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

March 20, 2019

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

SUBJECT: GE-HITACHI VALLECITOS NUCLEAR CENTER – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE INSPECTION REPORT NO. 50-073/2018-201

Dear Mr. Feyrer:

From July 10-12, 2018, the U.S. Nuclear Regulatory Commission (NRC) conducted an inspection at your GE-Hitachi Vallecitos Nuclear Center. The enclosed report presents the results of that inspection, which were discussed on July 12, 2018, with members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selective procedures and records, observed various activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations* Section 2.390, "Public inspections, exemptions, requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Mr. Johnny H. Eads at (301) 415-0136 or by electronic mail at Johnny.Eads@nrc.gov.

Sincerely,

/RA/

Anthony J. Mendiola, Chief
Research and Test Reactors Oversight Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

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

Enclosure:
As stated

cc: w/enclosure: See next page

cc:

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Test, Research and Training
Reactor Newsletter
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SUBJECT: GE-HITACHI VALLECITOS NUCLEAR CENTER – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE INSPECTION REPORT NO. 50-073/2018-201 DATE: MARCH 20, 2109

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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Docket No.:	50-073
License No.:	R-33
Report No:	50-073/2018-201
Licensee:	GE-Hitachi Vallecitos Nuclear Center
Facility:	General Electric Nuclear Test Reactor
Location:	Sunol, CA
Dates:	July 10-12, 2018
Inspector:	Johnny Eads
Approved by:	Anthony J. Mendiola, Chief Research and Test Reactors Oversight Branch Division of Licensing Projects Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

GE-Hitachi Vallecitos Nuclear Center
Nuclear Test Reactor
NRC Inspection Report No. 50-073/2018-201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the GE-Hitachi Vallecitos Nuclear Center's (VNC or the licensee's) Class II research reactor safety programs including: (1) organization and staffing; (2) operations logs and records; (3) procedures; (4) requalification training; (5) surveillance and limiting conditions for operation (LCO); (6) experiments; (7) health physics; (8) design changes; (9) committees, audits and review; (10) emergency planning; (11) maintenance logs and records; (12) fuel handling logs and records; and (13) transportation of radioactive materials procedures. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with the U.S. Nuclear Regulatory Commission (NRC) requirements.

Organization and staffing

- Organizational structure and staffing were consistent with technical specification (TS) requirements.

Operations Logs and Records

- Operations Logs and records were maintained in accordance with procedures and TSs.

Procedures

- The program for changing, controlling, and implementing facility procedures was acceptably maintained as required by the TSs and the applicable procedures.

Requalification Training

- Operator requalification was conducted as required by the Operator Requalification Plan

Surveillance and Limiting Conditions for Operation

- The inspector found that the surveillance program and supporting procedures met TS requirements.

- Operations met the TS LCO and surveillance requirements.

Experiments

- Experiments were reviewed and approved as required by the TS.

Health Physics

- Surveys were being completed and documented as required.

- Postings met regulatory requirements.
- Personnel dosimetry was being worn and recorded doses were within the NRC's regulatory limits.
- Radiation monitoring equipment was being maintained and calibrated as required.
- The radiation protection program (RPP) satisfied regulatory requirements.
- The radiation protection training program was being administered as required.
- Environmental monitoring satisfied license and regulatory requirements.

Design Changes

- The review, evaluation, and documentation of changes to the facility satisfied NRC requirements.

Committee Audits and Reviews

- The review and audit program was being conducted acceptably by the Nuclear Safety Review Group (NSRG) as stipulated in the TS.

Emergency Planning

- The emergency preparedness program was conducted in accordance with the Emergency Plan (E-Plan).

Maintenance Logs and Records

- Maintenance logs, records, reviews, and performance satisfied TS and procedure requirements.

Fuel Handling Logs and Records

- Fuel handling and inspection activities were completed and documented as required by TS and facility procedures.

Transportation of Radioactive Materials

- The program for shipping radioactive material satisfied regulatory requirements.

REPORT DETAILS

Summary of Facility Status

The GE-Hitachi VNC's 100 kilowatt research reactor was operated in support of neutron radiography, experiments, reactor operator training, and periodic equipment surveillances. During the inspection, the reactor was operated for radiography for the licensee's clientele.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure (IP) 69001)

To ensure that the requirements of TS Sections 6.1, "Organization and Staffing," and 6.6.2, "Special Reports," were being met, the inspector reviewed:

- General Electric Nuclear Test Reactor (NTR) organizational structure and staffing
- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018
- Standard Operating Procedure (SOP) 6.0, "Operational Summary"
- NTR Daily Surveillance Check Sheets for the past 2 years

b. Observations and Findings

The licensee's functional organization had not changed since the last NRC inspection in this area. The reactor operations staffs' qualifications satisfied the training and experience requirements stipulated in the TS. The operations logs and associated records confirmed that shift staffing met the minimum requirements for duty personnel. Review of records and staffing procedures verified that management responsibilities were administered as required by the TS.

c. Conclusion

The licensee's organization and staffing were in compliance with the requirements specified in the TS.

2. Operations Logs and Records

a. Inspection Scope (IP 69001)

To ensure that the requirements of TS Sections 3.0, "Limiting Conditions for Operation (LCO)," 4.0, "Surveillance Requirements," and 6.0, "Administrative Controls," were being met, the inspector reviewed:

- NTR Console Log Books for the past 2 years
- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018
- SOP 6.0, "Operational Summary"

- NTR Daily Surveillance Check Sheets for the past 2 years
- Control Room Data Sheets for the past 2 years

b. Observations and Findings

The inspector conducted observations of routine activities, including the startup checkout and reactor startup, and reviewed the NTR console log books, monthly and daily surveillance check sheets, and operation record forms. It was noted that the operators on duty were knowledgeable and proficient.

The inspector verified that the reactor operating characteristics and other procedurally required entries were logged appropriately and that the checklists were completed. A review of the licensee's logs and records indicated that the TS operational limits had not been exceeded and that the shift staffing met the minimum requirements.

c. Conclusion

The licensee's record keeping program conformed to the TS requirements.

3. Procedures

a. Inspection Scope (IP 69001)

To ensure that the requirements of TS 6.4, "Procedures," were being met, the inspector reviewed the following:

- SOP 9.4, "Change Authorization," Revision (Rev.) 16, dated June, 6, 2016
- GE VNC Vallecitos Safety Standards (VSS), Various
- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018

b. Observations and Findings

Records showed that procedures for TS required items were available. Changes were made for clarification. The licensee maintained approved procedures to satisfy the requirements of the TS.

c. Conclusion

The licensee was maintaining and implementing written procedures in accordance with the TS requirements.

4. Requalification Training

a. Inspection Scope (IP 69001)

To ensure that the requirements of the NRC-approved Operator Requalification Program and TS 6.1.4, "Selection and Training of Personnel," were being met, the inspector reviewed:

- Reactor Operator Requalification Program for the "General Electric Nuclear Test Reactor," dated June 1987
- NTR Operator Requalification Written and Operating Examination for the past 2 years
- Requalification Training Records for the past 2 years
- Medical examination records for the past 2 years

b. Observations and Findings

As of the date of the inspection, all the operators' licenses were current. All operators were enrolled in the licensee's NRC-approved requalification and training program and had completed the minimum required hours per quarter of operating the reactor. The inspector noted that operators were receiving the required biennial medical examinations.

The licensee's requalification program included requirements for an annual operating test and a biennial written examination. The inspector verified that both examinations were administered at the specified frequency and that the level of difficulty was comparable to that of NRC-administered examinations.

The inspector confirmed that the requalification program was being administered in a manner that sufficiently maintains the qualifications and proficiency of all licensed operators.

c. Conclusion

Operator requalification was conducted as required by the Requalification Program and NRC regulations.

5. Surveillance and Limiting Conditions of Operation

a. Inspection Scope (IP 69001)

To ensure that the requirements of TS Sections 3.0, "Limiting Conditions for Operation (LCO)," 4.0, "Surveillance Requirements," 6.0, "Administrative Controls," and maintenance procedures were being met, the inspector reviewed:

- NTR Console Log Books for the past 2 years
- NTR Surveillance Check Sheets for the past 2 years
- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018
- SOP 6.0, "Operational Summary"
- SOP 12.0, "Preventive Maintenance – NTR,"

b. Observations and Findings

Daily, weekly, monthly and other periodic checks, tests, and verifications for TS required LCOs were being completed as required. The inspector performed a random sampling of the required surveillances and verified that all of the recorded results were within the TS and procedurally prescribed parameters.

The records and logs were noted to be complete and were being maintained as required.

c. Conclusion

The LCO and surveillances required by the TS were being properly implemented.

6. Experiments

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with TS Sections 3.5 and 4.5, "Experiments," Section 6.2, "Independent Reviews," and Section 6.4, "Procedures":

- NTR SOP 10.1 "Experiment Type Approvals," for explosive material radiography, various dates
- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018
- NTR Console Log, various dates

b. Observations and Findings

The inspector reviewed the process for the approval and conduct of experiments at the facility. The licensee's work tracking spreadsheet raises flags appropriately to notify of any restrictions and limitation thresholds that might be exceeded by the prepared work. The experiments and storage on site were being addressed and in adherence. The inspector determined that the experimental review process and approval for handling and storage of trinitrotoluene-equivalent explosive material is in accordance with the TS and approved procedures.

c. Conclusion

Experiments were reviewed and performed in accordance with the TS requirements and the licensee's written procedures.

7. Health Physics

a. Inspection Scope (IP 69001)

To ensure the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20, "Standards for Protection against Radiation," TS Sections 3.2, "Reactor Control and Safety System," 3.4, "Reactor Cell and Ventilation System," 4.2, "Reactor Control and Safety System," 4.4, "Reactor Cell and Ventilation System," and 6.3, "Radiation Safety," requirements were being met, the inspector reviewed the following:

- Meeting minutes of the GE VNC as low as reasonable achievable committee for the past 2 years
- GE VNC dosimetry records for the past 2 years

- Annual RPP Review for the past 2 years
- Survey results for daily, weekly, monthly, routine, and special surveys for the past 2 years
- Calibration and periodic check records for radiation monitoring instruments for the past 2 years
- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018

b. Observations and Findings

The inspector toured the facility and interviewed licensee personnel, observing practices regarding the use of dosimetry, radiation monitoring equipment, and placement of radiological postings and barriers and determined that they were appropriate.

The licensee used a National Voluntary Laboratory Accreditation Program-accredited vendor to process personnel dosimetry. Radiation work permits were used for all activities to track workers and dose sources with appropriate alarm set points depending on each different area. Due to the reduced staffing levels, exposure amounts have increased for the two active license holders, though one is receiving the majority of the increase as the primary reactor operator. The facility has an administrative limit of 300 millirem/quarter. On occasion, a request for additional exposure has been submitted and approved. The inspector noted that, even with these increases, doses were well within the regulatory limits and consistent with the operations of the NTR.

The licensee's RPP was established through various standards and procedures in use at the facility. These were maintained and available on-line. The program included requirements that all personnel who performed work in association with radioactive material receive training in radiation protection, policies, procedures, requirements, and facilities. These were being tracked on-line and completed at the required frequency. Additionally, the annual review of the RPP was being completed internally by different managers at the required frequency.

The inspector reviewed survey and calibration records and found that they were being completed as required with no safety issues identified. The inspector also observed surveys being performed and found the process appropriate. Copies of current notices to workers were posted in the facility.

The inspector reviewed the records documenting on-site and off-site effluent and environmental monitoring stations for the past 2 years. Airborne and water releases were below regulatory limits. Off-site samples indicated normal background.

c. Conclusion

The inspector verified that the licensee's RPP was effective in minimizing radiation doses to individuals through training, notices to workers, radiation monitoring and surveys, and calibrated equipment. The program met regulatory

requirements. Effluent releases, effluent monitoring, and environmental monitoring satisfied license and regulatory requirements.

8. Design Changes

a. Inspection Scope (IP 69001)

To ensure the requirements of 10 CFR 50.59, "Changes, tests and experiments," the TS, and the licensee's administrative procedures were being met, the inspector reviewed the following:

- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018
- 10 CFR 50.59, Determination Worksheet

b. Observations and Findings

During the inspection, the licensee conducted a maintenance activity to repair secondary cooling system flowmeter. Testing was performed and results correlated with previous data. All changes were reviewed and approved by the senior reactor operator/NTR Manager, Regulatory Compliance, Vallecitos Technological Safety Council, and the VNC Site Manager as required.

c. Conclusion

Records indicated that changes at the facility were acceptably reviewed in accordance with 10 CFR 50.59 and applicable licensee administrative controls.

9. Committees, Audits and Review

a. Inspection Scope (IP 69001)

The inspector reviewed the following to verify compliance with TS Section 6.2, "Independent Reviews":

- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018
- Vallecitos Technical Safety Council (VTSC) Committee Meeting Minutes for the last 2 years

b. Observations and Findings

The inspector verified that the NSRG, composed of the VTSC and regulatory compliance (RC) were in compliance with TS Section 6.2. VTSC composition, meeting quorums, and meeting frequency followed the requirement of VSS 1.1. The inspector also reviewed the RC's periodic audits of the facility operations, maintenance, and administration. The independent group was completing the audits within the required 2-year cycle.

c. Conclusion

The review and audit program was being conducted acceptably by the NSRG as stipulated in the TS.

10. Emergency Preparedness

a. Inspection Scope (IP 69001)

To ensure that the requirements of the E-Plan were being met, the inspector reviewed:

- "GE Hitachi Vallecitos Nuclear Center (VNC) Integrated Contingency Plan," dated October 2015
- VNC Reactor and Radiological – Radiological E-Plan, reviewed November 2013
- SOP 8.0, "Emergency Procedures"
- Memorandum of understanding with Valleycare Medical Center, Alameda County Sheriff's Office, and Paramedics Plus
- VNC Biennial Exercise and Building Evacuation Drills for the past 2 years
- Various VNC Emergency Training Records

b. Observations and Findings

The E-Plan currently in use was being properly maintained by the licensee. The inspector noted that the E-Plan was applicable to the VNC campus and the NTR has implemented specific procedures. These procedures were readily available in the NTR control room and offices.

The inspector reviewed records for the monthly alarm testing and the semi-annual emergency equipment cabinet inventory check and found that they were being completed as required.

Training for the facility operators, staff, and members of the VNC having emergency response duties included completion of an initial training program and the performance of annual review and an examination. Several staffers have completed respirator program training as well which included annual fit test, medical, and equipment checks. The inspector noted through records and interviews with licensee personnel that the training and examination was completed satisfactorily.

The inspector also noted that off-site first responders participated in on-site orientation and training. Participants included Paramedics Plus Alameda, the Alameda County Sheriff's Office, and the Cal Fire department.

Through the review of drill scenarios and record reviews, the inspector determined that key emergency response personnel can respond to an emergency condition as required. The annually emergency evacuation drill was conducted as required by the E-Plan. The biennial comprehensive emergency

drill, which involved State and local officials, was also completed. The lessons learned were discussed at the end of the drill.

c. Conclusion

The emergency preparedness program was conducted in accordance with the E-Plan and implementing procedures.

11. Maintenance Logs and Records

a. Inspection Scope (IP 69001)

To ensure that the requirements of TS Sections 3.0, “Limiting Conditions for Operation (LCO),” 4.0, “Surveillance Requirements,” 6.0, “Administrative Controls,” and maintenance procedures were being met, the inspector reviewed:

- NTR Console Log Books for the past 2 years
- NTR Surveillance Check Sheets for the past 2 years
- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018
- SOP 12.0, “Preventive Maintenance – NTR,”
- NTR Preventive Maintenance Index and Completion Records

b. Observations and Findings

The inspector reviewed the corrective maintenance cards for minor issues for the past 2 years, with no issues identified. Major maintenance activities discussed in the annual reports were previously reviewed by the inspector. Routine and preventive maintenance were well controlled and documented in a tracking system.

A review of the NTR preventive maintenance log indicated that all maintenance activities were generally conducted consistent with applicable requirements and that any modifications had been properly evaluated in accordance with 10 CFR 50.59. After all maintenance items were completed, system operational checks were performed to ensure the affected systems were operable before returning them to service.

c. Conclusion

Maintenance was performed and logs and records maintained consistent with the TS and licensee procedure requirements.

12. Fuel Handling Logs and Records

a. Inspection Scope (IP 69001)

To ensure that fuel integrity was being maintained, the inspector interviewed licensee personnel and reviewed:

- NTR Console Log Books for the past 2 years
- Annual Report No. 58 for the GE-Hitachi NTR, dated April 18, 2018

b. Observations and Findings

The licensee did not conduct fuel movements and fuel inspection is not required by the TS. In the event fuel handling is required, the licensee indicated that they would develop procedures to conduct such operations. Fuel integrity is verified via the primary chemistry surveillance. The inspector did not identify any issues with the results.

c. Conclusion

Fuel movements were performed safely in accordance with the TS requirements and licensee procedural requirements.

13. Transportation of Radioactive Materials

a. Inspection Scope (IP 86740)

The inspector reviewed the following to verify compliance with regulatory and procedural requirements for shipping or transferring licensed material:

- Selected records of radioactive material transfers for the last 2 years
- GE VNC VSS, Standard No. 7.5, “On-Site Transfers of Radioactive Material”
- Certificates for Transportation of Radioactive Material Various Survey Records

b. Observations and Findings

Records showed that radioactive material produced in the reactor and destined to be shipped off site were typically transferred to the facility’s State of California broad scope license.

Radioactive material to be used on site were also transferred to the broad scope license and distributed by Environmental Health and Safety. The irradiated material was held for decay until levels were below established limits. The transfer forms indicated the material had been surveyed prior to custodial change. The program for radioactive material transfer and transport were consistent with procedural requirements.

The inspector also verified that individuals responsible for transporting radioactive material received radioactive material and transportation of radioactive material training. They are certified every 2 years.

c. Conclusion

Radioactive material shipments were made according to procedures and regulatory requirements.

14. Exit Interview

The inspector presented the inspection results to licensee management at the conclusion of the inspection on July 12, 2018. The inspector described the areas inspected and discussed in detail the inspection observations. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Feyrer	VNC Manager
T. McConnell	NTR Manager

INSPECTION PROCEDURES USED

IP 69001	Class II Non-Power Reactors
IP 86740	Transportation

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened:

None

Closed:

None

Discussed:

None

LIST OF ACRONYMS USED

E-Plan	Emergency Plan
IP	Inspection Procedure
LCOs	Limiting Conditions for Operation
NRC	U.S. Nuclear Regulatory Commission
NTR	Nuclear Test Reactor
NSRG	Nuclear Safety Review Group
RC	Regulatory Compliance
REV.	Revision
RPP	Radiation Protection Program
SOP	Standard Operating Procedure
TS	Technical Specification
VNC	Vallecitos Nuclear Center
VSS	Vallecitos Safety Standards
VTSC	Vallecitos Technical Safety Council