



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

November 10, 2005

Docket No. 05000213

License No. DPR-61

Mr. Wayne A. Norton  
President  
Connecticut Yankee Atomic Power Company  
362 Injun Hollow Road  
East Hampton, CT 06424-3099

SUBJECT: INSPECTION 05000213/2005002, CONNECTICUT YANKEE ATOMIC POWER  
COMPANY, EAST HAMPTON, CONNECTICUT SITE

Dear Mr. Norton:

The NRC completed an inspection at your nuclear reactor facility in East Hampton, Connecticut, which covered an inspection period that began on April 1, 2005, and concluded on September 30, 2005. The inspection findings were discussed with you and members of your staff upon the conclusion of our on site inspections on April 14, 2005, June 16, 2005, July 18, 2005, and September 22, 2005 and during a telephone conversation on November 3, 2005. The enclosed report presents the results of that inspection.

During this inspection period, we inspected your decommissioning operations related to organization changes, safety reviews, self-assessments, and decommissioning status. We also inspected your plant support activities related to radiation protection, effluent controls, radioactive waste management, transportation, and routine maintenance and security programs related to the Independent Spent Fuel Storage Installation. The inspection consisted of observations by the inspectors, interviews with personnel, and selective examinations of procedures and representative records. With respect to these inspection areas, we noted that you maintained an effective program for decommissioning the site. In April, the NRC contractor from the Oak Ridge Institute for Science and Education's (ORISE) Environmental Survey and Site Assessment Program (ESSAP) conducted independent in-process radiation and contamination surveys of selected areas of your facility. The enclosed ORISE report presents the results of these surveys.

Based on the results of this inspection, the NRC has determined that two Severity Level IV violations of NRC requirements occurred during this inspection period. The first violation involved the failure to control access to a high radiation area in the Spent Fuel Pool Building in accordance with the requirements of 10 CFR 20.1601(a)(1). This violation is being dispositioned as a Non-Cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy, because the violation was self-identified, entered into your corrective action program, corrected in a timely manner, was not repetitive or willful, and had a low potential for actual exposure of workers. This NCV is described in Section 2.3 of the enclosed inspection report. The second violation involved the failure to meet the requirements of 10 CFR 71.5(a)(1)(i) and 49 CFR 173.410(f) for preparing a shipment of an intermodal container to prevent inadvertent damage during transport. This violation is being dispositioned as an NCV, consistent with Section VI.A of the NRC Enforcement Policy, because you did not have prior

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Connecticut Yankee Atomic Power Company

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opportunity to identify the problem that was identified by the consignee. In addition, you entered the violation into your corrective action program and corrected the issue in a timely manner. We also noted that there was a low potential for actual exposure to the public and workers, and was not repetitive or willful. This NCV is described in Section 2.4 of the enclosed inspection report. No response to the above NCVs is required.

If you contest these violations or the significance of these violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with Section 2.390 of the NRC's "Rules and Practices," Part 2, Title 10, Code of Federal Regulation, a copy of this letter and its enclosures will be placed in the NRC Public Document Room (PDR) and will be accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/pdr.html>. No reply to this letter is required.

Your cooperation with us is appreciated.

Sincerely,

/RA/

Marie Miller, Chief  
Decommissioning Branch  
Division of Nuclear Materials Safety

Enclosures:

1. NRC Inspection Report No. 05000213/2005002
2. Final Report - In-Process Inspection Survey Results for the West End Excavation and Service Building at the Connecticut Yankee Haddam Neck Plant, Haddam, Connecticut (Docket No. 50-213, RFTA No. 03-008) [ADAMS Accession Number ML053040022]

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U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

INSPECTION REPORT

Inspection No. 05000213/2005002

Docket No. 05000213

License No. DPR-61

Licensee: Connecticut Yankee Atomic Power Company (CYAPCO)

Location: 362 Injun Hollow Road  
East Hampton, CT 06424-3099

Inspection Dates: April 1 - September 30, 2005

Inspectors: Suresh Chaudhary, Reactor Engineer  
Decommissioning Branch (DB)  
Division of Nuclear Materials Safety (DNMS), Region I

Laurie Kauffman, Health Physicist  
DB, DNMS, Region I

James Kottan, Senior Health Physicist  
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Theodore Smith, Project Manager  
Reactor Decommissioning Section  
Division of Waste Management and Environmental Protection (DW&EM)  
Office of Nuclear Materials Safety and Safeguards (NMSS)

Duane Schmidt, Health Physicist  
Reactor Decommissioning Section  
DW&EM, NMSS

Bruce Watson, Health Physicist  
Reactor Decommissioning Section  
DW&EM, NMSS

Approved By: Marie Miller, Chief  
DB, DNMS, Region I

## **EXECUTIVE SUMMARY**

Connecticut Yankee Atomic Power Company  
NRC Inspection Report No. 05000213/2005002

This integrated inspection report includes aspects of decommissioning activities regarding dismantlement and decommissioning of the facility. The report covers a six-month period of announced safety inspections conducted by three regional inspectors, three NMSS inspectors, and the NRC contractor from the Oak Ridge Institute for Science and Education's (ORISE) Environmental Survey and Site Assessment Program (ESSAP). The report details reviews and assessments of decommissioning operations related to organization changes, safety reviews, self-assessments, and decommissioning status. The report also covers plant support activities related to radiation protection (RP), effluent controls, radioactive waste management, transportation and routine maintenance and security programs related to the Independent Spent Fuel Storage Installation (ISFSI).

### **Decommissioning Operations**

The licensee's organization was adequate to support ongoing decontamination and decommissioning activities. Management oversight was adequate for the activities conducted.

The licensee maintained an effective safety review program and adequately implemented the requirements of 10 CFR 50.59 for facility changes.

The licensee maintained an adequate audit, self-assessment, and corrective action program to identify, resolve, and prevent recurrence of conditions and issues that degrade safety and the quality of decommissioning activities.

The licensee conducted decommissioning activities in accordance with the approved License Termination Plan (LTP). The change in the location of the Industrial Area access point was appropriate and commensurate with the license requirements after the complete removal of spent fuel from the spent fuel building (SFB) to the ISFSI.

### **Plant Support**

Surveys and sample analysis did not identify any radiological contamination in excess of NRC-approved release criteria. The soil samples, and bedrock and concrete core samples analyzed for hard-to-detect radionuclides, such as tritium and strontium-90, were below the Derived Concentration Guideline Levels listed in the licensee's approved LTP.

The licensee effectively implemented and maintained the Radioactive Effluent Control Program (RECP) and the Radiological Environmental Monitoring Program (REMP) in accordance with the Radiological Environmental Monitoring Offsite Dose Calculation Manual (REMODCM) requirements.

The licensee generally maintained an effective radiation control program to control and limit occupational radiation exposures. In one instance, the licensee failed to ensure that a high radiation area (HRA) in the Spent Fuel Pool Building was controlled in accordance with the

requirements of 10 CFR 20.1601(a)(1). This violation is considered a Non-Cited Severity Level IV violation, consistent with the NRC Enforcement Policy.

In general, the licensee implemented an adequate solid radioactive waste management and transportation program, with one exception. The license failed to prepare a shipment to prevent inadvertent damage to an intermodal container during transport in accordance with the requirements of 10 CFR 71.5 and 49 CFR 173.410(f). This violation is considered a Non-Cited Severity IV violation, consistent with the NRC Enforcement Policy.

The licensee maintained an effective Security Program as it relates to the ISFSI and met safeguards program commitments and regulatory requirements.

The licensee effectively implemented the Preventive Maintenance and Routine Surveillance Programs and adequately maintained proper operation of radiation monitoring and effluent control equipment and ensured the safe storage of spent fuel.

## **REPORT DETAILS**

### **1.0 Decommissioning Operations**

#### **1.1 Organization, Management, and Cost Controls**

##### **a. Inspection Scope (Inspection Procedure (IP) 36801)**

The scope of this inspection area was to review recent decommissioning organization changes to determine the effectiveness of the Connecticut Yankee (CY) management oversight on waste management and overall decommissioning activities. The inspector assessed the effectiveness of management oversight through observations in the field, attendance at staffing meetings, and interviews with management and staff.

##### **b. Observations and Findings**

The licensee adjusted the organizational structure based on overall changes in the status of decommissioning and to increase management oversight of decommissioning and waste activities. Effective May 4, 2005, Site Closure was transferred from the Decommissioning Project group to the Project Support group. Effective September 19, 2005, the Director of Decommissioning was temporarily assigned to Yankee Rowe. A replacement had not been named to fill the position but the responsibilities were assumed by the President, CYAPCO.

Regarding the effectiveness of management oversight, managers conducted site tours and verification checks in the field. A schedule was implemented to ensure coverage, including the evening and weekend shifts. The managers and supervisors were directly involved with the implementation of jobs, ensuring that safety and protective equipment were being utilized by workers conducting demolition and excavation activities.

##### **c. Conclusions**

The licensee's organization was adequate to support ongoing decontamination and decommissioning activities. Management oversight was adequate for the activities conducted.

#### **1.2 Safety Reviews, Design Changes, and Modifications**

##### **a. Inspection Scope (IP 37801)**

The scope of this inspection area was to verify that the licensee's safety review program for design changes and modifications was effective. The inspector ascertained whether facility design change packages (DCP), field change requests (FCR) and modifications were effectively conducted, managed, and controlled during plant decommissioning. An evaluation of the safety program and procedures was performed through review of documentation, discussion with cognizant personnel, site tours, and witnessing work evolutions. DCPs and FCRs were reviewed to assess technical adequacy and validity of design parameters. The following DCPs, FCRs, and diagrams were reviewed regarding

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the Spent Fuel Pool drain-down, the alternate effluent discharge pathway, and the removal of the yard crane foundation.

CY-HP-0168, Rev. 0 & 1; Alternate Water Processing Design Review  
 BCY-HP-0100, Rev. 2; Demineralized Water Storage Tank and Temporary  
 Sampling and Discharge Tank Bounding Calculations  
 GPP-GGGC-00024-002, RCA Waste Water Header  
 GPP-GGGC-00010-001, FCR # 24265-F-0007-1058, F-2005-0008, F-2005-0009  
 Removal of Yard Crane Foundation Under Column R111  
 Engineering Evaluation of Blast Plan for Rock Removal  
 DCR-00-001-05; Declassification/Re-categorization of Systems, Structures, and  
 Components  
 K-1002, Rev 5; Sheet 1 & 2; Waste Water Processing Relocation  
 K-2005-0011, Rev. 2; SFP Drain-down Demineralizer Connection  
 Piping & Instrumentation Diagram (P&ID) 16112-26002, Makeup Water System

b. Observations and Findings

The Alternate Water Processing design document (CY-HP-0168) covered the relocation of the existing waste water processing system from the waste disposal building to the Radwaste Reduction Facility. Document BYC-HP-0100 described the technical rationale and engineering design parameters to assure the safety of the present Demineralized Water Storage Tank (DWST) and any temporary sampling or discharge storage tanks. The licensee assessed the technical and engineering adequacy of the design. Both documents were comprehensive and were supported by calculations and engineering analyses. The licensee's DCPs were comprehensive, and included relevant engineering documentation and subsequent changes to the original design through the use of revisions and FCRs.

To support remediation of the bedrock in Primary Auxiliary Building (PAB) West excavation area, it was necessary to remove a portion of the bedrock under the column R111. The licensee performed a feasibility analysis, engineering analysis and calculations to support the activity. The engineering analysis and evaluation were technically sound and were supported by the engineering calculations.

c. Conclusions

The licensee maintained an effective safety review program and adequately implemented the requirements of 10 CFR 50.59 for facility changes.

**1.3 Self-Assessment Auditing and Corrective Action Program**

a. Inspection Scope (IP 40801)

The scope of this inspection area included an evaluation the licensee's Quality Assurance Program (QAP) and Corrective Action Program (CAP) to identify, resolve,

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and prevent recurrence of conditions and issues that degrade safety and the quality of decommissioning activities. The inspector assessed the qualifications and independence of the audit and surveillance personnel. The inspector also reviewed Quality Assurance (QA) Audit Report CY-05-A04-01, the QA Audit Plan, the Surveillance Plan, and selected procedures, Quality Assurance Surveillance Reports (QSR), and Condition Reports (CR). The following surveillance reports and CRs were reviewed.

QSR-05-001, "Septic Sand Filter Survey Plans #129-02 (Vault A) and 129-03 (Vault B) for Secondary Side Areas/Structure Release for Demolition"  
 QSR-05-021, "Phase II - Final Survey Release Record Review"  
 CR-05-0403, "Un-surveyed Secondary Side Material Removed from Site"  
 CR-05-0534, "Vehicle Accident"  
 CR-05-0608, "High Radiation Area Boundary Posting Deficiency"  
 CR-05-0662, "Breach of Shipping Container During Transit"

b. Observations and Findings

The licensee conducted an independent audit of the Emergency Plan and QAP, and conducted several surveillances of selected programs. The audit results were documented in QA Audit Report, CY-05-A04-01 and the surveillance results were documented in QSRs. The audit and surveillances were detailed and performed by qualified personnel who identified strengths and program weaknesses. CRs were initiated for identified findings and entered into the CAP. The findings were appropriately addressed and corrected. In general, audits and surveillances were performed according to plans and schedules. A review of several CRs indicated that the licensee identified problems and deficiencies, reviewed and classified the issues, and appropriately assigned the CRs for corrective action.

c. Conclusions

The licensee maintained an adequate audit, self-assessment, and corrective action program to identify, resolve, and prevent recurrence of conditions and issues that degrade safety and the quality of decommissioning activities.

## 1.4 Decommissioning Performance and Status Review

a. Inspection Scope (IP 71801)

The scope of this inspection area included site tours and discussions with the licensee to review the status of decommissioning activities and to verify whether the licensee was conducting decommissioning activities in accordance with the LTP.

b. Observations and Findings

In April 2005, the licensee redirected access to and from the Industrial Area (IA) following the complete removal of spent fuel from the spent fuel pool to the ISFSI. No safety concerns were identified regarding these changes.

The licensee demolished most of the buildings and facilities and shipped them to a waste processing facility in Tennessee. The licensee excavated the former PAB area down to bedrock and conducted characterization surveys and remediated suspect areas. The excavation site was divided into three major sections: the PAB-West (Waste Disposal Facility, Health Physics Facility, and PAB, except Residual Heat Removal (RHR) pit); the PAB-Center (PAB and RHR pit, Primary Vent Stack, and the contaminated pipe trench); and the PAB-East (tank farm and spent resin facility). The licensee completed a Radiological Assessment (RA) of the entire PAB-West and the PAB-Center RHR pit area. In April 2005, the licensee backfilled most of the PAB-West excavation area using clean fill and grouted the RHR pipe. The NRC staff noted that the Derived Concentration Guideline Level (DCGLs) had not yet been approved by the NRC. The DCGLs for large pipes were still under review as a revision to the LTP.

As of September 2005, the licensee backfilled the PAB-Center and a portion of PAB-East. The licensee determined that portions of the remaining PAB-East required blasting and remediation activities. The inspector observed the blasting activities and noted the licensee implemented appropriate safety practices.

c. Conclusions

The licensee conducted decommissioning activities in accordance with the approved LTP requirements. The change in the location of the IA access point was appropriate and commensurate with the license requirements after the complete removal of spent fuel from the SFB to the ISFSI.

## **2.0 Plant Support**

### **2.1 NRC In-Process Surveys**

a. Inspection Scope (IP 83801)

The NMSS staff, Regional inspector, and the NRC's contractor, ORISE, reviewed survey data and performed independent radiological surveys of the PAB-West excavation area (Survey Unit 9801). ORISE personnel performed gamma surface scans over 90% of accessible areas of the bedrock and soil. Beta surface scans were performed on 50% of containment lower walls (up to two meters) and on 50% of bedrock. ORISE performed direct measurements and tritium smears along the containment wall surface and collected five soil samples for gamma spectrometry analysis. Nine additional archived soil and bedrock samples provided by CY were analyzed by ORISE. ORISE also conducted a cursory survey of the Service Building that included alpha plus beta

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and gamma surface scans on 15% of the floor and 25% of the lower walls. The results of the analyses were compared to the licensee's DCGLs in the approved LTP.

b. Observations and Findings

ORISE identified two areas of elevated activity on the concrete wall surface and four areas of elevated activity on bedrock surfaces in the PAB West excavation area. For the concrete wall surfaces, the total beta activity measurements ranged from -327 to 1,710 disintegrations per minute per 100 square centimeters (dpm/100 cm<sup>2</sup>) and the removable tritium results ranged from -2.4 to 19.2 dpm/100cm<sup>2</sup>. The licensee collected one concrete core from an area with the highest activity and determined that the core contained 3.39 picoCuries per gram (pCi/g) of strontium-90 (Sr-90). For the bedrock surfaces, ORISE performed direct measurements on the three highest elevated areas. The total beta activity measurements ranged from 1,710 to 10,080 dpm/100 cm<sup>2</sup>. The beta activity in the bedrock was due to naturally occurring potassium-40 (K-40). ORISE also identified elevated gamma activity at several bedrock surface locations. The licensee used in-situ gamma spectrometer results to determine that these elevated areas were the result of naturally-occurring radioactive material in the bedrock. ORISE analyzed the five soil samples they collected and the nine additional archived soil samples provided by CY. The radioactive material in the ORISE samples, the archived soil samples, and the Service Building were below the DCGLs.

Specific details of the ORISE evaluation are contained in the ORISE Report, "Final Report - In-Process Inspection Survey Results for the West End Excavation and Service Building at the Connecticut Yankee Haddam Neck Plant, Haddam, Connecticut (Docket No. 50-213, RFTA No. 03-008)". [ADAMS Accession Number ML053040022]

c. Conclusions

Surveys and sample analysis did not identify any radiological contamination in excess of NRC-approved release criteria. The soil samples, and bedrock and concrete core samples analyzed for hard-to-detect radionuclides, such as tritium and Sr-90, were below the DCGLs listed in the licensee's approved LTP.

## 2.2 **Radioactive Effluent Control Program and Radiological Environmental Monitoring Program**

a. Inspection Scope (IP 84750)

The scope of this inspection area included an evaluation of the RECP and the REMP. The evaluation also included a review of the Annual Radioactive Effluent Release Report for 2004, the Annual Environmental Monitoring Operating Report for 2004, the analytical data for January through August 2005, and site tours. The programs were inspected against the REMODCM and QAP.

b. Observations and Findings

Effective March 30, 2005, the licensee transferred the effluent control and environmental monitoring program requirements from the Technical Specifications (TS) to the QAP, and implemented the REMODCM, Revision 18, according to the approved TS Change Request, Changes Related to the Unloaded Spent Fuel Pool, dated August 11, 2004. The licensee completed the radioactive liquid effluent release permits and set the release set-points according to the Offsite Dose Calculation Manual (ODCM) and procedures. The calibration results for the liquid effluent radiation monitor (RM-22) were within the acceptance criteria. The inspector also reviewed the REMP and verified that the licensee collected and analyzed the samples within the required frequencies and that the analytical results met the lower limits of detection. The inspector noted that the above change request allowed the licensee to discontinue sampling air particulates, fruits, vegetables, broad leafy vegetation, and allowed the Land Use Census to be conducted on an as needed basis. The procedures were detailed and the staff were knowledgeable regarding the REMODCM requirements.

c. Conclusions

The licensee effectively implemented and maintained the RECP and the REMP in accordance with the REMODCM requirements.

## **2.3 Radiation Protection**

a. Inspection Scope (IP 83750)

The scope of this inspection area included observations of radiation worker practices and radiological postings and boundaries. The inspector observed chemistry technicians perform analyses on lapel air samplers and RP technicians conduct calibrations for the lapel air samplers and portable contamination monitors (PCMs). The inspector reviewed the calibration and source check results for PCMs, survey instrumentation, portable air monitors, the Bicron ASM-6000 vehicle monitor (truck monitor), and the alpha-CAM.

b. Observations and Findings

Chemistry and RP technicians were knowledgeable, experienced, and familiar with the procedures to effectively complete assigned tasks. The calibration and source check results were within the acceptance criteria. Radiation workers in the SFB and containment were wearing the appropriate protective clothing and lapel air samplers, per Radiation Work Permit (RWP) requirements. Radiation workers conducted frisks appropriate to the work conducted, and then proceeded to the RP control point for a final check, as required. The inspector noted that the new filter system, recently installed in the SFB to clean the spent fuel pool water, was appropriately posted. Postings and barriers were generally appropriate, with one exception.

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On August 8, 2005, the licensee's RP staff identified an incorrectly posted HRA during the night shift's routine RP surveys in SFB. The licensee initiated a CR (CR-05-608), entered the issue into the CAP, and conducted an investigation. The licensee determined that at the direction of a RP Supervisor, a sock filter was placed in a temporary storage location earlier the same day while waiting to transfer the filter into a High Integrity Container (HIC). The sock filter was temporarily stored under lead blankets, surveyed, and posted as a HRA. The licensee determined that the filter was slightly protruding between two lead blankets, and as a result, was partially outside the plane of the HRA boundary. The dose rate from the filter was 120 mR/hr at 30 cm, which exceeded the HRA boundary limit of 100 mR/hr at 30 cm. The filter was immediately relocated to a Locked HRA (LHRA) by a night shift RP supervisor. All personnel working in the area were wearing self reading electronic dosimeters, thermoluminescent dosimetry, and PCs, and were signed on the appropriate RWP. A review of the dosimetry records did not indicate any abnormal exposures for this time period. The licensee developed standing orders to require a second verification when posting any HRAs or LHRAs.

10 CFR 20.1601(a)(1), requires, in part, that the licensee shall ensure that each access point HRA has a control device that causes the level of radiation to be reduced below the level at which an individual might receive a deep-dose equivalent of 0.1 rem in one hour at 30 cm from the radiation source or from any surface that the radiation penetrates. Contrary to this, on August 8, 2005, a sock filter was identified by the licensee, reading 120 mR/hr at approximately 30 cm in violation of 10 CFR 20.1601(a)(1). However, because the condition was self-identified, within an inaccessible area resulting in a low potential for worker overexposure, and because of the timeliness and effectiveness of licensee corrective actions, the violation is being considered a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy (**NCV 05000213/2005-002/01**).

c. Conclusions

The licensee generally maintained an effective radiation control program to control and limit occupational radiation exposures.

## 2.4 **Radioactive Waste Management and Transportation Programs**

a. Inspection Scope (IP 86750)

The scope of this inspection area included an evaluation of the Solid Radioactive Waste Management and Transportation programs to determine whether the licensee properly processed, packaged, stored, and shipped radioactive materials. The inspector reviewed selected Low Specific Activity (LSA) and Surface Contaminated Object (SCO) radioactive waste shipments from June through September 2005, including dry active waste (DAW) and low-level radioactive demolition debris. The inspector observed the licensee transfer a spent fuel rack from the spent fuel pool to a shipping container and prepare a Type A cask containing the remaining reactor piping and neutron shield for

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shipment to Duratek. The inspector evaluated the event regarding a vehicle accident involving a flatbed truck carrying United States Department of Transportation (USDOT) exempt low-level radioactive material to a landfill in Tennessee. The inspector also evaluated an event regarding an intermodal container that had been damaged while en-route to a bulk radioactive waste facility in Utah.

b. Observations and Findings

The selected radioactive waste shipment records included completed copies of a Characterization Report, Waste Manifest Shipping papers, Emergency Response Information, Survey Record Forms, USDOT Classification Summary, and other documentation, such as shipment inspection plans and truck inspection records. The licensee met the transportation requirements for shipments reviewed. The licensee used the appropriate Work Plan and Inspection Records (WP&IR) to transfer a spent fuel rack from the spent fuel pool to a shipping container and to prepare a Type A shipping cask for shipment to Duratek. Hold-points and step sign-off points were implemented, as required. The inspector noted that the Type A shipping cask was properly prepared according to transportation regulations. No findings of safety significance were identified.

On July 7, 2005, a flatbed tractor trailer truck, delivering an intermodal container containing USDOT exempt low-level radioactive demolition debris to a landfill in Tennessee, tipped over and spilled a portion of the debris onto highway pavement. CY initiated a CR (CR-05-0534), dispatched personnel knowledgeable in transportation regulations to the accident scene to conduct an investigation and perform surveys. The surveys indicated that the radioactivity level in the debris was less than detectable. The licensee reported the event to NRC per 10 CFR 50.72(b)(2)(xi). The licensee's response and follow-up actions were timely and appropriate. No violations of NRC or USDOT regulations were identified regarding this matter.

On May 2, 2005, the licensee initiated CR-05-0403, regarding a re-circulation tank that had been sent to the Bozrah, Connecticut clean waste landfill without a direct radiological survey. The licensee contacted the NRC inspector, conducted a cause determination analysis and a technical evaluation, and documented the results. The licensee demonstrated that the re-circulation tank was part of the auxiliary septic system and was analyzed in 1998, 2004, and 2005. The licensee showed that the activity levels on the effluent tank downstream of the re-circulation tank were less than detectable. The licensee concluded that the tank met unrestricted release requirements. No violations of NRC or USDOT regulations were identified regarding this matter.

On September 14, 2005, the licensee was notified by Envirocare of Utah, Inc. (Envirocare), that an intermodal container shipped from CY was received and inspected at the bulk waste facility, and found damaged. CY promptly initiated a CR (CR-05-0662), dispatched personnel knowledgeable in transportation regulations to the facility, contacted the NRC inspector, and conducted an investigation. The licensee shipped a SFB air-cooled heat exchanger by truck and then by rail in an intermodal shipping container (BKRU 025679). The heat exchanger contained internal contamination and

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was classified as SCO-II. The approximately 9000 pound heat exchanger was loaded against the door of intermodal. Boxes, pipes, wood, and metal debris were loaded to fill the remaining volume of the container. Based on this configuration, the licensee had determined that the heat exchanger was not required to be shored or braced to prevent the contents from shifting during normal conditions of transport. The as found condition of the intermodal consisted of an outward bowing of the door, with two puncture holes through the door, where a portion of the heat exchanger impacted the door. Gaps were noted along the sides and bottom of the door, where flaps and connections separated. Broken securing devices on the opposite side of the intermodal were also noted. A pipe was protruding from the lower gap, and wood and a small amount of fine rock-like debris was laying on the railcar coupling mechanism.

10 CFR 71.5(a)(1)(i) requires, in part, that licensees shall comply with the applicable requirements of the DOT regulations in 49 CFR Parts 171 through 180 appropriate to the mode of transport. 49 CFR 173.410(f) requires that packages used for shipment of Class 7 (radioactive) materials must be designed so that the package will be capable of withstanding the effects of any acceleration, vibration or vibration resonance that may arise under normal conditions of transport without any deterioration in the effectiveness of the closing devices on the various receptacles or in the integrity or the package as a whole and without loosening or unintentionally releasing the nuts, bolts, or other securing devices even after repeated use. Contrary to this, on September 14, 2005, an intermodal container was identified by the licensee's consignee as extensively damaged with a portion of the package contents protruding through the lower door seam. The package was not capable of withstanding the effects of acceleration or vibration that arose under normal conditions of transport. The licensee determined that the root cause of the event was due to excessive coupling speeds and contributing factors were due to not shoring or bracing the package to prevent shifting during transport. The inspector noted that the licensee did not have prior opportunity to identify the problem and therefore did not fail to take action that would have prevented the event. Because the contents of the intermodal contained only trace amounts of loose contaminated material and the potential exposure to the public and radiation workers was low, and because of the timeliness and effectiveness of licensee corrective actions, the violation is being considered a Non-Cited Violation consistent with Section VI.A of the NRC Enforcement Policy. **(NCV 05000213/2005-002/02)**

c. Conclusions

In general, the licensee implemented an adequate solid radioactive waste management and transportation program, with one exception. The license failed to prepare a shipment to prevent inadvertent damage to an intermodal container during transport in accordance with the requirements of 10 CFR 71.5 and 49 CFR 173.410(f). This violation is considered a Non-Cited Severity IV violation, consistent with the NRC Enforcement Policy.

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## **2.5 Security Program and Operation of Independent Spent Fuel Storage Installation**

### **a. Inspection Scope (IPs 81001 and 60855)**

The inspector reviewed the ISFSI Security Program to determine whether the licensee met safeguards program commitments and regulatory requirements. The inspector reviewed the licensee's security plan and implementing procedures, including safeguards and normal operating procedures.

### **b. Observations and Findings**

Selected procedures described the roles and responsibilities for maintaining the security program at the ISFSI. Staff were knowledgeable and professional regarding the duties, and demonstrated the appropriate level of communication to maintain security. Records and reports were prepared, reviewed, and retained according to the implementing procedures and regulations. No safety concerns were identified.

### **c. Conclusions**

The licensee maintained an effective Security Program as it relates to the ISFSI and met safeguards program commitments and regulatory requirements.

## **2.6 Maintenance and Surveillance Program**

### **a. Inspection Scope (IP 62801)**

The scope of this inspection area consisted of an evaluation of the licensee's Preventive Maintenance (PM) and Routine Surveillance Programs to verify the operation of radiation monitoring and effluent control equipment and to ensure the safe storage of spent fuel. The inspector reviewed the ISFSI Operations PM and routine surveillance procedures and associated logs for July and August 2005.

### **b. Observations and Findings**

The licensee's procedures clearly described the roles and responsibilities of the maintenance staff for maintaining the effluent and radiation monitoring equipment and the equipment at the ISFSI. Preventive maintenance and routine surveillances were performed within frequencies specified in the procedures and results were within the acceptance criteria. Responsible staff were knowledgeable and maintained equipment according to the procedures.

### **c. Conclusions**

The licensee effectively implemented the PM and Routine Surveillance Programs and adequately maintained proper operation of radiation monitoring and effluent control equipment and ensured the safe storage of spent fuel.

Enclosure



### **3.0 Exit Meeting**

The inspectors presented the inspection results to representatives of the licensee's staff at the conclusion of onsite inspections on April 14, 2005, June 16, 2005, July 18, 2005, and September 22, 2005. On November 3, 2005, a summary of the inspection findings for the entire inspection period was presented to the licensee. Licensee representatives acknowledged the inspection findings. Although proprietary items were reviewed during the inspection, no proprietary information is presented in this report.

Enclosure

## **PARTIAL LIST OF PERSONS CONTACTED**

### Licensee

- \* J. Arnold, Staff Assistant, Regulatory Affairs
  - A. Barry, Nuclear Safety Engineer, Quality Assurance, Nuclear Safety and Regulatory Affairs
  - S. Berger, Technical Support, Duratek
- \* J. Bourassa, Director, Nuclear Safety and Regulatory Affairs
- \* P. Clark, Regulatory Affairs Engineer, Regulatory Affairs
- \* E. Darois, Site Closure, Technical Support
  - J. Fan, Manager, Project Support, Project Support and Engineering
- \* H. Farr, Manager, Radiation Protection, Nuclear Safety and Regulatory Affairs
  - R. Haight, Waste Management Coordinator, Waste Management, Decommissioning
- \* R. Joshi, Regulatory Affairs Engineer, Regulatory Affairs
- \* J. Marchi, Manager, Quality Assurance, Nuclear Safety and Regulatory Affairs
- \* M. Marston, Director, Project Support and Engineering
- \* J. McCarthy, Engineer, Site Closure, Project Support and Engineering
- \* R. McGrath, Site Closure, Technical Support Manager
  - R. Mitchell, Manager, Operations/Maintenance/ISFSI
  - W. Norton, President, CYAPCO
  - T. Peacock, Manager, Site Closure, Project Support and Engineering
  - R. Porter, Waste Management Supervisor, Waste Management, Decommissioning
  - R. Yetter, FSS Project Lead, Site Closure, Project Support and Engineering
  - C. Young, Waste Management Engineer, Waste Management, Decommissioning
- \* J. Wagner, FSS Project Engineer, Site Closure, Project Support and Engineering

### State of Connecticut

M. Firsick, Connecticut, DEP

\* These individuals participated in the exit briefing held on November 3, 2005.

## **INSPECTION PROCEDURES USED**

36801	Organization, Management, and Cost Controls
37801	Safety Reviews, Design Changes, and Modifications
40801	Self-Assessment Auditing and Corrective Action Program
71801	Decommissioning Performance and Status Review
81001	Physical Security Program
62801	Maintenance and Surveillance Program
83801	Inspection of Final Status Surveys
83750	Occupational Radiation Exposure
84750	Radioactive Waste Treatment, Effluent and Environmental Monitoring
86750	Solid Radioactive Waste Management and Transportation
60855	Operation of Independent Spent Fuel Storage Installation

## ITEMS OPEN, CLOSED, AND DISCUSSED

### Items Opened:

05000213/2005-002/01	NCV	Failure to control access to a high radiation area in accordance with 10 CFR 20.1601(a)(1).
05000213/2005-002/01	NCV	Failure to follow transportation regulations 10 CFR 71.5(a) and 49 CFR 173.410(f).

### Items Closed:

05000213/2005-002/01	NCV	Failure to control access to a high radiation area in accordance with 10 CFR 20.1601(a)(1).
05000213/2005-002/01	NCV	Failure to follow transportation regulations 10 CFR 71.5(a) and 49 CFR 173.410(f).

### Items Discussed:

None

## LIST OF ACRONYMS USED

CAP	Corrective Action Program
CR	Condition Reports
CY	Connecticut Yankee
CYAPCO	Connecticut Yankee Atomic Power Company
DAW	Dry Active Waste
DCGL	Derived Concentration Guideline Levels
DCP	Design Change Package
DWST	Demineralized Water Storage Tank
ESSAP	Environmental Survey and Site Assessment Program
FCR	Field Change Requests
GEL	General Engineering Laboratories
HIC	High Integrity Container
HPF	Health Physics Facility
HRA	High Radiation Area
IA	Industrial Area
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
ISOCs	In-Situ Object Counting System
LHRA	Locked High Radiation Area
LSA	Low Specific Activity
LTP	License Termination Plan
NMSS	Office of Nuclear Materials Safety and Safeguards
ODCM	Offsite Dose Calculation Manual
ORISE	Oak Ridge Institute for Science and Education
P&ID	Piping and Instrumentation Diagram
PAB	Primary Auxiliary Building
pCi/g	Pico Curies per Gram
PCM	Portable Contamination Monitors
PM	Preventive Maintenance
QAP	Quality Assurance Program
QA	Quality Assurance
QSR	Quality Assurance Surveillance Reports
RA	Radiological Assessment
RECP	Radioactive Effluent Control Program
REMP	Radiological Environmental Monitoring Program
REMODCM	Radiological Environmental Monitoring Offsite Dose Calculation Manual
RHR	Residual Heat Removal
RP	Radiation Protection
RRF	Radwaste Reduction Facility
RWP	Radiation Work Permit
SCO	Surface Contaminated Object
SFB	Spent Fuel Building
Sr-90	Strontium-90
TB	Turbine Building
TLD	Thermoluminescent Dosimeters
TSD	Technical Support Document

TS	Technical Specifications
USDOT	United States Department of Transportation
WDF	Waste Disposal Facility
WP&IR	Work Plan and Inspection Records