U.S. NUCLEAR REGULATORY COMMISSION
Region I

Report No.: 50-29/89-01

Docket No.: 50-29

License No.: DPR-3

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

Facility Name: Yankee Nuclear Power Station

Inspection at: Rowe, Massachusetts

Inspection Conducted: January 18, 1989 - February 27, 1989

Inspectors: Harold Eichenholz, Senior Resident Inspector
Michael T. Markley, Resident Inspector

Approved By: Donald R. Haverkamp 3/29/89
Donald R. Haverkamp, Chief Date
Reactor Projects Section No. 3C
Division of Reactor Projects

Inspection Summary: Inspection on January 18, 1989 - February 27, 1989
Report No. 50-29/89-01

Areas Inspected: Routine onsite regular and backshift inspection by resident inspectors. Areas inspected included licensee actions on previous inspection findings, operational safety verification, radiological controls, events requiring telephone notification of the NRC, plant events, maintenance observations, surveillance observations, on-site review committee activities, and plant information reports.

Results: No violations were identified by the inspector. One unresolved item was identified regarding the operability and reportability of the control room ventilation system (Section 13).

Licensee performance during the inspection period was good. Licensee management routinely demonstrated involvement in daily activities. Personnel were observably conscientious in performing their duties and responding to plant events.

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DETAILS

1. Persons Contacted

Yankee Nuclear Power Station

N. St. Laurent, Plant Superintendent
T. Henderson, Assistant Plant Superintendent
R. Mellor, Technical Director

The inspector also interviewed other licensee employees during the inspection, including members of the operations, radiation protection, chemistry, instrument and control, maintenance, reactor engineering, security, training, technical services and general office staffs.

2. Summary of Facility and NRC Activities

At the start of the inspection period on January 18, 1989, the licensee had completed core XX refueling and was at 43% of rated power. While increasing load to full power, an unanticipated increase in turbine load occurred due to problems with the governor speed controller. On February 8, 1989, after an emergency load reduction to repair a leaking feed control valve, the governor speed controller was repaired. Reactor power was increased and the plant was placed on the grid on February 9, 1989. These events are described in Section 7 of this inspection report.

Resident inspection activities were conducted during both normal and backshift working hours for approximately 146 and 20 hours, respectively. In addition, deep backshift inspection was conducted from 8:30 a.m. to 4:30 p.m. on January 21, 1989, from 10:00 p.m. on February 1, 1989 to 3:00 a.m. on February 2, 1989, from 8:15 a.m. to 12:15 p.m. on February 4, 1989 and from 11:30 a.m. to 2:30 p.m. on February 19, 1989.

On January 27, 1989, an Enforcement Conference was held in the NRC Region I office regarding non-conservative nuclear instrumentation gain adjustments (Inspection Report No. 50-29/88-25).

3. Licensee Action of Previous Inspection Findings

(Closed) Inspector Follow Item 50-29/87-06-02: Review results of metallurgical examination of cracked main coolant stop valve discs. During the 1987 refueling outage, cracks were discovered on both discs of the loop two cold leg stop valve. The inspector reviewed Yankee Nuclear Services Division memorandum PED 482/88, dated December 8, 1988, which documented the vendor's (Westinghouse) disc failure analysis findings. The cause of the cracking was a combination of high residual fabrication stresses and possible fabrication anomalies, and long-term embrittlement. This issue is discussed further in Section 18 of Inspection Report No. 50-29/88-22.

This item is closed.

(Closed) Unresolved Item 50-29/88-22-03: Verify that relocated hanger conforms to system design requirements. The current configuration of pressurized surge line hanger CRB-H29 was analyzed by a vendor as part of the 1983 Systematic Evaluation Program. The inspector reviewed the licensee evaluation of the hanger relocation and identified no problems.

This item is closed.

4. Operational Safety Verification

a. Daily Inspection

During routine facility tours, the following items were checked: shift manning, access control, adherence to procedures and limiting conditions for operation, instrumentation, recorder traces, protective systems, control rod positions, containment temperature and

pressure, control room annunciators, radiation monitors, emergency power source operability, control room and shift supervisor logs, tagout log, and operating orders. The inspector made the following findings:

-- Observation of control room activities indicated good licensee performance. Personnel were attentive and fit for duty. Senior station management visited the control room routinely. Daily review of the shift log book by the Operations Manager was noted. The inspector observed that operators responded appropriately to control room annunciators. Off-normal conditions were described adequately to relief personnel and properly documented. During tours of the facility, the inspector noted that auxiliary operators were knowledgeable of plant systems and normal operating conditions.

-- Subsequent to NRC Inspection No. 50-29/88-22, the licensee issued Special Order 89-25 to address inspector concerns regarding inadequate documentation and turnover of off-normal operating conditions for control rods Nos. 1 and 10 as observed while completing OP-4222, Rev. 10, Reactor Rod Control System Precritical Check. Although the off-normal condition continues to exist, it does not limit the licensee's ability to safely operate or shut down the plant. The special order delineates specific lessons learned and details specific areas needing improved performance. The inspector verified this item to be included in control room turnovers. The licensee action was adequate and appropriate.

-- The inspector observed the conduct of senior reactor operator training in the control room. Manipulation of controls and changes in plant configuration by trainees was supervised properly by licensed operators. No 10 CFR 54 concerns regarding oversight of trainees were identified.

-- Adequate maintenance of plant equipment monitored in the control room was evident by a general absence of lighted annunciator panalarms. Anomalies were investigated by operators appropriate to the safety significance involved. A review of recorder traces verified consistent recorded operability. The safety parameter display system exhibited greater reliability than was observed during the last inspection period. The maintenance of a "black board" during power operations continues to be a licensee strength.

-- Inspector review of in-plant equipment operability identified no unacceptable conditions. Appropriate tagging of equipment was verified. System leak rate determinations were performed as required and combined leakage met Technical Specification requirements.

b. System Alignment Inspection

Operating confirmation was made of selected piping system trains. Accessible valve positions and status were examined. Power supply and breaker alignments were checked. Visual inspections of major components were performed. Operability of instruments essential to system performance was assessed. The following systems were checked during plant tours and control room panel status observations:

-- Spent fuel pool cooling system
-- Safety injection system
-- Emergency diesel generator units
-- Chemical and volume control system

No inadequacies or unacceptable conditions were identified.

c. Biweekly and Other Inspections

(1) General Facility Observation

During plant tours, the inspector observed shift turnovers, compared boric acid tank levels and sample analysis results to Technical Specifications requirements, and reviewed the use of radiation work permits and radiation protection procedures. Area radiation levels and air monitor use and operational status were reviewed. Review of records indicated that tagouts were properly conducted. No inadequacies were identified.

(2) Fire Protection and Housekeeping

No inadequacies were noted regarding fire protection practices. Inspector observation of housekeeping practices indicated adequate performance. In the waste gas and evaporator rooms in the radwaste building, the inspector observed protective garments draped over plant gaitronic communications speakers thereby muffling audible output. When identified to the licensee, they were removed immediately. The licensee was similarly prompt in addressing most items identified during an NRC regional management tour on January 20, 1989.

At the end of the inspection period, the licensee had not determined the acceptability of the diesel fire pump battery configuration. Specifically, the cage surrounding the batteries is bolted to the floor, but the battery racks within the cage are not permanently mounted. No immediate safety concern was identified. The inspector will review this item during the next routine inspection.

(3) Observations of Physical Security

Inspector observation of physical security indicated good licensee performance. Search equipment was adequately maintained and operable, with deficiencies corrected in a timely manner. The protected and vital area security systems operated properly. The inspector noted the absence of egress posting on two monitored doors of a building within the vital area. The security guard responding to an alarm inadvertently actuated by the inspector brought the inspector's concern to the attention of security management. The licensee stated that appropriate signs had been ordered but not yet delivered. The inspector had no further questions in this area.

During the inspection period, the licensee added one supervisory level person to its permanent security staff. Also, the contractor security force was increased by five new officers.

d. Backshift Inspection

The inspector conducted backshift, weekend or holiday inspections on January 21 and February 1, 2, 4, 9, 17, 19 and 23. Operators and shift supervisors were attentive and responded appropriately to

annunciators and plant conditions. Control of inplant activities was consistent with performance observed during normal working hours. No deficiencies were identified during backshift inspections.

e. Bimonthly Inspection Elements

The inspector verified operations and maintenance department personnel overtime to be consistent with regulatory and administrative requirements. Review of operating cycle and refueling outage overtime for 1988 and 1989 to date indicated that overtime is being closely monitored by the licensee.

During tours of the facility, the inspector observed that instructions and notices to workers were conspicuously posted as required by 10 CFR 19.

On February 3, 1989, the inspector attended the licensee's General Plant Retraining (GRT) program, which included a pre-test, formal instruction, and a final examination. The licensee uses the pre-test to evaluate the individual's general knowledge of security, emergency preparedness, and radiological work practices and requirements. The pre-test also serves as a test to qualify personnel to attend the abbreviated curriculum. The inspector considered the pre-test to be a program strength. The instructor was suitably knowledgeable of the course material. Subsequent to the training, the licensee solicited feedback and opportunities for improvement from the students and the inspector.

5. Radiological Controls

Subsequent to the refueling outage, the inspector observed improved licensee performance in this area.

Radiological controls were observed on a routine basis during the reporting period. Standard industry radiological work practices and conformance to licensee radiological control procedures and 10 CFR Part 20 requirements were observed. Independent surveys of radiological boundaries and random surveys of nonradiological areas throughout the facility were performed by the inspector, who noted no deficiencies.

Review of Radiation Work Permits (RWPs) indicated good correlation with radiological survey data. Most RWPs were issued for routine work activities. Inspector review of RWPs for vapor container entries performed at power were noted to include radiological monitoring requirements for mixed radiation fields including neutron exposure. Radiological control postings were consistent with safety and regulatory requirements. Radiation protection technicians demonstrated a good questioning attitude. ALARA program implementation for the work performed was good.

6. Review of Events Requiring Telephone Notification to the NRC

The circumstances surrounding the following events, which required NRC notification via the dedicated ENS-line, were reviewed. A summary of the inspector's review findings follows or is documented elsewhere as noted below:

-- At 5:00 a.m., on February 1, 1989, the NRC Operations Center notified the licensee that their test of the ENS phone was unsuccessful. The licensee was similarly unsuccessful in contacting the NRC using the ENS. This loss of emergency communications capability was reported to the NRC in accordance with 10 CFR 50.72(b)(1)(v). The licensee successfully demonstrated emergency communication capability through contact with the NRC via commercial phone lines.

-- At 11:21 a.m., on February 9, 1989, the NRC was notified in accordance with 10 CFR 73.71(b) that individuals may have been authorized access to protected and vital areas prior to completion of background investigations. On January 26, 1989, Vermont Yankee Nuclear Power Station personnel informed the licensee that irregularities had been identified in background investigations for contractor health physics technician support personnel. This was the same contractor used by YNPS for its recently completed refueling outage. At the time of notification by Vermont Yankee, all personnel employed by the contractor at YNPS had been terminated.

The licensee conducted an investigation of the firm which performed the security clearances. Included in this investigation was an evaluation of the health physics contractor's communications with the security investigation company. Preliminary results indicated that some questionable practices existed regarding the dates of verbal confirmation and the dates of supporting documentation. However, all personnel granted access to the protected and vital areas at YNPS received appropriate security clearance authorizations from the licensee for the areas accessed. The licensee is preparing a detailed evaluation, including corrective action to prevent recurrence, in a thirty-day written report to the NRC.

-- At 9:40 p.m., on February 20, 1989, the NRC Operations Center notified the control room that the ENS phone system was out of service due to a cable separation in Pennsylvania. The cable was repaired and the ENS phone system was returned to service at 6:33 p.m., the same evening. The licensee reported the loss of ENS service to the NRC in accordance with 10 CFR 50.72(b)(1)(v).

7. Plant Events

a. Unanticipated Turbine Load Increase

On January 18, 1989, while raising main generator load from 80 MWe from the main control board, plant operators noticed that the turbine governor speed changer was not responding as smoothly as expected. Upon operating the manual control knob at the high pressure turbine governor end pedestal, an unanticipated increase in generator load occurred. The operator responded by establishing control on the governor load limit valve and stabilizing the generator at 118 MWe. Normal plant operation resumed using manual control of the speed changer.

During an unscheduled load reduction on February 8, 1989, the licensee inspected the governor control block and found minor thread damage on the speed changer operating stem sufficient to have caused erratic operation of the governor. A new stem and bushing were installed. No further main generator control problems have been experienced subsequently.

The inspector considered the licensee's actions to be appropriate and identified no safety concerns associated with this event.

b. Emergency Load Reduction for Feedwater Control Valve Repair

At 1:20 p.m., on February 8, 1989, the licensee performed an emergency load reduction to Mode 2 (Startup) in response to the blow out of breach block packing on line 3 normal feedwater control valve (BF-FCV-1200). Valve repairs were completed expeditiously and the main generator was phased to the grid at 6:19 a.m. on February 9, 1989.

The inspector verified that the licensee properly performed the emergency load reduction in accordance with emergency procedure OP-3003, Rev. 14, Emergency Controlled Plant Load Reduction, operating procedure 2104, Rev. 31, Plant Shutdown to Mode 2 or Mode 3, and applicable Technical Specifications. The reactor operator involved identified a lack of procedure clarity regarding nuclear instrument gain adjustment guidance in OP-2104 demonstrating a good questioning attitude and licensee responsiveness to a previously identified NRC concern.

No unacceptable conditions regarding this event were noted by the inspector.

8. Maintenance Observations

The inspector observed and reviewed maintenance and problem investigation activities to verify compliance with regulations, administrative and maintenance procedures, codes and standards, proper QA/QC involvement, safety tag use, equipment alignment, jumper use, personnel qualification, radiological controls for worker protection, fire protection, retest requirements and reportability per Technical Specifications. The following activities were included:

-- Maintenance Request (MR) 89-395; #2 turbine control valve will not operate

-- MR 89-468; #3 battery charger low indicated voltage

-- MR 89-467; MS-V-694/#3 S/G steam supply to ST-EBFP has body-to-bonnet leak

-- MR 89-459; Diesel oil pressure gauge on diesel fire pump reads zero

-- MR 89-539; #3 Pressurizer heater does not appear to energize in manual

Inspector review of licensee activities in this area revealed no safety concerns or deficiencies. The licensee consistently approached problem resolution from a technically sound, conservative approach. Inspector observation of in-plant maintenance noted personnel to be using the correct procedure revisions, obtaining the required approvals and tagouts, and establishing quality control hold points where required. Maintenance personnel interviewed by the inspector were knowledgeable and conscientious.

9. Surveillance Observations

The inspector observed tests or parts of tests to assess licensee performance in accordance with approved procedures and LCO's, test results, removal and restoration of equipment, and deficiency review and resolution. The following tests were reviewed:

-- OP-2102, Rev. 15, Turbine Testing and Startup

-- OP-4201, Rev. 16, Nuclear Instrumentation Course Gain Adjustment

-- OP-4202, Rev. 11, Control Rod Operability Check

-- OP-4217, Rev. 17, ATT A&C, Charging System Operability Test

-- OP-4220, Rev. 15, Main Coolant System Water Balance

-- OP-4260, Rev. 7, Turbine Control Valve Exercise

-- OP-4610, Rev. 14, Containment Isolation System Calibration

Based upon a review of licensee activities in this area, the inspector noted the following:

During performance of surveillance, the inspector observed that licensee personnel properly obtained the required authorizations and executed the proper tagouts prior to initiating testing. Surveillances were completed on schedule. When surveillance results failed to meet stated acceptance criteria, maintenance requests were issued appropriately.

While observing the performance of OP-2102, Section F, Turbine Overspeed Test, on January 18, 1989, the inspector noted that Step 2 referenced a precaution which was not in the procedure. The supervisory control room operator immediately investigated the discrepancy and determined that the precaution had been renumbered in a previous procedure revision.

The inspector also noted that while the communications setup between the turbine operator and the control room was adequate, it did not satisfy the licensee commitment detailed in Licensee Event Report (LER) No. 87-12, dated August 5, 1987. That LER stipulated as a corrective action that during turbine testing, direct communication between the turbine and reactor operator would be established. The licensee acknowledged the inspector's concern and incorporated specific guidance to this effect in revision 16 of OP-2102.

The inspector considered the licensee response to be adequate and had no further questions.

10. Onsite Review Committee Activities

The inspector attended regularly scheduled meetings of the Yankee Nuclear Power Station on-site review committee (PORC) on January 18 and February 21, 1989 to ascertain that provisions of TS 6.5.1 were met.

Inspector observation of PORC meeting proceedings and associated documentation indicated that regulatory requirements were being met. The inspector noted a high degree of participation by the Plant Superintendent, who routinely returned proposed procedure changes to department representatives for further review and modification when required. The committee's approach to safety issues was conservative and thorough.

11. Plant Information Reports

A plant information report (PIR) prepared by the licensee in accordance with administrative procedure AP-0004 was reviewed. The inspector determined whether the conditions were reportable as defined in the Technical Specifications (TS) and whether the licensee's system of problem identification and corrective action is being effectively utilized. The following PIR was reviewed:

PIR No.	Occurrence Date	Report Date	Subject
88-8	8/16/88	9/27/88	Inability to isolate normal control room ventilation in the event it became necessary to initiate CREACS systems.

PIR 88-8: This report describes the August 16, 1988, event which occurred during the performance of surveillance procedure OP-4666, Functional Test of the Fire Suppression System. Operation of the control room fresh air supply dampers trip switch in the main fire panel failed to shut fire dampers B and E (control room normal fresh air exhaust) and deenergize fan FN-12 (fresh air exhaust fan).

The licensee's investigation discovered that a wiring error had occurred during the performance of surveillance procedure OP-4644, Functional Test of the Fire Detection Instrumentation, on March 7, 1988. Licensee personnel corrected the wiring problem and successfully completed the surveillance on August 17, 1988. In accordance with administrative procedure AP-0008, the licensee determined that this event was not reportable to the NRC.

Inspector reviewed of this event indicated that, during the period while the wiring error went undetected, the control room ventilation system may have been unisolable. In addition, the licensee's system restoration verification program did not identify the error when it occurred.

The inspector was concerned that the wiring error adversely affected control room ventilation operability relative to Technical Specifications and 10 CFR 50, Appendix A, Criterion 19. The licensee is evaluating its long-term corrective actions and the inspector's concerns. Operability of the control room ventilation system and reportability of this event constitute an unresolved item (50-29/89-01-01).

12. Unresolved Items

An unresolved item is a matter about which more information is required to ascertain whether it is an acceptable item, a deviation or a violation. Unresolved items are discussed in Sections 3 and 11 of this report.

13. Management Meetings

During the inspection period, the following management meetings were conducted or attended by the inspector as noted below:

-- On February 17, 1989, the inspector attended a meeting conducted by NRC Region I management to discuss changes in the resident inspector assignments at Yankee Nuclear Power Station.

-- On February 23, 1989, the inspector conducted an exit meeting for inspection 50-29/89-01. The findings of the inspection were discussed at that time.

-- At periodic intervals during the course of the inspection period, meetings were held with senior facility management to discuss the inspection scope and preliminary findings of the resident inspector.