



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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January 7, 2004

Mr. Wayne A. Norton

President
Connecticut Yankee Atomic Power Company
362 Injun Hollow Road
East Hampton, CT 06424-3099

SUBJECT: NRC INTEGRATED INSPECTION REPORT 50-213/2003-002

Dear Mr. Norton:

On December 17, 2003, the NRC completed an inspection at the Haddam Neck Plant. The findings of the inspection were discussed with Mr. Robert Mitchell, and others by telephone on December 18, 2003. The enclosed report presents the results of that inspection.

During this approximately five-month period, we inspected your decommissioning operations relative to organization and management, self-assessment, and spent fuel safety. We also inspected facility support activities including radiation protection, radioactive effluents and environmental monitoring programs, and final status survey. The inspection consisted of selective examinations of procedures and records, observations by the inspectors, interviews with personnel, and independent measurements and survey plan reviews conducted by the Oak Ridge Institute for Science and Education (ORISE). We consider the programs to be appropriately implemented. A draft report detailing the ORISE confirmatory survey results was reviewed by NRC on December 17, 2003. ORISE will prepare a final report, which we will forward to you as a supplement to this report. Based on the results of this inspection, there are no violations.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure 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.html>. No reply to this letter is required.

Sincerely,

/RA/

Ronald R. Bellamy, Chief
Decommissioning Branch
Division of Nuclear Material Safety

Docket No. 50-213
License No. DPR-61

Enclosure:

Mr. W. Norton

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NRC Inspection Report No. 50-213/2003-002

cc w/encl:

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket No.: 50-213
License No.: DPR-61
Report No.: 50-213/2003-002
Licensee: Connecticut Yankee Atomic Power Company (CYAPCO)
P. O. Box 270
Hartford, CT 06141-0270
Facility: Haddam Neck Plant
Location: Haddam, Connecticut
Dates: July 7, 2003 through December 17, 2003
Inspectors: J. Wray, Health Physicist, DNMS
M. Miller, Senior Health Physicist, DNMS
Approved by: Ronald Bellamy, Chief, Decommissioning Branch (DCB)
Division of Nuclear Materials Safety (DNMS)

EXECUTIVE SUMMARY

Haddam Neck Plant NRC Inspection Report No. 50-213/2003-002

This routine integrated inspection included aspects of licensee activities regarding dismantlement and decommissioning of the facility. The report covers a five-month period of announced inspections by two regional inspectors, and a two-person and five-person inspection team from the Oak Ridge Institute for Science and Education's Environmental Survey and Site Assessment Program (ORISE). It includes reviews and assessments of organization, self-assessment, spent fuel safety, and facility support activities related to radiation protection, radioactive effluents and environmental monitoring programs, and final status survey (FSS).

Decommissioning Operations and Spent Fuel Safety

The licensee's site organizations were sufficiently staffed and qualified to support ongoing decontamination, demolition, decommissioning and spent fuel storage activities. The transition of responsibility for decommissioning activities following the termination of the Decommissioning Operations Contractor (DOC) contract was completed safely and in accordance with regulatory requirements. No safety concerns were identified.

The licensee completed spent fuel pool (SFP) building modifications to provide adequate facilities to safely conduct dry cask storage container transfer and welding activities. The inspector verified that, based on results of an engineering evaluation, Vertical Concrete Casks (VCCs) will be moved with handling equipment similar to that used successfully at Yankee Rowe.

The licensee maintained an effective self assessment program to identify strengths, programmatic weaknesses, and areas of declining performance. Most condition reports (CR) were documented promptly. The condition reports regarding the licensee's evaluation of incomplete survey documentation and timeliness of reporting this condition were not closed-out as of the end of this inspection period. The licensee's evaluation regarding these matters were reviewed during a subsequent inspection, and the inspection findings will be documented in NRC Inspection Report 50-213/2003-003.

Plant Support and Radiological Controls

Licensee controls for high radiation area and potential airborne work activities were adequate. Worker doses were within regulatory and licensee administrative limits.

The licensee maintained effective radioactive liquid and gaseous effluent control programs and a radiological environmental monitoring program (REMP). The Radiological Environmental Monitoring Offsite Dose Calculation Manual (REMODCM) contained sufficient specification and instruction to acceptably implement and maintain the radioactive liquid and gaseous effluent control programs. The REMP revisions were reflective of facility environmental conditions.

The licensee was implementing its License Termination Plan (LTP) and related procedures with respect to the use of Data Quality Objectives, survey unit identification, classification, and

characterization. The issue regarding the audio divide-by-circuit for the Eberline E-600 ratemeter for the calculated scan minimum detectable concentration was satisfactorily addressed by the licensee in a Technical Support Document dated October 2003. The results of the independent sampling and scanning in all selected survey areas (eleven) confirmed that the radiological conditions of the open land areas survey units met the approved site-specific Derived Concentration Guidelines Levels (DCGLs) and operational DCGLs for Co-60 and Cs-137. These results also confirmed that the survey units had been classified correctly.

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REPORT DETAILS

Summary of Facility Activities

The spent fuel remains safely in storage in the spent fuel pool (SFP) while the licensee plans for long-term storage of the spent fuel in dry casks onsite. The reactor pressure vessel (RPV) was grouted with concrete in preparations for shipping, and work was completed on cutting of the RPV nozzles and lifting the RPV into its shipping package inside containment. Dismantlement of the waste tank farm and removal of commodities in the loop areas were in progress. Characterization and final status surveys were ongoing.

I. Decommissioning Operations and Maintenance

O1 Conduct of Operations

O1.1 Organization and Management

a. Inspection Scope (36801)

The inspector reviewed the licensee's organization changes and staffing to determine whether the licensee and contractor organization, staffing, and qualifications were in accordance with regulatory requirements. During this inspection period, the licensee terminated the Decommissioning Operations Contractor (DOC) contract and resumed responsibility for conducting decommissioning work. The inspector reviewed the project plans that were developed by the licensee managers and contingency team prior to Bechtel leaving the site.

b. Observations

The licensee announced changes in site management during this inspection period. Mr. Wayne Norton was named President of Connecticut Yankee (CY). Mr. Norton replaced Mr. James Crowe, who was interim President. The new site organization involved changes to responsibilities of certain individuals and hiring additional management personnel for some key functional areas. These changes were made to position the site and corporate organizations to better focus on demolition and site closure activities, and spent fuel transfer to the Independent Spent Fuel Storage Installation (ISFSI). The inspector discussed responsibilities and expectations with each newly appointed manager. A review of their qualifications, including educational background and work history, was performed. The inspector concluded that these managerial changes were made in accordance with regulatory requirements and will contribute to public health and safety during future decommissioning activities.

During this inspection period, the licensee terminated its contract with Bechtel as the site DOC, which began in April 1999. Bechtel's last day on site was July 18, 2003. Connecticut Yankee resumed responsibility for all site decommissioning activities. The licensee restricted work to essential activities during a transition phase and until an adequate Connecticut Yankee line organization was established. The inspector reviewed transition plans for this transfer of authority and verified that proper procedures and processes were developed for licensed activities before resumption of decommissioning work. Site security personnel additions were also made to monitor site transition activities and for pending spent fuel transfer activities. Qualifications of the radiation protection department personnel, including the Radiation

Protection Manager (RPM), the Quality Assurance (QA) department, the Oversight department, and the Security department were reviewed. The inspector noted that the transition from an oversight organization to a line organization was completed safely and in accordance with regulatory requirements. The licensee conducted self-assessments and audits of their transition process to evaluate transition effectiveness and determine readiness to re-start decommissioning activities. The inspector reviewed these self-assessments and QA audits and determined that they were thorough and comprehensive. The inspector also noted that turnover of databases, such as dosimetry records and condition reports (CR), were addressed as part of the transition. No safety concerns were identified.

c. Conclusions

The licensee's site organizations were sufficiently staffed and qualified to support ongoing decontamination, demolition, decommissioning and spent fuel storage activities. The transition of responsibility for decommissioning activities following the termination of the DOC contract was completed safely and in accordance with regulatory requirements. No safety concerns were identified.

O1.2 Preparations for Spent Fuel Handling

a. Inspection Scope (60705)

The inspector reviewed preparations for transfer of spent fuel to the ISFSI. Procedure development, equipment testing, and SFP building modifications were reviewed.

b. Observations

The inspector reviewed licensee activities associated with preparations for transferring spent fuel to the ISFSI. The licensee developed a procedure for handling Vertical Concrete Casks (VCCs) and assuring safe movement on the heavy haul trailer from the SFP building to the ISFSI pad. The inspector observed test results and an engineering evaluation for the possible use of a Johnson Bar (J-bar lifting device) to move the VCCs. The licensee concluded that a Johnson Bar would not be used to move the VCCs, but would use equipment similar to that used successfully at Yankee Rowe. The inspector verified that the equipment, which has a gripping device to hold the VCCs, was onsite and ready for use. No safety concerns were identified.

The inspector observed the mock-up training areas for welding, vacuum drying, and lifting transportable storage containers (TSCs) that were being conducted in the maintenance warehouse. The licensee was using a Spanco gantry that had a 15 ton capacity, with two hoists marked as 15 ton and 6 ton. Only one TSC lift would require the use of both hoists due to the physical dimensions of the TSC. The calculated weight for this lift would not exceed 5 tons. To ensure the gantry system will not exceed the 15 ton capacity, the licensee is controlling the lifts by the same procedure that will be used when spent fuel is loaded into the TSC.

The inspector toured the SFP building and observed modifications completed to the access port and the mezzanine area where work will be conducted during TSC transfer and welding operations. The inspector also reviewed the status of the "B" SFP pump, which had been out of

service for approximately three months. The inspector noted that the delay in completing the corrective maintenance was caused by the need to purchase a second re-build kit, a deflector and an oil seal. The licensee was successful in returning the "B" SFP pump to service in early July. The inspector determined that adequate equipment and facilities were available to safely perform dry cask storage transfer activities and maintain spent fuel cooling. No safety concerns were identified.

c. Conclusions

The licensee completed SFP building modifications to provide adequate facilities to safely conduct dry cask storage container transfer and welding activities. The inspector verified that, based on results of an engineering evaluation, VCCs will be moved with handling equipment similar to that used successfully at Yankee Rowe.

O7 Self Assessments

a. Inspection Scope (40801)

The inspector evaluated the effectiveness of the licensee's self assessment process through discussions with personnel, reviews of Surveillance Reports and associated CRs, and performance observations of CY oversight and management personnel. The inspector reviewed selected CRs from July 2003 through October 2003 to determine the timeliness and appropriateness of the assigned significance level of the CRs. The inspector conducted performance observations to assess surveillance and oversight techniques.

b. Observations

The inspector conducted performance observations of licensee managers conducting surveillance activities of licensee personnel who were performing site characterization activities and radiation protection exposure control activities. Licensee personnel conducting these surveillances and walk-downs were knowledgeable of the requirements for these respective activities. The inspector was also informed that as part of the transition from Bechtel to CY, additional management walk-downs were performed. The inspector noted an increase in the quantity of CRs. A safety stand down was held in November to discuss safety and radiation protection concerns.

One CR involving incomplete documentation of required radiation surveillance surveys by a health physics (HP) technician was not entered as a CR or discussed by the Management Review Team (MRT) for nearly two weeks. At the end of this onsite inspection period, the inspector was informed of the first CR concerning worker performance, and a second CR concerning the timeliness of documenting the first CR for discussion by the MRT. The licensee stated they would evaluate the causes for both of these CRs. The inspector was able to determine from a review of the surveys completed by other technicians and recently completed survey records that there were no radiological concerns. During a subsequent inspection during the week of October 27, 2003, the follow-up to these CRs was reviewed. The inspector determined that senior management had been informed of the worker performance issue in a timely manner. Initial corrective actions for the first CR included using the HP technician's field

notes and laboratory results to complete the survey records, and supervisory review of all survey records.

c. Conclusions

The licensee maintained an effective self assessment program to identify strengths, programmatic weaknesses, and areas of declining performance. Most condition reports were documented promptly. The condition reports regarding the licensee's evaluation of incomplete survey documentation and timeliness of reporting this condition were not closed-out as of the end of this inspection period. The licensee's evaluation regarding these matters were reviewed during a subsequent inspection, and the inspection findings will be documented in NRC Inspection Report 50-213/2003-003.

II. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 External and Internal Exposure Controls

a. Scope (IP 83750)

The inspector reviewed Haddam Neck's program for controlling and monitoring personnel access to high radiation areas and radiation control areas, including controls for the removal of the reactor pressure vessel (RPV). Information was gathered through a review of the radiation work permits, pre-job briefings, dosimetry data, and air sampling records from July thru October 17, 2003. The inspector also conducted plant walkdowns, observed the alignment of the RPV into the shipping container, and conducted interviews with cognizant radiation protection personnel.

b. Observations and Findings

The inspector verified that controls were in place for locked high radiation areas. In addition, radiologically controlled areas (RCAs) were appropriately posted and labeled. The inspector observed staging for contaminated areas and posting for the tank farm, charging floor, and loop areas in the containment building. Appropriate health physics coverage and support surveys were conducted. Dosimetry placement met established criteria. In addition, multiple dosimeters and tele-dosimetry were used for workers in close proximity to the RPV.

The inspector observed that all personnel entering the high radiation areas to support the RPV work were challenged by radiation protection personnel to ensure that access requirements were met. Measures to limit exposure rates included use of water shield walls on the charging floor and fencing to control work zones. There were no unplanned or over-exposures of workers. No safety concerns were identified.

c. Conclusions

Licensee controls for high radiation area and potential airborne work activities were adequate. Worker doses were within regulatory and licensee administrative limits.

R1.2 Implementation of the Radioactive Liquid and Gaseous Effluent Control and Radioactive Environmental Monitoring (REMP) Programs

a. Inspection Scope (84750)

The inspector reviewed the licensee's Radiological Environmental Monitoring Offsite Dose Calculation Manual (REMODOCM), Revisions 15 and 16, and related documentation, and conducted a physical walk-down of facilities and equipment, including radioactive effluent radiation monitors to evaluate the effectiveness of the licensee's radioactive liquid and airborne effluent control programs. The requirements of these programs were specified in the Technical Specifications (TSs), and REMODOCM.

b. Observations and Findings

During the inspection, all effluent radiation monitors and the spent fuel building air cleaning system were operable. Further, the SFP building was maintained at a negative pressure, as required.

The licensee's effluent control procedures were detailed and licensee staff were knowledgeable of the REMODOCM requirements. Radioactive liquid and gaseous effluent release permits were found to be properly completed. All necessary parameters, such as effluent radiation monitor setpoint calculation methodologies, and site-specific dilution factors, were listed. The inspector observed a staff member collect a particulate sample and demonstrate the use of analytical counting equipment. The staff member's performance was determined to be acceptable and in accordance with the licensee's procedures.

The 2002 Annual Radioactive Effluent Report properly reported: (1) the total released radioactivity through liquid and airborne effluents; (2) radioactive effluent condition reports; (3) REMODOCM changes; and, (4) the projected maximum doses to the public. No reporting discrepancies were noted. Projected doses to the public were well below the regulatory limits.

The inspector also reviewed the licensee's 2002 Annual Radiological Environmental Operating Report and discussed the June 11, 2002 revision to the REMODOCM. Licensee personnel were familiar with the program and demonstrated an understanding of the monitoring requirements, sampling locations and vendor data and quality assurance reports. Control stations for water, air and vegetation were upstream or upwind or greater than ten miles from the facility. The Lower Limits of Detection for the sampling media were met. In July 2003, the licensee added the ISFSI to the REMP to collect baseline conditions prior to fuel movement. No concerns were identified.

c. Conclusions

The licensee maintained effective radioactive liquid and gaseous effluent control programs and REMP. The REMODCM contained sufficient specification and instruction to acceptably implement and maintain the radioactive liquid and gaseous effluent control programs. The REMP revisions were reflective of facility environmental conditions.

R1.3 Characterization and Final Status Survey (FSS) Activities

a. Inspection Scope (83801)

On July 8, 2003, NRC inspectors and NRC's contractor, ORISE, reviewed licensee activities associated with the planning and design of FSS for the purpose of determining compliance with the requirements of the License Termination Plan (LTP), Revision 1, dated October 2002, and to prepare for subsequent confirmatory inspections. During the week of September 29, 2003, NRC inspectors and NRC's contractor, ORISE performed a review of Haddam Neck's implementation of their FSS program. ORISE staff also performed independent radiological surveys of selected survey units and discussed the licensee's technical basis for use of the Eberline E-600 digital ratemeter for scanning in open land areas. Information was gathered through reviews of documents, including survey plans, interviews with cognizant personnel, direct observations of work, and performance of in-process and confirmatory radiological surveys.

b. Observations

The open land area survey plans included the survey units located north and east of the industrial area, alongside site roads leading to the ISFSI, construction debris piles, radioactive material storage area, permitted landfill area, and selected peninsula areas. Surface scans for gamma radiation were performed systematically in Class 2 and 3 survey units, as well as judgmental selected locations in non-impacted open land areas survey units where radioactivity may have concentrated during operations. Gamma scans were performed over approximately 50% of the soil surface area in Class 2 survey units; 10% of the soil surface in Class 3 survey units; and 1% of the surface soil area in non-impacted survey units. Seventy soil samples were collected from eleven survey units. Soil samples were analyzed by gamma spectroscopy, and results were analyzed for Co-60, Cs-137, and for other gamma-emitting fission and activation products associated with the Haddam Neck facility. A complete listing of the survey units and results are documented in an ORISE Final Report, which will be forwarded as a supplement to this inspection.

On June 11, 2003, NRC staff and ORISE discussed with cognizant licensee and licensee contractor personnel a concern with regard to the use of the Eberline E-600 ratemeter for field scanning, regarding the ability to distinguish changes in audible signal and meet the required minimum detectable concentration. On July 2, 2003, the licensee provided the basis for the use of the E-600 for land areas in a Technical Support Document, "Evaluation of the Effects of the Divide-by-Circuit on Scan MDC for the Eberline E-600." NRC and ORISE reviews concluded that the licensee's procedures provided adequate guidance for calibration, operation, and use of the E-600 Digital Survey meter in performing radiological surveys.

c. Conclusions

The licensee was implementing its LTP and related procedures with respect to the use of Data Quality Objectives, survey unit identification, classification, and characterization. The issue regarding the audio divide-by-circuit for the Eberline E-600 ratemeter for the calculated scan minimum detectable concentration was satisfactorily addressed by the licensee in a Technical Support Document dated October 2003. The results of the independent sampling and scanning in all selected survey areas (eleven) confirmed that the radiological conditions of the open land areas survey units met the approved site-specific Derived Concentration Guidelines Levels (DCGLs) and operational DCGLs for Co-60 and Cs-137. These results also confirmed that the survey units had been classified correctly.

III. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management periodically during the inspection, and during a teleconference with the site directors and others on December 18, 2003. The licensee acknowledged the findings presented by the inspectors. The inspectors reviewed with the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

X2 Other Meetings

On August 19, 2003, an NRC inspector attended the Community Decommissioning Advisory Committee (CDAC) meeting. The meeting was open for public participation. Approximately fifty members of the public and the CDAC were in attendance. During the meeting, the licensee discussed recent site activities regarding ground water sampling and presented preliminary sample results. The NRC inspector addressed questions from the public and the committee regarding historical environmental monitoring at the site.

On October 17, 2003, the licensee supported a site visit by Mr. Martin Virgilio, Director, Office of Nuclear Materials Safety, NRC, Commissioner Julio Barcelo, of the Spanish Consejo De Seguridad Nuclear, and NRC staff that supported the site visit.

PARTIAL LIST OF PERSONS CONTACTED

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*M. Powers, Engineer
D. Roberson, Health Physics Supervisor
*G. Sergent, Nuclear Safety Engineer
*J. Tarzia, Nuclear Safety Manager
G. van Noordennen, Regulatory Affairs Manager
A. Yates, Chemistry Supervisor

*Denotes attendance at the telephonic exit meeting held on December 18, 2003

INSPECTION PROCEDURES USED

IP 36801	Organization, Management & Cost Controls at Permanently Shutdown Reactors
IP40801	Self Assessment, Auditing, and Corrective Actions
IP 60705	Preparations for Fuel Handling
IP 83750:	Occupational Radiological Exposure
IP 83801	Inspection of Final Surveys at Permanently Shutdown Reactor Facilities
IP 84750	Radioactive Waste Treatment and Effluent & Environmental Monitoring

ITEMS OPEN, CLOSED, AND DISCUSSED

Open

None

Closed

None

Discussed

None

LIST OF ACRONYMS USED

CDAC	Community Decommissioning Advisory Meeting
CR	Condition Report
CY	Connecticut Yankee
CYAPCO	Connecticut Yankee Atomic Power Company
DCB	Decommissioning and Laboratory Branch
DCGL	Derived Concentration Guidance Levels
DNMS	Division of Nuclear Materials and Safety
DOC	Decommissioning Operations Contractor
ESSAP	Environmental Survey and Site Assessment Program
FSS	Final Safety Survey
HP	Health Physics
ISFSI	Independent Spent Fuel Storage Installation
LTP	License Termination Plan
MRT	Management Review Team
ORISE	Oak Ridge Institute for Science and Education
PDR	Public Document Room
QA	Quality Assurance
RCA	Radiologically Controlled Area
REMODOCM	Radiological Environmental Monitoring Offsite Dose Calibration Manual
REMP	Radiological Environmental Monitoring Program
RPM	Radiation Protection Manager
RPV	Reactor Pressure Vessel
SFP	Spent Fuel Pool
SNM	Special Nuclear Material
TS	Technical Specifications
TSCs	Transportable Storage Containers
VCCs	Vertical Concrete Casks