioning on the airlock door to the containment building that provided an alarm at the 300 feet elevation area alarm panel and at the Central Alarm Station. The licensee had a portable dehumidifier to remove significant quantities of condensation that tended to buildup in the facility. The licensee had lighting installed and it was operating sufficiently to ensure the passageways and stairs were safely lit. The stack was no longer operational, and the licensee was using a portable ventilation system.

The radiation levels were generally less than 1 milliroentgen per hour (mR/hr) throughout the facility, except in certain areas. The inspectors measured maximum radiation level of 1.65 mR/hr around mainly a floor drain, using a Thermo Scientific RadEye G survey meter (Serial No. 378, calibration due date of December 15, 2022). The licensee continues to maintain concrete blocks over the reactor vessel and the head/shield plug storage pit. In addition, a wooden cover was installed over the empty spent fuel storage pool, with an installed railing to prevent entry since the wooden cover was not designed to support a load. The licensee maintains control of the area with keys that are stored in a lock box.

3. General Electric Test Reactor

General Electric Test Reactor is a possession-only reactor under License No. TR-1, Amendment No. 17. The reactor was a 50 MW thermal experimental test, development, and isotope production reactor that utilized highly enriched plate fuel and was initially licensed to operate in 1959. The reactor was shut down in 1977 and subsequently deactivated. All fuel and isotope production targets containing special nuclear material have been removed from the facility and shipped offsite. The reactor, systems, and piping, and spent fuel pool have been drained of water. The containment polar crane was functional, and only required re-certification for it to be considered operable.

The inspectors toured the containment building, old control room, tank farm, and GETR auxiliary buildings immediately adjacent to the containment structure. The radiation levels inside the containment building were generally less than 1 mR/hr throughout the facility, except in certain areas. As GETR has been shut down since 1977, there are no licensed operators nor a requalification program, which is appropriate for the plant conditions. Staffing was appropriate to meet the required weekly surveillance patrols, which were being conducted in accordance with site procedures.

4. Other

The licenses for the three shutdown reactors require, in part, that activities involving access to the facility area and use of any area shall be conducted under the direction of a designated facility manager with functional responsibility and commensurate authority to maintain the facility in a safe and secure condition at all times. The inspectors reviewed the licensee's organization and discussed the organizational structure with members of the licensee's organization. Based on discussions and observations, the inspectors determined that the individual fulfilling the licensed responsibility as the facility manager for the defueled reactors, adequately met the license condition requirements.

1.3 Conclusions

The licensee conducted annual inspections and audits of the three shutdown reactors in accordance with regulatory, license, and procedure requirements. The licensee adequately implemented an organization that reflected the shutdown reactors license requirements and adequately managed the site facilities to safely support the shutdown reactors activities.

2 Occupational Radiation Exposure at Permanently Shutdown Reactors (83750)

2.1 Inspection Scope

The inspectors reviewed occupational exposures and the results of the licensee's radiological surveys within the three shutdown reactors for compliance with license and regulatory requirements.

2.2 Observations and Findings

Each of the shutdown reactors have license conditions that require annual entries for routine radiation surveys and general examination of conditions throughout the buildings. The licensee performed its entries and surveillances in accordance with Procedures 6.1, "Access Control," Revision 10, and 6.2, "Patrols and Inspections," Revision 16. The licensee had completed their annual inspections and surveys of the shutdown reactors, but at the time of this inspection, the report had not been issued.

In the area of training, the inspectors focused on radiological training. In particular, the inspectors reviewed the training and qualifications for one of the radiation workers at the site. This radiation worker has recently been involved in the activities to remove some of the water from the VBWR reactor vessel. It was noted by the inspectors that all qualified radiological workers had received the appropriate training as required by licensee procedures.

During the inspection, the inspectors toured accessible areas within the VBWR, EVESR, and GETR containment buildings to observe radiological postings and access controls. The inspectors also performed independent radiation surveys to ensure that postings adequately reflected the radiological hazards using a Thermo Scientific RadEye G survey meter (Serial No. 378, calibration due date of December 15, 2022). Through performance of these surveys, the inspectors determined that the postings and controls within the areas were adequate to protect worker health and safety.

2.3 Conclusions

The licensee conducted its radiation control program in accordance with the license conditions and regulatory requirements.

3 Exit Meeting Summary

On March 17, 2022, the NRC inspectors presented the final inspection results to the Mr. Matt Feyrer, Site Manager, and other members of the licensee's staff. The

inspectors asked the licensee whether any material examined during the inspection should be considered proprietary information. No proprietary information was identified.

SUPPLEMENTAL INSPECTION INFORMATION

KEY POINTS OF CONTACT

Licensee

M. Feyrer, Site Manager
J. Smyly, Environmental, Health and Safety Manager
D. Heckman, Regulatory Affairs and Licensing Lead
K. Zanutto, Facilities Manager
J. Ayala, Project Management

INSPECTION PROCEDURES

IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 69002 Class III Research and Test Reactors
IP 83750 Occupational Radiation Exposure at Permanently Shutdown Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS	Agency Documents Access and Management Systems
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
EVESR	Empire State Atomic Development Associates Incorporated Vallecitos Experimental Superheat Reactor
GEH	GE Hitachi Nuclear Energy Americas, LLC
GETR	General Electric Test Reactor
NRC	U.S. Nuclear Regulatory Commission
VBWR	Vallecitos Boiling Water Reactor
VNC	Vallecitos Nuclear Center