

August 10, 1999

Mr. R. A. Mellor

Vice President - Operations and Decommissioning

Connecticut Yankee Atomic Power Company

362 Injun Hollow Road

East Hampton, CT 06424-3099

SUBJECT: NRC INTEGRATED INSPECTION REPORT 50-213/99-02

Dear Mr. Mellor:

On July 19, 1999, the NRC completed an inspection at the Haddam Neck Plant. The enclosed report presents the results of that inspection.

During the three-month period covered by this inspection, your conduct of activities at the Haddam Neck facility was characterized by the continuation of radiological work and completion of several tasks in preparation for decontamination and dismantlement activities. Your conduct of activities associated with control of radiological work at Haddam Neck was generally characterized as careful and thorough.

Effective programs were observed for corrective actions, self-assessment, and auditing of decommissioning activities. Identification of unresolved safety questions was generally adequate and revisions to technical specifications were appropriate. However, an error in a control room dose calculation was submitted as part of an update to the Updated Final Safety Analysis Report in 1997. The error was self-identified during a review of the calculation in support of the new control room modifications. The submittal of inaccurate information to the NRC is a concern, which we are continuing to evaluate.

We determined that your surveillance program for systems, structures, and components important to safe storage of spent fuel is effective. Your transition plan to turn systems over to the decommissioning contractor is very good.

Effective radioactive effluent and radiation protection controls with respect to the Bus-10 removal project were established and implemented. An effective quality assurance program for the radioactive effluent control program was noted. The completion of the corrective actions for Spent Fuel Building ventilation issues was adequate.

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).

Sincerely,

Original signed by:

Ronald R. Bellamy, Chief

Decommissioning and Laboratory Branch

Division of Nuclear Material Safety

Docket No. 50-213

License No. DPR-61

Enclosure:

NRC Inspection Report No. 50-213/99-02

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U.S. NUCLEAR REGULATORY COMMISSION REGION I

Docket No.: 50-213

License No.: DPR-61

Report No.: 50-213/99-02  
Licensee: Connecticut Yankee Atomic Power Company  
P. O. Box 270  
Hartford, CT 06141-0270  
Facility: Haddam Neck Station  
Location: Haddam, Connecticut  
Dates: April 20, 1999 to July 19, 1999  
Inspectors:

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Tom Frederichs, Project Manager, NRR  
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Approved by: Ronald Bellamy, Chief, Decommissioning and Laboratory Branch  
Division of Nuclear Materials Safety

#### EXECUTIVE SUMMARY

Haddam Neck Station

NRC Inspection Report No. 50-213/99-02

This routine inspection included aspects of licensee activities in preparation for dismantlement and decommissioning of the facility. The report covers a three-month period of inspection by regional and headquarters NRC personnel, and includes reviews and assessments of spent fuel safety, engineering and plant support activities, and management effectiveness.

#### Decommissioning Operations and Spent Fuel Safety:

The licensee was generally conducting activities in accordance with license requirements and commitments. The inspectors observed good performance by the facility staff to control and conduct facility decommissioning.

The licensee maintained an effective corrective action program and performed very good audits and assessments of the decommissioning programs to help self-identify and correct issues and problems. No significant safety concerns were identified.

The safety evaluations performed by the HN staff for the control room modification to remove the "J" bottles and Updated Final Safety Analysis Report (UFSAR) update used incorrect information supplied by the Northeast Utilities Radiation Assessment Branch (NURAB) staff. However, the changes had no effect on the dose consequences to a member of the public as a result of a resin accident. In addition, the changes did not result in a significant increase in occupational dose to personnel in the control room during and following a resin accident.

The licensee discovered and corrected several errors in its July 1997 calculation of the dose to control room personnel due to a resin accident. The recalculation revised the model used to calculate the doses and included information on actual source term activity that was unavailable at the time the erroneous calculation was performed.

The documentation presented by the licensee for Design Change Request (DCR) CY-98001, dated April 24, 1998, demonstrated a lack of control of design change documentation. The licensee adequately identified unresolved safety questions and the need to revise the TS in its design process.

#### Maintenance and Surveillance:

Required surveillances important to safe decommissioning and storage of spent reactor fuel are being scheduled/planned. For those systems designated operable or available, surveillances are being conducted in a timely and effective manner. The Maintenance Rule Program is thorough with enough detail to ensure effective compliance with 10CFR50.65. The Transition Plan to the Decommissioning Operations Contractor (DOC) appears to be very good in that all structures, systems and components (SSCs) have been addressed in the turnover plan. Spent Fuel Pool (SFP) Building Ventilation System modifications appear to be progressing satisfactorily. No concerns were identified.

#### Plant Support and Radiological Controls:

The licensee established representative sampling of effluents from the Bus-10 containment HEPA filter. The licensee provided very good controls for radioactive materials and contamination, surveys and monitoring during decommissioning work activities.

The licensee established, implemented, and maintained an effective quality assurance program for the radioactive effluent control program with respect to self-assessments, chemistry laboratory quality control, and adverse condition resolution.

The licensee completed their corrective action plan to address Spent Fuel Building (SFB) ventilation system issues. The inspector identified no further issues pertaining to the SFB ventilation system.

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## REPORT DETAILS

### Summary of Facility Activities

The plant was maintained in a permanently shutdown condition during this inspection period. The licensee continued priority activities to prepare the plant and supporting functions for turnover to a decommissioning operations contractor (DOC). These activities included spent fuel cooling system modifications, processing of resins from the reactor coolant system (RCS) decontamination, radiological remediation of the Bus-10 area, and site radiological characterization.

#### I. Decommissioning Operations

##### O1 Conduct of Operations

##### O1.1 Self-assessment, Auditing, and Corrective Action

###### a. Inspection Scope (40801)

A review was performed to evaluate the effectiveness of licensee controls in identifying, resolving, and preventing issues that degrade safety or the quality of decommissioning. The inspector evaluated the licensee's self-assessment, auditing, corrective actions, and root cause evaluations through a review of licensee documents and interviews with licensee personnel.

###### b. Findings and Observations

The inspector reviewed the recent audits and surveillances performed by the Oversight (Quality Assurance) Group. The audits and surveillances were performed by qualified individuals who were independent from the organization performing the work. The inspector found that there was a very good level of detail and appropriate critical review of the areas reviewed by the licensee's Oversight Group. For most concerns or findings, effective corrective actions were immediately implemented and longer term corrective actions were timely and appropriate.

Very good administrative controls were used to track, trend, and implement corrective actions.

The licensee continued to use a Condition Report (CR) system to identify concerns and ensure timely, appropriate corrective actions. The inspector noted that the CR system was effectively used by all levels

within the organization. CRs were discussed at Management Review Team (MRT) meetings, which ensured that each problem or concern was discussed by an interdisciplinary team with representatives from all major site departments. The inspector attended several MRT meetings and noted that there was a very good level of peer review and discussion for each issue. The inspector also reviewed various CR's to determine how the issues were resolved. Root cause evaluations were performed for higher safety significant issues and repetitious events or occurrences were handled appropriately.

Other programs and meetings were used for self-assessment by the licensee's staff. The Nuclear Corporate Assessment Team (NCAT) provides management oversight and reports directly to the Northeast Utilities' Board of Directors. The Joint Oversight Committee (JOC) performs assessments at both Haddam Neck and Maine Yankee and reports to the Connecticut Yankee Atomic Power Company (CYCAPCo) and Maine Yankee Atomic Power Company (MYAPCo) Boards of Directors. An annual site visit is performed by the Independent Management Assessment Committee (IMAC) to provide oversight of decommissioning management. The Nuclear Safety Assessment Board (NSAB) reviews specific areas of decommissioning and makes recommendations to CYCAPCo management. The Employee Concerns Program provides a confidential program for employees to raise concerns to site management.

#### c. Conclusions

The licensee maintained an effective corrective action program and performed very good audits and assessments of the decommissioning programs to help self-identify and correct issues and problems. No significant safety concerns were identified.

### O1.2 Decommissioning Performance and Status Review

#### a. Inspection Scope (71801)

The inspector evaluated the licensee's status of decommissioning and verified that the licensee and its contracted workforce are conducting decommissioning activities in accordance with licensed requirements through a review of licensee documents and interviews with licensee personnel. The inspector toured the facility to evaluate the material integrity of structures, systems, and components (SSCs) necessary for the safe decommissioning of the facility.

#### b. Findings and Observations

Status of decommissioning during the inspection period was obtained through weekly phone conferences with the licensee's staff and contractors, and through attendance at onsite planning meetings. The general activity of decommissioning was low since the licensee's DOC was not fully functional on the site. However, modifications to the spent fuel storage facility continued that will allow independent operation of the spent fuel pool (SFP) from other plant systems (spent fuel pool island concept). Work also continued on relocation of the control room to an area adjacent to the industrial security area access point. Other activities involved preparations for turnover of systems and components to the DOC for decontamination and dismantlement.

The inspector toured the control room and observed a shift turnover meeting in the control room. The inspector observed that the systems necessary for safe decommissioning were functional and operational. Plant operator logs were maintained with appropriate information. Shift turnover meetings were held to communicate conditions and status to shift personnel. Control room staffing met the licensee's commitment. Professionalism was maintained in control room communications and actions. The inspector also toured the spent fuel pool building (SFPB) and other nearby areas to assess work conditions and decommissioning activities. Decontamination and remediation of the Bus 10 concrete pad next to the SFP was completed and work was continuing on the new pad and electrical distribution bus. Modifications were continuing on the SFPB ventilation system. Workers were following approved work instructions. Material condition of SSCs was adequate to maintain safe storage of spent fuel. The licensee was controlling the SFPB as a vital area; however, the inspector questioned the process for controlling access to the building. The licensee explained the controls to the inspector and the inspector determined that the controls met the minimum standards for protection of spent fuel. Housekeeping and fire protection in the SFPB were adequate. No other concerns were noted.

#### c. Conclusions

The licensee was generally conducting activities in accordance with license requirements and commitments. The inspectors observed good performance by the facility staff to control and conduct facility decommissioning.

### O8 Miscellaneous Issues

#### O8.1 Control Room Habitability Evaluation

##### a. Inspection Scope (37700)

On March 2, 1999, in accordance with the requirements of 10 CFR 50.72(b)(1)(ii)(B), the licensee notified the NRC of a potential error in the calculation of the dose to control room personnel during a postulated resin fire accident as described in the Updated Final Safety Analysis Report (UFSAR). On March 18, 1999, the licensee retracted the notification based on a new calculation using the actual curie content of resins stored on site rather than the postulated curie content assumed in the UFSAR accident analysis.

The licensee's UFSAR analyses of the dose to control room personnel, its root cause investigation of the calculation error, and its 1999 recalculation of the dose were inspected.

#### b. Observations and Findings

##### Control Room Dose Before Permanent Shutdown

Section 6.4 of the UFSAR presents the design and analysis of the habitability systems installed at HN to maintain it in a safe mode under normal conditions and during and following a postulated design basis accident. The last UFSAR revision of control room habitability before HN permanently shutdown was dated March 1994.

The design bases for the habitability systems were:

- 1) The control room is inhabited at all times. Food and potable water are provided in sufficient quantities to sustain five people for five days. Sanitary facilities and medical supplies are provided.
- 2) General Design Criteria 19 for providing adequate radiation protection under accident conditions.
- 3) Self-contained breathing apparatus sufficient for five operators for five hours.
- 4) Regulatory Guide 1.95 for protecting control room operators from a postulated chlorine release.
- 5) Regulatory Guide 1.78 for assumptions for evaluating the habitability of the control room following postulated chemical release.

The analysis of the control room shielding showed that the 30-day whole body dose for the control room was 0.624 rem, based on the loss of coolant accident (LOCA) source term conforming to NUREG-0588 and Technical Information Document, TID-14844. The whole body dose was calculated from direct shine from the containment and immersion in the noble gas plume from a postulated LOCA. Whole body doses from airborne activity within the control room were not included, and no doses other than to the whole body were included.

##### Control Room Dose After Permanent Shutdown

Section 6.4 was updated in January 1998 to reflect changes in the facility due to permanent shutdown and defueling.

The design bases were revised to remove the reliance on self-contained breathing apparatus (basis 3, above) and other sources of supplied air for the control room (a bank of "J" bottles filled with oxygen). In addition, the design basis accidents changed. The LOCA was no longer possible. In its place, the shielding analysis considered a fuel handling accident and a resin fire.

The revised shielding evaluation expanded the number of exposure pathways analyzed. The results presented in the revised UFSAR were:

##### CONTROL ROOM DOSES (REM)

Type Fuel Handling Accident Resin Container Accident

Whole Body 2.36 E-4 3.73 E-5

Thyroid 7.23 E-1 1.41 E-2

Skin 7.02 E-1 1.17 E-3

Max Organ 1.06 E-2 3.83

##### Licensee Root Cause Investigation

The erroneous calculation of control room dose in the permanently defueled condition was issued July 28, 1997 by Northeast Utilities Radiation Assessment Branch (NURAB) and transmitted to Connecticut Yankee. The results of the calculation were used by the HN staff in safety evaluations of a modification that removed the "J" bottles supplying oxygen to the original control room and the January 1998 update of control room habitability information in the UFSAR. The safety evaluations concluded that no unresolved safety question existed because the whole body dose to control room personnel from accidents in the permanently shutdown condition was less than the whole body dose in the operating condition.

Subsequently, the licensee began evaluations of a modification to relocate the control room from the turbine building to a location near the plant access point. The new location is not equipped with the specialized ventilation and shielding found in operating plant control rooms. The licensee's review of the design bases for the control room revealed the errors in the July 1997 calculation of control room dose.

The licensee initiated its root cause investigation into the calculation discrepancy on March 4, 1999, and completed it on May 9, 1999. The investigation team contacted CY and Northeast Utilities personnel involved with the erroneous calculation, including personnel who are no longer employed by the licensee or its parent company.

The licensee concluded that the primary root cause was the use of an incorrect dose conversion factor (DCF) by NURAB personnel performing the calculation. The calculation depends on inputting DCFs into the computer code developed for control room habitability determinations (HABIT). NURAB used the HABIT computer code and a method of calculation provided in NUREG/CR-6210. However, the person performing the calculation overlooked the guidance on selecting DCFs for alpha-emitting nuclides, which is the appropriate case at HN due to a history of failed fuel.

An important contributing root cause was the failure to apply QA controls to the calculation, contrary to the direction of the licensee's procedure, NUC DCM, Chapter 5, "Calculations."

As a result of the error, the maximum organ dose, which was dose to the bone surface, was underestimated by about a factor of ten. However, this dose was less than the equivalent dose to an organ (50 rem) allowed by General Design Criterion (GDC) 19 of Appendix A to 10 CFR Part 50, and fell within the design bases for the control room.

The licensee identified the following corrective actions in response to the error:

- 1) Perform a control room habitability calculation (for the existing control room) using CY DCM methodology and modify the UFSAR as necessary.
- 2) Ensure that future control room dose calculations are performed using CY DCM methodology.
- 3) Ensure adequate management controls are in place which specify the scope, internal CY review requirements and quality assurance criteria for engineering work performed by outside organizations.
- 4) Communicate the results of the root cause analysis to NURAB for inclusion in their corrective action program.

An internal memo (CY-KJH-99-015) dated June 8, 1999, assigned responsibility for the first three corrective actions to groups in the CY organization. The CR identifying the errors was forwarded to NURAB on March 3, 1999.

#### Comparison of Doses for Operating and Decommissioning Conditions

A conference call with the licensee and NRC staff was held on April 5, 1999, to discuss the appropriate method for comparing the doses to control room personnel in the operating and decommissioning conditions in view of the fact that the exposure pathways of the two UFSAR evaluations differed considerably. The licensee agreed to calculate and compare the total effective dose equivalent (TEDE) of the two conditions to determine if the changes resulted in an increase in dose consequences.

#### Recalculation of Control Room Dose

The licensee recalculated the dose to control room personnel to correct the errors discovered in the July 1997 analysis. The licensee also applied an updated model for atmospheric dispersion of gaseous releases and revised the source term to reflect the actual amount of radioactivity in ion exchange resin stored on site.

The licensee found and corrected the following errors in the July 1997 calculation:

- 1) The bone DCF was corrected to bone surface from red bone marrow, conforming to the guidance of NUREG/CR-6210.
- 2) Co-60 DCF was corrected to class Y from class W, conforming to Appendix B of 10CFR20.
- 3) Activities for Pu-239/240 and Cm-243/244 were corrected to the combined activity for each pair from individual activity for each nuclide, conforming to the radiochemical protocol for reporting the concentrations of these nuclides.
- 4) The control room ventilation flow rate was corrected to 9500 CFM from 6150 CFM, conforming to the maximum flow rate of the fan.

The licensee recalculated the control room dose using the methodology of NUREG/CR-6331, Atmospheric Relative Concentrations in Building Wakes, which uses the ARCON96 computer code. The licensee selected the ARCON96 code on the basis that it better fits the case of atmospheric dispersion from a point source than the HABIT code used previously.

The licensee revised the source term to reflect the actual amount of activity in a resin liner. The estimated activity assumed for the accident analysis presented in the January 1998 UFSAR update was one resin container with 448 curies. Based on radiochemical analysis of the contents, the actual maximum amount of activity in a resin container was 110 curies.

The licensee recalculated the TEDE dose to control room personnel in the turbine hall location due to a resin accident as 0.093 rem. This was less than the TEDE of 0.624 rem calculated for a LOCA. The TEDE for the proposed control room location near the plant access point was calculated as 0.068 rem. The licensee also reviewed its dose estimates at the site boundary due to a resin accident. The site boundary estimates had been performed separately. The licensee concluded that no errors had been made in the previous estimates. Based on the actual source term in a resin container, the licensee determined that the actual dose at the site boundary would be less than previously estimated. The control room habitability information submitted for the January 1998 UFSAR update to the dose to control room personnel was incorrect. The reported maximum organ dose was calculated with an incorrect DCF, and consequently underestimated the dose given the assumptions presented in the accident analysis. This is a potential violation of 10 CFR 50.9, "Completeness and accuracy of information." However, the NRC has not yet completed the inspection and review of this potential violation. At the time of the inspection, the licensee had not assigned responsibility for each of the corrective actions recommended by its root cause investigation team. The licensee's completion of corrective actions will be the subject of a future inspection. URI 99-02-01

#### c. Conclusions

The safety evaluations performed by the HN staff for the control room modification to remove the "J" bottles and UFSAR update used incorrect information supplied by the NURAB staff. However, the changes had no effect on the dose consequences to a member of the public as a result of a resin accident. In addition, the changes did not result in a significant increase in occupational dose to personnel in the control room during and following a resin accident.

The licensee discovered and corrected several errors in its July 1997 calculation of the dose to control room personnel due to a resin accident. The recalculation revised the model used to calculate the doses and included information on actual source term activity that was unavailable at the time the erroneous calculation was performed.

#### O8.2 Review of 10 CFR 50.59 Evaluations Performed in 1998

##### a. Inspection Scope

The following list of safety evaluations were examined:

SY-EV-97-0045 SY-EV-97-0138 SY-EV-98-0018, Rev 0 & Rev. 1

SY-EV-97-0094 SY-EV-97-0145 SY-EV-98-0023

SY-EV-97-0095 DCR CY-98001 SY-EV-98-0031

SY-EV-97-0108 SY-EV-98-002 SY-EV-98-0033

SY-EV-97-0137 SY-EV-98-005 SY-EV-98-0072

##### b. Observations and Findings

The safety evaluations were adequate in their assessment of unresolved safety questions. The threshold for determining the existence of an unreviewed safety question (USQ) was appropriate.

However, the documentation presented by the licensee for Design Change Request (DCR) CY-98001, approved by the CY engineering group on April 24, 1998, was an uncontrolled copy of the 10 CFR 50.59 applicability review. It had not been approved by the Plant Operations Review Committee (PORC). The change was for implementation of the defueled Security Plan at CY, which included several modifications to the physical security system. The April 24, 1998, copy erroneously concluded that a change to the operating license was required for the implementation.

The licensee presented the controlled copy of the safety evaluation for DCR CY-98001 dated May 7, 1999, and approved by PORC. The approved copy correctly concluded that no operating license change was required to implement the defueled Security Plan.

The licensee reported that the uncontrolled copy had been obtained from the documents kept in its Administrative offices. These are uncontrolled copies. As corrective action, the licensee labeled the uncontrolled design change documents as "UNCONTROLLED" and gave directions to obtain controlled copies from the Nuclear Documents Services group.

##### c. Conclusions

The documentation presented by the licensee for DCR CY-98001, dated April 24, 1998, demonstrated a lack of control of design change documentation. The licensee adequately identified unresolved safety questions and the need to revise the TS in its design process.

#### M1 Maintenance and Surveillance

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

A review was performed of the licensee's program to ensure that maintenance and surveillance of SSCs important to the safe storage of spent fuel and proper operation of radiation monitoring and effluent control equipment are being effectively conducted. The inspector examined the licensee's planned surveillances, work on the SFPB Ventilation System, and the licensee's Maintenance Rule Program for 10 CFR50.65.

#### b. Findings and Observations

The inspector reviewed the following four surveillance packages for effectiveness and detail:

Sealed Sources Test for Leakage Contamination

Quarterly Meteorological Tower Preventive Maintenance Activities

Emergency Diesel Generator Preventive Maintenance Tests

Polar Crane Inspections and Tests

In all cases, work orders were examined and found to be timely written and thorough in scope. The inspector observed field work performed while completing the Quarterly Meteorological Tower surveillances. The inspector noted that the licensee has a system for identifying those systems as operable, available, in lay-up, or abandoned. Surveillances are still planned and conducted on systems designated operable or available. Surveillances for systems in lay-up have been rescheduled for a later time. Surveillances for abandoned systems have been canceled.

The surveillance and tests of the polar crane were examined in detail since this equipment will play a major role in the removal of the heavy loads from containment. The inspector reviewed available documentation including a letter dated March 29, 1999, from the Project Manager entitled "Polar Crane Inspections, Refurbishment and Load Test Closure Summary". The inspector noted that the licensee's inspection revealed that refurbishment of the polar crane was needed prior to heavy load lifting in containment. The refurbishment was completed in December 1998 and the crane successfully load tested in March 1999. The test included a dynamic load test at 100% capacity and a static load test at 125% capacity. The licensee concluded that the containment polar crane is capable of performing to its normal rated capacity of 175 tons and occasional loading of 227.5 tons.

The inspector reviewed available documents regarding the licensee's Maintenance Rule Program including the Connecticut Yankee Decommissioning/Nuclear Island Maintenance Rule Manual, the 1998 Fourth Quarter Maintenance Rule Summary Report, and meeting notes from the Connecticut Yankee Expert Panel where decisions are made as to the applicability of the Maintenance Rule for certain plant systems. The inspector verified that the licensee's program met the requirements of 10CFR50.65 and that application of the Maintenance Rule is thorough and effective to ensure safe storage of spent fuel and proper operation of necessary equipment.

The inspector reviewed Minor Modification Package No. CY-98535 for the first phase of replacing the ventilation and radiation monitoring equipment in the Spent Fuel Building. This will allow decommissioning of other structures and systems without affecting the operation of the Spent Fuel Building. The inspector also observed work in progress and discussed the project in detail with cognizant engineers. The tie in of the new ventilation system to the existing system is covered under DCR No. 98-402 (not completed at the time of this review). The inspector noted adequate precautions were being applied on the SFP operating floor while construction work was being conducted to prevent inadvertent dropping of articles into the pool containing spent fuel. The path for isokinetic sampling lines from the stack to the new monitor was also walked down. Adequate room appeared to be designed into the system to meet the requirements for controlling line losses. The system will be inspected in more detail following completion of all installation activities.

#### c. Conclusions

Required surveillances important to safe decommissioning and storage of spent reactor fuel are being scheduled/planned. For those systems designated operable or available, surveillances are being conducted in a timely and effective manner. The Maintenance Rule Program is thorough with enough detail to ensure effective compliance with 10CFR50.65. The Transition Plan to the DOC appears to be very good in that all SSCs have been addressed in the turnover plan. SFP Building Ventilation System modifications appear to be progressing satisfactorily. No concerns were identified.

## II. Plant Support and Radiological Controls

### R1 Radiological Protection and Chemistry (RP&C) Controls

#### R1.1 Radiological and Effluent Controls for the Bus-10 Removal Project

##### a. Inspection Scope (84750)

The inspection consisted of a review of licensee technical support documents to support isokinetic sampling of Bus-10 high efficiency particulate air (HEPA) filter effluents. The licensee had completed concrete scabbling work, removed the lead sheeting and had started removing soils from the Bus-10 area at the time of the inspection.

b. Findings and Observations

As mentioned in NRC Inspection Report 50-213/99-01, HEPA effluent air filter sample results taken from the Bus-10 containment were less than the lower limit of detection. The licensee established isokinetic sampling in accordance with NRC Regulatory Guide 1.21.

c. Conclusions

The licensee established representative sampling of effluents from the Bus-10 containment HEPA filter.

R1.2 Radiological Surveys

a. Inspection Scope (83750)

The inspectors reviewed the controls for radioactive materials and contamination, surveys and monitoring through observation of work activities, tours of the facility, interviews with personnel and a review of licensee documents.

b. Findings and Observations

The inspectors verified that there was an adequate supply of radiation survey and monitoring equipment available to assess radiological conditions in work areas. All equipment checked by the inspector was operable and within the current calibration period. Current radiological surveys of various work locations were reviewed by the inspector. The surveys contained detailed information regarding current radiological dose rates and hazards in the work areas. Surveys were posted at the main control point for the RCA. Appropriate licensee management personnel had reviewed the radiological surveys.

The inspectors toured various areas of the facility to determine the adequacy of contamination controls. Portal monitors and frisking instruments were located throughout the facility for use by workers as they left radioactive materials areas or contaminated areas. Appropriate instructions were given to workers to ensure that materials taken from an RCA were surveyed for potential radiological contamination. The inspectors noted that the licensee had erected a fence around an area on the Southwest Storage Site Area (also known as the peninsula). This area had been used to store potentially contaminated items in the past. The fence was erected to maintain controls for items that had not yet been surveyed for release for unrestricted use. Signs were posted inside the fenced area to remind workers that permission was required to remove items from the area. The exterior of the fence was posted with no trespassing signs and warnings since the area was accessible from the public areas adjoining the site. The inspectors determined that the controls were adequate to prevent unintentional removal of potentially contaminated items from the area.

Radiological housekeeping was generally good with appropriate controls established to minimize the spread of contamination. Areas that presented a challenge to the licensee's staff due to changing conditions and ongoing work were kept in good condition. Posting of radioactive material areas and labeling of radioactive materials was very good.

c. Conclusions

The licensee provided very good controls for radioactive materials and contamination, surveys and monitoring during decommissioning work activities. No violations or significant safety concerns were identified.

R7 Quality Assurance (QA) in RP&C Activities

a. Inspection Scope (83750 and 84750)

The inspection consisted of: (1) a review of inter-laboratory measurement comparisons; (2) a review of chemistry laboratory quality control program radioactive liquid and gaseous effluent samples; (3) a review of the 1998 Health Physics Assessment; and (4) a review of responses to adverse condition reports (ACRs) 98-0788, 98-0801, 98-0819, and 98-0849.

b. Observations and Findings

All interlaboratory quality assurance measurement comparisons were within the licensee's acceptance criteria. Anomalous trends identified during reviews of quality control charts for gamma and tritium measurements were investigated and resolved.

The 1998 Health Physics Assessment provided an integrated assessment of the Health Physics program. This document largely took credit for the surveillances and departmental self-assessments conducted in 1998. No significant issues were identified.

Licensee responses to the above-noted ACRs were reasonable and timely. These particular issues were identified and corrective actions were initiated soon enough to preclude them from having regulatory significance.

c. Conclusions

The licensee established, implemented, and maintained an effective quality assurance program for the radioactive effluent control program with respect to self-assessments, chemistry laboratory quality control, and adverse condition resolution.

R8 Miscellaneous RP&C Issues

R8.1 Spent Fuel Building Ventilation System (URI 97-09-01)

a. Inspection Scope (84750)

NRC Inspection Report 50-213/97-09 identified problems relating to the spent fuel building (SFB) ventilation system resulting in a violation pertaining to design control. In addition, an unresolved item was opened to further evaluate the issues pertaining to the SFB ventilation system.

The inspection consisted of: (1) a tour and discussion of the SFB ventilation system modifications with the system engineer; (2) a review of flow rate meter electronic alignment results; (3) a review of DCRs CY-97026, "SFB Supply Fan Speed Reduction" and CY-98034, "Ventilation Flow Instrument Replacement"; and (4) a review of pertinent operating procedures to determine whether limitations identified within the DCRs were administratively controlled through incorporation into the operating procedures.

The following procedures were reviewed.

1. NOP 2.15-1, "PAB Ventilation System Operation," Revision 17, 4/13/99
2. NOP 2.15-2, "Reactor Containment Atmospheric Control System," Revision 19, 4/13/99
3. NOP 2.15-3, "Spent Fuel Building Ventilation System Operation," Revision 17, 4/13/99

b. Findings and Observations

Visual observation indicated that the licensee installed the new flow rate indicators and air flow testing ports in accordance with industry standards. Electronic alignment results for the flow rate meters were found to be within the licensee's acceptance criteria. No issues were noted pertaining to licensee acceptance criteria. Procedures were modified to properly address limitations identified by the DCRs. The licensee reduced the SFB ventilation system supply fan speed. SFB ventilation system air flow testing results indicated that the licensee's modification successfully balanced system air flow rates to be in conformance with the air flow rates described in the UFSAR.

c. Conclusions

The licensee completed their corrective action plan to address SFB ventilation system issues. The inspector identified no further issues pertaining to the SFB ventilation system; therefore, URI 97-09-01 is closed. As mentioned previously, enforcement action pertaining to the SFB ventilation system design issues was already issued as VIO97-09-02. As such, no additional enforcement actions will be taken pertaining to these specific issues.

**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 Mr. R. Mellor and others at the conclusion of the inspection on July 19, 1999. The licensee acknowledged the findings presented by the inspector. The inspector reviewed with the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

**PARTIAL LIST OF PERSONS CONTACTED**

\*G. Bouchard, Unit Director

J. Bourassa, Oversight Manager

\*M. Cavanaugh, Communications Manager

P. Dadlani, Project QA Manager, Bechtel

N. Fetherston, Decommissioning Operations Manager

K. Harner, Chemistry Manager

\*J. Haseltine, Strategic Planning Director

P. Hollenbeck, Site Characterization Supervisor

M. Hornyak, Supervisor - Corrective Actions

D. Heffernan, Maintenance Manager

\*K. Heider, Decommissioning Director

K. Jackson, Assistant Project Manager, Bechtel  
D. Karr, Oversight  
A. Kelly, Project Manager, Bechtel  
S. Kumar, Regulatory Affairs  
\*R. Mellor, Vice President Operations and Decommissioning  
\*R. Mitchell, Operations and Maintenance Manager  
G. van Noordennen, Regulatory Affairs Manager  
D. Scribner, Project Engineer, Bechtel  
\*R. Sexton, Radiation Protection Manager  
\*J. Tarzia, Radiation Protection Manager, Bechtel  
T. Troutman, Transition Manger, Bechtel  
S. Webster, Licensing, Bechtel

\* Denotes attendance at the telephone exit meeting held on June 19, 1999.

#### INSPECTION PROCEDURES USED

IP 40801: Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors

IP 62801: Maintenance and Surveillance at Permanently Shutdown Reactors

IP 71801: Decommissioning Performance and Status Review

IP 83750: Occupation Radiation Exposure Controls

IP 84750: Radioactive Waste Treatment, and Effluent and Environmental Monitoring

#### ITEMS OPEN, CLOSED, AND DISCUSSED

Open

99-02-01 URI Incorrect Control Room Habitability Information Submitted for UFSAR

Closed

97-09-01 URI Spent Fuel Building Ventilation System

Discussed

97-09-02 VIO Inadequate SFB Ventilation Design Controls

#### LIST OF ACRONYMS USED

ACR Adverse Condition Report

CAL Confirmatory Action Letter

CFH Certified Fuel Handler

CFR Code of Federal Regulations

CR Condition Report

CYAPCo Connecticut Yankee Atomic Power Company

DCF Dose Conversion Factor

DCR Design Change Request

DOC Decommissioning Operations Contractor

GDC General Design Criterion

HEPA High Efficiency Particulate

HN Haddam Neck

HP Health Physics

IFI Inspection Followup Item

IMAC Independent Management Assessment Committee

IR Inspection Report

JOC Joint Oversight Committee

LOCA Loss of Coolant Accident

mrem millirem

MRT Management Review Team

MYAPCo Maine Yankee Atomic Power Company

NCAT Nuclear Corporate Assessment Team

NOV Notice of Violation

NRC Nuclear Regulatory Commission

NSAB Nuclear Safety Assessment Board

NU Northeast Utilities

NURAB Northeast Utilities Radiation Assessment Branch

PDR Public Document Room

PORC Plant Operation Review Committee

QA Quality Assurance  
RCS Reactor Coolant System  
RP Radiation Protection  
RP&C Radiological Protection and Chemistry  
RWPs Radiation Work Permits  
RWST Reactor Water Storage Tank  
SAT Systems Approach to Training  
SFB Spent Fuel Building  
SFP Spent Fuel Pool  
SFPB Spent Fuel Pool Building  
SSCs Structures, Systems, and Components  
TEDE Total Effective Dose Equivalent  
TID Technical Information Document  
TS Technical Specifications  
UFSAR Updated Final Safety Analysis Report  
URI Unresolved Item  
USQ Unreviewed Safety Question