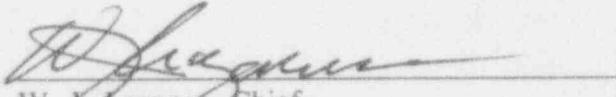


U.S. NUCLEAR REGULATORY COMMISSION
REGION I

REPORT NUMBER: 50-309/93-23
DOCKET NUMBER: 50-309
LICENSEE NUMBER: DPR-36
LICENSEE: Maine Yankee Atomic Power Company
83 Edison Drive
Wiscasset, Maine
FACILITY: Maine Yankee Atomic Power Station
INSPECTION DATES: October 12 through November 19, 1993
INSPECTORS: Jimi T. Yerokun, Senior Resident Inspector
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APPROVED BY: 
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Reactor Project Section 3B

12/16/93
Date

Scope: Resident inspection of plant activities including operations, maintenance and surveillance, engineering and technical support, and overall plant support.

Overview: See executive summary.

EXECUTIVE SUMMARY

Operations

The plant continued to be operated safely. Operations maintained a good safety perspective. Operators promptly identified a technical specifications violation (non-cited violation) when plant power indicated above 2% power prior to completing the required Emergency Feedwater System lineup. However, another violation of technical specifications occurred when the CEA Deviation alarms were inoperable and proper actions were not taken.

Maintenance and Surveillance

Maine Yankee personnel performed maintenance and surveillance activities in accordance with station directives and procedures. Actions taken to resolve identified Diesel Generator fuel oil problems were appropriate and demonstrated strong safety perspective.

Engineering and Technical Support

Engineering continued to provide good plant support. Technical evaluations of identified problems continued to be good. Engineering personnel demonstrated technical competence.

Plant Support

Radiological controls were well implemented. The licensee properly identified, during an audit, a violation (non-cited violation) of the technical specification requirement to have approved procedures. Adequate actions were taken.

The security program continued to be effectively implemented.

Safety Assessment/Quality Verification

PORC meetings were conducted in a professional manner with good safety perspective.

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DETAILS

1. OPERATIONS

The plant completed the cycle 13 refueling outage on October 9, 1993, when the plant was made critical. Phase-on occurred on October 14, 1993. The plant then operated at or near full power during this inspection period except during the following periods:

- October 22, 1993, power reduction to 70% to repair heater drain tank normal level control valve, HD-A-180.
- November 15 to 17, 1993, power reduction to 80% to replace service water pump 29B and back flush condenser waterboxes. However, Pump 29B could not be replaced at this time as discussed in this report.

On a daily basis, inspectors verified adequate staffing, appropriate access control, adherence to procedures and technical specifications limiting conditions for operation, and operability of protective systems including emergency power source. The inspectors also verified operability of selected Engineered Safety Features (ESF) trains and assessed the condition of plant equipment, radiological controls, security and safety. The inspectors viewed some safety-related tagout, chemistry sample results, shift turnovers, portions of containment isolation valve lineup and the posting of notices to workers. The inspectors evaluated plant housekeeping and cleanliness. The inspectors monitored the status of control room annunciators and radiation monitors to ascertain that they were being maintained adequately.

1.1 Inadvertent Power Escalation above 2%

During plant startup, per OP-1-3, on October 12, 1993, operators noticed that the wide range nuclear instrument (WRNI) power indications were not properly tracking with the power range nuclear instruments (PRNI) indications. Further investigation revealed that the WRNI power was more reliable. The PRNI was expected to read high at very low power levels because a bias to read high had been entered. Power increase was halted and an evaluation of real thermal power was performed. Historical data showed that actual reactor thermal power never exceeded 2%. However, the data indicated that at 6:03 p.m. on October 11, 1993, PRNI indicated power had exceeded 2% prior to the operators verifying that the Emergency Feedwater (EFW) flow path for EFW pump 25C was operable.

Exceeding 2% power as indicated on the PRNI is prohibited by technical specification 3.8.E unless all the EFW pumps and associated flow paths are operable to supply emergency feedwater. The licensee generated an unusual occurrence report (UOR number 93-094) to address this event. The event was reported to the NRC via LER 93-020 dated November 15, 1993.

This violation of Technical Specifications 3.8.E is not being cited because the criteria of 10 CFR 2, App. C., VII.B for exercise of enforcement discretion were met. The safety significance was minimal since actual power never exceeded 2% prior to the EFW system

being aligned; the violation was not willful; the licensee identified and reported the violation; and immediate corrective actions were taken after it was verified that actual power was in fact below 2% such that indicated PRNI power did not inadvertently exceed 2%. Operations personnel were alerted to this concern and the need to ensure full compliance during subsequent startups. The inspector was satisfied that adequate actions were taken to address this issue.

1.2 Inoperable CEA Deviation Alarms

On November 4, 1993, Maine Yankee operations personnel conducted the monthly CEA exercising as directed by station procedure OP 3.1.8, "CEA Exercising." Prior to performing this procedure, control room panel alarm R-2-3, CEA POSITION DEVIATION REED SWITCH, was locked in (illuminated). There was an outstanding work order (WO 92-3409) for the alarm's intermittent operation for a group 5A problem.

During the conduct of the test, when rod 38 was inserted, the other control room alarm, R-1-7U, CEA DEVIATION PULSE HI, did not alarm as it should have. The test was temporarily suspended and troubleshooting for the cause of the failure of R-1-7U to alarm was initiated. The licensee found that all the interlock relay cards for the alarm in the plant computer were in the withdrawn position, and apparently had been in that condition since the plant startup on October 9, 1993. The cards were inserted and alarm R-1-7U was made operable. The operator resumed and successfully completed the CEA exercising.

The inspectors were concerned with the apparent weakness in work controls in that the licensee did not know that the RPSS interlock relay cards in the computer had been left withdrawn, thereby rendering alarm R-1-7U inoperable. While the computer itself was not safety-related, actions that appeared inadequately controlled had affected the proper performance of a technical specifications control room alarm. Additionally, alarm R-2-3 was sealed in and had an outstanding work order from 1992 and no actions were taken to clear the alarm prior to commencing the monthly CEA exercise. These two alarms had both been inoperable for a considerable time. The licensee did not know this and had not taken the required compensatory actions. The circumstances of this situation appear to be in violation of Technical Specification 3.10.A.4, which requires that individual CEA positions be logged and misalignment checked every 4 hours if the CEA deviation alarms from both the computer pulse counting system and the reed switch indication system are not available. The licensee knew that the reed switch indication system alarm (R-2-3) was inoperable since it was already sealed in, but was unaware that the computer pulse system alarm (R-1-7U) was inoperable. (Violation 50-309/93-23-01).

During this event, other indications of CEA position deviation were available. The reed switch red arrow light, the metroscope, and the computer deviation on the screen and printer were all operable. The licensee was, however, unable to determine why the RPSS cards had been left out.

1.3 Containment Isolation Valve Surveillance Testing

On November 3, 1993, during routine containment isolation valve testing, high pressure drain valve HPD-A-96 failed to stroke to the full open position as required by station procedure 3-1-20.1, "Containment Isolation Valve Testing at Power." The valve was declared inoperable and containment integrity was maintained by rebounding (establishing a new boundary) in accordance with station technical specifications section 3.11.B.

A work order was written to investigate and repair the valve. The valve packing had dried out, thereby causing stem binding and subsequent failure to stroke properly. The valve was repacked and successfully retested. The inspector was concerned that the licensee's packing and lubrication program did not identify this deficiency. The licensee is reviewing this problem.

2. MAINTENANCE and SURVEILLANCE

The inspectors observed and reviewed maintenance and problem investigation activities to verify compliance with regulations, administrative and maintenance procedures. The inspectors ascertained that maintenance activities on safety related equipment were performed in accordance with approved work order (WO) requirements, codes and standards, with proper QA/QC involvement, proper safety tag and jumper use, and equipment alignment.

The inspectors witnessed surveillance testing activities and ascertained that they were performed in accordance with technical specification requirements, codes and standards and administrative and surveillance procedures. The inspectors observed portions of the following activities:

- WO 93-01615, D/G 1B Startup Air PM
- WO 93-03140, D/G 1B Startup Air Lines PM
- WO 92-05820, Overhaul Service Water Pump P-29B
- WO 92-05820-1, Electrical Determ/Reterm P-29B
- Procedure No. 3-1-5.2, EFW Pump 25A Test.
- Procedure No. 5-29-1, Disassembly, Repair and Assembly of Service Water Pumps

Maine Yankee personnel performed the observed maintenance and surveillance activities in accordance with station directives and procedures.

2.1 Diesel Generator DG-1B Fuel Oil Pressure and Filter Leak

On November 9, Maine Yankee operations personnel initiated emergency diesel generator DG-1A monthly surveillance testing as required by station technical specifications. The nuclear plant operator (NPO) started DG-1A and brought the engine to rated speed without electrical load, in accordance with station procedure 3.1.4, Emergency Diesel Generator Testing. The NPO noted that the DG-1A engine driven fuel oil pump pressure was

indicating 62 psi. The procedure required a range of 40 to 55 psi. The NPO swapped the filters of the duplex filter with no change in indicated pressure. The NPO notified the control room Shift Operating Supervisor (SOS) who requested that maintenance personnel investigate the problem. Station instrument and controls (I&C) technicians checked the calibration of the pressure gage and found it satisfactory. A work order was written to change the fuel filters and the SOS directed the NPO to shutdown the engine down as required by the procedure.

After the filter replacement, DG-1A was restarted and accelerated to 450 rpm and the engine driven fuel oil pressure was found to be 32 psi. Investigation by the NPO revealed a gasket leak at the fuel oil strainer. The control room supervisor directed the NPO to shutdown DG-1A to prevent further fuel leakage. All of the spilled fuel was contained in the DG-1A area and subsequently recovered. The leaking fuel filter gasket was replaced. DG-1A was restarted and engine driven fuel oil pressure indicated in the proper range.

On November 10, 1993 at 12:00 a.m., the Shift Supervisor directed DG-1A to be restarted and tested as required by procedure 3.1.4. The engine driven fuel oil pressure was normal and the test was completed satisfactorily. The EDG was declared operable and T.S. 3.12 remedial action was exited.

Plant engineering personnel inspected the original fuel filters and found debris and sludge present. Technicians sampled the fuel oil storage tanks, but found no evidence of contamination. A station closeout plan was developed by the plant engineering department to investigate the reason for problems identified during the testing and to provide resolution as required. The inspector reviewed Maine Yankee's actions to resolve the identified problems and determined that a strong safety perspective was evidenced by all personnel and the actions were appropriate.

2.2 Service Water Pump P-29B Maintenance

On several occasions during the inspection period the inspector observed Maine Yankee maintenance personnel during removal, overhaul and reinstallation of service water pump P-29B. The maintenance personnel accomplished the work as directed by station work order WO 92-05820 and station procedure 5-29-1, Disassembly, Repair and Reassembly of Service Water Pumps. The maintenance department lead mechanic provided excellent day-to-day work control of contractor personnel and was knowledgeable of the requirements of the work order and procedures.

The pump was reinstalled on November 15, 1993, and when the mechanics attempted to rotate the pump prior to motor installation, the impeller was found to be rubbing on the pump bowl. The pump was removed and subsequent inspection revealed that the new pump impeller had not been machined properly by the vendor. On November 19, 1993, Maine Yankee returned the pump impeller and bowl to the vendor for repair. A non-conformance

report (NCR) was written by the station quality programs department to document the event. This provided a closeout plan and a plan to assess the vendor's actions to investigate the cause of the non-conformance and subsequent resolution.

The inspector found the licensee's actions adequate. There was good interface among the Maintenance and Engineering departments in identifying and repairing the pump. Work activities were well coordinated and timely.

2.3 Motor Control Center (MCC) Feeder Breaker 12B Trip

On November 11, 1993, Maine Yankee operations personnel determined that the feeder breaker for non-safety motor control center (MCC) 12B had tripped on over-current. This circuit breaker is equipped with an RMS-9 solid state over current trip device manufactured by General Electric. These devices have recently been observed to cause inadvertent trips of safety related equipment as reported in NRC inspection reports 50-309/93-18 and 93-21. Subsequently, Maine Yankee management directed that safety related circuit breakers be modified to reinstall the original electro-mechanical EC type over-current trip devices until the RMS-9 problem is resolved.

This particular circuit breaker (MCC 12B) has been observed to trip on two previous occasions. Maintenance department electricians identified oil present in a unit heater in the circulating water pump house to be the probable cause of the electrical short which caused the feeder circuit breaker to trip. This unit heater was repaired. The inspector reviewed Maine Yankee's actions to resolve this problem and found them to be appropriate, in that no safety concern was identified and corrective actions were prompt and comprehensive. The inspector had no further questions regarding this issue.

3. ENGINEERING and TECHNICAL SUPPORT

3.1 Secondary Component Cooling Safety/Non-Safety Related Boundary

During this inspection period, the licensee identified portions of secondary component cooling (SCC) system that were connected to non-safety related piping without any trip valves for isolation purposes. Valves SCC-26, SCC-29 and SCC-493 provide continuous vent paths to the SCC surge tank (TK-59) through non-safety related piping without any isolation boundary. This may be outside the current design basis for the SCC system which assumes that all non-safety related portions of the system are isolated by trip valves in order to protect against a non-safety related pipe failure and loss of cooling water inventory.

The primary concern was the potential loss of SCC inventory through non-safety related piping in the SCC system. The licensee initiated a Safety Issue Concern (SIC 93-007) to address this issue. Valves SCC-26, SCC-29 and SCC-493 were immediately tagged shut to isolate the non-safety related piping until this issue is resolved. SCC operability is not

affected and the system will be manually vented as required if entrained air is indicated by chemistry samples. A closeout plan (COP 93-021) was generated to document the actions taken to resolve the issue.

The inspector found the licensee's operability determination incomplete because the operability of SCC was not properly addressed. Additionally, the licensee was unable to determine why non-safety related piping connecting vent lines to the SCC surge tank could have remained unidentified. The licensee was unable to determine if this was reportable per 10 CFR 50.72 and 73. This issue remains unresolved pending completion of the licensee's determination as to whether this configuration was outside the design basis and whether it was reportable. (Unresolved Item No. 50-309/93-23-02).

3.2 Control Room ECCS Light-box

The licensee took actions to correct a problem identified with the control room emergency core cooling system (ECCS) light-box. The problem had resulted in intermittent loss of air operated valves (AOV) position indication on the light-box and occurred during valve strokes only. While the valves were determined to be operable (verified through other indications), the light-box indications are required per Regulatory Guide 1.97, and the FSAR. A safety issue concern (SIC 93-006) was generated to address this problem.

The cause of the failures was identified as the unaccounted-for temperature coefficient of the logic cards in the control circuit. Because the motor operated valves (MOV) control circuits operate at slightly higher voltage, they did not experience this problem. The licensee developed a closeout plan (C.O.P. 93-019) for actions to be taken to resolve the problem. The licensee determined that all the light-box logic cards (130 installed plus 10 spares) should be returned to the vendor for repair. This is currently being done in groups of 22, such that only 12 valves will have inoperable light-box indication during the process. The repairs are scheduled to be completed by end of the year.

The inspectors found the overall effort to address the ECCS light-box problems adequate. Information was properly disseminated to control room operators as to the operability of the light-box. Instructions were posted by the light-box describing which valves' indications were affected and what other means of position indications were available.

3.3 Station Air Compressor Replacement

Maine Yankee engineering and contractor personnel commenced installation of new service air compressors during the inspection period as required by station engineering design change request (EDCR) 93-31, Replacement Instrument and Service Air Compressors. The original

installed air compressors were removed and the area was prepared for installation of the new equipment. The EDCR also required installation of new feeder cabling from the motor control center (MCC), and new air drying equipment.

Maine Yankee management implemented the EDCR sooner than originally planned due to the excessive corrective maintenance required to maintain the original equipment in working order and also due to the increased air demand required during recent outages. The inspector reviewed the EDCR package and found that all required reviews were accomplished and that the 10 CFR 50.59 screening conclusions were appropriate. The 10 CFR 50.59 screening assessed the affect of the change on electrical safety busses. The feeder circuit breakers for the air compressors are supplied from a safety electrical bus even though the equipment is not safety related. The inspector determined that Maine Yankee's actions were appropriate and that no unresolved safety issue exists. The inspector had no further questions regarding the modification.

4. PLANT SUPPORT

4.1 Radiological Controls

Inspectors routinely reviewed radiological controls including Organization and Management, external radiation exposure control and contamination control. The inspectors also monitored standard industry radiological work practices, and conformance to radiological control procedures and 10 CFR 20 requirements.

4.1.1 Radiation Monitoring System Calibration Procedures

Throughout the inspection period the inspector assessed the station radiation monitoring system (RMS) in view of the fact that many area and liquid monitors had not been repaired and returned to service prior to completion of the recent refueling outage. A review of maintenance records for the RMS system covering the last two and a half years identified over one hundred fifty separate maintenance requests to repair or calibrate system components. Several detectors were out of service for almost the entire cycle and the primary vent stack (PVS) high radiation monitor, which is used for accident off-site dose calculations, was out of service from November 1992 until September 1993. This was due to components awaiting repairs and an eventual technical specification revision request. The TS amendment was required due to installation of a new channel drawer, which had a different channel checking capability, and did not require weekly source checking as required by the previously installed equipment. This technical specification amendment was approved by the NRC and the licensee implemented it in October of this year.

The inspector reviewed a Yankee Atomic (YA) audit of the RMS, completed in May of this year, which identified a deficiency that Maine Yankee did not provide PORC-approved calibration procedures to YA personnel when RMS components were sent off-site for calibration. This is a violation of station technical specifications, section 5.8.2, which states,

in part, that all safety-related surveillance testing is to be accomplished by PORC approved procedures. This violation is not being cited because the criteria of 10 CFR 2, App. C., VIIB for exercise of enforcement discretion were met. It was identified by the licensee, had minimal safety significance, was not repetitive, and the licensee took prompt and appropriate actions.

As a result of this audit, Maine Yankee management directed that a committee be established to investigate the RMS system problems and make recommendations to bring about resolution of identified concerns. The committee developed a station close-out plan which identified twenty items requiring resolution. Although the close-out plan was very detailed, the inspector noted that neither the YA audit, nor MY closeout plan addressed the issue of RMS system reliability. The inspector brought this issue to Maine Yankee's management attention and they plan to investigate and make a determination of overall system reliability. The inspector determined that the licensee's response was appropriate for the identified concern. This item remains open pending completion of licensee's actions to assess overall system reliability in light of the numerous recent maintenance activities on the system.

4.2 Security

The inspectors verified that security conditions met regulatory requirements, the requirements of the physical security plan, and complied with approved procedures. The checks included security staffing, protected and vital area barriers, vehicle searches and personnel identification, access control, badging, and compensatory measures when required. No discrepancies were identified.

5. SAFETY ASSESSMENT/QUALITY VERIFICATION

5.1 Licensee Event Reports (LER) (92700)

The inspectors reviewed the following LERs which provided the licensee's final assessment of several recent events. The inspectors verified that the event description was consistent with their prior knowledge of the events, that Maine Yankee identified the root cause of the event, took timely and appropriate corrective actions, addressed generic implications, implemented actions to prevent recurrence, and met the reporting requirements of 10 CFR 50.73.

- LER 93-015, Emergency Cooling System Valves Found Unlocked
- LER 93-017, Emergency Diesel Generator Voltage Sensing Relay Wiring Discrepancy
- LER 93-018, Number of Defective Tubes in Steam Generator #3 Greater Than Technical Specification 4.10 Limit
- LER 93-019, Degraded Service Water Pump Found During Flow Rate Testing

5.2 Plant Operations Review Committee (PORC)

On occasions, the inspectors attended PORC meetings to ascertain that the committee performed the required reviews and oversight to ensure nuclear safety as required by station technical specifications, Section 5.5. The committee had the proper quorum and met within the frequency specified in the station technical specifications.

6. ADMINISTRATIVE

6.1 Persons Contacted

During this report period, inspectors conducted interviews and discussions with various licensee personnel, including plant operators, maintenance technicians and the licensee management.

6.2 Summary of Facility Activities

Other inspections conducted during this inspection period include an Emergency Planning Annual Program Inspection (50-309/93-24), Security Inspection (50-309/93-25), and Operations Examinations (50-309/93-26).

6.3 Interface with the State of Maine

Periodically, the resident inspectors and the onsite representative of the State of Maine discussed findings and activities of their corresponding organizations. No unacceptable plant conditions were identified.

6.4 Exit Meeting

Inspectors periodically held meetings with senior facility management to discuss the inspection scope and findings. At the conclusion of the inspection, the inspectors also presented a summary of findings for the report period.

During the inspection period the inspectors conducted backshift inspection on October 13, 21, 26, 27, and November 4 and 17, 1993 and deep backshift inspection on October 26 and 27, 1993.