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

February 7, 2006

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 05000213/2005003, CONNECTICUT YANKEE ATOMIC POWER COMPANY, EAST HAMPTON, CONNECTICUT

Dear Mr. Norton:

On January 26, 2006, the NRC completed an integrated inspection at the Haddam Neck Plant, which began on October 1, 2005. The inspection findings were discussed with you and members of your staff upon the conclusion of our onsite inspections on September 22, 2005 and November 10, 2005, and with Mr. Bourassa and your staff during a telephone conversation on February 2, 2006. The enclosed report presents the results of this inspection.

During this inspection period, we inspected your decommissioning operations related to organization changes, self-assessments, decommissioning status, and radioactive effluent controls. We evaluated your decommissioning and remediation activities related to the former Primary Auxiliary Building (PAB) site and to an excavation site adjacent to the Spent Fuel Building (SFB). Regarding the former PAB site and the excavation site adjacent to the SFB, NRC-selected samples of soil, bedrock, and concrete were analyzed by the NRCs' contract radioanalytical laboratory, Oak Ridge Institute for Science and Education (ORISE) Environmental Survey and Site Assessment Program (ESSAP). The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, observations by the inspectors, and independent direct radiation measurements made by the inspectors.

Within the scope of this inspection, no violations were identified. We determined that you maintained an effective program for decommissioning the site. The enclosed ORISE reports present the results of the above mentioned samples from the PAB site and the excavation site adjacent to the SFB.

In accordance with Section 2.390 of the NRC's "Rules and Practices,' Part 2, Title 10, Code of Federal Regulations, 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/adams.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. 05000213/2005003
2. Report for Analysis of Soil and Miscellaneous Samples from the Connecticut Yankee Haddam Neck Plant, Haddam, Connecticut (Docket No. 50-213, RFTA No. 03-008) [ADAMS Accession Number ML060320124]
3. Revised Report for Analysis of Samples from the Connecticut Yankee Haddam Neck Plant, Haddam, Connecticut [Inspection Report No. DPR-61/2005003] [RFTA NO. 06-001] [ADAMS Accession Number ML060310028]

cc:
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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No.	05000213/2005003
Docket No.	05000213
License No.	DPR-61
Licensee:	Connecticut Yankee Atomic Power Company
Location:	362 Injun Hollow Road East Hampton, CT 06424-3099
Inspection Dates:	October 1, 2005 - January 26, 2006
Inspectors:	Laurie A. Kauffman, Health Physicist Decommissioning Branch (DB) Division of Nuclear Materials Safety (DNMS), Region I (RI) James Kottan, Senior Health Physicist DB, DNMS, RI
Approved By:	Marie Miller, Chief DB, DNMS, RI

Enclosure

EXECUTIVE SUMMARY

Connecticut Yankee Atomic Power Company (CYAPCO)
NRC Inspection Report No. 05000213/2005003

This integrated inspection report includes aspects of decommissioning activities regarding dismantlement and decommissioning of the facility. The report covers a four-month period of announced safety inspections conducted by two regional inspectors and contractor assistance provided by the Oak Ridge Institute for Science and Education (ORISE) Environmental Survey and Site Assessment Program (ESSAP). The report covers reviews and assessments of decommissioning operations related to organization changes, self-assessments, decommissioning status, and radioactive effluent controls. The report also covers an evaluation of decommissioning and remediation activities related to the former Primary Auxiliary Building (PAB) site and to an excavation site adjacent to the Spent Fuel Building (SFB).

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 adequate audit, self-assessment, and corrective action program (CAP) 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) requirements. Regarding the former PAB site, surveys and sample analysis did not identify any radiological contamination in excess of NRC-approved release criteria. The soil samples, bedrock, and concrete core samples analyzed for hard-to-detect radionuclides, such as tritium and Sr-90, were below the Derived Concentration Guideline Limits (DCGL) listed in the licensee's approved LTP. The analytical results of samples from the excavated area adjacent to the SFB indicated that the licensee's characterization of the radioactive contamination in the samples related to the SFB excavation was in agreement with the NRC's characterization. Based on the results, there was no significant contribution to onsite and offsite doses.

Plant Support

The licensee effectively controlled effluent releases from the SFB, in accordance with the Radiological Environmental Monitoring Offsite Dose Calculation Manual (REMODCM) and Quality Assurance Program (QAP) requirements.

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 evaluate 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

No significant findings were identified.

Effective September 19, 2005, the Director of Decommissioning was temporarily assigned to Yankee Rowe. The position remains vacant, but the responsibilities were assumed by the President, CYAPCO. Managers continued to conduct site tours and verification checks in the field, and managers and supervisors were directly involved with the implementation of jobs, to ensure safe worker practices 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.

1.3 Self-Assessment Auditing and Corrective Action Program

a. Inspection Scope (IP 40801)

The scope of this inspection area included an evaluation of the QAP and CAP and the licensee's ability to identify, resolve, and prevent recurrence of conditions and issues that degrade safety and the quality of decommissioning activities.

b. Observations and Findings

No significant findings were identified.

The audit and surveillance reports performed by the licensee were thorough and sufficiently detailed to identify areas of declining performance or programmatic weaknesses in decommissioning program areas. A review of selected condition reports

(CR) indicted that the licensee had in place a program for reporting safety issues, appropriately classifying the issues, and providing appropriate management review to resolve this issues.

c. Conclusions

The licensee maintained an adequate audit, self-assessment, and CAP 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 evaluate the status of decommissioning activities and to verify whether the licensee was conducting decommissioning activities in accordance with the LTP.

Specifically, the inspector observed decommissioning and remediation activities related to the former PAB site and to an excavation site adjacent to the SFB. The inspectors reviewed the analysis results, conducted independent surveys, conducted a visual inspection of the exterior SFB concrete wall below grade, and selected samples to be independently analyzed by the NRC's contractor, ORISE.

b. Observations and Findings

No significant findings were identified.

The licensee demolished most of the buildings and facilities, and excavated the former PAB down to bedrock and conducted characterization surveys and remediated contaminated areas. As of April 2005, the licensee had completed Radiological Assessments (RA) and backfilled most of the excavated areas. Between May and October 2005, the licensee completed RA's in the PAB-Center, which included the residual heat removal (RHR) pit, and had determined that portions of the remaining PAB-East required blasting and additional remediation activities. In August 2005, the inspector had selected bedrock from the PAB-Northeast excavation area, concrete cores from the cable vault and containment areas, and soil from the PAB-Center excavation for independent analysis by ORISE. The NMSS staff and the Regional inspectors discussed these results with the licensee prior to backfilling the areas.

Specific details of the ORISE analysis are contained in the ORISE Report, "Report for Analysis of Soil and Miscellaneous Samples from the Connecticut Yankee Haddam Neck Plant, Haddam, Connecticut (Docket No. 50-213, RFTA No. 03-008)", which is enclosed. [ADAMS Accession Number ML060320124]

During characterization of onsite areas using a geo-probe (a device used to collect deep core samples in the ground), the licensee had identified an area adjacent to the SFB

with slightly elevated levels of radioactivity compared to other areas of the site. As part of the decommissioning process, the licensee excavated the suspect area, and sampled and analyzed the soil, bedrock, and the below grade concrete wall of the SFB. The licensee suspected that the source of the radioactivity could have been either a possible leak from the spent fuel pool or a spill, which may have occurred during plant operations. While excavating the area, the licensee had noted a white substance on the exterior of the SFB wall below grade. The licensee conservatively assumed the substance was boron (an indication of a possible leak from the spent fuel pool) and prior to analyzing the substance, notified the State of Connecticut, as required, that a leak may have occurred during plant operations. The licensee also notified the Regional inspectors.

The licensee had collected and analyzed all of the white substance from the SFB wall and determined that the substance was not boron. The licensee was unable to determine the exact chemical composition of the material but, was able to determine that the substance was a mineral or a salt-like crystalline material that is naturally extracted from bedrock via ground water flows. Over time, the mineral was likely deposited onto the exterior concrete wall due to ground water flow toward the wall.

On November 7, 2005, the inspectors conducted a visual inspection of the exterior SFB concrete wall. No evidence of significant segmentation of the concrete wall was identified. No evidence of an active leak was identified. No evidence of a previous or a recent leak through the concrete was identified. No evidence of additional mineral or salt-like material was identified.

The inspectors surveyed the excavated area and the exterior SFB wall. Contact dose rate surveys of the SFB wall were made with attention to the core holes and any visible cracks. The contact dose rates were in the range of 20-30 microR/hr, with one exception. The dose rate for one concrete hole (related to core sample number 9801-0000-009-1C-RAEXV-01) was 75 microR/hr. The dose rates obtained by the inspectors were in good agreement with the licensee's dose rates.

The inspectors split two soil samples (9801-0000-028-RAE-XV and 9801-0000-029-RAE-XV), two concrete core samples (9801-0000-009-1C-RAEXV and 9801-0000-018-1C-RAEXV), and three crushed bedrock samples (9801-0000-025-RA-EXV, 9801-0000-026-RA-EXV, and 9801-0000-027-RA-EXV) with the licensee. The samples were independently analyzed by the NRC's contractor, ORISE.

The results of the split samples indicated that the soil samples contained very low levels of detectable cesium-137 (Cs-137) and no detectable strontium-90 (Sr-90) or tritium (H-3); the bedrock samples contained very low levels of either Cs-137 or Sr-90 and no H-3; and the concrete samples all contained low levels H-3, Sr-90, and Cs-137. A comparison of the licensee's results to the NRC's results are presented in the table and figure below. A plot of the ratios indicated that the licensee's characterization of the radioactive contamination in the samples related to the SFB excavation was generally in agreement with the NRC's characterization. For these split samples, a ratio of between

0.1 and 10 is considered acceptable for intercomparison for the purpose of characterization of the material sampled. This criteria is judgmental in nature based on the fact that the samples which were split: soil, bedrock, and concrete were not homogeneous samples, and, in addition, were not used to demonstrate compliance with NRC regulatory requirements. Both the NRC and the licensee arrived at the same conclusion regarding characterization of the sampled material from their independent sample analyses.

Specific details of the ORISE analysis are contained in the ORISE Report, "Revised Report for Analysis of Samples from the Connecticut Yankee Haddam Neck Plant, Haddam, Connecticut [Inspection Report No. DPR-61/2005003] [RFTA NO. 06-001]", which is enclosed. [ADAMS Accession Number ML060310028]

Table 1

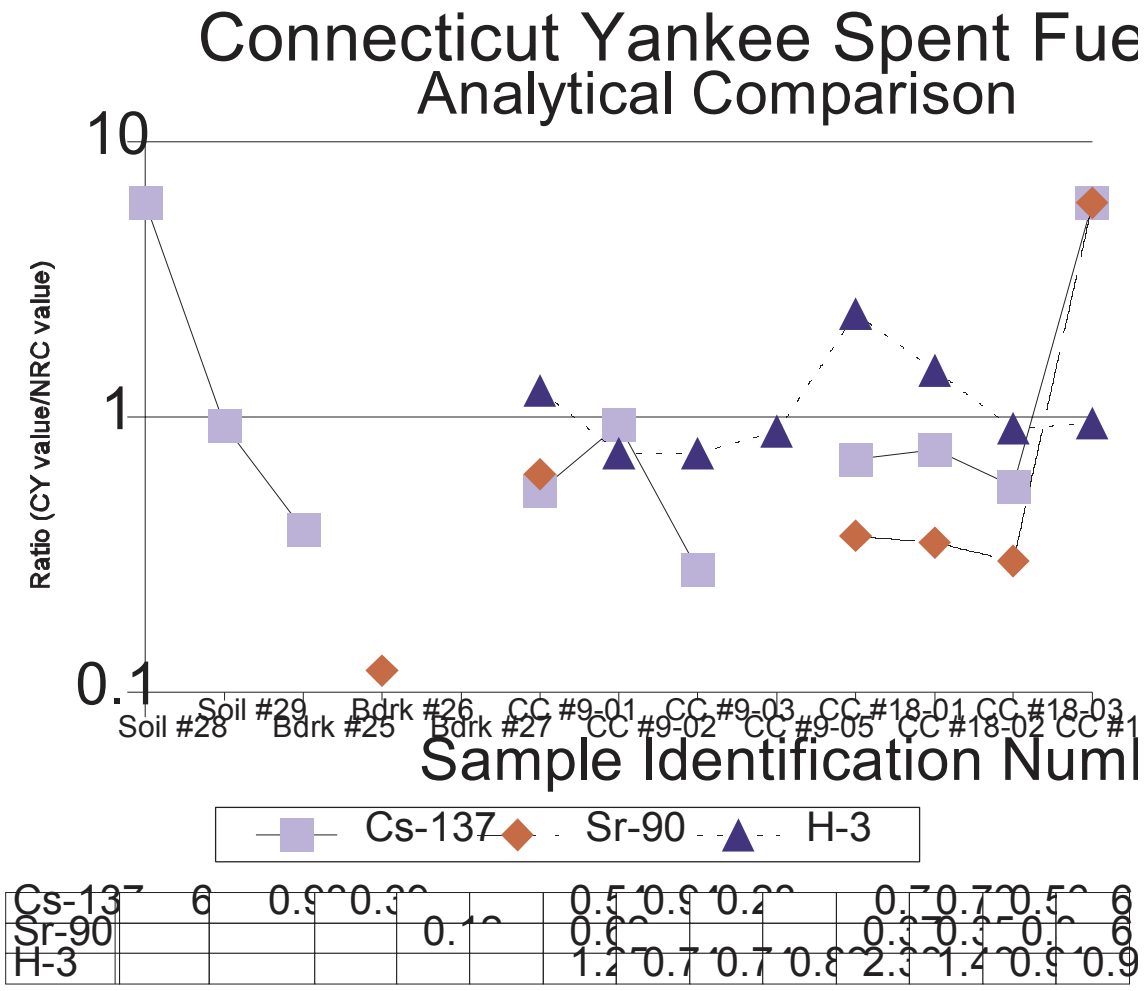
Connecticut Yankee/NRC Analytical Comparison Results from the SFB Excavation Site

Sample Identification	Isotope	NRC Value[a] (pCi/g)	Licensee Value[a] (pCi/g)	Ratio (Licensee/NRC)
Soil 9801-0000-028-RAE-XV	Cs-137	0.16 ± 0.04	8.99 ± 1.89	6
	Sr-90	0.02 ± 0.12	Not Reported	--
	H-3	0.3 ± 1.8	Not Reported	--
Soil 9801-0000-029-RAE-XV	Cs-137	0.44 ± 0.04	0.41 ± 0.11	0.93
	Sr-90	-0.04 ± 0.12	Not Reported	--
	H-3	0.26 ± 0.85	Not Reported	--
Bedrock 9801-0000-025-RA-EXV	Cs-137	0.33 ± 0.03	0.128 ± 0.028	0.39
	Sr-90	-0.01 ± 0.11	0.0078 ± 0.0079	--
	H-3	2.2 ± 1.8	-0.272 ± 0.896	--
Bedrock 9801-0000-026-RA-EXV	Cs-137	0.02 ± 0.02	0.038 ± 0.030	--
	Sr-90	0.23 ± 0.12	0.0274 ± 0.0107	0.12
	H-3	0.2 ± 1.7	0.26 ± 1.07	--
Bedrock 9801-0000-027-RA-EXV	Sr-90	-0.06 ± 0.09	0.0051 ± 0.0122	--
	H-3	2.9 ± 1.8	-0.56 ± 0.81	--

Sample Identification	Isotope	NRC Value[a] (pCi/g)	Licensee Value[a] (pCi/g)	Ratio (Licensee/NRC)
Concrete 9801-0000-009-1C-RAEXV-01	Cs-137	186.0 ± 6.8	100 ± 7	0.54
	Sr-90	1.22 ± 0.18	0.754 ± 0.026	0.62
	H-3	128 ± 13	161 ± 7	1.25
Concrete 9801-0000-009-1C-RAEXV-02	Cs-137	0.24 ± 0.07	0.227± 0.039	0.94
	Sr-90	0.06 ± 0.12	0.00334 ± 0.00619	--
	H-3	223 ± 22	164 ± 5	0.74
Concrete 9801-0000-009-1C-RAEXV-03	Cs-137	0.50 ± 0.07	0.138 ± 0.029	0.28
	Sr-90	0.04 ± 0.12	0.000795 ± 0.00288	--
	H-3	174 ± 17	128 ± 5	0.74
Concrete 9801-0000-009-1C-RAEXV-05	Cs-137	0.05 ± 0.04	0.031 ± 0.026	--
	Sr-90	0.06 ± 0.12	-5.33E-5 ± 0.0055	--
	H-3	35.4 ± 4.2	31.5 ± 2.5	0.89
Concrete 9801-0000-018-1C-RAEXV-01	Cs-137	325 ± 12	228 ± 20	0.70
	Sr-90	5.07 ± 0.36	1.88 ± 0.06	0.37
	H-3	44.1 ± 5.0	105 ± 3	2.38
Concrete 9801-0000-018-1C-RAEXV-02	Cs-137	51.6 ± 2.0	39.0 ± 0.3	0.76
	Sr-90	1.11 ± 0.18	0.388 ± 0.015	0.35
	H-3	163 ± 16	242 ± 6	1.48
Concrete 9801-0000-018-1C-RAEXV-03	Cs-137	10.91 ± 0.43	6.13 ± 0.13	0.56
	Sr-90	0.33 ± 0.13	0.098 ± 0.008	0.30
	H-3	371 ± 36	339 ± 9	0.91
Concrete 9801-0000-018-1C-RAEXV-04	Cs-137	1.78 ± 0.12	11.0 ± 0.8	6
	Sr-90	0.19 ± 0.11	1.25 ± 0.06	6
	H-3	401 ± 39	382 ± 10	0.95

[a] Uncertainties represent the 95% confidence level, based on total propagated uncertainties.

Figure 1



c. Conclusions

The licensee conducted decommissioning activities in accordance with the approved LTP requirements. Regarding the former PAB site, surveys and sample analysis did not identify any radiological contamination in excess of NRC-approved release criteria. The soil samples, bedrock, and concrete core samples analyzed for hard-to-detect radionuclides, such as H-3 and Sr-90, were below the DCGL listed in the licensee's approved LTP. The analytical results of samples from the excavated area adjacent to the SFB indicated that the licensee's characterization of the radioactive contamination in the samples related to the SFB excavation was generally in agreement with the NRC's characterization. Based on the results, there was no significant contribution to onsite and offsite doses.

2.0 Plant Support

2.1 Radioactive Effluent Control Program

a. Inspection Scope (IP 84750)

The scope of this inspection area included an evaluation of the liquid effluent release permits, gamma analysis results, and chemistry controls for the liquid effluent releases from the SFB. The effluent releases were inspected against the REMODCM and QAP.

b. Observations and Findings

No significant findings were identified.

The licensee had drained a portion of the SPF pool water to verify a closed system (e.g., no leaks) and to verify proper system configuration. The licensee drained approximately 15,000 gallons of pool water to the Effluent Release tanks. The licensee processed and released the tank contents according to their effluent procedures. The licensee's effluent release permits and gamma analysis results indicated that the releases were below the effluent lower limits of detection. In addition, the inspector noted that the licensee's water filtering system was effective in lowering the levels of turbidity and radioactivity from the pool water, prior to release.

c. Conclusions

The licensee effectively controlled effluent releases from the SFB, in accordance with the REMODCM and QAP requirements.

3.0 Exit Meeting

The inspectors presented the inspection results to representatives of the licensee's staff at the conclusion of onsite inspections on September 22 and November 10, 2005. On February 2, 2006, 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.

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
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* J. Wagner, FSS Project Engineer, Site Closure, Project Support and Engineering
* G. vanNoordennen, Manager, Regulatory Affairs

State of Connecticut
* Firsick, Connecticut, DEP

* These individuals participated in the exit briefing held on February 2, 2006.

INSPECTION PROCEDURES USED

36801	Organization, Management, and Cost Controls
40801	Self-Assessment Auditing and Corrective Action Program
71801	Decommissioning Performance and Status Review
84750	Radioactive Waste Treatment, Effluent and Environmental Monitoring

ITEMS OPEN, CLOSED, AND DISCUSSED

Items Opened:

None

Items Closed:

None

Items Discussed:

None

LIST OF ACRONYMS USED

CAP	Corrective Action Program
CR	Condition Reports
Cs-137	Cesium-137
CY	Connecticut Yankee
CYAPCO	Connecticut Yankee Atomic Power Company
DCGL	Derived Concentration Guideline Levels
ESSAP	Environmental Survey and Site Assessment Program
H-3	Tritium
IP	Inspection Procedure
LTP	License Termination Plan
NMSS	Office of Nuclear Materials Safety and Safeguards
ORISE	Oak Ridge Institute for Science and Education
PAB	Primary Auxiliary Building
pCi/g	PicoCuries per Gram
QAP	Quality Assurance Program
QA	Quality Assurance
QSR	Quality Assurance Surveillance Reports
RA	Radiological Assessment
RECP	Radioactive Effluent Control Program
REMODCM	Radiological Environmental Monitoring Offsite Dose Calculation Manual
RHR	Residual Heat Removal
SFB	Spent Fuel Building
Sr-90	Strontium-90
TS	Technical Specifications