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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 81-13

Docket No. 50-309

License No. DPR-36 Priority -- Category C

Licensee: Maine Yankee Atomic Power Company

1671 Worcester Road

Frammingham, Massachusetts 01701

Facility Name: Maine Yankee Nuclear Power Station

Inspection at: Wiscasset, Maine

Inspection conducted: April 27 - June 5, 1981

Inspectors: *W. Lazarus*
W. Lazarus, Reactor Inspector

7/22/81
date signed

P. Swetland
P. Swetland, Reactor Inspector

7/13/81
date signed

Charles D. Petrone
C. Petrone, Reactor Inspector

7/16/81
date signed

Approved by: *R. Gallo*
R. Gallo, Chief, Reactor Projects
Section No. 1A, DRPI

7/22/81
date signed

Inspection Summary:

Inspection on: April 27 - June 5, 1981 (Report No. 50-309/81-13)

Areas Inspected: Routine, regular and backshift inspections by three resident and region-based inspectors (213 hours). Areas inspected included the Control Room, Turbine building, Primary Auxiliary Building, Spray Building, Auxiliary Feed Pump Room, Reactor Containment, and Spent Fuel Pool. Activities/Records inspected included Radiation Protection, physical security, plant operations, preparation for refueling, refueling operations, maintenance and surveillance testing, followup on IE Bulletins, followup on previous inspection findings, followup of licensee events, and review of periodic reports.

Results: Of the ten areas inspected, no items of noncompliance were identified in nine areas; two items of noncompliance were identified by the licensee in one area. Failure to maintain decay heat removal capability in accordance with Technical Specifications; Failure to filter containment purge gases prior to release in accordance with Technical Specifications

Region I Form 12
(Rev. April 77)

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DETAILS

1. Persons Contacted

R. Arsenault, Plant Shift Superintendent
D. Boynton, Reactor Engineer
J. Brinkler, Technical Support Department Head
G. Cochrane, Health Physics Supervisor
J. Hebert, Director, Plant Engineering
R. Jutras, Plant Engineer
R. Lawton, Director, Operational Quality Assurance
W. Paine, Operations Department Head
R. Prouty, Maintenance Department Head
D. Sturniolo, Technical Assistant to the Plant Manager
M. Veilleux, Plant Engineer
E. Wood, Plant Manager

The inspectors also interviewed several plant operators, technicians and members of the engineering and administrative staffs.

2. Followup on Previous Inspection Findings

- a. (Closed) Followup Item (309/78-08-06) The inspector reviewed the licensee's procedure 3.17.6 E, Inspection of Class I Spring Hangers, Revision 1, dated May 5, 1981. This procedure now requires removal of pipe insulation which covers the area where the hanger and pipe are attached. The inspector had no further questions in this area.
- b. (Closed) Unresolved Item (309/78-09-01) The inspector reviewed procedure 3.1.10, Refueling Interlocks Test, Revision 6, dated May 14, 1981, to verify that all safety features were tested and that air pressure tolerances were specified. Hoist set points are to be incorporated in this procedure prior to the next refueling (reference Item f below).
- c. (Closed) Followup Item (309/79-06-02) The inspector verified that valve tags were installed on the remaining valves from the locked valve checklist. No further inadequacies were identified.
- d. (Closed) Unresolved Item (309/79-16-01) The inspector verified that as a result of discussions with the licensee in October 1980 (reference IE Inspection Report 50-309/80-15) witness/hold points are being utilized in accordance with the approved Quality Assurance Program.

- e. (Closed) Followup Item (309/80-04-09) During the June 1981 refueling, the inspector observed operations in the spent fuel pool area frequently. Work requiring personnel to remove safety lines was conducted by approved procedures, and supervised by licensee personnel. No further inadequacies were identified.
- f. (Open) Followup Item (309/80-04-10) During preparations for the June 1981 refueling, the licensee determined the proper settings for the Refueling Machine grapple zones. The inspector verified the alignment of the machine to these settings prior to fuel movement. The licensee will incorporate these settings into the Refueling Machine Interlocks Test prior to the next refueling outage.
- g. (Closed) Unresolved Item (309/80-09-02) Revised calculations of the maximum gassing rates for the batteries based on IEEE standard 484-1975, Recommended Practice for Installation Design of Main Storage Batteries, indicates a ventilation flow of 315 CFM to each Battery room is adequate. Present air flows meet this specification. Ventilation specifications listed in the Maine Yankee Fire Protection Program have been revised to reflect the capabilities of installed equipment. A battery room air flow indicator is being installed which will prevent recurrence of this event. Completion of this installation is tracked by item 309/81-04-02. The inspector had no further questions.
- h. (Closed) Followup Item (309/80-11-01) Review of licensee compliance with Radiation Work Permit Procedures was conducted by the NRC Health Physics Appraisal Team (reference IE Inspection Report 50-309/81-01), and by the resident inspectors on a continuing basis. No items of noncompliance have been identified.
- i. (Closed) Unresolved Item (309/81-03-02) The licensee has modified the component cooling systems to provide adequate separation and redundancy of components to satisfy single failure criteria with the present Technical Specification requirements. The inspector had no further questions in this area.

3. Review of Plant Operations - Plant Inspections

The inspector reviewed plant operation through direct observation throughout the reporting period. Except as noted below, conditions were found to be in compliance with the following licensee documents:

- Maine Yankee Technical Specification
- Maine Yankee Technical Data Book
- Maine Yankee Fire Protection Program
- Maine Yankee Radiation Protection Program
- Maine Yankee Tagging Rules
- Administrative and Operating Procedures

a. Instrumentation

Control room process instruments were observed for correlation between channels and for conformance with Technical Specification requirements. No unacceptable conditions were identified.

b. Annunciator Alarms

The inspector observed various alarm conditions which had been received and acknowledged. These conditions were discussed with shift personnel who were knowledgeable of the alarms and actions required. Operator response was verified to be in accordance with procedure 2-100-1, Response to Panalarms, Revision 4, dated June 1979. During plant inspections, the inspector observed the conditions of equipment associated with various alarms. No unacceptable conditions were identified.

c. Shift Manning

The operating shifts were observed to be staffed to meet the operating requirements of Technical Specifications, Section 5, both to the number and type of licenses. Control room and shift manning were observed to be in conformance with 10 CFR 50.54.

d. Radiation Protection Controls

Radiation Protection control areas were inspected. Radiation Work Permits in use were reviewed, and compliance with those documents, as to protective clothing and required monitoring instruments, was inspected. Proper posting and control of radiation and high radiation areas was reviewed in addition to verifying requirements for wearing of appropriate personal monitoring devices. There were no unacceptable conditions identified.

e. Plant Housekeeping Controls

Storage of material and components was observed with respect to prevention of fire and safety hazards. Plant housekeeping was also evaluated with respect to controlling the spread of surface and air-borne contamination. There were no unacceptable conditions identified.

f. Fire Protection/Prevention

The inspector examined the condition of selected pieces of fire fighting equipment. Combustible materials were being controlled and were not found near vital areas. Selected cable penetrations were examined and fire barriers were found intact. Cable trays were clear of debris. No abnormal conditions were identified.

h. Equipment Lineups

The inspector verified that the major valve and switch positions were correct to insure operability of the Shutdown Cooling Systems, by observation of the Main Control Board and inspections in the Diesel Generator Rooms, Spray and Turbine Buildings. Except as noted in paragraph 11, no unacceptable conditions were identified.

4. Review of Plant Operations - Logs and Records

During the inspection period, the inspector reviewed operating logs and records covering the inspection time period against Technical Specifications and Administrative Procedure Requirements. Included in the review were:

| | |
|---------------------------------------|------------------------------------------|
| Control Room Log | - daily during control room surveillance |
| Jumper and Lifted Leads Log | - all active entries |
| Maintenance Requests and Job Orders | - all active entries |
| Safety Tag Log | - all active entries |
| Plant Recorder Traces | - daily during control room surveillance |
| Plant Process Computer Printed Output | - daily during control room surveillance |
| Night Orders | - daily during control room surveillance |

The logs and records were reviewed to verify that entries are properly made and communicate equipment status/deficiencies; records are being reviewed by management; operating orders do not conflict with the Technical Specifications; logs detail no violations of Technical Specification or reporting requirements; logs and records are maintained in accordance with Technical Specification and Administrative Control Procedure requirements.

Several entries in these logs were the subject of additional review and discussion with licensee personnel. No unacceptable conditions were identified.

5. Observation of Physical Security

The resident inspector made observations, witnessed and/or verified, during regular and off-shift hours, that the selected aspects of the security plan were in accordance with regulatory requirements, physical security plans and approved procedures.

- Maine Yankee Security Plan, dated October 1979
- 15-1, Security Organization and Responsibilities, Revision 6, April 1980
- 15-2, Security Force Duties, Revision 9, February 1981

- 15-3, Plant Personnel Security, Revision 9, February 1981
- 15-7, Access Authorization and Control, Revision 1, April 1981
- 15-8, Protected Area Entry/Exit Control, Revision 1, September 1980

a. Physical Protection Security Organization

- Observations and personnel interviews indicated that a full time member of the security organization with authority to direct physical security actions was present, as required.
- Manning of all three shifts on various days was observed to be as required.

b. Physical Barriers

Selected barriers in the protected area, access controlled area, and the vital areas were observed and random monitoring of isolation zones was performed. Observations of truck and car searches were made.

c. Access Control

Observations of the following items were made:

- Identification, authorization and badging
- Access control searches
- Escorting
- Communications
- Compensatory measures when required

No items of noncompliance were identified.

6. Followup on IE Bulletins

Licensee action concerning the following IE Bulletins was reviewed to verify that:

- The Bulletin was forwarded to appropriate onsite management.
- A review for applicability was performed.
- Written response (when required) was within the stated time period and contains the required information.
- Written response contains adequate corrective action commitments.
- Information on the licensee's written response was accurate.
- Corrective action taken by the licensee is as described in the written response.

a. IEB 81-01, Surveillance of Mechanical Snubbers

The inspector reviewed the licensee's response (Maine Yankee letter FMY 81-27 dated March 6, 1981) which states that Maine Yankee has no mechanical snubbers installed. The inspector verified by inspection of selected snubbers that no mechanical snubbers were in use. The inspector had no further questions in this area.

b. IEB 81-02, Failure of Gate Valves to Close Against Differential Pressure

The inspector reviewed the licensee's response (Maine Yankee letter FMY 81-69, dated April 30, 1981) which states that none of the subject valves are installed at Maine Yankee. Inspector review of the site component and valve listing verified the licensee's response. The licensee is, however, evaluating the capability of the installed PORV block valves to close under differential pressure. A modification to the Anchor Wedge Disc Gate Valves was performed (Plant Design Change Request 14-81) to equalize the bonnet area to the pressurizer in order to prevent thermal-hydraulic lock up. An operational test of these block valves at design differential pressure will be conducted prior to start-up from the current refueling outage. The inspector reviewed this test procedure 4.118, PORV Block Valve Closure with Flow, Revision 1, dated June 1981. The inspector had no further questions in this area pending successful completion of this operational test.

c. IEB 81-03, Flow Blockage of Cooling Water to Safety System Components

The licensee's response (Maine Yankee letter FMY 81-83, dated May 21, 1981) states that mussel fouling of sea water cooling systems was predicted in the plant design and that measures have been in use since initial startup to control mussel growth by recirculation of hot water through the heat exchangers. The inspector reviewed procedure 1-100-3, Mussel Control Operation, Revision 10, dated December 1980, which specifies these measures required for mussel control. The licensee did not perform system flow rate measurements. The inspector concluded that the routine heat exchanger cleaning program based on heat exchanger performance (gauged by component cooling outlet temperature) adequately maintains the heat exchangers clear of flow blockage. Staggered cleaning of redundant heat exchangers ensures adequate cooling available to safety system components. The inspector had no further questions in this area.

Except as noted above, the licensee's evaluations/corrective actions for these Bulletins were appropriate.

7. Preparation for Refuelinga. New Fuel Receipt Inspection

References:

- MYM-5-129 New Fuel Handling and Storage, Revision 6, dated July, 1979
- MYM-5-128 New Fuel Container Unloading and Transfer, Revision 6, dated July, 1979
- MYP-13-20 New Fuel Detailed Inspection, Revision 3, dated June, 1979

The inspector reviewed the documentation of receipt inspections for the 72 new fuel assemblies. The inspector observed the unloading of three shipment containers (6 assemblies) and the receipt inspections of 5 assemblies (K010, K011, K012, K014, K047). Guide tube upper end fittings were rejected on four assemblies and were replaced.

No items of noncompliance were identified.

b. Approved Procedures Available for Use

The inspector reviewed licensee procedures to verify that approved procedures were available and technically adequate for the following evolutions:

- New fuel handling and inspection
- Fuel transfer
- Core loading and verification
- CEA eddy current testing

c. Core Reload Package Submittal

The inspector reviewed the licensee's submittal for modification of Technical Specifications (Maine Yankee letter FMY 81-65 dated April 28, 1981) based on the Cycle 6 core reload. Inspector inputs were requested by the NRC Licensing Project Manager involving the areas of minimum shutdown margin, WASH 1400 Event V configurations and the main steam line break safety analysis. The inspector will verify implementation of the revised Technical Specifications prior to plant start-up.

d. Refueling Outage Control

The inspector reviewed the licensee's plan for coordination of refueling outage activities. Outage control is to be supplied by round-the-clock management coordinators supported by a contracted critical path updating/coordinating service. The inspector had no questions in this area.

8. Refueling Operations

a. Procedure Review

The inspector reviewed the following licensee procedures to verify that:

- procedures are current and approved
- procedures are technically adequate

The inspector observed the activity and/or verified by documentation the completion of these evolutions.

- 3.1.10, Refueling System Interlocks Check, Revision 6, dated 5/14/81 (Completed 5/18/81).
- 13.6, Manipulator Crane Position Indication Alignment, Revision 4, dated 11/26/79 (Completed 5/19/81).
- 13.2, Fuel Handling in the Spent Fuel Pool, Revision 9, dated 11/14/80 (Initial condition completed 5/15/81).
- 13.1, Fuel Transfer New Fuel to Spent Fuel Pool, Revision 2, dated 11/26/79 (Completed 5/15/81).
- 13.4, Refueling Machine Operation, Revision 8, dated 5/14/81 (Initial conditions completed 5/15/81).
- 10.1, Core Reloading, Revision 6, dated 5/8/81.
- 13.23, Removal/Replacement of CEA Extension Shafts, Revision 1, dated 11/26/79.
- 1-12-1, Containment Ventilation and Purging, Revision 8, dated 12/18/80, (Performed on 5/12/81).

No items of noncompliance were identified.

b. Fuel Handling Activities

The inspector observed fuel handling operations in the refueling cavity, spent fuel pool, and the Control Room frequently during this inspection, including portions of all three shifts. The following items were reviewed:

- Core monitoring performed
- Fuel handling, fuel accountability conducted in accordance with approved procedures
- Core internals stored to protect from damage
- Housekeeping and cleanliness conditions acceptable
- Make-up and qualification of refueling crews
- Refueling Cavity and Spent Fuel Pool water level as required by Technical Specification 3.13.E
- Boron concentration (shutdown margin) as required by Technical Specification 3.13.A.6
- Constant direct communication maintained between the Control Room and fuel handling personnel when core alterations were in progress
- RHR flow maintained to Refueling Cavity as required by Technical Specification 3.13.A.4
- Audible count rate monitoring functioning in the Refueling Cavity Area and Control Room
- Radiation protection requirements
- Fuel Building ventilation lineup as required by Technical Specification 3.13.C
- Core Component verification Checklist RE-CV-1.1
- Core Reloading Check-off sheets 235 through 243
- Core Component Check-off sheets 6-IC-1 through 6-IC-3; 6-2-1 through 6-2-62 and 6-2-186 through 6-6-243

No items of noncompliance were identified.

9. Observation of Maintenance and Surveillance Testing

The inspector observed various maintenance and problem investigation activities. The inspector reviewed these activities to verify compliance with regulatory requirements, including those stated in the Technical Specifications; compliance with applicable codes and standards; required QA/QC involvement; proper use of safety tags; proper equipment alignment and use of jumpers; appropriate personnel qualifications; proper radiological controls for worker protection; adequate fire protection; and appropriate retest requirements. The inspector also ascertained reportability as required by Technical Specifications.

The inspector witnessed the performance of surveillance testing of selected components to verify that the surveillance test procedure was properly approved and in use; test instrumentation required by the procedure was properly calibrated and in use; technical specifications were satisfied prior to removal of the system from service; test was performed by qualified personnel; the procedure was adequately detailed to assure performance of a satisfactory surveillance; and, test results satisfied the procedural acceptance criteria, or were properly dispositioned.

The following documents were reviewed:

- EDCR 81-45, Modification of PCC/SCC Systems
- Procedure 4-112, Partial Draining of SCC System
- Procedure 4-113, Partial Draining of PCC System
- Procedure 4-114, Hard Seat Check Valve Repair
- Procedure 5-100, 101, Overload Heater Replacement for T.H. and T.C. Valves
- Procedure 3.1.4, EDG Monthly Surveillance Testing
- Procedure 3.6.2.1.1, Pressurizer Pressure Protection and Safeguards Channel Calibration
- Procedure 3-17-2, Surveillance Functional Testing of Hydraulic Shock Suppressors
- Procedure 3-17-6.4, Surveillance Inspection of Hydraulic Shock Suppressors
- Procedure 3-17-6.5, Inspection of Class I Spring Hangers
- Procedure 5-5, Testing and Setting of Steam Generator Safety Valves
- Radiation Work Permits 81-05-178, 243, 305 and 378.

The inspector observed the following maintenance and surveillance tests during the report period:

- Modification of Primary and Secondary Component Cooling systems
- Inspection of HSI-17, Loop 1 hard seat check valve
- Functional test of Hydraulic Snubber RC-HSS-103
- Surveillance test of Steam Generator Safety Valve MS-S-23
- Calibration of RPS Channel A Pressurizer Pressure Device

Except as noted below, no abnormal conditions were identified.

- a. Maintenance was performed on May 10-17, 1981, on check valve HSI-17 to determine the cause of back-leakage through the valve. The work location had high radiation levels requiring significant portable shielding. The inspector reviewed radiation work permits and personnel exposure records to determine that adequate measures were used to control and limit personnel exposure. The inspector verified that licensee maintenance personnel (certified as supervisors by the Maintenance Department Head) supervised job progress and certified compliance with the work procedure. The valve components were found to be intact but disc to seat contact was significantly impaired due to warping. Since a new flapper disc was not available and significant exposure would be expended to machine the valve internals, HSI-17 was reassembled without repair. Another check valve was installed at a different location to restore the no back-leakage feature of the high pressure injection piping. Subsequent retests verified the integrity of the reactor coolant boundary. No items of noncompliance were identified.
- b. Surveillance of hydraulic shock suppressors was performed on May 27-28, 1981. The inspector observed the test for snubber RC-HSS-103. A rod end bearing failed during the lock up testing of this 2½" Grinell shock suppressor. The licensee representative stated that this failure was due to the lack of proper shimming of the rod end when installed in the test machine. This apparently allowed the bearing to move partially out of the rod end during the lock up test, causing bearing failure. The bearing was replaced and all subsequent testing was performed with rod ends shimmed in the test machine to a tolerance equal to that required for snubbers installed in the plant. The licensee also inspected the bearings on the other tested snubbers and found no damage. The licensee committed to revise the functional test procedure to require that the snubbers be tested with rod ends shimmed to duplicate the plant installed condition and to require visual inspection of these bearings after functional testing. This item will be followed in a subsequent inspection. (309/81-13-01).
- c. Surveillance was performed on May 8, 1981 to verify the lift set-points of six of the steam generator code safety valves. The inspector observed the testing for valve MS-S-23. This valve and three others of the six safeties tested were not found within the tolerance specified by the procedure and the ASME Code Section III. The valves

were adjusted to the specified lift setpoint. Failure of these valves to operate within the specified tolerance is reportable under Technical Specification 5.9. This item is unresolved pending submittal of a Licensee Event Report. (309/81-13-02).

10. In-Office Review of Licensee Event Reports (LERs)

The inspector reviewed the following LERs received in the RI office to verify that details of the event were clearly reported including the accuracy of the description of cause and adequacy of corrective action. The inspector also determined whether further information was required from the licensee, whether generic implications were indicated, and whether the event warranted on site followup. The following LERs were reviewed:

- 81-02, Failure of Service Air Line Containment Isolation Valve
- 81-03, Exceeding Containment Leakrate during Operations/Unplanned Release (details: Report 50-309/81-12)
- 81-04, Failure of AFW Flow Indicator Power Supply
- 81-05, Failure of RWST Level Switch
- *-- 81-06, Failure to Filter Containment Purge
- *-- 81-07, Loss of Shutdown Cooling
- * Reports selected for onsite followup.

11. On Site Followup of LERs

During on site followup, the inspector verified that reporting requirements of Technical Specifications and Regulatory Guide 1.16 had been met, that appropriate corrective action had been taken, that the event was reviewed by the licensee as required, and that continued operation of the facility was conducted within Technical Specification limits. The review included discussions with licensee personnel, review of PORC meeting minutes, and applicable logs. The following LERs were reviewed:

- 81-06, Failure to Filter Containment Purge. The maintenance procedure (Engineering Design Change Request 81-16) for installation of three 10" check valves in the Safety Injection piping required the filters in the containment purge lines to be bypassed to prevent filter bed exhaustion due to welding fumes. This procedure was approved and implemented disregarding the Technical Specification 3.17 requirement to filter the purge during refueling evolutions. The purge was unfiltered for the 16 hours between 6:00 p.m. May 21, 1981 and 10:00 a.m. May 22, 1981. The licensee identified this noncompliance

and promptly redirected the purge air through the filters and terminated the welding inside containment. The inspector verified that containment air samples during this period showed activity less than the minimum permissible concentrations, and that the containment purge isolation valves were operable. The licensee revised procedure 10.1, Core Reloading Revision 6, dated May 8, 1981 (PCR 81-91) to include, as an initial condition for fuel handling, meeting the Technical Specification requirement for filtering the purge gases. Operators were informed of this event and cautioned to insure that all refueling requirements were reviewed and verified at regular intervals. Training in this area will be incorporated into the annual retraining program. This event constitutes a licensee identified item of noncompliance. (309/81-13-03).

- 81-07, Loss of Shutdown Cooling. While performing maintenance on half of the 4160 volt AC electrical distribution system, both 480 volt vital buses were being supplied by one 4160 volt vital bus (through a normally open manual bus tie breaker). Two service water (SW) pumps (250 HP) are powered from each 480 volt vital bus. On June 2, 1981, the plant was in a refueling shutdown condition with two SW pumps running. Control room operators were asked to test a third SW pump currently under repair. The load of this third SW pump tripped the breaker (ACB 6081), supplying both 480 volt buses. Power was returned to one 480 volt bus directly from its 4160 volt bus after inspecting and resetting the tripped circuit breaker. The manual bus tie breaker could not be reclosed to energize the second 480 volt bus. Maintenance was terminated on the electrical distribution system and tags removed to normalize the system. Both buses were re-energized after 24 minutes. No SW pumps ran during the 24 minute bus outage, but coolant temperature did not rise significantly. Reactor coolant continued to circulate during this period because the residual heat removal pumps were unaffected. Inspection of the malfunctioning manual bus tie breaker revealed no abnormal conditions and subsequent operation of the breaker was satisfactory.

Technical Specifications 3.8 and 3.13 require residual heat removal systems to be operable during shutdown conditions. The SW pumps which supply the heat sink for decay heat removal were unavailable while the 480 volt vital buses were de-energized. This constitutes a licensee identified item of noncompliance. (309/81-13-04).

12. Review of Periodic Reports

The inspector reviewed the following periodic reports to verify that the reporting requirements of Technical Specification 5.9 were met.

- Monthly Operating Reports for February - May 1981.
- Annual Report of Changes under 10 CFR 50.59a, (1980).

No inadequacies were identified.

13. Unresolved Items

Unresolved items are matters about which more information is required in order to determine whether they are acceptable items or items of noncompliance. Unresolved items identified during this inspection are discussed in paragraph 9c.

14. Exit Interviews

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