



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

September 19, 2018

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
050-00018/2018-001; 050-00070/2018-001; 050-00183/2018-001 AND NOTICE
OF VIOLATION

Dear Mr. Feyrer:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on July 31, 2018, through August 2, 2018, 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). A preliminary exit meeting was conducted on August 2, 2018, with you and members of your staff, and representatives from the Wilmington, North Carolina office. The NRC performed further in-office evaluation of the violation identified during the inspection. Upon completion of the in-office evaluation, the NRC inspectors presented the results of the inspection and the significance of the violation identified during the inspection to you and members of your staff, during a final, telephonic exit meeting on August 21, 2018. 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.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation was evaluated in accordance with the NRC Enforcement Policy. The current NRC Enforcement Policy is included on the NRC's Web site at (<https://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>).

The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report. The violation is being cited in the Notice because it was identified by the NRC and corrective actions had not been fully articulated on the docket at the time of the final exit meeting. Therefore, you are required to respond to this letter and should follow the instructions specified in the enclosed Notice when

preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements. If you contest the violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to: (1) the Regional Administrator, Region IV, and (2) the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosures, 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.

Should you have any questions concerning this inspection, please contact Rachel Browder, Senior Health Physicist, at 817-200-1452 or the undersigned at 817-200-1151.

Sincerely,

/RA/

Janine F. Katanic, PhD, CHP, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

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

Enclosures:

1. Notice of Violation
2. Inspection Report 050-00018/2018-001;
050-00070/2018-001; 050-00183/2018-001
w/Attachment: Supplemental Information

cc:

S. Murray, GE Hitachi Nuclear Energy Americas LLC
G. Perez, Div. of Food, Drug, & Radiation Safety
Dr. R. Weisenmiller, California Energy Commission
Pleasanton Public Library

NOTICE OF VIOLATION

GE Hitachi Nuclear Energy
Vallecitos Boiling Water Reactor
Sunol, CA

Docket No. 050-00018
License No. DPR-1

During an NRC inspection conducted on July 31, 2018, through August 2, 2018, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

NRC License No. DPR-1, Amendment 21, License Condition 3.a. states, in part, that the licensee shall possess the facility in the condition described in the "Final Report on Deactivation of Vallecitos Boiling Water Reactor" dated February 5, 1965.

"Final Report on Deactivation of Vallecitos Boiling Water Reactor," Section V., states, in part, that the condition, security and integrity of the retired facility will be checked during the inspection, and the integrity of the reactor vessel will be verified. In addition, Section II.A.3 specifies that a manometer located outside of containment will allow monitoring of the water level of the pressure vessel and that periodic readings of the manometer will be taken.

Licensee Procedure 6.2, "Patrols and Inspections," Revision 7, implements the license requirements as stated above, and establishes the periodicity of the inspections. Specifically, Section IV.D., "Annual Inspections and Radiation Surveys" states, in part, that an annual inspection, radiation and contamination surveys, and other surveillance activities, including the interior of the containment building for Vallecitos Boiling Water Reactor (VBWR) are required to be performed by the facility license, as described above. In addition, Section IV.A., "EVESR/VBWR Weekly Patrols" states, in part, that a routine patrol will be performed each week to check the VBWR reactor vessel water level.

Contrary to the above, the licensee failed to implement Procedure 6.2, "Patrols and Inspections," Revision 7, for the activities covering VBWR, as evidenced by the following two examples:

1. On December 9, 2017, the licensee failed to follow Procedure 6.2 and inspect the condition and integrity of the retired facility and verify the integrity of the reactor vessel during the annual inspection, when water was identified in the basement of VBWR. Specifically, during the annual inspection and radiological survey, there was no assessment of structural integrity and radiological conditions of the facility in order to assess and mitigate the associated environmental radiological risk from the water in the basement. As a result of not taking any action, approximately 2,100 gallons of water remained in the basement of VBWR until June 21, 2018, when the licensee pumped the water out of the basement.
2. Since May 2018, the licensee failed to take weekly readings of the manometer, to measure the water level in the VBWR reactor vessel, as required. Specifically, during calibration of the manometer in May 2018, the device was over pressurized and broke and the manometer has not been replaced.

This is a Severity Level IV violation (Section 6.3.d.3).

Pursuant to the provisions of Title 10 *Code of Federal Regulation* (CFR) 2.201, GE Hitachi Nuclear Energy is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region IV, 1600 E. Lamar Blvd., Arlington, TX 76011-4511, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation:

- (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level;
- (2) the corrective steps that have been taken and the results achieved;
- (3) the corrective steps that will be taken; and
- (4) the date when full compliance will be achieved.

Your response may reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued requiring information as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region IV.

Your response will be made available electronically for public inspection in the NRC Public Document Room or in the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at: <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary or safeguards information so that it can be made available to the public without redaction.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 19th day of September 2018

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 No. 050-00018/18-001; 050-00070/18-001; and 050-00183/18-001

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: July 31, 2018 – August 2, 2018

Inspectors: Rachel S. Browder, CHP, Senior Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Stephanie G. Anderson, Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Chris D. Steely, Health Physicist
Fuel Cycle and Decommissioning Branch
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Accompanied By: Jack D. Parrott, Project Manager
Reactor Decommissioning Branch
Decommissioning, Uranium Recovery, and Waste Programs
Office of Nuclear Materials Safety and Safeguards

Approved By: Janine F. Katanic, PhD, CHP, Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

GE Hitachi Nuclear Energy NRC Inspection Report 050-00018/18-001; 050-00070/18-001; and 050-00183/18-001

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 inspectors identified one Severity Level IV violation associated with implementing Licensee Procedure 6.2, Patrols and Inspections, Revision 7, for the Vallecitos Boiling Water Reactor (VBWR). Other than the one identified violation, the licensee was conducting site activities in accordance with regulatory, license, and procedure requirements.

Decommissioning Performance Review at Permanently Shutdown Reactors

The licensee conducted its radiation control program in accordance with regulatory requirements and license conditions, with one exception. The inspectors identified a violation associated with the assessment of the structural integrity and radiological condition of VBWR associated with the environmental radiological risk from the water in the basement and not having the capability to measure the water level in the reactor vessel of VBWR. (Section 1.2)

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 Number 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 held a public meeting in Pleasanton, CA on July 22, 2015, and published a notice of the receipt of the release request in the Federal Register on July 20, 2015 (80 FR 42846). The NRC evaluated the request under the provisions of 10 CFR 50.83, and approved the partial site release by letter dated May 3, 2016 (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 DPR-1, DR-10, and TR-1 (ML15349A045). The licensee also submitted a request on July 10, 2015 (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 (ML17138A121). The licensee responded to this request by letter dated July 31, 2017 (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 (ML17312B359). On March 28, 2018 (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.

1 Decommissioning Performance Review at Permanently Shutdown Reactors (Inspection Procedures as listed below)

1.1 Inspection Scope

The inspection objective is to determine if site activities for the shutdown reactors were being conducted safely and in accordance with regulatory requirements and license commitments. Areas reviewed included the licensee's organization, surveillance requirements, and radiological surveys of the three shutdown reactors.

1.2 Observations and Findings

a. Organization, Management, and Cost Controls at Permanently Shutdown Reactors (IP 36801)

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 NRC inspectors reviewed the licensee's organization and discussed the organizational structure with members of the licensee's organization. The VNC's organization was structured under two divisions, identified as "Operations" and "Support." The VNC Site Manager had operational and support experience as a result of past work experience in multiple areas within the GE Hitachi system. The Manager reported to Services Operations in Wilmington, North Carolina. The inspectors observed there was good communications and support between the VNC facility and operations in Wilmington, North Carolina. Based on discussions and observations, the NRC inspectors determined that the individual fulfilling the licensed responsibility as the facility manager for the defueled reactors, adequately met the license condition requirements.

The NRC inspectors reviewed the routine activities performed at the three defueled reactors and reviewed the organization structure that supported those activities. Based on the review and discussions with licensee representatives, there had not been any significant changes to the organization or new personnel hired to perform the routine radiological safety activities at the shutdown reactors. There had been a reduction in staff across the site, due to retirements and attrition. The licensee recently hired a contractor to perform instrumentation and control functions under facilities maintenance. The inspectors observed that the staff have a great deal of historical knowledge of processes that may not be completely captured in training documents or procedures. The inspectors discussed with management that it would be beneficial to incorporate the information as deemed appropriate for certain tasks, including the use and calibration of the manometer. In addition, the historical knowledge could further be captured to corroborate and support the historical site assessment, as part of any future decommissioning activities.

The licensee is required under 10 CFR 50.48(f) to maintain a fire protection program to: (1) reasonably prevent fires from occurring; (2) rapidly detect, control, and extinguish those fires that do occur and that could result in a radiological hazard; and (3) ensure that the risk of fire-induced radiological hazards to the public, environment, and plant personnel are minimized. The inspectors observed fire hydrants with fire department pumper connections and hose connection stations with hoses, in close proximity to the

three shutdown reactors. The licensee also has fire protection reservoir tank and piping connections throughout the site. Since the licensee was not required to maintain fire detection or suppression equipment, then the capabilities at the facility were determined to be sufficient to meet the regulatory requirement. The licensee maintained trained and knowledgeable staff in the area of fire protection.

- b. Decommissioning Performance and Status Review at Permanently Shutdown Reactors (IP 71801) and Class III Research and Test Reactors (IP 69002)
 - i. Vallecitos Boiling Water Reactor (Power Reactor)

Vallecitos Boiling Water Reactor (VBWR) 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 GE Hitachi 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 only water remaining in the facility was inside the reactor vessel. The inspectors determined that the licensee was maintaining the audible control device on the doors to the containment building. The licensee operated a portable dehumidifier inside containment building of VBWR. The condensed water was ultimately transferred to the onsite waste evaporator plant for processing.

The inspectors and Headquarters Project Manager entered the basement level to observe the structure of VBWR. The inspectors observed some cracking in the concrete and several places that indicated water mineral seepage down the walls of the structure. Further evaluation of the structure integrity will be performed as part of the Agency's evaluation to assess GEH's request for license continuance.

The inspectors noted that the licensee had not recorded the weekly water level of the reactor vessel for VBWR on the "EVESR/VBWR Weekly Patrols" document as specified in Licensee Procedure 6.2, "Patrols and Inspections," Revision 7, since May 2018. The licensee explained that the manometer had been over-pressurized and broke, and another manometer had not been installed. The licensee implemented Procedure 6.2, "Patrols and Inspections" to meet the requirement to take periodic readings of the manometer as required by license DPR-1, Amendment 21, License Condition 3.a., which referenced the February 5, 1965, report "Final Report on Deactivation of Vallecitos Boiling Water Reactor."

The licensee explained that the reactor vessel was a closed system and that the reactor vessel had not been opened since the fuel had been removed. Based on historical recordings of the manometer, the licensee indicated that the water level in the reactor vessel had remained at approximately 95 inches of water. The NRC concluded that this was a low safety significance because of the steady value of the reactor vessel water level over a long period of time, coupled with the reduction of radionuclides due to decay since the facility was shutdown.

The February 5, 1965, report also requires, in part, that the condition, security and integrity of the facility would be checked by the licensee during the periodic inspection and the integrity of the reactor vessel would be verified. The inspections were performed annually in accordance with Licensee Procedure 6.2, "Patrols and Inspections," Revision 7. The licensee performed the annual patrol and inspection of VBWR on December 9, 2017, and documented on the survey form that there was no entry into the basement due to rain water in basement. The licensee subsequently submitted the annual report for VBWR as required by License Condition 2., on March 29, 2018, and the survey form was included as part of the annual report (ML18088A736). The licensee had not initiated a condition report, had not taken any further action to verify the integrity of the reactor vessel or assessment of the structural integrity of the facility, and had not performed a sample analysis to determine if there were any radiological constituents present in the water.

Once the NRC reviewed the report and held a telephonic conference call with the licensee on April 17, 2018, the licensee subsequently analyzed a water sample from the basement of VBWR containment for gross beta, gross alpha, and tritium. The results were included in a supplement to the Annual Report No. 53 for Year 2017, for VBWR, dated June 20, 2018, (ML18171A068). The results are summarized in Table 1, below. The licensee pumped approximately 2,100 gallons of water from the basement to the mobile tank to the onsite waste evaporator plant for processing, on June 21, 2018.

Table 1

| Water Sample Results | Gross Beta (pCi/l) | Gross Alpha (pCi/l) | Tritium (μCi/ml) |
|----------------------|--------------------|---------------------|------------------|
| April 2018 | 346 | 87 | < MDC |
| MDC | 185 | 74 | 1.54E-05 |

pCi/l = (picocuries per liter)
MDC = minimum detectable concentration

The NRC determined these two examples were evidence of a failure to implement Procedure 6.2, "Patrols and Inspections," Revision 7, for the activities associated with VBWR, which is a violation of license requirements. (VIO 0500018/2018001-01)

ii. ESADA Vallecitos Experimental Superheat Reactor (Power 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 had been removed.

The inspectors toured the facility with Headquarters Project Manager and licensee representatives. The inspectors confirmed there was an alarm 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. Prior to the inspection, the licensee explained that the sump located outside and adjacent to the containment structure had

alarmed at the Central Alarm Station, due to the pump not working. The licensee corrected the problem with the sump pump and reset the alarm. The licensee utilized a portable dehumidifier to remove condensation from inside the EVESR building. The licensee had temporary lighting installed and it was operating sufficiently to ensure the passageways and stairways were safely lit.

iii. General Electric Test Reactor (Research and Test Reactor)

The General Electric Test Reactor (GETR) 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 licensee explained that the containment polar crane was functional, and only required re-certification for it to be considered operable.

The tank farm located outside the control room building had three underground tanks and one above ground tank, with each one having a capacity of 25,000 gallons. The licensee stated the underground tanks were monitored on a quarterly basis. As needed, the water from the tanks was transferred by piping to the above ground tank and the water was subsequently transported by a mobile tank to the onsite waste evaporator plant for processing.

The licensee's Environmental Monitoring Manual, Revision 2, specified that the monitoring well (B-2) located outside of the GETR control room, would be sampled in June and December each year, for gross beta, gross alpha, and tritium. The licensee documented the results in the 2017 annual report for GETR, submitted to the NRC on March 29, 2018 (ML18088A736). The sample results are provided in Table 2, below. In addition to the 2017 sample results, the June 2016 sample result is provided for reference, since the December 2016 sample had been lost in transit. In addition, the licensee sampled the (B-2) well in March 2018, and the results are included in Table 2, below.

Table 2

| Month | Gross Beta (pCi/l) | Gross Alpha (pCi/l) | Tritium (pCi/l) |
|---------------|--------------------|---------------------|-----------------|
| June 2016 | 458.0 | 151.0 | < MDC |
| June 2017 | 4.49 | 1.70 | 1656.0 |
| December 2017 | 2.69 | 25.57 | 133.0 |
| March 2018 | 0.00 | 8.86 | 949.0 |

MDC was not reported

The emergency preparedness program was not reviewed because the license does not have a requirement to implement an emergency preparedness program. The license stipulates that GETR is already in SAFSTOR mode and there are no accidents that could significantly affect occupational or public health and safety. The licensee does implement a common, site-wide emergency preparedness program that is routinely inspected in conjunction with the other NRC licenses.

c. Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors (IP 37801) and Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors (IP 40801)

The licensee is not subject to the quality assurance criteria under 10 CFR Part 50, Appendix B, and does not have a requirement to implement and maintain a quality assurance program under any of the three shutdown reactor licenses; therefore IP 37801 was not performed for the shutdown reactors.

The licensee implemented its corrective action program under Procedure CP-16-108, "Corrective Action Program," Revision 10.1. The procedure was utilized by all the nuclear sites and facilities under GE Hitachi oversight, including VNC. However, the licensee does not have a requirement under any of the three shutdown reactor licenses to implement a corrective action program; therefore, the corrective action program itself, was not reviewed during this inspection.

The inspectors reviewed corrective actions that were generated in accordance with the licensee's procedure. Specifically, the inspectors reviewed condition report (CR) 28719, that was initiated to remove the water from the VBWR basement, which had been completed by facilities maintenance. The last action was to formerly investigate the source of the water intrusion into VBWR, with a completion date of November 30, 2018. The licensee did not initiate a condition report on the over-pressurization of the manometer. The inspectors discussed with the licensee, the benefits of documenting the occurrence of the over-pressurization to address if there were any possible deficiencies in the procedures, processes, or training, since the individual who had previously performed the activity had recently retired.

d. Occupational Radiation Exposure (IP 83750)

The three shutdown reactor licenses stipulate that a radiation survey shall be conducted annually, and that GETR would be served by the health physics program established in other NRC licenses, specifically the research and test reactor (R-33) and the special nuclear materials license (SNM-960).

Each of the shutdown reactors have license conditions that require annual reports be performed and submitted to the NRC, as required. The licensee performed its surveillances in accordance with Licensee Procedure 6.1, "Access Control," Revision 8, which provided a step-by-step instruction for conducting entries into the three shutdown reactors. Based on the observed entries that were conducted and the documentation generated to support the entries, the inspectors determined that the licensee had adequately implemented its instruction for entering the shutdown reactors, which ensured safe access to the facilities. The dose rates, radiological contamination levels, and air sample results were consistent with historical data documented in previous annual reports. The results indicated that all radiological measurements remained low and the licensee did not identify any unexpected anomalies in the air quality of the shutdown reactors. The inspectors used Ludlum Model 2401-S survey instrument (NRC No. 079765, calibration due date October 21, 2018) to conduct independent radiation surveys. The survey results were consistent with the licensee's survey data for the shutdown reactors.

The Licensee Procedure 6.2, "Patrols and Inspections," Revision 7, provided the instructions to ensure that the three shutdown reactors were inspected regularly and that periodic radiation and contamination surveys were conducted to ensure compliance with each of the three reactor licenses and 10 CFR Part 20 requirements. The licensee was required to perform weekly patrols that consisted of items including, but not limited to external door locks, ground water sump levels, postings, and power to the 300 feet elevation area alarm panel. The licensee performed quarterly routines at GETR that included radiation survey measurements and verification of radiation signs and barriers. Finally, the licensee performed annual inspections and radiation survey measurements inside each of the three shutdown reactors. The 2017 annual report for the three shutdown reactors was submitted to the NRC on March 29, 2018, (ML18088A736) and supplemented on June 20, 2018 for the VBWR license (ML18171A068). The inspectors discussed with licensee management that the representation of Licensee Procedure 6.2, should reflect the facility components and systems that should be inspected. For example, the procedure described a containment sump alarm in VBWR, which was not present.

The regulation under 10 CFR 20.1101(c) requires licensees to assess the radiation protection program content and implementation. The licensee performed Self-Assessment Number VNC-2018-02 on March 19-22, 2018, for the 2017 annual review of the radiation protection program. The assessment was performed by the Radiation Protection Program Leader, from the GE Hitachi, Wilmington, North Carolina office, so there was independence in the performance of the assessment. The licensee did not identify any deficiencies or make recommendations associated with the shutdown reactor licenses program. The assessment identified a couple of deficiencies and made several recommendations associated with other permits and licenses authorized at the facility. These were documented in CR 28660. The inspectors determined that the licensee performed a thorough assessment of its radiation protection program.

During 2017, the licensee monitored 199 employees and the radiation exposures received at the facility were under other authorized licenses and permits. Since the licensee was not performing any work activities at any of the three shutdown reactors, there was no personnel exposure monitoring required for the shutdown reactors. The licensee used lab coats, booties and gloves to minimize contamination inside the shutdown reactors. The inspectors observed that the licensee effectively maintained step-off pads for contamination control at the exit points from each of the three shutdown reactors. In addition, the postings were adequate and in compliance with the requirements under 10 CFR Part 20.

e. Radioactive Waste Treatment, and Effluent and Environmental Monitoring (IP 84750) and Solid Radioactive Waste Management and Transportation of Radioactive Materials (IP 86750)

The licensee submitted its 2017 Annual Effluent Monitoring and Environmental Surveillance Program report on February 28, 2018 (ML18059A825 and ML18059A826) with a supplemental report dated May 11, 2018 (ML18131A011) as required by various site licenses and permits issued by the NRC and the State of California. The licensee does not have a specific requirement to implement an effluent and environmental monitoring program under any of the three shutdown reactor licenses. During 2017, the licensee did not perform any activities at the shutdown reactors. As a result, there is no data from the shutdown reactors required to be reported in the annual report.

The licensee stated that the last maintenance performed on the GETR stack was in 2011, and the stack was tested at that time. Although the ventilation system remained operational, the licensee did not operate the system during 2017. The licensee analyzed one groundwater well (B-2) that is located outside of GETR, next to the control room. The results were published in the 2017 annual report for GETR and summarized in Section (b.iii.) of this inspection report.

The licensee was not performing any work activities at the shutdown reactors, and therefore, no wastes or transportation activities were conducted during this inspection period. Therefore, IP 86750 was not performed.

f. Inspection of Remedial and Final Survey at Permanently Shutdown Reactors (IP 83801)

The licensee was not performing any work activities at the shutdown reactors, and therefore, no remediation or final status surveys were performed during this inspection period. Therefore, IP 83801 was not performed.

1.3 Conclusions

The licensee conducted its radiation control program in accordance with regulatory requirements and license conditions, with one exception. The inspectors identified a violation of license requirements associated with the assessment of the structural integrity and radiological condition of VBWR associated with the environmental radiological risk from the water in the basement and not having the capability to measure the water level in the reactor vessel of VBWR.

2 Exit Meeting Summary

On August 21, 2018, the NRC inspectors presented the final inspection results to Mr. M. Feyrer and other members of his staff, as well as with Mr. S. Murray from the Wilmington, North Carolina office. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Feyrer, Site Manager
B. Lockwood, GM Operations
J. Smyly, Environmental, Health and Safety Manager
S. Murray, Manager, Facility Licensing
J. Ayala, Radiation Protection Supervisor
M. Schrag, Facilities Manager
H. Stuart, Radiation Monitor Technician

INSPECTION PROCEDURES

IP 36801 Organization, Management, and Cost Controls at Permanently Shutdown Reactors
IP 37801 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors
IP 40801 Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors
IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 83750 Occupational Radiation Exposure
IP 83801 Inspection of Remedial and Final Surveys at Permanently Shutdown Reactors
IP 84750 Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 86750 Solid Radioactive Waste Management and Transportation of Radioactive Materials
IP 69002 Class III Research and Test Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|---------------------|-----|---|
| 05000018/2018001-01 | VIO | Failure to implement Procedure 6.2, "Patrols and Inspections," Revision 7, for activities associated with VBWR. |
|---------------------|-----|---|

Closed/Discussed

None

LIST OF ACRONYMS

| | |
|-------|--|
| 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 |
| MW | Megawatt |
| NRC | U.S. Nuclear Regulatory Commission |
| VBWR | Vallecitos Boiling Water Reactor |
| VNC | Vallecitos Nuclear Center |

GE HITACHI NUCLEAR ENERGY - NRC INSPECTION REPORT 050-00018/2018-001;
 050-00070/2018-001; 050-00183/2018-001 AND NOTICE OF VIOLATION - DATED
 SEPTEMBER 19, 2018

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| DATE | 9/18/18 | 9/19/18 | 9/19/18 | |

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