



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
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June 11, 2002

Mr. K. Heider  
Vice President - Operations and Decommissioning  
Connecticut Yankee Atomic Power Company  
362 Injun Hollow Road  
East Hampton, CT 06424-3099

SUBJECT: NRC INTEGRATED INSPECTION REPORT 50-213/02-001

Dear Mr. Heider:

On April 29, 2002, the NRC completed an inspection at the Haddam Neck Plant, which began on January 14, 2002. The findings of the inspection were discussed with Mr. Noah Fetherston, and others by telephone on April 29, 2002. The enclosed report presents the results of that inspection.

Your decommissioning operations, administration, self-assessment, and radiological controls programs were inspected during this fifteen-week period. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspectors. The programs were considered to be appropriately implemented. Areas that require further NRC review involve licensee-identified concerns regarding failure by two individuals to follow radiation protection procedures, and removal of radioactive material from a storage location without authorization. These concerns will be reviewed to assess extent of condition and implementation of corrective actions during future inspections.

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 J. J. Kottan Acting for/***

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. 50-213/02-001

cc w/encl:

Mr. K. Heider

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U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

Docket No.: 50-213

License No.: DPR-61

Report No.: 50-213/02-001

Licensee: Connecticut Yankee Atomic Power Company (CYAPCO)  
P. O. Box 270  
Hartford, CT 06141-0270

Facility: Haddam Neck Station

Location: Haddam, Connecticut

Dates: January 14, 2002 through April 29, 2002

Inspectors: Marie Miller, Sr. Health Physicist  
Laurie Peluso, Health Physicist  
John Wray, Health Physicist

Approved by: Ronald Bellamy, Chief, Decommissioning and Laboratory Branch (D&LB)  
Division of Nuclear Materials Safety (DNMS)

## EXECUTIVE SUMMARY

### Haddam Neck Station NRC Inspection Report No. 50-213/02-001

This routine inspection included aspects of licensee activities regarding dismantlement and decommissioning of the facility. The report covers a fifteen-week period of inspection by regional NRC personnel, and includes reviews and assessments of spent fuel pool safety, security enhancements, final status survey implementation, self-assessment, and radiation protection programs.

#### **Decommissioning Operations**

The licensee maintained an effective Spent Fuel Pool Chemistry Control program. Required samples were being taken at the prescribed times and chemistry parameters were being maintained within required limits. The Spent Fuel Pool Air Cleanup System was appropriately tested in accordance with industry standards and meets applicable leakage criteria.

The licensee successfully completed a test of the yard crane at 100% and 125% of rated capacity. This test of the single failure proof yard crane was required prior to transferring spent fuel from the spent fuel building to the Independent Spent Fuel Storage Installation (ISFSI).

Effective security enhancements continue to be in place since being implemented following the terrorist events of September 11, 2001.

#### **Decommissioning Status of Facilities and Equipment**

Dismantlement and removal of equipment and components continued to be conducted in a safe and efficient manner in accordance with work packages and release survey plans. The licensee continues to conduct its Final Status Survey Program. Any detectable radioactive material results are documented in the licensee's Corrective Action Program (CAP). The information will be used for final status survey decisions.

The licensee's License Termination Plan (LTP) contains cost estimates in support of the pending construction of the ISFSI. The methods in which the licensee administered the employee and safety concerns program were appropriate.

Management's performance to conduct reviews of self-assessments, audits, and corrective actions were effective and timely. The licensee maintained an effective condition reporting program to identify, resolve, and prevent problems that degrade safety or the quality of decommissioning. The licensee maintained an effective quality assurance audit program to identify strengths and programmatic weaknesses, and areas of declining performance.

## **Plant Support and Radiological Controls**

The licensee's exposure controls were effective. The radiation protection program was being followed, with a few isolated exceptions. While it appears that the recent radiological condition reports were caused by inadequate individual performance, the licensee had planned additional cultural and trend assessments to determine the extent of condition and the cause of recent significant condition reports. These condition reports related to concerns about (1) failure to follow radiation protection procedures and (2) removing radioactive material from a storage location without authorization. Two unresolved items will track the licensee's assessment of extent of condition and implementation of corrective actions.

The licensee had established an adequate program for tracking as low as reasonably achievable (ALARA) goals and objectives and radiation protection performance. The 2001 end of year ALARA summaries provided appropriate evidence to assess the program. ALARA goals and objectives were not exceeded during the year 2001.

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## **REPORT DETAILS**

### **Summary of Facility Activities**

The plant was maintained in a permanently shutdown condition during this inspection period. The spent fuel remains in storage in the spent fuel pool while the licensee plans for long-term storage of the spent fuel in dry casks onsite. Dismantlement and removal of major plant equipment and structures continued with removal of equipment from the primary auxiliary building and completion of dismantlement activities in the turbine building.

### **I. Decommissioning Operations and Spent Fuel Pool Safety**

#### **O1 Conduct of Operations**

##### **O1.1 Spent Fuel Pool Chemistry Controls and Routine Surveillances**

###### **a. Inspection Scope (60801)**

The inspector reviewed the licensee's spent fuel pool (SFP) chemistry program to determine adherence to technical specification (TS) and licensee commitments. Results of surveillances of the SFP Air Cleanup System were compared to TS requirements.

###### **b. Observations**

TS require the boron concentration in the SFP be maintained greater than 800 parts per million (ppm). The Technical Response Manual (TRM) specifies the frequency and limits for chlorides and fluorides which are controlled to reduce the potential for stress corrosion cracking of the spent fuel assemblies. The inspector reviewed with the senior Shift Fuel Handler (SFH) results of chemistry sampling for 2001. All TS required chemistry samples were taken within the prescribed time period and the data indicated that no fuel pool parameter limits were exceeded. No safety concerns were identified.

The TRM requires the Fuel Storage Building Air Cleanup System be operable during fuel movement or crane operation with loads over the storage pool. It also requires the system satisfy the in-place high efficiency particulate air filter leakage test, using dioctyl phthalate aerosol, and the bypass leakage test acceptance criteria of ANSI N510. The inspector reviewed records and verified that the system satisfied test criteria and that the tests were performed by trained and qualified personnel within the TS required time frames. No safety concerns were identified.

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

The licensee maintained an effective SFP Chemistry Control program. Required samples were being taken at the prescribed times and chemistry parameters were being maintained within required limits. The SFP Air Cleanup System was appropriately tested in accordance with industry standards and meets applicable leakage criteria.

## O1.2 Yard Crane Load Test

### a. Inspection Scope (71801)

TS 3.9.7 prohibits loads greater than 1800 pounds from traveling near or over fuel assemblies in the spent fuel pool unless such loads are handled by a Single-Failure-Proof-Handling System, which meets the criteria of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants", and NUREG 0554, "Single-Failure-Proof Cranes for Nuclear Power Plants." The licensee completed modifications to the yard crane in order to satisfy the criteria for a single failure system in anticipation of transferring spent nuclear fuel to the ISFSI. The inspector reviewed the licensee's procedure for testing the yard crane and examined test results.

### b. Observations

In anticipation of moving spent fuel from the spent fuel pool building to an ISFSI, the licensee was required to upgrade their existing yard crane to meet the single-failure-proof criteria of NUREG-0612 and NUREG 0554. The licensee plans to use the NAC Multi-Purpose Canister (NAC-MPC) System (Certificate No.1025) to transfer spent fuel assemblies from the SFP to an ISFSI. Combined weights of the NAC-MPC system components filled with spent fuel assemblies will be approximately 80 - 100 tons.

The inspector reviewed procedure 24265-500-V00-MJKG-G0154-02, "Field Acceptance Test for Hoist and Yard Crane Upgrades". The test was conducted on several dates in February and March 2002. The procedure required tests of the yard crane at the design load of 100 tons and at 125% of the design load (125 tons). The auxiliary hoist was tested at 100% and 125% of rated capacity which was 20 tons and 25 tons respectively. The inspector reviewed the results of the tests and verified that the acceptance criteria were satisfied. The cranes were able to lift the weights, traverse the length of the crane rails, hold the load for a specified time, and brake in an emergency. The test on the yard crane was conducted at 21 degrees Fahrenheit, which satisfies a cold weather requirement. No safety concerns were identified.

### c. Conclusions

The licensee successfully completed a test of the yard crane at 100% and 125% of rated capacity. This test of the single failure proof yard crane was required prior to transferring spent fuel from the SFP to the ISFSI.

## O1.3 Security

### a. Inspection Scope (71801)

Following the terrorist events of September 11, 2001, the licensee initiated enhanced security measures in accordance with their Security Plan and regulatory guidance, including the placement of additional vehicle barriers in the parking lot. In preparation for construction of the Vertical Concrete Cask (VCC) concrete pad, these barriers were moved. The inspector discussed with the security manager whether these barriers were evaluated regarding compliance to requirements and commitments.

### b. Observations and Findings

The inspector determined that the changes to the vehicle barriers to support the VCC pad construction in the parking lot were not required to be analyzed in accordance with the licensee's Security Plan. The inspector toured the site and noted that other required enhancements to the licensee's security plan and commitments were in place.

A review of the licensee's safeguards program was completed. The inspector discussed with security, operations, radiation protection, and emergency preparedness personnel controls in place between departments to respond to a security event. Based on these discussions and a review of site documents, the inspector concluded that inter-departmental procedures are adequate. No safety concerns were identified.

c. Conclusions

Effective security enhancements continue to be in place since being implemented following the terrorist events of September 11, 2001.

## **II. Decommissioning Status of Facilities and Equipment**

### **O2 Decommissioning Status of Facilities and Equipment**

#### **O2.1 Equipment Dismantlement**

a. Inspection Scope (71801)

The inspector evaluated the licensee's status of decommissioning work through discussions with cognizant licensee personnel and observations of major equipment dismantlement activities during the inspection period.

b. Observations and Findings

The licensee completed the dismantlement and removal of commodities from the primary auxiliary building (PAB) with the exception of the ventilation system (which provides purge for containment) and the isolated Aerated Drain Tank and Primary Drain Tank. The removal of equipment and commodities from the residual heat removal (RHR) system was challenging because of high levels of alpha contamination. The licensee completed the dismantlement and removal of commodities from the waste disposal building (WDB). The removal of equipment and commodities from the WDB was also challenging because of high levels of alpha contamination. The inspector observed the removal of the waste evaporator and identified no safety concerns. The inspector observed that the dismantlement activities were completed in a safe and effective manner.

The licensee also completed the dismantlement and removal of commodities from the turbine building (TB). The TB was controlled as a Radiologically Controlled Area (RCA) during demolition activities and was in the process of being surveyed for release from radiological controls at the conclusion of this inspection period. The inspector reviewed records of radiological surveys of commodities and personnel working in the TB during demolition. No safety concerns were identified.

The main transformer was removed, partially dismantled, and shipped offsite by barge. A special radiological release survey package was completed. The licensee encountered a problem while

loading the transformer onto the barge. The crane used to lift the transformer partially tipped over and caused a delay in the loading process. The transformer was not suspended at the time. The inspector reviewed the condition report generated to document the event and verified proper licensee response. No safety concerns were identified.

The licensee removed all reactor segmentation equipment from the containment building. This equipment included cavity bridge cranes, cutting tools, underwater electronic equipment, the A43 High Integrity Containers (HICs) used to store spent garnet, and various hoses and filters. At the end of the inspection period, the cavity was clear of commodities and the licensee was beginning gross decontamination of the cavity surfaces. No safety concerns were identified.

c. Conclusions

Dismantlement and removal of equipment and components continued to be conducted in a safe and efficient manner in accordance with work packages and release survey plans.

O2.2 Final Status Survey Program

a. Inspection Scope (71801)

The inspector reviewed the Final Status Survey (FSS) Program to determine the licensee's progress regarding the characterization, scoping, and final status surveys that have been performed. The inspector toured and discussed several survey areas, which included the area being prepared for the proposed ISFSI site, haul road, the burrow pit, the shooting range, and the landfill area. The inspector observed the licensee collect a soil sample from Survey Area 9523.

b. Observations and Findings

In November 2001, the licensee began conducting FSS with the knowledge that the License Termination Plan (LTP) continues to be under review by NRC. The licensee stated that FSS were completed for non-impacted Survey Areas 9526-000, 9528-000, and 9532. The licensee also conducted scoping surveys and collected soil samples in Survey Areas 9528-0001 and -0002. These survey areas are adjacent to and north of the haul road, which will be used to gain access to the proposed ISFSI site. The licensee cut down the trees that were along haul road to widen the road. The licensee left the roots, soil, and vegetation intact. Scoping surveys and soil samples will be performed prior to removal of the roots, soil, and vegetation.

The inspector reviewed the results of the surveys and soil samples collected from Survey Areas 9528-0001 and -0002. The licensee detected low levels of cobalt-60 (Co-60) in one discrete location of each survey area. The licensee collected additional soil samples. The results of the additional samples showed no detectable radioactive material for those locations. The licensee initiated condition reports for any detectable radioactive material and added this information to its 10 CFR 50.75(g) Decommissioning File.

The inspector discussed the licensee's plans for temporarily storing the soil, roots, rock, and vegetation from the haul road in the burrow pit, which is located in Survey Area 9524-0000. The material will be placed in separate groups according to classification. The burrow pit is a 61,600 square foot area of land with a sandy soil. The licensee plans to excavate and level the area, lay Geofabric as the interface, pack six inches of previously excavated sand onto the interface, and then place the material from the haul road on top of this prepared surface. The licensee does not

plan to place any material from the haul road in the solid waste storage area (Survey area 9535), the landfill area (Survey Area 9536), or the shooting range (Survey Area 9537).

The inspector observed the licensee collect a soil sample from Survey Area 9523, the Southeast Wetlands Area. The sample was collected according to procedure 24265-000-GPP-GGGR-R5102-002, "Collection of Surface and Subsurface Soil, Shoreline Sediment, Asphalt and Liquid Samples for Scoping and Characterization Surveys ". The licensee's procedure and sampling methods were adequate to collect soil samples.

c. Conclusions

The licensee continues to conduct its Final Status Survey Program. Any detectable radioactive material results are documented in the licensee's Corrective Action Program (CAP). The information will be used for final status survey decisions.

**O6 Operations Organization and Administration**

O6.1 Decommissioning, Planning and Cost Evaluations

a. Inspection Scope (36801)

The inspector reviewed the licensee's cost estimations in support of the pending construction of the ISFSI.

b. Observations and Findings

The inspector noted that the post-shutdown decommissioning activities report (PSDAR) was to be updated to reflect dry cask storage. However, the LTP contained cost estimates and financial plans, which included financial assurance for ISFSI-related costs. The LTP was submitted to NRC in accordance with 10 CFR 50.82(a)(8)(iii).

c. Conclusion

The licensee's LTP contains cost estimates as required in support of the pending construction of the ISFSI.

O6.2 Employee and Safety Concerns

a. Inspection Scope (36801)

The inspector interviewed the employee concerns program manager and reviewed the methods the licensee uses to resolve employee and safety concerns. The inspector evaluated availability and employee access to information regarding management resolution of safety concerns, use of the program, and feedback mechanisms.

b. Observations and Findings

The availability and employee access to information regarding management resolution of safety concerns was available through a response letter to concerned individuals. These letters restate

the concern, describe the investigation results, and discuss any applicable corrective actions. The concerns program is used by licensee and contractor employees for various employee or safety concerns. The concerns program encourages concerned individuals to complete a questionnaire to determine if the individual was satisfied with the manner in which the concern was processed and resolved.

c. Conclusion

The methods in which the licensee administered the employee and safety concerns program were appropriate.

**O7 Quality Assurance in Decommissioning**

O7.1 Management Reviews and Quality Independence

a. Inspection Scope (40801)

The inspector evaluated management's reviews of self-assessments, audits, and corrective actions, and the independence of the quality assurance organization to determine whether management oversight contributed to decommissioning safety. The inspector reviewed several self-assessments, audits, and corrective actions. Management Review Team (MRT) meetings were observed to assess management knowledge of plant performance, and to assess depth of questions and decisions made on Condition Reports (CRs), corrective actions, and recommendations. The organization chart and selected audit and surveillance reports were reviewed to determine independence, expertise, and critical evaluation of the auditors.

b. Observations and Findings

Procedural requirements involving management reviews and approvals contained the appropriate level of guidance to assure quality oversight and decommissioning safety. The inspector determined that management reviews of self-assessments, audits, and corrective actions were timely, identified generic or programmatic weaknesses, and resulted in improvements.

The MRT demonstrated a command of previous experiences and plant performance. Questions and decisions regarding CRs, corrective actions, and recommendations were critical and commensurate with the severity of the issue. The inspector discussed with several department managers methods for trending and tracking to ensure problems were being adequately dispositioned. Managers were aware of the condition reports assigned to them, and evaluated issues for possible trends. Trends were evaluated by both the assigned manager and the MRT.

The independence and authority of Nuclear Safety Oversight (NSO) was appropriate to assure management oversight contributed to decommissioning safety. Interviews with NSO and upper management, and a review of the organization chart, indicated that a direct line of communication exists between NSO and upper management.

The Quality Assurance (QA) Plan and selected audit and surveillance reports were reviewed to determine independence, expertise, and critical evaluation of the auditors. The auditors had sufficient qualifications and expertise to conduct audits and surveillances. Technical specialists were utilized to conduct audits of particular disciplines, thus maintaining objectivity and independence. The auditors were critical of the performance of the organization audited.

Problems and trends were identified and CRs were generated commensurate with the safety significance of issues. The auditors reviewed previous audits and determined whether corrective actions were effective and appropriate actions were taken.

c. Conclusions

Management's performance to conduct reviews of self-assessments, audits, and corrective actions were effective and timely.

O7.2 Identification, Resolution and Prevention of Problems

a. Inspection Scope (40801)

The inspector assessed the ability of the licensee to identify, resolve, and prevent problems that could degrade safety or the quality of decommissioning. The corrective action program was reviewed against the licensee's administrative control procedures, (ACP) 1.2-16.5 "Condition Resolution Program" and ACP 1.2-16.8 "Event Analysis" to determine procedure compliance and program performance. The inspector assessed the completion, effectiveness, and timeliness of the corrective actions. Several CRs were reviewed; however, the following CRs were highlighted based on significance level and/or apparent cause or common cause status.

- CR-01-0406, "Sr-90 in Mat Sump" (Apparent Cause CR)
- CR-01-0440, "Self-Assessment" (Common Cause CR)
- CR-02-0084, "Missing Vacuum"
- CR-02-0145, "Inappropriate response to ARM alarm"
- CR-02-0146, "HP technician not wearing lapel and/or not submitting lapel for analysis in accordance with Radiation Work Control Procedures"
- CR-02-0149, "Construction Supervisor failing to follow radiation protection procedures in accordance with Radiation Work Control Procedures"

b. Observations and Findings

The licensee identified problems and initiated CR's when events or situations that could compromise safety or quality arose. An average of fifteen CR's were generated a week with most of low safety significance. A low threshold was set so that any individual may initiate a CR. The inspector noted that the percentage of CRs generated by Bechtel staff had increased.

The licensee's ability to resolve problems and prevent problems from recurring was evidenced by the investigations conducted to identify contributing factors and the implementation of the corrective actions and recommendations. Licensee management interviewed personnel; reviewed associated documentation; verified operability and functionality of any structures, systems, or components important to safe decommissioning; reexamined the event, if necessary; determined if the concern was reportable; considered similar situations and generic implications; and devised and implemented preventive actions. The inspector noted that management focused its attention on significant conditions and monitored the progress of the corrective actions to determine effectiveness.

c. Conclusions

The licensee maintained an effective condition reporting program to identify, resolve, and prevent problems that degrade safety or the quality of decommissioning.

### O7.3 Quality Assurance Audits and Self-Assessments

#### a. Inspection Scope (40801)

The inspector reviewed selected NSO audits and departmental self-assessments to assess the effectiveness of the licensee's quality assurance audit program. Selected self-assessment reports from 2001 through 2002 were reviewed for the operations, maintenance, radiation protection, security, technical services, nuclear safety, and safety oversight departments. Selected Focused Evaluation Reports and Standard Evaluation Reports were also reviewed. The inspector reviewed the following audit reports:

- CY-01-A04-01, "Connecticut Yankee Spent Fuel Pool Island", dated January 17, 2002
- CY-01-A10-01, "Radiation Protection/Process Control Program and Radioactive Waste", dated June 16, 2001

#### b. Observations and Findings

The objective of the SFP Island audit was to ensure the safe storage of spent fuel and compliance with state and federal requirements. The audit scope included an assessment of operations, SFP makeup monitoring program, and conformance to regulatory documents. The SFP Island audit identified one finding, four deficiencies and six observations. The auditor identified a programmatic breakdown in the Bechtel Material Control and Procurement Process, a non-QA item, for the ISFSI Electrical Equipment Enclosure. The auditor determined that the problem was applicable for a safety-related piece of equipment, investigated the item, considered the matter a finding, initiated a significant condition level CR to correct the deficiencies, and evaluated and accepted the corrective actions.

The objective of the Radiation Protection (RP) audit was to ensure effective protection of plant personnel and the public from the hazards of radiation and radioactive materials. The audit scope included an assessment of procedures, training, exposure control, contamination control and the radioactive waste and shipping programs. The RP audit identified no findings, seven deficiencies, and five observations. The licensee was effective in incorporating industry experiences into the audit program to ensure effective implementation of similar work.

Both audits identified strengths and weaknesses in the SFP and RP programs. Where program deficiencies or safety concerns were identified, CRs were generated at the appropriate level of safety significance. The audits verified the status of previous audit issues, condition reports, and the self-assessment program.

#### c. Conclusions

The licensee maintained an effective quality assurance audit program to identify strengths and programmatic weaknesses, and areas of declining performance.

## **III. Plant Support and Radiological Controls**

## **R1 Radiological Protection Controls**

### **R1.1 External and Internal Exposure Controls**

#### **a. Inspection Scope (83750)**

The inspector reviewed controls for radiation exposure through observations of work activities, tours of the facility, interviews with personnel, and review of radiation work permits and radiation surveys. In addition, the inspector reviewed the following four radiological compliance condition reports:

- CR-02-0145, Shift Technician Response to Containment Area Radiation Monitor;
- CR-02-0146, Senior Health Physics (HP) Technician not wearing a lapel air sample and adequacy of personnel support surveys during reactor cavity work;
- CR-02-0149, Construction Supervisor Radiation Work Permit procedure adherence; and
- CR-02-0084, Loss of Radioactive Material related to loss of vacuum cleaner

The inspector discussed with Bechtel and licensee site and radiation protection management representatives the documented summaries of interviews with personnel who were involved in the events, reviewed applicable radiation work permits (RWPs), procedures and surveys to determine radiological safety significance, and discussed and observed implementation of initial corrective actions.

#### **b. Observations**

The inspector toured most of the radiological controlled areas, including containment, PAB, SFB, TB, WDB, and yard areas. All radiation areas and high radiation areas were posted and barricaded as required. All personnel were observed wearing personnel dosimetry, lapel air samplers, and protective clothing as required. Contamination controls and boundaries were in place and appropriately posted. The inspector noted that workers were aware of the requirements of their respective RWPs. However, there were four concerns that were licensee-identified that were reviewed by the inspector against the licensee's radiation protection program requirements.

With respect to CR-02-0145, on April 8, 2002, the HP shift technician directed a radiation worker to reset the reactor cavity bridge area radiation monitor (ARM) alarm without determining if there was a change in the actual dose rates in the area. A follow-up area radiation survey determined that the alarm was spurious. However, the action by the RP technician was not consistent with site radiation protection expectations. The licensee initiated an investigation and entered this concern as a significant condition report. Disciplinary action was taken, and a radiation protection standing order was drafted to document the specific actions to be taken in response to an unexplained ARM alarm. The inspector reviewed the radiological conditions associated with CR-02-145 and determined that the failure to confirm actual dose rates following the reactor cavity bridge ARM alarm constitutes a failure of minor safety significance not subject to formal NRC enforcement actions.

With respect to CR-02-0146, on April 8, 2002, the licensee notified the NRC that an internal investigation determined that during March 2002, and part of April 2002, a HP Senior Technician on several occasions did not wear a lapel air sampler and often did not submit lapel air samples for analysis for 18 of the 20 days while working in containment under RWP-2124. This RWP required,

in part, lapel air samplers for all personnel on the charging floor, as directed by Radiation Protection Supervision. The licensee restricted the technician's access to the RCA and initiated follow-up actions for a significant condition report. The technician resigned, when questioned by the licensee about his failure to follow RWP-2124. The inspector reviewed the radiological conditions associated with the above CR-02-0146 and a recent personnel contamination event, and agreed with the licensee's determinations that NRC radiological and licensee administrative dose limits were not exceeded. Airborne concentration levels in containment during March and April were very low and there were no significant intakes of radioactive material.

With respect to CR-02-0149, on April 10, 2002, a Construction Supervisor entered containment on RWP-2111 and attempted to prevent a HP technician from decontaminating and surveying an underwater light (dose rate of 2R/hr) that was to be removed from the reactor cavity and transferred in air to the transfer canal. If the survey had not been performed, this would have been a failure to comply with RWP-2124, which established requirements for reactor cavity clean-up, vacuuming, and support work, including surveying material to be removed from the cavity. Next, the supervisor proceeded to work in a contaminated area near the reactor cavity and subsequently became contaminated when he knelt down. Performing work in a contaminated area was a failure to comply with RWP-2111, which only authorized walk-downs, tours, and inspections. Further, after alarming portal monitors upon exiting containment, the supervisor started personnel decontamination activities without contacting Health Physics for support and evaluation of the contamination event, as required by the licensee's Radiation Work Control Program. The licensee restricted the individual's access to the RCA and initiated follow-up actions for a significant condition report. The inspector reviewed the radiological conditions associated with CR-02-0149, and determined that appropriate surveys had been performed and that the personnel contamination was of minor significance.

The inspector reviewed the follow-up actions completed for CR-02-0146 and 0149 at the time of the inspection and noted that additional audits, evaluations of ongoing work and an Apparent Root Cause evaluation were being conducted. The inspector observed the briefing of non-manual Bechtel workers regarding procedure compliance and noted that the licensee initiated field assessments to determine if the procedure compliance issues were pervasive. The licensee also stated that an independent audit to assess the cultural aspects of the organization regarding implementing the radiation protection requirements would be conducted. Based on the information to date, failure to comply with the requirements of RWP-2124 to wear a lapel air sampler on the charging floor and conducting work under RWP-2111 appears to be a failure to comply with Radiation Work Control Program, RPM 2.1. This item is unresolved pending the completion of the licensee actions and further NRC review. **(URI 2002-001-01)**

With respect to CR-02-0084, on February 25, 2002, Bechtel's subcontractor, DEMCO, noted that a four-gallon dry canister vacuum cleaner was not in the designated storage location where it had been stored on February 21, 2002. The licensee immediately initiated a search for the vacuum and conducted interviews. On the following day, a CR (CR-02-0084) was initiated. Detailed and systematic searches of the site were conducted by all departments for several weeks. On March 27, 2002, the vacuum was officially declared missing and the CR was upgraded to a significant condition. The licensee conducted an evaluation of relative contamination levels in the area where the vacuum was used and estimated that the vacuum contained a quantity of licensed material greater than ten times the quantity specified in 10 CFR 20 Appendix C, but less than 1000 times that quantity. On April 04, 2002, the licensee made a telephone report to the NRC per the requirements of 10 CFR 20.2201(a)(1)(ii) and reported the vacuum missing.

The inspector reviewed the licensee's follow-up actions completed at the time of the inspection. The inspector noted that additional searches, including a search at the offsite waste processing facility and in contaminated areas within the RCA, and an Apparent Root Cause evaluation were being conducted. Based on the information to date, the licensee has not yet been able to locate the vacuum and the potential exists that radioactive material was removed from the designated storage location without authorization per the requirement of 10 CFR 20.1801. This item is unresolved pending the completion of the licensee's actions and further NRC review. **(URI 2002-001-02)**

c. Conclusions

The licensee's exposure controls were effective. The radiation protection program was being followed, with a few isolated exceptions. While it appears that the recent radiological condition reports were caused by inadequate individual performance, the licensee had planned additional cultural and trend assessments to determine the extent of condition and the cause of recent significant condition reports. These condition reports related to concerns about (1) failure to follow radiation protection procedures and (2) removing radioactive material from a storage location without authorization. Two unresolved items will track the licensee's assessment of extent of condition and implementation of corrective actions.

R1.2 End of Year ALARA Summaries

a. Inspection Scope (83750)

The inspector reviewed the licensee's ALARA goals and objectives for 2001 to determine the adequacy of tracking performance of the radiation protection program. The inspector reviewed the licensee's Personnel Contamination Event Summary, Internal Dosimetry Assessment Summary, and Overall Dose Goals versus Dose Projections and Actual Dose Summary.

b. Observations and Findings

Regarding the 2001 Personnel Contamination Event Summary, the licensee compared the number of skin contamination events to the total number of personnel contamination events (shoe, clothing, etc.) based on 1000 Radiation Work Permit hours (RWP-Hrs) over a period of one year. The results show that a small fraction of the total number of personnel contamination events were skin contaminations. The inspector discussed the skin contamination events with the licensee and determined that these events were of minor risk significance and that CRs were generated, as appropriate.

Regarding the 2001 Internal Dosimetry Assessment Summary, the licensee compared the number of positive whole body counts to the total number of whole body counts performed over a period of one year. The results show no positive whole body counts, which would result in a committed dose greater than 50 millirem.

Regarding the 2001 Overall Dose Goals versus Dose Projections and Actual Dose Summary, the licensee compared the dose projections to the actual doses for dose-significant jobs over a period of one year. Thirteen jobs were assessed, six were containment jobs and seven were primary auxiliary building and waste disposal building jobs. The actual dose total for all the jobs was below the overall dose goal. In accordance with TS 6.7.1, the licensee submitted its annual occupational

radiation exposure report for 2001. The occupational exposure of all plant personnel totaled approximately 100 rem for 2001.

Based on the scope of all work for the entire decommissioning project, the licensee's projected doses to date are approximately 963 rem, compared to an actual dose expended of approximately 565 rem.

c. Conclusion

The licensee had established an adequate program for tracking ALARA goals and objectives and radiation protection performance. The 2001 end of year ALARA summaries provided appropriate evidence to assess the program. ALARA goals and objectives were not exceeded during the year 2001.

**V. 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 manager and others on April 29, 2002. 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 February 19, 2002, an NRC inspector attended the Community Decommissioning Advisory Committee (CDAC) meeting. The meeting was open for public participation, with an audience of approximately 20 people. During the meeting, NRC discussed the results of inspection 2001-003.

## PARTIAL LIST OF PERSONS CONTACTED

- J. Allen, Project Manager, Duratek
- \* J. Bourassa, Safety Oversight Manager
- M. Cavanaugh, Communications Manager
- E. Darois, Health Physicist, Bechtel
- \* S. Day, Regulatory Affairs
- J. DeLawrence, Technical Support Specialist
- D. Dodge, Core Health Physics Technician, Bechtel
- D. Drulard, Site Construction Manager, Bechtel
- H. Farr, Radiological Engineer, Bechtel
- \* N. Fetherston, Site Manager
- M. Firsick, Connecticut DEP
- K. Gavin, Project Field Engineer, Bechtel
- R. E. Gault, Radiation Protection Specialist
- \* K. Heider, Vice President Operations and Decommissioning
- K. Jackson, Assistant Project Manager, Bechtel
- R. Johnson, Site Manager, Bechtel
- S. Litterer, Health Physics Operations Manager, Bechtel
- \* J. Lynch, Construction Oversight Manager
- J. McCarthy, Site Radiological Release Supervisor, Bechtel
- \* R. McGrath, HP and Waste Oversight Manager
- W. McConnell, Assistant Waste Manager, Bechtel
- D. Montt, Chemistry Oversight
- \* R. Mitchell, Unit Manager
- F. Perdomo, Regulatory Affairs
- M. Powers, Construction Oversight
- \* R. Prunty, Licensing, Bechtel
- D. Roberson, Health Physics Supervisor, Bechtel
- \* E. Sergent, Nuclear Safety
- \* E. Shyloski, Project Manager, Bechtel
- \* J. Tarzia, Radiation Protection and Chemistry Manager, Bechtel
- R. Vallem, Waste Management Supervisor, Bechtel
- \* G. van Noordennen, Regulatory Affairs Manager
- \* S. Webster, Licensing, Bechtel
- A. Yates, Chemistry Supervisor

\*Denotes attendance at the telephonic exit meeting held on April 29, 2002.

### INSPECTION PROCEDURES USED

IP 36801 Organization, Management, and Cost Controls at Permanently Shutdown Reactors  
IP 40801 Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors  
IP 60801: Spent Fuel Pool Safety at Permanently Shutdown Reactors  
IP 71801: Decommissioning Performance and Status Review at Permanently Shutdown Reactors  
IP 83750: Occupation Radiation Exposure Controls

### ITEMS OPEN, CLOSED, AND DISCUSSED

#### Open

2002-001-001	URI	Failure to follow radiation protection procedures.
2002-001-002	URI	Radioactive material was removed from the designated storage location without authorization per the requirement of 10 CFR 20.1801.

#### Closed

NONE

#### Discussed

NONE

## LIST OF ACRONYMS USED

ACP	Administrative Control Procedures
ALARA As Low As Reasonably Achievable	
ARM	Area Radiation Monitor
CAP	Corrective Action Program
CDAC	Community Decommissioning Advisory Committee
CFR	Code of Federal Regulations
CR	Condition Report
CY	Connecticut Yankee
CYAPCO	Connecticut Yankee Atomic Power Company
D&LB	Decommissioning and Laboratory Branch
DNMS	Division of Nuclear Materials and Safety
FER	Focused Evaluation Report
FSS	Final Status Survey
HP	Health Physics
ISFSI	Independent Spent Fuel Storage Installation
LER	Licensee Event Report
LTP	License Termination Plan
MRT	Management Review Team
NAC-MPC	NAC Multi-Purpose Canister
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NSO	Nuclear Safety Oversight
PAB	Primary Auxiliary Building
ppb	parts per billion
ppm	parts per million
PSDAR	post-shutdown decommissioning activities report
QA	Quality Assurance
RCA	Radiologically Controlled Area
RCRA	Resource Conservation and Recovery Act
REMODCM	Radiological Effluent Monitoring and Offsite Dose Calculation Manual
RP	Radiation Protection
RWP	Radiation Work Permit
RG	Regulatory Guide
RHR	Residual Heat Removal System
RP	Radiation Protection
SER	Standard Evaluation Reports
SFH	Shift Fuel Handler
SFP	Spent Fuel Pool
TB	Turbine Building
TRM	Technical Requirements Manual
TS	Technical Specifications
UFSAR Updated Final Safety Assessment Report	
URI	Unresolved Item
VCC	Vertical Concrete Casks
WDB	Waste Disposal Building