



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

March 20, 2002

Mr. Kenneth Heider, Vice President
Operations and Decommissioning
Yankee Atomic Electric Company
49 Yankee Road
Rowe, Massachusetts 01367

SUBJECT: NRC INSPECTION REPORT NO. 50-029/2001-003

Dear Mr. Heider:

On February 15, 2002, the NRC completed an inspection at your nuclear reactor facility in Rowe, Massachusetts which covered an inspection period that began on October 1, 2001. The findings of the inspection were discussed with Mr. Brian Wood and members of his staff on February 14, 2002. The enclosed report presents the results of that inspection.

Your radiation protection, radioactive waste shipping, employee concerns, and emergency preparedness programs were inspected during this twenty-week inspection period. In addition, training and qualifications of personnel, and your response to NRC Security Advisories and a Safeguards Confirmatory Action Letter dated October 26, 2001, were reviewed. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector. Improvements in site security were made in response to the security advisories and effective programs for shipping radioactive waste were noted. However, there was one self-identified instance where the radiation protection program was not being fully implemented.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred during this inspection period. This violation involved dose rates beyond your restricted area fence in excess of 10CFR20.1301 limits to members of the public. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or severity level of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with Section 2.790 of the NRC's "Rules and Practices," Part 2, Title 10, Code of Federal Regulations, 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.

Mr. K. Heider

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Sincerely,

/RA/

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

Docket No. 05000029
License No. DPR-03

Enclosure: NRC Region I Inspection Report No. 50-029/2001-003

cc w/encl:

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B. Woods, Site Manager

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T. Rapone, Massachusetts Executive Office of Public Safety

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Citizens Awareness Network

Commonwealth of Massachusetts, SLO Designee

State of Vermont, SLO Designee

Mr. K. Heider

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No. 05000029

License No. DPR-03

Report No. 50-029/2001-003

Licensee: Yankee Atomic Electric Company
580 Main Street
Bolton, Massachusetts 01740-1398

Facility Name: Yankee Nuclear Power Station

Location: Rowe, Massachusetts

Dates: October 1, 2001 to February 15, 2002

Inspectors: John Wray, Health Physicist

Approved by: Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety, RI

EXECUTIVE SUMMARY

Yankee Facility
NRC Inspection Report No. 50-029/2001-003

Inspections were conducted to determine whether the decommissioning activities carried out at the Yankee Rowe facility were conducted safely and in accordance with NRC requirements. This report covers a twenty week period of inspection. Areas reviewed included the radiation protection, radioactive waste shipping, employee concerns, emergency preparedness programs as well as training and qualifications of personnel, and your response to NRC Security Advisories and a Safeguards Confirmatory Action Letter dated October 26, 2001. The inspector noted effective programs for shipping radioactive waste and self identifying concerns. Improvements in site security were made in response to the security advisories.

Operations and Decommissioning Status

The licensee maintained General Employee Training (GET), radiation worker, and Certified Fuel Handler (CFH) training up-to-date. Adequate on the job training (OJT) for Vertical Concrete Cask (VCC) movement was observed. Qualifications of personnel were commensurate with their responsibilities.

The licensee maintained an adequate Employee Concerns Program where workers can raise health and safety issues to management in a harassment free workplace. The inspector verified that concerns were reviewed by appropriate levels of management, investigated thoroughly, and closed in a timely manner.

The licensee established an adequate program to maintain the operability of systems and equipment important to safety during the cold weather season.

Timely and effective security enhancements required by NRC Safeguards Advisories and affirmed in a Confirmatory Action Letter dated October 26, 2001, were implemented.

The licensee conducted an adequate exercise in accordance with the defueled emergency preparedness exercise.

Plant Support and Radiological Controls

The licensee has generally provided good controls to limit exposures of workers to external and internal sources of radiation. However, one instance in which dose rates in an unrestricted area exceeded 10CFR20.1301 limits was identified.

The licensee maintained an effective radioactive material shipping program in compliance with regulatory requirements.

The licensee's QA and oversight program with regard to the radiation protection and chemistry programs was effectively implemented.

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REPORT DETAILS

Summary of Facility Activities

Decommissioning activities at the Yankee Rowe Nuclear Power Station continued under the approval granted through a letter from the NRC (reference correspondence, dated October 28, 1996, from Mr. Morton Fairtile to Mr. James Kay).

I. Operations and Decommissioning Status

O1 Conduct of Operations

O1.1 Organization, Staffing and Qualifications

a. Inspection Scope (36801)

The inspector reviewed the licensee's site organization, staffing, and qualifications to determine whether the licensee and contractor organization, staffing, and qualifications were in accordance with regulatory requirements.

b. Observations

The licensee's General Employee Training (GET), Radiation Worker, and Certified Fuel Handler (CFH) training records for selected licensee and contractor personnel (both management and technician) were examined. Records for site personnel were adequately administered and maintained. The inspector verified that the CFH retraining program included retraining senior operations staff in training techniques. Because moving fuel is a task performed infrequently, qualifications will require a separate week-long training given to the specific crew just prior to the actual work. No safety concerns were identified.

The inspector observed on the job training (OJT) and classroom training conducted for workers implementing procedure OP-2963, "VCC Movement". The training was appropriately detailed and the class was able to safely demonstrate moving the vertical concrete cask as required. The inspector also reviewed the Yankee Rowe Dry Cask Storage Lesson Plan. This plan specified training objectives for handling the transfer cask. No safety concerns were identified.

The inspector reviewed qualifications for selected licensee and contractor CFHs and radiation protection technicians. The licensee and contractor maintain adequate matrices to ensure personnel are trained for their responsible tasks. Organization charts and staffing numbers were examined. The inspector was informed that additional contractor supervision and licensee oversight personnel will be added to the existing work force prior to fuel movement. The inspector reviewed qualifications of personnel added to the site organization during this inspection period and stated that radiation protection performance will continue to be evaluated during future inspections.

The licensee completed a Quality Surveillance of the contractor training program in October 2001. The inspector reviewed QSR 01-045-YR, FTOC Training Program Assessment and determined that the audit was comprehensive and thorough. Appropriate findings were

documented and brought to the appropriate level of management for resolution. No safety concerns were identified.

c. Conclusions

The licensee maintained GET, radiation worker, and CFH training up-to-date. Adequate OJT for VCC movement was observed. Qualifications of personnel were commensurate with their responsibilities.

O1.2 Employee Concerns Program

a. Inspection Scope (36801)

The inspector evaluated methods used by the licensee to resolve employee concerns and assessed the licensee's effectiveness at identifying and resolving personnel issues which could lead to problems adverse to public health and safety.

b. Observations

The inspector reviewed the licensee's Employee Concerns Program Manual and discussed the Employee Concerns Program with cognizant representatives. The program provides a number of ways employees can anonymously raise health and safety issues to management's attention including a telephone Alertline available 24 hours a day, seven days a week. A letter dated June 1, 2001, from the President and Chief Executive Officer of the company reaffirms its continuing commitment to maintaining a harassment free workplace. The inspector observed locations on site where material relevant to employee concerns was posted. Names of contacts and telephone numbers were readily available. The inspector discussed the program with selected licensee and contractor personnel and determined that workers were aware of their rights to raise concerns to management and to the NRC if they believe that management did not adequately address their concerns.

The inspector reviewed records of tracking and resolution of employee raised health and safety concerns. The licensee has directed adequate resources to investigations and has closed employee concerns in a timely manner. No safety issues were identified.

c. Conclusions

The licensee maintained an adequate Employee Concerns Program where workers can raise health and safety issues to management in a harassment free workplace. The inspector verified that concerns were reviewed by appropriate levels of management, investigated thoroughly, and closed in a timely manner.

O1.3 Station Freeze Protection Program

a. Inspection Scope (71714)

The inspector evaluated the licensee's preparations to maintain the operability of those systems and equipment important to safety during the cold weather season.

b. Observations

The inspector reviewed preventive maintenance and operations procedures, checklists and the schedule for weekly tests and checks of the equipment. The inspector observed a licensee representative conduct a required surveillance and discussed the process to resolve as-found deficient conditions. Unit heaters deployed in building areas to maintain adequate ambient temperatures were observed. The inspector verified that heat trace was energized where required. No safety concerns were identified.

c. Conclusions

The licensee established an adequate program to maintain the operability of systems and equipment important to safety during the cold weather season.

O1.4 Miscellaneous Security Related Activities

a. Inspection Scope (71801)

The inspector reviewed enhanced security measures and evaluated compliance to requirements and commitments.

b. Observations and Findings

On October 12, 2001, a safeguards advisory was issued to communicate certain actions necessary to enhance safety and safeguards at NRC licensed facilities. This advisory supplemented the Information Assessment Team (IAT) Advisory Update issued October 6, 2001. In addition, a Confirmatory Action Letter (CAL) was issued by Region I on October 26, 2001, to affirm discussions of safeguard enhancements agreed to by the licensee. During this inspection, the inspector verified that all applicable actions of the Advisories and the CAL were implemented as required and operational.

c. Conclusions

Timely and effective security enhancements required by NRC Safeguards Advisories and affirmed in a CAL dated October 26, 2001, were implemented.

O1.5 Evaluation of Defueled Emergency Preparedness Exercise

a. Inspection Scope (71801)

The inspector observed and evaluated the licensee's defueled emergency preparedness exercise and self-critique to assess the licensee's implementation of their Emergency Preparedness program and procedures.

b. Observations and Findings

The inspector reviewed the implementation of the exercise by reviewing specific activities in the Control Room and the Technical Support Center (TSC). The inspector observed that the shift organization had sufficient knowledge of the emergency and operations procedures and performed the required emergency functions, including emergency assessment, classification, and notification for activation of the defueled emergency response organization. In addition, the inspector discussed with the Operations Shift Manager the assessment and classification scheme for emergency classification.

The TSC was activated and staffed in accordance with the response timeliness goals and performed the emergency functions of radiological dose assessment, dispatch of a search and rescue team, and communications. The Emergency Director received periodic briefings from his key managers, however, sometimes updates were given to a senior licensee representative who, at the time, had not yet become the Emergency Director. Adequate communications was observed to ensure health and safety of plant personnel and the public.

The inspector observed the licensee's player and controller critique following the exercise. The inspector found that the licensee's self-assessment was very thorough and noted that the licensee identified the same issues that were observed by the NRC. All licensee exercise objectives were met. The exercise involved offsite safeguards personnel from the Massachusetts State Police. Good information exchange was noted between the licensee and state security personnel.

c. Conclusions

The licensee conducted an adequate exercise in accordance with the defueled emergency preparedness exercise.

II. Plant Support and Radiological Controls

R1 Radiological Protection Controls

R1.1 Occupational Exposure Controls

a. Inspection Scope (83750)

The inspector reviewed the licensee's program to determine capability to monitor and control radiation exposure to employees and to determine adequacy of the licensee's radiation

protection program under various conditions. The inspection consisted of observations and interviews with selected radiation protection supervisors and staff.

b. Observations

The inspector reviewed significant work activities in the Radiologically Controlled Area (RCA) periodically during this inspection period, including the fuel reconstitution work and the removal of Greater Than Class C (GTCC) equipment from the Spent Fuel Pool (SFP) and the repairs to Tank-81.

In order to consolidate the number of fuel assemblies and total fuel rods to be stored in canisters at the Independent Spent Fuel Storage Installation (ISFSI), the licensee completed a campaign to reconstitute intact and partial fuel rods from previous reconstitution efforts. Damaged rods from eight fuel assemblies and miscellaneous cages, stainless steel tubes, and storage containers were transferred to the Reconfigured Fuel Assembly (RFA). The RFA held the equivalent of approximately 60 fuel rods at the end of the project. The radiation protection department estimated that this work would consume approximately 3.8 person-rem of exposure based on effective dose rates in the work area of 1.0 to 2.0 mR/hr. The job was expected to take approximately 3700 man-hours to complete. Effective preplanning and ALARA controls reduced the effective dose rates in the work area to 0.07 to 0.5 mR/hr and the total time expended to complete the job was approximately 1600 man-hours. This resulted in a project exposure of 0.670 person-rem. In addition, the job was completed with only four personnel contaminations which resulted in insignificant additional personnel exposure. The inspector stated that effective controls were used to control exposures on fuel reconstitution.

Part of the waste water processing system includes a 20,000 gallon tank (Tk-81), which collects waste water and feeds the propane fired evaporator. Evaporator bottoms are collected and shipped to a licensed burial facility in a High Integrity Container. Distillate is collected and temporarily stored in two 5000 gallon tanks and discharged to the environment through radiation detection equipment via the Auxiliary Service Water system. In order to repair a leaking flange gasket in Tk-81, the tank was drained. A routine radiation survey on December 4, 2001, indicated elevated dose rates along the east restricted area boundary (for approximately 13 feet). One level of 5 mR/hr was detected at the fence line, outside the posted radiation area and dose rates up to 2.2 mR/hr were identified approximately 5 feet beyond the fence in an unrestricted area accessible to the public. This condition lasted for approximately 30 to 36 hours. When the elevated dose rates were discovered, the licensee immediately initiated an investigation. A significant condition report was written and a root cause analysis was started. A detailed survey was performed and the proper posting and controls were established. Since repairs to Tk-81 were already in progress, the licensee decided to continue work activities to hasten refilling of the tank. The repair work was completed with no further discrepancies.

The inspector observed the postings and controls put into effect after discovery of excessive dose rates in the unrestricted area. The area outside the fence, although accessible to the public, is remote and difficult to access. The inspector reviewed logs and discussed this event with licensee personnel including security patrols who conduct surveillances of the site boundary. The inspector determined that no one entered the unposted, uncontrolled radiation area in the unrestricted area during this 30 to 36 hour time period. However, the inspector stated that dose rates in excess of 2mR/hr for greater than one hour in areas accessible to the

public is a violation of 10CFR20.1301. However, because of the low safety significance and the timeliness and effectiveness of the licensee's corrective actions, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy (**NCV 50-029/2001-003-01**).

The inspector reviewed calendar year 2001 site exposures. The licensee established an original dose goal for 2001 of 27 person-rem. This figure was based on the assumption that fuel would be transferred from the SFP to the ISFSI in 2001. When this did not occur, the licensee reestablished the site exposure goal to 8.5 person-rem based on the actual work load. The final tally of site exposure was 3.9 person-rem. Most of the dose savings was attributable to the performance of the fuel constitution work discussed above. However, the inspector also noted good performance in the GTCC sorting project (0.8 person-rem expended vs. 1.2 person-rem goal) and radiation protection support activities (1.0 person-rem expended vs. 1.8 person-rem goal).

The inspector reviewed results of whole body counts, personnel contamination reports, and individual radiation exposure records for 2001. No internal uptakes of radioactive material were identified. Individual exposures were maintained below regulatory limits. Doses to the skin and whole body from personnel contamination events were appropriately calculated and assigned correctly to the individual's official dose record. No safety concerns were identified.

c. Conclusions

The licensee has generally provided good controls to limit exposures of workers to external and internal sources of radiation. However, one instance in which dose rates in an unrestricted area exceeded 10CFR20.1301 limits was identified.

R1.2 Radioactive Waste and Transportation

a. Inspection Scope (86750)

The inspector reviewed selected records of radioactive waste shipments for the calendar year 2001 to determine compliance to NRC and Department of Transportation regulations.

b. Observations

The licensee made 54 shipments of radioactive material in the year 2001. The licensee made 44 of these shipments and the onsite waste contractor made 10 at the end of the year after assuming waste shipment responsibilities. Most of the shipments were for transferring trash, laundry, or waste samples. There was one shipment of contaminated filters which contained a total of 0.6 curies of activation and fission products and a shipment of two Cs-137 sealed calibration sources returned to J. L. Shepherd which contained 0.2 curies total activity. These two shipments represented approximately 90% of the total activity shipped from the site last year.

The inspector randomly selected seven radioactive waste shipment packages to determine compliance to regulatory requirements. These packages included shipments of mixed wastes,

dewatered resins, and radioactive trash. The inspector reviewed package dose rate survey data, radioactive material labeling, total activity, nuclide distributions, manifests, hazard waste classification, 10CFR61 documentation, and final truck surveys where applicable. Documentation satisfied regulatory requirements. No safety concerns were identified.

c. Conclusions

The licensee maintained an effective radioactive material shipping program in compliance with regulatory requirements.

R7 Quality Assurance (QA) in RP&C Activities

R7.1 Quality Assurance Audits and Quality Control Activities

a. Inspection Scope (40801)

The inspection consisted of a review of the Quality Assurance Audit of the Radiation Protection and Chemistry programs and selected surveillances of radiation protection activities.

b. Observations and Findings

The inspector reviewed QA Audit Y-01-A11-01, Radiation Protection/Radioactive Waste/Process Control Program/Chemistry Program and REMP/Radioactive Effluent Control Program Audit. The licensee audit team members identified a number of findings/deficiencies and made some observations for improved performance. The scope and technical depth of the audit was sufficient to appropriately identify weaknesses in the radiation protection program. None of the identified deficiencies were significant with respect to impact on the public health and safety, or the environment. No safety concerns were identified.

The inspector reviewed selected surveillance reports conducted by the licensee's oversight group and the contractor QA department. Surveillances of fuel reconstitution work, GTCC sorting equipment removal, and effectiveness of route cause determinations of previous condition reports were examined. The surveillances were comprehensive and thorough. A matrix of recommendations was maintained to ensure proper resolution. The progress of recommendations is monitored by management on a routine basis. No safety concerns were identified.

c. Conclusions

The licensee's QA and oversight program with regard to the radiation protection and chemistry was effectively implemented.

III. MANAGEMENT MEETINGS

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management periodically during the inspection, and during an exit meeting with Mr. B. Wood and others on February 14, 2002. The licensee acknowledged the findings presented by the inspectors. The inspector reviewed with the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

X2 Management Meetings

Senior licensee representatives met with Region I staff and management and staff from NRR on January 10, 2002, in the Region I office. The meeting was open to the public. The state offices of Massachusetts and Connecticut were linked to the meeting by telephone. Recent decommissioning activities were discussed for Yankee Rowe including site safety performance, security enhancements, and dry fuel storage project status including fuel transfer preparations and ISFSI activities. A copy of the licensee's handout is enclosed.

PARTIAL LIST OF PERSONS CONTACTED

- *G. Babineau, Safety Oversight Manager
- *W. Blackadar, DE&S, Radiation Protection Oversight
 - R. Dee, NAC, Scheduler
 - S. Garvie, Security Supervisor
- *E. Heath, Asst. Safety Oversight Manager
- K. Heider, Vice President, YAEC
- *F. Helin, NAC, Site Project Manager
- *B. Holmgren, Dry Cask Storage Oversight Manager
- *J. Kay, Manager of Regulatory Affairs
 - C. Lloyd, Lead QA Engineer
 - K. LaDuke, QA Auditor
 - D.R. LeFranois, NAC, Site Engineering Manager
 - J. McCumber, DE&S, YAEC Oversight
 - T. Osterhoudt, NAC, Operations Manager
- *C. Palmer, NAC, Health Physics Manager
- *S. Racz, DE&S, Quality Assurance Supervisor
- *N. Rademacher, NAC, Site QA Manager
 - J. Rucki, NAC, Operations Supervisor
- *B. Sklar, NAC, Plant Services Manager
- *L. Tremblay, NAC, Licensing & Contracts manager
- *M. Vandale, Radwaste Supervisor, DE&S
 - F. Williams, Plant Superintendent
 - M. Williams, Framatone, Fuel Handling Operations Manager
- *B. Wood, Site Manager

* These individuals participated in the exit briefing held on February 14, 2002

LIST OF ACRONYMS

CAL	Confirmatory Action Letter
CFH	Certified Fuel Handler
CFR	Code of Federal Regulations
GET	General Employee Training
GTCC	Greater Than Class C
IAT	Information Assessment Team
ISFSI	Independent Spent Fuel Storage Installation
NCV	Non-Cited Violation
NRR	Nuclear Reactor Regulation
OJT	On the Job Training
PDR	Public Document Room
QA	Quality Assurance
RCA	Radiologically Controlled Area
REMP	Radiological Environmental Monitoring Program
RFA	Reconfigured Fuel Assembly
SFP	Spent Fuel Pool
TSC	Technical Support Center
VCC	Vertical Concrete Cask

INSPECTION PROCEDURES USED

IP 36801	Organization, Management & Cost Controls
IP 40801	Self-Assessment and Corrective Action
IP 71714	Cold Weather Preps
IP 71801	Decommissioning Performance
IP 83750	Occupational Radiation Exposure
IP 86750	Solid Radwaste Management & Transportation

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

2001-003-01 NCV Dose rates at fence exceeded 10CFR20.1301 limits

Closed

2001-003-01 NCV Dose rates at fence exceeded 10CFR20.1301 limits

Discussed

NONE