



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

September 26, 2011

Mr. Mark Varno
Acting Manager, Vallecitos Nuclear Center
GE-Hitachi Nuclear Energy
6705 Vallecitos Road
Sunol, California 94586

SUBJECT: NRC INSPECTION REPORT 050-00018/11-007; 050-00070/11-001;
050-00183/11-001

Dear Mr. Varno:

This refers to the inspection conducted on September 12-15, 2011, of the three permanently defueled reactors at GE-Hitachi Nuclear Energy's Vallecitos Nuclear Center located in Sunol, California. This inspection was an examination of activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. The inspection results were presented to you at the conclusion of the onsite inspection. The enclosed report presents the results of this inspection. No violations were identified, and no response to this letter is required. A separate report will be issued regarding the inspection of your special nuclear materials license which was conducted the same week.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC's 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.

Should you have any questions concerning this inspection, please contact Mr. Robert Evans, Senior Health Physicist, at (817) 860-8234 or the undersigned at (817) 860-8191.

Sincerely,

/RA/

D. Blair Spitzberg, PhD, Chief
Repository and Spent Fuel Safety Branch

Docket Numbers: 050-00018/11-007; 050-00070/11-001; and 050-00183/11-001
License Numbers: DPR-1; TR-1; and DR-10

Enclosure:

NRC Inspection Report 050-00018/11-007; 050-00070/11-001; and 050-00183/11-001

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Publicly Avail.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sensitive Value:		
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RJEvans	GASchlapper	DBSpitzberg		
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Numbers: 050-00018; 050-00070; and 050-00183

License Numbers: DPR-1; TR-1; and DR-10

Report Number: 050-00018/11-007; 050-00070/11-001; and 050-00183/11-001

Licensee: GE-Hitachi Nuclear Energy

Facility: Vallecitos Nuclear Center

Location: Sunol, California

Dates: September 12-15, 2011

Inspectors: Robert Evans, PE, CHP, Senior Health Physicist
Repository and Spent Fuel Safety Branch

Gerald Schlapper, PhD, CHP, Health Physicist
Repository and Spent Fuel Safety Branch

Accompanied By: D. Blair Spitzberg, PhD, Chief
Repository and Spent Fuel Safety Branch

Approved By: D. Blair Spitzberg, PhD, Chief
Repository and Spent Fuel Safety Branch

Attachment: Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

GE-Hitachi Nuclear Energy
NRC Inspection Report 050-00018/11-007; 050-00070/11-001; and 050-00183/11-001

This inspection was a routine, announced inspection of licensed activities being conducted under the three licenses for the permanently defueled reactors at the Vallecitos Nuclear Center. Within the scope of this inspection, the licensee was conducting activities in accordance with regulatory, license, and procedure requirements.

Site Status

- During the inspection, the three reactors continued to remain permanently shut down and defueled. Risk reduction work was completed at the Vallecitos Boiling Water Reactor during 2007-2008. Risk reduction work was completed at the Empire State Atomic Development Associates Incorporated Vallecitos Experimental Superheat Reactor during 2008-2011. Finally, the licensee plans to conduct risk reduction work at the GE Test Reactor during 2012.

Decommissioning Performance and Status Review

- The licensee conducted the annual inspections of the three reactors in accordance with license and procedure requirements. The licensee continued to conduct annual radiological surveys inside of the three structures, and the sample results were comparable to the previous year's sample results (Section 1.2.a).
- The licensee monitored workers who conducted risk reduction work for their exposures to radiation. These occupational exposures were well below the regulatory limit (Section 1.2.b).
- Effluents were monitored by the licensee, and public doses to these radioactive effluents were determined to be well below the annual regulatory limit (Section 1.2.c).
- The inspectors conducted site tours of the three containment buildings and concluded that the licensee was maintaining the buildings in accordance with procedure requirements (Section 1.2.d).
- The licensee shipped radioactive wastes for disposal in accordance with regulatory requirements (Section 1.2.e).
- The licensee conducted training for site workers in accordance with regulatory requirements (Section 1.2.f).
- Finally, the licensee established an emergency response program in accordance with procedure requirements (Section 1.2.g).

REPORT DETAILS

Summary of Plant Status

At the time of the inspection, the three reactors continued to be permanently shut down and defueled. Risk reduction work had been completed at two of three reactors. Risk reduction work consists of removal and disposal of contaminated equipment from within the containment buildings, as allowed by the three licenses. The licensee plans to commence with risk reduction work at the third reactor during 2012.

The Vallecitos Boiling Water Reactor (VBWR) achieved full power operations during 1957 but was permanently shut down during 1963. The licensee commenced with risk reduction work during late-October 2007 to remove all ancillary equipment from the VBWR containment. The licensee dismantled all systems and components with the exceptions of the reactor pressure vessel, polar crane, biological shield, and fuel pool. All radioactive wastes were packaged and shipped offsite for disposal. This risk reduction work was completed by November 2008.

During the performance of risk reduction work at the VBWR, the licensee replaced the original equipment hatch with an industrial roll-up door. Since the last inspection, the licensee permanently disposed of the hatch cover and hatch cover bolts. At the time of this inspection, the licensee was considering its options for conducting additional risk reduction work at the VBWR. This additional work includes removal of non-structural lead bricks and high density concrete blocks as well as cleanup of some groundwater from the basement floor.

The Empire State Atomic Development Associates Incorporated Vallecitos Experimental Superheat Reactor (EVESR) achieved full power operations during 1964 but was permanently shut down during 1967. Some cleanup work was conducted during 2008, but the work was suspended pending NRC approval of a license amendment to allow work to commence below the 549-foot elevation level within containment. The NRC subsequently amended the license on December 1, 2008, which allowed work to be conducted within containment below the 549-foot elevation.

Risk reduction work within EVESR commenced during March 2009. During August 2009, the polar crane suffered a catastrophic failure. A gear located within the gear box failed, resulting in the loss of the main hoist. The licensee was unable to repair the gear box. Risk reduction work within the EVESR was completed during early 2011. However, the removal of the heavier components, including the dump tank, had to be deferred until a later date.

Finally, the GE Test Reactor (GETR) was in standby awaiting commencement of risk reduction work. The licensee may commence with risk reduction work at the GETR during early 2012. This work is expected to take about nine months to complete. The first phase of work includes the development of the various work plans, supporting procedures and programs necessary for conducting the field work. This first phase of work was almost complete at the time of this inspection.

The licensee implemented two staff changes since the last inspection. The Vallecitos Nuclear Center Manager left the facility during June 2011. An individual was assigned to the position of acting manager for two months. During August 2011, the licensee assigned a second individual to the position of acting manager. At the time of the onsite inspection, the licensee had not selected the individual who would serve as manager on a permanent basis.

1 Decommissioning Performance and Status Review

1.1 Inspection Scope

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

1.2 Observations and Findings

a. Routine Inspections and Audits

Each license requires the licensee to conduct inspections of the facilities including surveys of radioactivity levels. The instructions for these inspections are provided in facilities maintenance Procedure 6.2, Revision 5, "EVESR/VBWR/GETR Surveillance Procedures." This procedure stipulates that weekly inspections be conducted to observe attributes such as groundwater sump levels, door locks, electrical circuit breaker positions, and fence conditions. The procedure also describes the annual inspection and radiological survey requirements.

The annual inspections of the three reactors were most recently conducted during December 2010. The inspections included measurements of ambient gamma exposure rates, airborne beta-gamma concentrations, and removable beta-gamma contamination levels. As required by the three licenses, the licensee submitted annual reports for each reactor to the NRC. The most recent annual reports were submitted on March 30, 2011.

The annual reports documented the radiological conditions identified in each of the three containment buildings. The exposure rate and contamination level sample results for calendar year 2010 were comparable to the results obtained during 2009. No air sample result exceeded the licensee's action level. Slightly elevated removable contamination levels were identified in the EVESR, but these increases were attributed to recent risk reduction work activities within the EVESR. The inspectors identified several typographical errors in the licensee's reported radiological data, and the licensee agreed to review and correct the errors as necessary.

Regulation 10 CFR 20.1101(c) requires that licensees review radiation program content and implementation at least annually. The inspectors reviewed the licensee's annual radiation protection program report for 2010 and discussed the contents of the report with licensee representatives. The report included all licensed activities, including activities conducted at the shutdown reactors. The report provided detailed information to licensee management about the status of the radiation protection program from the previous year. Subject areas discussed in the report included site-wide occupational exposures for 2010 and As Low As Reasonably Achievable (ALARA) goals for 2011.

b. Occupational Exposures

The inspector reviewed the licensee's exposure records for 2010 to ensure that no individual exceeded the regulatory limits specified in 10 CFR 20.1201. The licensee provided the inspectors with records of occupational doses to workers assigned to the EVESR risk reduction work. The typical work crew consisted of five to six individuals, plus oversight and support personnel, but the contractor routinely rotated the workers to

different jobs onsite. Therefore, the inspectors reviewed the occupational doses of all contract workers for 2010 and the first half of 2011.

Based on the licensee's occupational exposure records, a total of 46 workers were monitored during 2010. The highest total effective dose equivalent for any worker was 2467 millirem with a regulatory limit of 5000 millirem. This dose was associated with an uptake event that occurred during February 2010. (The uptake event was described in NRC Inspection Report 070-00754/10-001). Excluding the uptake event, the highest dose to an individual during 2010 was 626 millirem. In summary, occupational doses for EVESR risk reduction work were well below the 5000 millirem total effective dose equivalent exposure limit specified in 10 CFR 20.1201. During 2010, the collective dose of all workers was 6710 millirem, above the ALARA goal of 4000 millirem due, in part, to the February 2010 uptake event.

The licensee's occupational exposure records for the first half of 2011 were also reviewed. The licensee monitored 22 individuals who may have worked at the EVESR during this time frame. For the first half of 2011, the highest dose was 318 millirem with an annual regulatory limit of 5000 millirem. The collective dose was 1720 millirem, below the ALARA goal of 2000 millirem for the same time period.

c. Public Dose Assessment

The licensee is required to monitor offsite releases and the resulting public doses. The licensee conducted environmental and effluent monitoring and documented the results in an annual report. The sampling results for 2010 were submitted to the NRC by letter dated March 31, 2011. The inspectors reviewed this report and compared the results to the regulatory limits.

Regulation 10 CFR 20.1101(d) provides a constraint on air emissions for individual members of the public of 10 millirem per year from these emissions. Using the COMPLY computer code, the licensee calculated an annual dose at the property line. For 2010, this calculated dose was 1.4 millirem due to all emissions. This calculated value was compliant with the 10 millirem constraint rule.

Regulation 10 CFR 20.1301 provides the dose limits for individual members of the public. This regulation specifies that the total effective dose equivalent to individual members of the public from licensed operations does not exceed 100 millirem in a year. The licensee monitors ambient gamma radiation at 31 monitoring stations. The results for 2010 ranged from 33.6 millirem per year to 86.2 millirem per year. Background was not subtracted from these reported values. The licensee's background station was located in the onsite security building, and this location measured 93.9 millirem for 2010. All monitoring station results were less than the 100 millirem annual limit even with background included. In summary, licensed operations did not result in public doses greater than regulatory limits during 2010.

d. Site Tours

The inspectors toured the three reactor containment buildings. The VBWR remained in safe storage. Maintenance Procedure 6.2 requires routine checks of the VBWR reactor vessel water level using a rotometer located outside of the containment building. The VBWR contains water, in part, for radiation shielding. The licensee's records indicate

that the VBWR water level continues to remain relatively constant. The inspectors observed groundwater on the basement floor, but the licensee plans to remove the water from the building during early 2012.

The EVESR was also toured by the inspectors. Equipment removal work was completed in the EVESR. One high radiation area existed in EVESR, and this area was positively controlled by the licensee. The inspectors observed the components that could not be removed from the building, including the dump tank, because of the August 2009 polar crane failure.

Finally, the inspectors toured the GETR. Little decommissioning work had been performed in this facility. As noted earlier, the licensee plans to commence with risk reduction activities in the GETR during 2012.

During site tours, the inspectors conducted independent gamma exposure rate measurements using an NRC-issued Ludlum Model 2401-EC2 survey meter (NRC number 21116G, calibration due date of 12/06/11). The inspectors' survey results during the site tour were consistent with the licensee's December 2010 annual survey results.

In summary, no unsafe condition was identified, postings were found to be adequate, and radiation levels measured by the inspectors were comparable to the results documented in the licensee's annual reports. Housekeeping was appropriate for the work in progress. The licensee had maintained these three buildings in accordance with regulatory, license, and procedure requirements.

e. Transportation of Radioactive Material and Control of Radwaste

The inspectors reviewed the licensee's shipment records for 2010-2011 which included shipment of EVESR and legacy waste material. During 2010, the licensee shipped slightly under 13,000 cubic feet of wastes containing about 6.2 curies of radioactivity in 18 shipments to a disposal site located in Utah or to a waste processor in Tennessee. These shipments included wastes from the EVESR risk reduction work. Most shipments consisted of dry active wastes, but three shipments included mixed wastes. During 2011, the licensee shipped about 8000 cubic feet of wastes containing about 5.9 curies of radioactivity in 15 shipments to either the disposal site or the waste processor. The most recent shipment occurred on August 31, 2011.

The inspectors reviewed three representative shipping packages. The packages included all pertinent documents including waste manifests, bills of lading, and radiological surveys. Each package included verification that emergency instructions had been provided to the drivers. In summary, the licensee's documentation was found to be in compliance with U.S. Department of Transportation requirements.

f. Site Worker Training

Instructions to workers are required by 10 CFR 19.12. The site-wide training requirements are provided in Sections 5.8 and 7.3 of Appendix A to the licensee's special nuclear material license. The licensee maintained an extensive training program for site workers. The training courses for 2010-2011 included radiation safety, radiation protection refresher, respirator fundamentals and fit testing, emergency response, criticality safety and industrial safety. U.S. Department of Transportation function

specific training was presented to site staff during September 2010. In summary, the licensee provided instructions to workers in accordance with regulatory requirements.

g. Emergency Response Program Review

The inspectors reviewed the licensee's program for responding to emergencies. The licensee established site emergency procedures. These procedures included instructions for radiological incidents, criticality accidents, bomb threats, fires, natural events, major power outages, and security breaches. The licensee had emergency response agreements in place with the local sheriff's department and the local hospital. The licensee was in the process of arranging a site tour with the local fire department.

The inspectors reviewed the licensee's scheduling of emergency response exercises. The exercises and associated training were being tracked with a computerized tracking system. The exercises included criticality, fire, radiation, building evacuation, and first aid. At the time of the inspection, the procedure-required exercises were up to date. The licensee also routinely verified the accuracy of the telephone list. In summary, the licensee was implementing its emergency response readiness program in accordance with procedure requirements.

1.3 Conclusions

The licensee conducted the annual inspections of the three reactors in accordance with license and procedure requirements. The licensee continued to conduct annual radiological surveys inside of the three structures, and the sample results were comparable to the previous year's sample results. The licensee monitored workers who conducted risk reduction work for their exposures to radiation. These occupational exposures were well below the regulatory limit. Effluents were monitored by the licensee, and public doses to these radioactive effluents were determined to be well below the annual regulatory limit. The inspectors conducted site tours of the three containment buildings and concluded that the licensee was maintaining the buildings in accordance with procedure requirements. The licensee shipped radioactive wastes for disposal in accordance with regulatory requirements. The licensee conducted training for site workers in accordance with regulatory requirements. Finally, the licensee established an emergency response program in accordance with procedure requirements.

2 Exit Meeting Summary

The inspectors presented the inspection results to the licensee's representatives at the conclusion of the onsite inspection on September 15, 2011. Representatives of the licensee acknowledged the findings as presented. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

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T. Kirkham, Consultant
D. Krause, Manager, Regulatory Compliance and EHS
B. Lillge, Supervisor, Remediation Programs
J. Reynolds, Environmental Health & Safety Manager
M. Schrag, Manager, Facilities

INSPECTION PROCEDURES USED

36801 Organization, Management, and Cost Controls at Permanently Shutdown Reactors
37801 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors
40801 Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors
62801 Maintenance and Surveillance at Permanently Shutdown Reactors
71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
83750 Occupational Radiation Exposure
84750 Radioactive Waste Treatment, and Effluent and Environmental Monitoring
86750 Solid Radioactive Waste Management and Transportation of Radioactive Materials

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
EVESR	Empire State Atomic Development Associates Incorporated Vallecitos Experimental Superheat Reactor
GETR	General Electric Test Reactor
VBWR	Vallecitos Boiling Water Reactor