



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

February 26, 2013

Docket No. 03003754

License No. 06-00217-06

John F. Conant
ABB Inc.
Director, Nuclear Engineering and Compliance
5 Waterside Crossing
Windsor, CT 06095

SUBJECT: NRC INSPECTION REPORT NO. 03003754/2012001 ABB INC. COMBUSTION
ENGINEERING SITE, WINDSOR, CONNECTICUT

Dear Mr. Conant:

This letter refers to the activities conducted on October 24-27, 2011, and April 30-May 3, 2012, by NRC staff and our contractor, Oak Ridge Associated Universities (ORAU), at the ABB Inc. Combustion Engineering (CE) site in Windsor, Connecticut. The purpose of these visits was to perform confirmatory radiological surveys and collect soil samples for analysis of previously remediated areas designated for unrestricted release upon license termination by the NRC. In addition, the ORAU report contains the analytical results for the 328 soil samples collected by the NRC and the Connecticut Department of Energy and Environmental Protection (CTDEEP) during ABB's remediation activities between June 2010 and December 2011. The results were provided to the NRC by ORAU in a report dated January 28, 2013 (ADAMS Accession No. ML13037A213).

The results of our review were discussed with you and other members of your staff on January 31, 2013, and are described in the enclosed report. No health and safety concerns were identified.

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Nuclear Materials; Med, Ind, & Academic Uses**; then **Regulations, Guidance and Communications**. The current Enforcement Policy is included on the NRC's website at www.nrc.gov; select **About NRC, Organizations & Functions; Office of Enforcement; Enforcement documents**; then **Enforcement Policy (Under 'Related Information')**. You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

The NRC's Safety Culture Policy Statement became effective in June 2011. While a policy statement and not a regulation, it sets forth the agency's *expectations* for individuals and organizations to establish and maintain a positive safety culture. You can access the policy statement and supporting material that may benefit your organization on NRC's safety culture Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/safety-culture.html>. We strongly encourage you to review this material and adapt it to your particular needs in order to develop and maintain a positive safety culture as you engage in NRC-regulated activities.

Please contact John Nicholson at 610-337-5236 if you have any questions regarding this matter.

Sincerely,

Original signed by Marc S. Ferdas

Marc S. Ferdas, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure:
Inspection Report No. 03003754/2012001

cc w/enclosure:
Heath Downey, C.H.P., Radiation Safety Officer
State of Connecticut

J. Conant

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The NRC's Safety Culture Policy Statement became effective in June 2011. While a policy statement and not a regulation, it sets forth the agency's *expectations* for individuals and organizations to establish and maintain a positive safety culture. You can access the policy statement and supporting material that may benefit your organization on NRC's safety culture Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/safety-culture.html>. We strongly encourage you to review this material and adapt it to your particular needs in order to develop and maintain a positive safety culture as you engage in NRC-regulated activities.

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Marc S. Ferdas, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure:
Inspection Report No. 03003754/2012001

cc w/enclosure:
Heath Downey, C.H.P., Radiation Safety Officer
State of Connecticut

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| OFFICE | DNMS/RI | N | DNMS/RI | N | | | | |
| NAME | JNicholson/jn | | MFerdas/mf | | | | | |
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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

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|---|--|
| Inspection No. | 03003754/2012001 |
| Docket No. | 03003754 |
| License No. | 06-00217-06 |
| Licensee: | ABB Inc. (ABB) |
| Address: | 5 Waterside Crossing, Windsor, CT 06095 |
| Locations Inspected: | 2000 Day Hill Road, Windsor, CT 06095 |
| Inspection Dates: | October 24 - 27, 2011 and April 30 - May 3, 2012 |
| Date Follow up Information Received: | January 28, 2013 Oak Ridge Associated Universities Report |
| Inspector: | John Nicholson Health Physicist Decommissioning Branch Division of Nuclear Materials Safety |
| Approved By: | Marc S. Ferdas, Chief Decommissioning Branch Division of Nuclear Materials Safety |

EXECUTIVE SUMMARY

ABB Inc.
NRC Inspection Report No. 03003754/2012001

The Nuclear Regulatory Commission (NRC) contracted with Oak Ridge Associated Universities (ORAU) to perform confirmatory radiological survey activities at the ABB Combustion Engineering (CE) Windsor, Connecticut site in areas that were designated for unrestricted release upon license termination by the NRC. ORAU performed confirmatory radiological surveys and sampling in October 24-27, 2011, and April 30-May 3, 2012, of areas that had been remediated by ABB. ORAU provided their survey results in a report, "Confirmatory Survey Results for the ABB Combustion Engineering Site Windsor, Connecticut" dated January 28, 2013 (ADAMS Accession Number: ML13037A213). These inspections were conducted pursuant to NRC Inspection Manual Chapter (IMC) 2602 and Inspection Procedure (IP) 87104.

In addition, the NRC and Connecticut Department of Energy and Environmental Protection (CTDEEP) personnel collected in-process soil samples during active remediation of the site between June 15, 2010, and December 14, 2011. These samples were collected prior to ABB backfilling and restoring each of the survey units (areas). The samples collected by the NRC were sent to the ORAU Radiological and Environmental Analysis Laboratory for radiological analysis. A total of 328 soil samples were collected and analyzed. The results were provided to the NRC in 19 separate letter reports and are summarized in Table F-2 of ORAU's January 28, 2013 report.

Based on the results of these inspections, no health and safety concerns were identified. ORAU confirmatory survey and sampling activities confirmed that radiological conditions were commensurate with the site release criteria [Derived Concentration Guideline Levels (DCGL)] contained in ABB's decommissioning plan. Surface soil contamination above background levels was not identified within the areas surveyed by ORAU. Four of the 328 soil samples collected by the NRC and CTDEEP during in-process site cleanup activities did not meet ABB's established release criteria. These areas corresponding to these sample locations were subsequently remediated to their established release criteria and/or evaluated by ABB and documented in their final status survey (FSS) report.

REPORT DETAILS

1. Confirmatory Survey & Sampling Activities

a. Inspection Scope

The NRC contracted with ORAU to perform confirmatory radiological survey activities at the ABB CE Windsor, Connecticut site in areas that were designated for unrestricted release upon license termination by the NRC. ORAU performed confirmatory radiological surveys and sampling in October 24-27, 2011, and April 30-May 3, 2012, of areas that had been remediated by ABB. ORAU provided their survey results in a report dated January 28, 2013 (ADAMS Accession Number ML13037A213). These inspections were conducted pursuant to NRC IMC 2602 and IP 87104.

In addition, the NRC and CTDEEP personnel collected in-process soil samples during active remediation of the site between June 15, 2010, and December 14, 2011. These samples were collected prior to ABB backfilling and restoring each of the survey units (areas). The samples collected by the NRC were sent to the ORAU Radiological and Environmental Analysis Laboratory for radiological analysis. A total of 328 soil samples were collected and analyzed. The results were provided to the NRC in 19 separate letter reports and are summarized in Table F-2 of ORAU's January 28, 2013 report.

b. Observations and Findings

The ORAU confirmatory survey activities were conducted in two phases and were observed by an NRC inspector. ORAU's confirmatory survey activities consisted of surface scans, one-minute static gamma count rate measurements, and soil sample collection and analysis. The inspector observed the ORAU personnel prepare equipment to be used during confirmatory activities. The inspector verified that the survey meters used were appropriately calibrated for their intended usage. Soil samples collected during these visits were split between the NRC/ORAU and ABB for analysis. ORAU personnel collected a total of 51 confirmatory soil samples. The inspector also observed the soil sample collection process and how samples were handled and controlled prior to packaging and shipment to the ORAU laboratory. ORAU performed confirmatory survey activities in October 2011 of the Woods Area, the Burning Grounds, the Drum Burial Pit, and the Clamshell Pile. ORAU also performed confirmatory survey activities in April and May 2012 of the Equipment Storage Yard, the Small Pond Buffer Area, the former Building 3 and 6 Complexes, the Industrial Waste Lines, the location of the former Waste Water Treatment Plant, and the former Controlled Storage Yard.

The inspector noted that ORAU's January 28, 2013 report concluded that all confirmatory surveys (gamma scans) taken were within background levels for the areas surveyed. In addition, all 51 confirmatory soil samples taken by ORAU were below the DCGL values contained in ABB's decommissioning plan. The inspector also confirmed that when the unity rule was applied, because more than one radionuclide of concern was present, the sum of the ratios was less than one for all 51 soil samples. The inspector determined that all confirmatory survey units surveyed by ORAU meet the site release criteria.

The Site Brook was not available to ORAU because remediation and environmental restoration were completed prior to ORAU conducting confirmatory activities. The area

had been restored under an environmental permit specification plan and the inspector determined that accessing the Site Brook could impact the environmental restoration that ABB had performed. NRC and CTDEEP personnel were on site throughout the remediation activities and performed surveys and collected 328 soil samples during these remediation activities, including acquiring samples in the Site Brook area.

The inspector noted that four of the 328 soil samples collected by the NRC and CTDEEP during in-process site cleanup activities did not meet ABB's established release criteria. Three of the samples (ABB-11-19-9, ABB-11-24-4, and ABB-11-26-1) exceeded the site specific DCGL for total uranium of 557 picocuries per gram (pCi/gm), and for one of the samples (ABB-11-12-1) when the unity rule was applied the sum of the ratios, was greater than one. The inspector verified that all four of these sample results were evaluated by ABB and were appropriately investigated and remediated in a manner that the as-left areas met established release criteria. Specifically,

- Sample ABB-11-19-9 from survey unit CE-FSS-33-02 in the Site Brook had a measured total uranium concentration of 1,850 pCi/gm. ABB performed an elevated area bounding investigation sampling and an Elevated Measurement Comparison (EMC) evaluation and concluded that the area met the established release criteria. The results were documented in Section 3.2.3 of FSS report submittal number 5, volume I.
- Sample ABB-11-24-4 from survey unit CE-FSS-33-04 in the Site Brook had a measured total uranium concentration of 796 pCi/gm. ABB performed elevated area bounding investigation sampling and an EMC evaluation was performed and concluded that the area met the established release criteria. The results were documented in Section 3.2.5 of ABB's FSS report submittal number 5, volume I.
- Sample ABB-11-26-1 from survey unit CE-FSS-33-05 in the Site Brook had a measured total uranium concentration of 652 pCi/gm. ABB created a small survey unit area CE-FSS-33-09 to capture the result and evaluated the location as a Class 1 area. ABB performed an elevated area bounding investigation sampling, gamma walkover surveys, and soil samples and did not identify any additional areas that exceeded their investigation levels. ABB concluded the area met established release criteria because the original collected soil sample (ABB-11-26-1) captured all of the uranium anomalies for this area and was subsequently remediated by the sample collection process. The results were documented Section 3.2.10 of ABB's FSS report submittal number 5, volume I.
- Sample ABB-11-12-1 from survey unit CE-FSS-39-03 in the Burning Grounds exceeded the unity rule sum of the ratios (value of 1.05), however, no individual radionuclide exceeded the established DCGL values for the applicable radionuclide. ABB performed elevated area bounding investigation sampling and an EMC evaluation and concluded that the area met the established release criteria. The results were documented in Section 3.2.12 of ABB's FSS report submittal number 3, volume I.

c. Conclusions

Based on the results of these inspections, no health and safety concerns were identified. ORAU confirmatory survey and sampling activities confirmed that radiological conditions were commensurate with the site release criteria (DCGL) contained in ABB's decommissioning plan, and surface soil contamination above background levels was not identified within the survey units surveyed by ORAU. Four of the 328 soil samples collected by the NRC and CTDEEP during in-process site cleanup activities did not meet ABB's established release criteria. These areas corresponding to these sample locations were subsequently remediated to their established release criteria and/or evaluated by ABB and documented in their FSS reports.

2. **Exit Meeting**

The results of the inspection were discussed on January 31, 2013 during a telephone conference call with John Conant (Director of Nuclear Engineering and Compliance), Heath Downey (Radiation Safety Officer), and Donell Jackson (Environmental Compliance Project Manager).

ATTACHMENT: SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

| | |
|----------------|--|
| John Conant | ABB Inc., Director, Nuclear Engineering and Compliance |
| Heath Downey | AMEC, Radiation Safety Officer |
| Donell Jackson | ABB Inc., Environmental Compliance Project Manager |

INSPECTION PROCEDURES USED

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| IMC 2602 | Decommissioning Oversight and Inspection Program for Fuel Cycle Facilities and Materials Licensees |
| IP 87104 | Decommissioning Inspection Procedure for Materials Licenses |

ITEMS OPEN, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Decommissioning Plan, Revision 2, CE Windsor Site, Windsor, CT August 2010 [ML102310473]

Final Status Survey Plan, Revision 1, July 2011 [ML12095A015]

Final Status Survey Report Submittal Number 3, December 2011 [ML113460167]

Final Status Survey Report Submittal Number 5, March 2012 [ML12081A057]

ORAU Report Confirmatory Survey Results for the ABB Combustion Engineering Site Windsor, Connecticut January 2013 [ML13037A213]

Oak Ridge Institute for Science and Education (ORISE) Letter Reports for Analytical Results for Soil Samples from ABB Inc., Windsor, Connecticut August 9, 2010 through November 30, 2012 [ML102310232, ML103070155, ML13051A659, ML13051A669, ML110110611, ML110480144, ML111160391, ML112510147, ML112510167, ML112930040, ML112930034, ML112930038, ML120240059, ML113180058, ML113180438, ML113610106, ML13051A693, ML12172A339, ML12346A150]

LIST OF ACRONYMS USED

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|--------|---|
| ABB | ABB, Inc. |
| CE | Combustion Engineering |
| CTDEEP | Connecticut Department of Energy and Environmental Protection |
| DCGL | Derived Concentration Guideline Level |
| EMC | Elevated Measurement Comparison |
| FSS | Final Status Survey |
| NRC | Nuclear Regulatory Commission |
| ORAU | Oak Ridge Associated Universities |
| pCi/gm | picocuries per gram |