U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Docket/Report: 50-309/85-09 License: DPR-36

Licensee: Maine Yankee Atomic Power Company

Inspection At: Wiscasset, Maine

Dates: April 14 to May 25, 1985

Inspectors: Kenneth P Ferlic 6/18/85
For C. Holden, Senior Resident Inspector date

Kenneth P Ferlic 6/18/85
K. Ferlic, Project Engineer date

J. Robertson, Reactor Engineer 6/14/85 date

Approved: T. C. Elsasser 6/18/85
T. C. Elsasser, Chief, Reactor Projects Section 3C date

Summary: Inspection Report 50-309/85-09

Areas Inspected: Routine resident inspection (147 hours) of the control room, accessible parts of plant structures, plant operations, radiation protection, physical security, fire protection, plant operating records, maintenance, surveillance, radioactive effluent sampling program, open items, and reports to the NRC. No violations were found.

Results: Two administrative problems were noted concerning containment integrity. One was a licensee identified violation and the other involved the failure to administratively control vent and drain valves for containment coolers. Operator knowledge of some system interfaces during maintenance was lacking. Improvements in the shift turnover practices appear to provide better continuity between shifts.

DETAILS

1. Persons Contacted

Within this report period, interviews and discussions were conducted with various licensee personnel, including reactor operators, maintenance and surveillance technicians and the licensee's management staff.

2. Summary of Facility Activities

Details of the following are included in the body of the report.

On April 14, 1985, 120 volt AC bus 3 was lost due to a failure of the connector at the outlet of the inverter. The bus was cross connected with vital bus 2 while the connector was replaced. Vital bus 3 was returned to the inverter power supply on April 17.

On April 24, 1985 at 2:04 p.m., Maine Yankee Nuclear Power surpassed a lifetime production goal of 60 billion kilowatt-hours.

The plant operated at 100 percent power from the beginning of the inspection period until April 30, 1985, when a load reduction was initiated to replace the main generator exciter fuses. A plant trip occurred while returning the plant to full power later that same day. The trip was caused by a technician who inadvertently grounded contacts in the low suction pressure trip circuit of the turbine driven feed pump while conducting maintenance. The reactor was returned to full power on May 1.

On May 4, 1985, the licensee reduced power and shutdown the plant for maintenance. Replacement of the diodes for the main generator exciter was the major maintenance item accomplished. The reactor was taken critical on May 6 and returned to full power on May 8 following delays for chloride cleanup of the steam generators.

On May 10, 1985, plant power was reduced to place the electric driven feed pumps in service. Plant power was returned to 97 percent (the maximum power level with electric driven feed pumps) for the remainder of the inspection period in order to perform maintenance on the steam driven feed pump.

3. Licensee Action on Previous Inspection Findings

(Update) Followup item (IFI 309/85-06-02) Spacing between new fuel rack tubes. The licensee determined that the spacing needed between each of the spent fuel rack tubes to provide the necessary flux trap for 3.3 weight percent fuel was .692 inches of water. In order to achieve this spacing on the new phase two racks, holes were drilled in each face of the tubes to remove the air between the boral and the tube face. The inspector will continue to follow this item.

4. Review of Plant Operations

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

-- Maine Yankee Technical Specifications

-- 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 in process instrumentation 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 5.

During plant inspections, the inspector observed the condition 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 re-

viewed in addition to verifying requirements for wearing appropriate personnel monitoring devices. There were no unacceptable conditions identified.

The licensee has initiated a program to upgrade the storage and cleanliness of the plant. Each department contributed to the workforce used to identify, sort, store and dispose of plant equipment that had accumulated. Various crews were assigned to specific areas of the plant for cleaning and decontamination. The result has been a reduction in the radiation levels at a number of locations throughout the plant.

e. Plant Housekeeping Controls

Storage of material and components was observed with respect to prevention of fire and safety hazards. Plant housekeeping was evaluated with respect to controlling the spread of surface and airborne contamination. The inspector conducted a tour of the containment building and noted a number of articles that had the potential of obstructing recirculation flow from the containment sump. These finding were discussed with plant management. Subsequently, the licensee removed the potential obstructions and conducted a cleanup of the area. The inspector had no further comments.

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.

g. Control of Equipment

During plant inspections, selected equipment under safety tag control was examined. Equipment conditions were consistent with information in plant control logs.

h. Plant Operations Review Committee (PORC)

The inspector attended Plant Operations Review Committee (PORC) meeting on April 25, 1985. Technical specification 5.5 requirements for required member attendance were verified. The meeting agenda included procedural changes, proposed changes to the Technical Specifications and field changes to design change packages. The meeting was characterized by frank discussions and questioning of the proposed changes. In particular, consideration was given to assure clarity and consistency among procedures. Items for which adequate review time was not available were postponed to allow committee members time to review and comment. Dissenting opinions were encouraged. The inspector had no further comments.

i. Control Room Atmosphere

During this report period, in addition to the normal review of the control room, the inspector reviewed the manner in which the operators carried out their daily duties. Recent changes to the Maine Yankee Dress Code have set new standards for operator appearance which has contributed to the professional atmosphere of the control room. Additionally, the licensee has instituted a formal review period prior to actual shift turnover to enhance the information flow between shifts. Each oncoming Plant Shift Supervisor and Shift Operating Supervisor reviews plant conditions and then conducts a brief of the oncoming crew. These briefings review plant problems and anticipated evolutions for the shift. Each member of the oncoming shift then conducts an on station turnover with the off going crew.

j. Loss of 120 Volt Vital Bus 3

On April 14, 1985, while at 100 percent power, the main control board annunciator for channel C Reactor Protective System (RPS) alarmed due to power being lost from the 120 volt AC vital bus 3. Bus 3 was crosstied to vital bus 2. Further investigation into the failure indicated that the cable connector at the outlet of the inverter had overheated and failed causing loss of the bus.

The licensee obtained spare parts and repaired the connector. Vital bus 3 was returned to service on April 16. The inspector had no further questions.

k. Steam Driven Feed Pump

On May 10, 1985, an increase in the vibration reading for the Steam Driven Feed pump (P-2C) was noticed. The pump was removed from service and the two electric driven feed pumps were placed in service. Investigation into the cause of the high vibration in P-2C revealed a piece of a stud and nut had entered the impeller area and were the source of the vibration. The impeller and pump shaft were replaced and the pump was balanced.

The licensee conducted a search for the source of the stud. One of the heater drain pumps was inspected since the stages of these multistage pumps are bolted together. While inspecting the "B" heater drain pump the remainder of the stud was found. All interstage fasteners were retorqued and the pump was returned to service. The "A" heater drain pump was removed from service and checked but no deficiencies were noted.

No violations were identified.

l. Troubleshooting Loop 1 Temperature Detector

On May 22, 1985, the plant conducted a routine entry into containment. One of the maintenance items conducted during this entry was the troubleshooting of Loop 1 Resistance Temperature Detector (RTD) for the cold leg temperature (T cold). The plant had noticed a difference between the three T cold Loop instruments and was investigating the problem. The maintenance involved pulling the penetration cable connector inside containment and measuring the resistance from the connector to the RTD. The inspector observed the maintenance activities inside containment and the quality control coverage that was provided. No problems were identified.

The inspector returned to the control room after exiting containment and observed the precautions the control room had taken prior to removal of the penetration connector. All bypass keys were installed in the Reactor Protective System (RPS) for channel A. Train B of the Auxiliary Feedwater Start circuit (AFWS) was also in test. When questioned, the operators were unsure of the exact interaction of the AFWS with the loop 1 RTD work but knew that both precautions were required to support the RTD troubleshooting. Further investigation revealed that a steam generator level instrument was also included in the connector that was being pulled to check loop 1 RTD. This level instrument fed the train B of the AFWS. Inoperability of this level instrument necessitated placing train B in test. The inspector reviewed the Technical Specification requirements for operability of these instruments. No violations were noted.

The inspector expressed the concern to plant management that the operators need detailed knowledge of the plant instrumentation that is affected during maintenance. In this case, the operators were aware that the AFWS system would be affected because the I&C section had briefed them prior to beginning the maintenance. Additionally, these limitations were addressed on the repair order. Because these controls were in place, the operators were aware that some of the capabilities of the AFWS would be temporarily lost. However, as explained above, when questioned as to the exact nature of the system interaction, the operators were not sure of the status of this system.

The inspector had no further comments.

m. Component Cooling Valves in Containment

On May 8, 1985, the licensee identified 52 vent and drain valves in the Primary Component Cooling (PCC) system that were not on the control drawings. As a result, these valves were not being administratively controlled by the procedure covering containment integrity. The valves are on the portions of the PCC system that services the reactor containment air recirculation cooler, containment penetration coolers and the return line from the Control Element Assembly (CEA) drive mechanism air cooler.

All but one of the valves are located inside containment. The purpose of these valves is to assist in the draining or venting of the containment coolers.

Each of the subject valves was verified in the closed position. There were no indications that these valves had been opened based upon the leakage rate of PCC and the lack of any indications of leakage around the coolers.

The licensee conducted an inspection of the various coolers inside of containment in order to identify any other valves which were not on the plant controlled drawings. The valves in question were labeled, lock wired closed and placed on the containment integrity valve list.

The inspector had no further comments.

n. Maintenance Outage

The plant conducted a maintenance outage from May 4 to May 6. Two of the nine diodes for the main generator had failed routine surveillance checks. Based on discussions with the manufacturer, the licensee decided to replace all nine diodes. A variety of additional maintenance items were accomplished during the outage.

o. Plant Trip

On April 30, 1985, during maintenance on the steam driven feed pump (P-2C) low suction pressure trip delay circuit, the plant tripped from approximately 95 percent power. All systems functioned normally. Investigation revealed that the technician performing the maintenance had grounded a pair of contacts in the low suction pressure circuit and caused pump P-2C to trip. The turbine trips automatically on a loss of pump P-2C and the reactor tripped due to loss of the turbine. The reactor was taken critical at 5:45 a.m. on May 1 and returned to 100 percent power.

5. Observations of Physical Security

The resident inspector made observations, witnessed and/or verified, during regular and backshift hours, that selected aspects of the security plan were in accordance with the regulatory requirements, physical security plan and approved procedures as noted below:

-- Maine Yankee Plan, dated October 1979

-- 15-1, Security Procedures, Revision 11

-- 15-12 Emergency Contingency Procedures, Revision 1

Observations and personnel interviews indicated that there was sufficient staffing of all three shifts. Selected barriers in the protected area, access control area, and the vital area were observed and random monitoring of the isolation zone was performed. Observations of vehicle searches were made. Observations of badging, escorting and communications were made. The inspector held discussions with plant management concerning the method of providing access control to portions of the protected area during maintenance.

No deficiencies were identified.

6. Plant Maintenance

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 qualifications, radiological controls for worker protection, fire protection, retest requirements, and reportability per Technical Specifications. The following activities were included: Troubleshooting of the Loop 1 RTD instrument and weld repair of the Emergency Diesel generator air filter supports.

No deficiencies were identified.

7. Surveillance Testing

The inspector observed parts of tests to assess performance in accordance with approved procedures and LCO's, test results, removal and restoration of equipment, and deficiency review and resolution. The timed stroke testing of safeguards valves was reviewed. Test results indicated that LM-A-57, the automatic isolation valve for a variety of containment pressure instruments, failed to meet the acceptance criteria. Analysis indicated the valve operated correctly but the indication in the control room was incorrect. A discrepancy report was issued to initiate corrective action. Adjustments to the valve limit switch corrected the indication problem. The inspector had no further questions.

8. Review of a Licensee Identified Violation

On April 24, 1985, the air regulator filter on BD-T-22 was to be replaced. BD-T-22 is the containment isolation valve in the blowdown line from Steam Generator No 2. In order to replace the regulator filter, the valve was to be shut and the air to the regulator secured. This process was to take approximately thirty minutes. At 10:00 a.m. BD-T-22 was shut and deactivated by securing the air to the regulator. During reassembly of the regulator a problem was encountered and BD-T-22 was not reactivated until 3:11 p.m., approximately 5 hours later. Technical Specification 3.11 states within 4 hours an inoperable containment isolation valve must be returned to service or the affected penetration isolated by use of at least one manual, remotely operated or deactivated automatic isolation valve secured (tagged) in the closed position or by use of a blind flange. The penetration was isolated by shutting

BD-T-22, the deactivated automatic isolation valve, but it was not tagged. This event was reported to the NRC inspector on site and is a license identified violation which meets the criteria of NRC policy for not issuing a violation.

Inspector review of the circumstances indicated the valve, BD-T-22, was not tagged when deactivated because it had not been identified as a containment isolation valve with Technical Specification limitations on the discrepancy report (No. 1426) issued to replace the air regulator filter. This oversite appeared to be due, in part, to the issuance of an earlier discrepancy report (No 1401) for inspection of the air supply filters on 450 air operated safety and non-safety related valves. On this earlier discrepancy report (No. 1401), the 450 valves were identified generically as containing Technical Specification valves. Individual safety related valves were not identified. The Shift Operating Supervisor or Plant Shift Supervisor was left with the responsibility for determining the classification (safety/non-safety) for each of the valves. A priority for changing the air filters was established based on the valves ability to degrade a safety function or interrupt plant operations if the filters clogged.

The licensee indicated that the violation was caused by the failure of operations personnel to properly identify the tagging requirements for the valve. Management also felt the issuance of the discrepancy report with 450 safety and non-safety valves contributed, if not, caused the error. Corrective action completed by the licensee include: (1) the immediate separation of the safety related filters from the non-safety related filters on the discrepancy report, (2) review of the overall process for handling similar problems to ensure a generic program or procedural inadequacies do not exit, and (3) review of the event by plant operators.

The inspector had no further questions.

9. Review of Low Pressure System Interfaces

In response to recent industry problems with the isolation systems between low pressure safety injection systems and high pressure safety injection systems, the resident inspector conducted a review of the licensee's surveillance and maintenance programs covering those valves which isolate primary coolant from low pressure Emergency Core Cooling System (ECCS) piping and components. If low pressure ECCS piping outside of containment is overpressurized and then ruptures, the cooling water it supplies will not be available for recirculation during an accident.

Maine Yankee had received a Confirmatory Order from the NRC on April 23, 1981, which required the installation of additional check valves in the low pressure safety injection system to protect it against overpressurization. The inspector verified the as-built isolation interfaces between high and low pressure piping, reviewed and evaluated the isolation valve surveillance and mainten-

ance procedures, verified the proper application of procedures and reviewed plant specific and industry wide experience to ensure the lessons learned were incorporated into the licensee's program.

The interfacing systems reviewed included the High Pressure Safety Injection system (HPSI), the Low Pressure Safety Injection system (LPSI) , the Residual Heat Removal (RHR) system, and the Safety Injection Tanks (SIT). The two systems that had an interface which could result in an overpressurization of low pressure systems was the interface between the HPSI and LPSI systems. Prior to cycle 7 operations, Maine Yankee installed an additional check valve in the LPSI piping and the capacity to conduct surveillance tests of these check valves. During an accident condition, this check valve is the only barrier between the high pressure and the low pressure systems.

The discharge of the LPSI pumps is via piping designed to withstand 600 pounds of pressure. The HPSI system is designed to withstand full accident pressure of 2485 pounds. These two systems combine before entering containment. A check valve protects the low pressure system from the high pressure system. During normal operation a motor operated valve in each of the high pressure and low pressure piping provides an additional barrier between the two systems.

The inspector reviewed the licensee's surveillance testing of these systems. In addition to the routine time testing of the motor operated ECCS valves, the licensee monitors the pressure in the piping between the check valve and the motor operated valve in the LPSI system to detect any leakage past the check valve. The In Service Testing program conducts leak checks and flow checks of these systems during refueling outages. The inspector reviewed the test results and the maintenance history of these pressure barrier components. During the refueling in June, 1975, leakage of these barriers (check valves and motor operated valves) was detected and corrected.

The inspector had no further questions in this area.

10. Exit Interview

Meetings were periodically held with senior facility management to discuss the inspection scope and findings. A summary of findings was presented to the licensee at the end of the inspection.