



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

March 17, 2011

Mr. David W. Turner, Manager
Vallecitos Nuclear Center
GE-Hitachi Nuclear Energy Americas LLC
6705 Vallecitos Road
Sunol, CA 94586

SUBJECT: NRC INSPECTION REPORT 070-00754/11-001

Dear Mr. Turner:

This refers to the inspection conducted on February 14-17, 2011, at the Vallecitos Nuclear Center located in Sunol, California. This inspection was an examination of 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. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. The preliminary inspection results were presented to you at the conclusion of the onsite inspection on February 17, 2011. The enclosed report presents the results of this inspection.

This inspection was an examination of 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. Within these areas the inspection consisted of selected examination of procedures and representative records, observation of activities, and interviews with personnel. In summary, the inspector determined that you were conducting activities in accordance with license and regulatory requirements.

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 Dr. Gerald Schlapper, Health Physicist, at 817-860-8273 or Dr. D. Blair Spitzberg, Chief, Repository and Spent Fuel Safety Branch, at 817-860-8191.

Sincerely,

/RA/

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

Docket: 070-00754
License: SNM-960

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NRC Inspection Report 070-00754/11-001

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 FINAL: R:\ DNMS\2011\GE-Hitachi IR 11-001

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ADAMS		<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> SUNSI Review Complete	Reviewer Initials: GAS
<input checked="" type="checkbox"/> Publicly Available		<input type="checkbox"/> Nonpublicly Available		<input type="checkbox"/> Sensitive	<input checked="" type="checkbox"/> Non-sensitive
RIV: DNMS/RSFS	C:RSFS				
GASchlapper;dlf	DBSpitzberg				
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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 070-00754
License: SNM-960
Report: 070-00754/11-001
Licensee: GE-Hitachi Nuclear Energy Americas LLC
Facility: Vallecitos Nuclear Center
Location: Sunol, California
Dates: February 14-17, 2011
Inspector: Gerald Schlapper, CHP, PhD, Inspector
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 Americas LLC
NRC Inspection Report 070-00754/11-001

This inspection was a routine, announced inspection of licensed activities being conducted at the Vallecitos Nuclear Center.

Management Organization and Controls

- The licensee provided oversight and control of site activities during 2010 in accordance with license and regulatory requirements (Section 1). Oversight of contractor activities was increased following a contamination event in February of 2010.

Radiation Protection

- The licensee implemented its radiation protection program in accordance with license and regulatory requirements during 2010. The licensee monitored workers for occupational exposures, and no individual exceeded the regulatory limits for whole-body and extremity doses during 2010 (Section 2).
- As noted in a previous inspection report (NRC Inspection Report 070-00754/10-001 dated October 8, 2010), two contractors experienced uptakes of radioactive material during February 2010 when they opened a drum to collect swipe samples from the drum. The licensee's failure to follow site procedures was a violation of the license. In addition, the licensee's failure to make or cause to be made surveys was a violation of regulatory requirements. Finally, the licensee's failure to report the event to the NRC in a timely manner was a violation of regulatory requirements (Section 2). This is public information. The licensee response to these violations is supplied in GE Reply to Notice of Violation; EA-10-096, ADAMS ML 110130503.

Operator Training/Retraining and Emergency Preparedness

- The licensee implemented training and emergency preparedness programs as required by license and regulatory requirements. In response to the February 2010 uptake event, the licensee planned to retrain site personnel to reinforce its expectations of adherence to radiation protection program requirements. These retraining efforts were reviewed during this inspection and were found to be adequate to address NRC concerns related to failure to follow procedures resulting in an uptake and failure to conduct effective surveys (Section 3). Licensee actions allow closure of corrective actions presented in Enforcement Actions 070-00754/EA-10-096-01, failure to follow procedures resulting in an uptake, and 070-00754/EA-10-096-02, failure to conduct an effective survey.

Maintenance and Surveillance Testing

- The licensee conducted instrumentation calibrations and checked source leak tests in accordance with license requirements (Section 4).

Effluent Control and Environmental Protection

- The licensee implemented its effluent and environmental monitoring programs in accordance with license and regulatory requirements. All required samples were collected, and no sample result exceeded any license or regulatory limits (Section 5).

Followup on Traditional Enforcement Actions

- The licensee completed corrective actions related to the February 2010 intake event as described in the licensee's response to the Notice of Violation (Section 6).

REPORT DETAILS

Summary of Plant Status

At the time of the inspection, the licensee continued to possess and store special nuclear material (SNM) at the facility. Licensed operations included SNM fuel examinations within various hot cells. Other work in progress in the hot cells included manufacturing of sealed sources under the licensee's State of California license.

The licensee subdivided the various areas containing SNM into criticality limit areas to limit the amount of SNM that is permitted in a given area. Compliance with these area limits eliminates the potential for a criticality accident. The licensee's calculations, and the implementation of these calculations, will be reviewed by the NRC during a future inspection.

1 Management Organization and Controls (88005)

1.1 Inspection Scope

The inspector reviewed the licensee's control and oversight of licensed activities.

1.2 Observations and Findings

The inspector reviewed the licensee's organizational structure and discussed the structure with licensee management. All management positions continued to be filled with qualified individuals. One organizational change was noted since the last inspection. A position was added in order to provide enhanced oversight of risk reduction contractor activities. This was in response to the February 2010 event where two contractor employees were exposed to airborne radioactivity. At the time of the inspection, approximately 110 individuals were assigned to the site, including both licensee and contractor employees.

The licensee previously implemented an enhanced As Low As Is Reasonably Achievable (ALARA) program. During 2010, the licensee established a site-wide goal of 19.3 rems of collective dose. The actual dose was 22.5 rems. The primary reason for the exceedance was increased Co-60 production, support of Building 304 clean out, and characterization and disposal of legacy waste.

The licensee continues to expand its ALARA program. During 2010, the licensee continued the ALARA work planning process for high dose jobs. The licensee increased oversight of contractor activities to include review of contractor generated procedures and other documents. The licensee introduced ALARA job observation to include licensee participation in plan-of-the-day briefings and frequent tours of contractor work areas. Collectively, these programs should help the licensee maintain control and oversight of work projects that result in elevated occupational exposures.

1.3 Conclusions

The licensee provided oversight and control of site activities during 2010 in accordance with license and regulatory requirements.

2 Radiation Protection (88030)

2.1 Inspection Scope

The inspector reviewed the radiation protection program to verify compliance with 10 CFR Part 20 and the license.

2.2 Observations and Findings

a. Radiation Protection Program Review for 2010

The inspector reviewed the licensee's occupational exposure records for 2010 to ensure that no individual had exceeded the limits specified in 10 CFR 20.1201. The licensee monitored employees for both external and internal exposures. Occupational doses consisted of combined doses from exposures to radioactive materials licensed by both the State of California and the NRC, including the NRC's SNM license. Neutron-detecting dosimeters were assigned to selected site workers based on work activity. Any neutron doses were assigned to individuals in addition to gamma radiation doses.

During 2010, the licensee monitored 211 General Electric employees and 156 visitors for occupational exposures. The highest total external exposure to an individual was 1.754 rem with a regulatory limit of 5 rem. The individual who received this dose was a member of the source fabrication group. Selected individuals were assigned finger rings to measure extremity doses. There were 47 extremity badges issued in 2010. Of these, 35 indicated minimal exposure and, for those with an indicated exposure, the average exposure was 204 millirem (mrem). The highest extremity dose was 0.92 rem with a regulatory limit of 50 rem. The contamination event of February 2010 resulted in a total effective dose equivalent to the maximally exposed individual of 2.441 rem compared to the regulatory limit of 5 rem. A second employee received a much lower exposure, 0.1 rem total effective dose equivalent.

The licensee had extensive contamination control, air sampling, and area radiation monitoring programs. The licensee maintained extensive records of surveys. The inspector reviewed a representative sample of these radiological surveys records to ensure that the surveys were being properly conducted and to ensure that radioactive material was not migrating out of the restricted areas. During 2010, no elevated measurements greater than the licensee's action levels were identified outside of the restricted area. The licensee also placed dosimeters in buildings occupied by employees. Varied locations in the buildings were chosen. The dosimeters were exchanged on a quarterly basis. Based on the results of these measurements, a dose to an individual that occupied the location for 8 hours/day, 5 days/week, and 52 weeks/year was calculated. All of the locations are within the protected area of the site and not accessible to members of the public. Of locations monitored, all indicated levels less than the allowed value of 100 mrem/year for exposure of members of the public, with the exception of the entrance to Building 348, a location across the road from a waste storage area. Once the waste was removed, levels in Building 348 dropped from a rate of 132 mrem/year to a rate of approximately 10 mrem/year.

b. Worker Contamination and Uptake Event

As noted in a previous inspection report and further documented in enforcement action, the licensee experienced a contamination event on February 16, 2010, that resulted in

the uptake of radioactive material by two contract workers. At the time of the onsite inspection, the licensee had implemented its corrective actions to prevent recurrence of the event. The contractor had upgraded its work control programs, in part, to ensure that its workers complied with the licensee's procedures and site requirements. The licensee identified two additional contamination events that occurred in 2010 that implied ineffective radiological control practices. These events occurred within a radiological material area (RMA) classified as an area controlled for contamination and did not result in the spread of contamination outside of the RMA. In August 2010 in Lab 209, Building 103, a chemist attempted to use a hot plate to evaporate a liquid contained in a beaker. At the end of the day, the chemist, though intending to turn the hot plate to the off position, turned the plate to the maximum level. On entry to the lab the next morning, another chemist noted that the beaker was cracked, resulting in contamination in the immediate area of the hot plate. An attempt was made to decontaminate the area, but subsequent contamination surveys indicated that the lab floor and other areas beyond the immediate area of the hot plate were also contaminated. Contamination was not found outside the laboratory. As soon as he was made aware of the event, the Health Physics Specialist decertified the lab as an RMA, required that the chemists be retrained on proper radiological work practices, and supervised decontamination of the laboratory to contamination levels that existed prior to the event. After decontamination and completion of retraining of the chemists, the laboratory was returned to service.

A second contamination event occurred in November 2010 in Building 103's Mass Spectrometry Laboratory (Room 208). This event resulted from personal error and poor radiological control practices relating to operation of an induction furnace that is used to melt metal samples to determine hydrogen content of the sample material. The interior of the furnace is highly contaminated. A technician had partially dismantled the furnace internals to correct a problem with a sample positioning device. Following these preparations for operation, but prior to actual use, a radiation monitor technician (RMT) conducting a swipe survey of the laboratory found contamination levels on the laboratory floor of approximately 4000 cpm, which was higher than levels normally found in this area of the laboratory. The RMT contacted the Health Physics Specialist who stopped work in the laboratory pending further surveys which found levels of about 12,000 cpm on horizontal surfaces in the laboratory. Surveys indicated that no contamination was found outside the laboratory. Decontamination efforts of the area were initiated and levels reduced prior to return of the lab to service. This event did not result in the spread of contamination outside the laboratory.

The inspector reviewed survey data prior to the events, immediately after the events, and following decontamination efforts. The inspector concluded that the licensee recognized the need for more training and halted laboratory operations pending decontamination. The licensee complied with Vallecitos Safety Standards for reports to regulatory agencies (GE Hitachi Vallecitos Nuclear Center, Vallecitos Safety Standards No 3.0, Revision 11, issued October, 2010) which ensures compliance with reporting requirements as outlined in 10 CFR 70.50. The inspector noted that these events were minor in nature and the licensee's corrective actions to these events were appropriate.

2.3 Conclusions

The licensee implemented its radiation protection program in accordance with license and regulatory requirements during 2010. The licensee monitored workers for occupational exposures, and no individual exceeded the regulatory limits for whole-body and extremity doses during 2010.

Full implementation of Vallecitos Safety Standard No. 3.0, Revision 11, "Reports to Regulatory Agencies," will ensure submittal of required reports to regulatory agencies and address NRC concerns of failure to report activities in a timely manner and thus Enforcement Action Item 070-00754/EA-10-096-03 can be closed.

3 Operator Training/Retraining and Emergency Preparedness (88010, 88050)

3.1 Inspection Scope

The inspector reviewed the licensee's training and emergency preparedness programs to ensure compliance with license and regulatory requirements.

3.2 Observations and Findings

The training requirements are provided in Sections 5.8 and 7.3 of Appendix A to the license. The licensee maintained an extensive training program for site workers. A computerized tracking system was used to track worker training. The training courses included criticality safety, radiation safety, radiation protection refresher, respirator fundamentals and fit testing, emergency response, and industrial safety.

One root cause for the uptake of radioactive material by two contractors in February 2010 was the inadequate indoctrination of contractor personnel into the licensee's radiological controls program. In response, the licensee retrained contractor personnel in applicable portions of the licensee's radiological controls program, including the actions to be taken in the event of a radiological incident. The inspector reviewed training related to whole-body frisking requirements that was initiated after the licensee determined that there was some confusion related to required personnel frisking processes. The inspector reviewed documentation of training completion, which included employee acknowledgement that they understood the requirements for frisking. During tours of the site, the inspector observed and participated in whole-body frisks as required. Techniques utilized by workers employing an extended reach beta/gamma frisker were adequate for detection of contamination on all areas of the body to include areas of the back. Individuals unable to survey themselves may contact a fellow worker or a radiation monitor for assistance. The beta/gamma frisker is also called a field monitoring instrument in site procedures. Procedures also permit use of a personnel contamination monitor (PCM) upon exit of areas. However, due to reliability problems, no PCMs were in use at the site during the period of the inspection.

The inspector reviewed the licensee's site communication during an emergency. Communication during an emergency is via an analog phone system (HICOM) backed up by radios and cell phones. The licensee noted that the HICOM system is a site-powered system and thus this system would not be expected to work during a loss of site-power event. The use of radios and cell phones, however, ensures no loss of communication during an emergency. The inspector confirmed that the licensee provided training and communication capability as required by the emergency plan.

In response to the February 2010 uptake event, the licensee retrained site contractor and licensee personnel to reinforce its expectations of adherence to radiation protection program requirements. The inspector reviewed contractor and licensee conduct of operations, work control, and initial and refresher training in radiation protection. The inspector noted that contractor documents had been reviewed and approved by licensee

personnel. The inspector also witnessed staff frisking out of areas controlled for radiation and contamination and noted adequate performance of these actions.

3.3 Conclusions

The licensee implemented training and emergency preparedness programs as required by license and regulatory requirements. Corrective actions for Enforcement Items 070-00754/EA-10-096-01, failure to follow procedures resulting in an intake and 070-00754/EA-10-096-02, failure to conduct an effective survey have been implemented as verified by documentation and inspector observation of activities and can be closed.

4 Maintenance and Surveillance Testing of Safety Systems/Permanent Plant Modifications (88025/88070)

4.1 Inspection Scope

The inspector conducted a review of the maintenance and calibration history of radiation detection instrumentation.

4.2 Observations and Findings

Radiological survey instrument calibrations are required by Section 8.6 of Appendix A to the license. The inspector reviewed the licensee's radiological survey instrument calibration program. The inspector determined that the licensee continued to conduct instrument calibration activities under its State of California license, although selected neutron monitoring systems were sent offsite to a licensed vendor for calibration. The licensee recently procured three additional portable neutron detection systems to ensure that neutron exposure levels could be adequately monitored. The inspector noted that, of approximately 300 instruments that require annual calibration and maintenance, there were 22 in the calibration shop awaiting calibration and/or repair. At the time of the inspection, there did not appear to be a backlog of instrumentation awaiting action on the part of the instrument technician. The licensee had a sufficient number of meters available for use by site workers. The licensee utilized an annual calibration cycle, and no meter was identified with an out-of-date calibration during site tours. The inspector also noted that the decommissioning contractor provided some of its own meters for use during its reactor decommissioning activities, although there was no decommissioning work in progress during the inspection.

Finally, License Condition S-3 requires the licensee to leak test all of its sealed plutonium sources. The licensee conducted the check source inventories and swipe tests on a semiannual basis. The inspector reviewed the inventory and swipe tests conducted during the period October through December 2010. No leaking or missing check sources were identified during the last inventory.

4.3 Conclusions

The licensee conducted instrument calibrations and check source leak tests in accordance with license requirements.

5 Effluent Control and Environmental Protection (88045)

5.1 Inspection Scope

The inspector reviewed the licensee's effluent and environmental protection programs to ensure compliance with license and regulatory requirements.

5.2 Observations and Findings

The environmental monitoring program requirements are provided in Section 10 of Appendix A to the license application. The program consisted of gaseous effluent, liquid effluent, groundwater, stream bottom (sediment), and vegetation sampling. License Condition S-6 requires the licensee to provide a copy of the annual report to the NRC summarizing the effluent and environmental monitoring programs. The 2009 annual report was submitted to the NRC on March 10, 2010. During the inspection it was noted that the report for 2010 was in preparation.

No adverse trends were identified by the inspector. The results confirmed that exposures to individual members of the public were less than the 100-millirem annual dose limit as specified in 10 CFR 20.1301(a).

The licensee conducted an analysis of the dose to potential members of the public from gaseous effluents using the COMPLY computer code. The results of the analysis indicated that the effective dose equivalent for calendar year 2009 at the industrial area fenced boundary was 5.2 mrem for the year, while the effective dose at the property line was 0.8 millirems from all emissions. These exposures are below the 10 millirems per year limit stipulated in 10 CFR 20.1101(d).

5.3 Conclusions

The licensee implemented its effluent and environmental monitoring programs in accordance with license and regulatory requirements. All required samples were collected, and no sample result exceeded any license or regulatory limits.

6 Followup on Traditional Enforcement Actions (92702)

6.1 Inspection Scope

The inspector reviewed the licensee's corrective actions implemented in response to the Notice of Violation issued December 16, 2010 (070-00754/10-001). Followup items regarding the corrective actions are discussed in detail in Sections 2 and 3 of this report. The inspector determined that all corrective actions identified to the NRC were completed as described in the licensee's letter dated January 12, 2011. These corrective actions are considered closed.

7 Exit Meeting Summary

The inspector presented the preliminary inspection results to the licensee's representatives at the conclusion of the onsite inspection on February 17, 2011. During the inspection, the licensee did not identify any information reviewed by the inspectors as proprietary.

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

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INSPECTION PROCEDURES USED

IP 88005	Management Organization and Controls
IP 88025	Maintenance and Surveillance Testing of Safety Controls
IP 88030	Radiation Protection
IP 88045	Effluent Control and Environmental Protection
IP 88050	Emergency Preparedness
IP 92702	Followup on Traditional Enforcement Actions

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

070-00754/EA-10-096-01	Failure to follow procedures resulting in an uptake
070-00754/EA-10-096-02	Failure to conduct an effective survey
070-00754/EA-10-096-03	Failure to submit 30 day report in timely manner

Discussed

None

LIST OF ACRONYMS

ALARA	as low as is reasonably achievable
CFR	<i>Code of Federal Regulations</i>
DOE	Department of Energy
HICOM	an analog phone system
mrem	millirem
IP	inspection procedure
NRC	Nuclear Regulatory Commission
PCM	personnel contamination monitor
RMA	radiological material area
RMT	radiation monitor technician
SNM	special nuclear material