U.S. NUCLEAR REGULATORY COMMISSION

REGION III

REPORT NO. 50-255/95009

FACILITY
Palisades Nuclear Generating Plant

LICENSEE
Palisades Nuclear Generating Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

DATES
July 4 through August 21, 1995.

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APPROVED BY

for W. J. Kropp, Chief
Reactor Projects Branch 2A

9-15-95
Date

AREAS INSPECTED

A routine, unannounced inspection of operations, engineering, maintenance, and plant support was performed. Safety assessment and quality verification activities were routinely evaluated.

OVERALL ASSESSMENT OF PERFORMANCE

Performance during the refueling outage overall has been satisfactory. Early in the outage there was a series of personnel errors that collectively indicated a weakness in the process for controlling plant activities in the areas of communications and attention to detail on the part of plant personnel. Management recognized these errors as precursors and took action to improve performance. Improvement began to show later in the outage.

The licensee generally maintained an improved posture this inspection period. Management oversight of the steam generator inspection program, fuel handling, containment closeout, and plant startup activities was positive. No problems were noted during reactor vessel reassembly activities, and no mobile crane errors were noted. (Problems in these areas were discussed in the previous inspection report 255/94008.) However, a significant weakness that remained from the previous inspection was in the area of control of foreign material. Management acknowledged this weakness and has begun action to improve performance in this area.

Planning and coordination of major projects was good. However, the challenge for management was to better plan and coordinate the lesser projects. Opportunities were missed to correct some minor longstanding maintenance deficiencies on the emergency diesel generators following major outages on both machines. Two inadvertent safety injection system actuations occurred during testing because of weaknesses in planning and coordination and poor worker practice.

Problems with plant labelling contributed to two other events during this inspection. False labelling on instrument root valves led to a reactor trip in Hot Standby. Lack of adequate labelling on a hose led to a health physics worker spraying a small amount of primary coolant pump oil into the reactor cavity.

Management's initial response to an unexpected control rod motion event, and to the discovery of the loss of the containment high pressure trip function was satisfactory.

ASSESSMENT BY FUNCTIONAL AREA

Performance within the area of OPERATIONS was good (section 1.0).

Operations' control of control room activities was good. Control room operators were not overburdened with outage related activities and traffic in the control room was maintained at an appropriate level. Control room manning exceeded minimum requirements. Operator distractions were minimized by maintaining the status board and communications center for core offload and reload in the shift supervisor's office, and by including a training department member to augment the day shift crew. Communications during refueling activities were appropriate.

Management and engineering's involvement during fuel handling activities was good. Use of procedures and log keeping was adequate. However, refueling equipment problems caused unanticipated delays with core reload.

Containment closeout inspection was favorable. Control of debris was very good with virtually no loose material present. This was a large improvement from the outage. Only approved items were left in containment and these were appropriately secured. Personnel performing the inspection were thorough and followed a procedure that provided adequate guidance. Containment sump debris screens were clean and in good condition. The remainder of the sump was also free of debris except for some sludge buildup on the floor, which the licensee periodically cleans.

Operators' response to a swagelock fitting leak on primary coolant system flow transmitter DPI-0112BB was good. However, labelling weaknesses were identified on a few primary system instrument root isolation valves.

The performance of operators was good during the approach to critical operations. Good communications and professionalism were exhibited.

An unexpected control rod motion event occurred. Operator response was appropriate. This issue will be assessed in more detail in the next routine inspection report.

Performance within the area of MAINTENANCE was adequate (section 2.0).

Maintenance performed many activities well and without significant errors. Examples included numerous pump and valve repairs, seal replacements on three primary coolant pumps, switchgear preventive maintenance, and numerous emergent work issues. However, weak portions of some maintenance procedures, and some poor worker practices were noted. Opportunities were missed to correct some minor maintenance deficiencies on the emergency diesel generators during maintenance outages.

Weaknesses were noted in control of foreign material. Two examples were noted. One was when a health physics worker inadvertently sprayed less than a gallon of oil into the reactor cavity while attempting to rinse the upper guide structure. This hose had earlier been used to make adjustments to the primary coolant pump oil system. The hose had not been drained of its residual oil and was not labeled. Another example was when a plastic bag for waste radiological materials was found in safety injection pump P-66A. Management acknowledged that plant procedures governing FME could be improved and that actions have been initiated to revise appropriate procedures.

Management expectations were not met during performance of a safety injection system test for containment high pressure and containment spray. Two separate inadvertent safety injection actuations occurred during the test. The first was due to a weakness in the surveillance test procedure. The second was due to personnel error. One contributing reason was that the test steps where the errors occurred were new portions of the test that had not received an adequate review by persons performing the test.

A major overhaul of emergency diesel generator (EDG) 1-1 was conducted as a result of enforcement action taken for failure to perform vendor-recommended maintenance in accordance with Technical Specifications (see inspection report 255/94017). Most engine components appeared in satisfactory condition. Two significant observations were evidence of engine exhaust recirculating into the air intake of the turbocharger, and an indication of water leakage into cylinder 7R. Both of these items were considered inspector followup items. Some lesser maintenance was performed on EDG 1-2 as well. Several minor work requests were still outstanding at the conclusion of the work on both EDGs. Planning and coordination between Maintenance and other departments to address these minor items warranted improvement.

Performance within the area of ENGINEERING was adequate (section 3.0).

The licensee discovered that the reactor protection system logic trip function for containment high pressure was inoperable during the last two operating cycles. Among the apparent root causes was an inadequate post modification test during an upgrade of this portion of the reactor protection system back in 1992. A detailed review of this event was performed and documented in special NRC inspection report 255/95010(DRS).

The steam generator (SG) eddy current inspection program was conservative. The licensee inspected 20 percent of the SG's tubes versus a 3 percent requirement. Additional testing using the motorized pancake coil and plus point probe was also performed. These examinations were performed at the top of the tubesheet area where recent industry findings identified circumferential cracking (Reference Generic Letter 95-03). No SG tubes required repair.

Planning efforts for performance of reactor vessel annealing were thorough and in compliance with NRC Draft Regulatory Guide 1027. Examples of good planning efforts include use of mockups to demonstrate feasibility and reduce exposure for placement of thermocouples within the annulus; and selection and placement of pressure vessel materials in surveillance capsules located in high neutron flux regions to get additional information on the amount of recovery for annealed vessel materials.

As part of a Regional Request, applicability of Information Notice 94-66, Supplement 1, "Overspeed of Turbine-Driven Pumps Caused by Binding in Stems of Governor Valves," was reviewed for Palisades. The licensee has not had any experience with governor valve stem binding or corrosion problems associated with its turbine-driven auxiliary pump. Pump components are inspected during routine preventive maintenance activities and pump performance is monitored during routine surveillance testing.

Performance within the area of PLANT SUPPORT was adequate (section 4.0).

The main steam line penetration through the turbine building/auxiliary building wall contained an opening that was greater than the allowable size for an opening in a vital area barrier. A security officer was posted at the opening as an immediate compensatory measure and a condition report was initiated to document the finding and corrective action. The safety

significance of the opening was minor because of its obscure location, small size, and environmental conditions due to proximity to the hot steam line. Management later determined that the opening was not a viable pathway and relieved the security officer.

Summary Of Open Items

Inspector Follow-up Items: identified in section 2.3.
Unresolved Item: identified in section 2.1.

INSPECTION DETAILS

1.0 OPERATIONS

NRC Inspection Procedures 71707 and 92709 were used in the performance of an inspection of ongoing plant operations. The findings showed performance was good.

1.1 Control Room Observations

Control room operators were not overburdened with outage related activities, and traffic in the control room was maintained at an appropriate level.

Control room manning during the outage consisted of the same number of licensed operators that would be on shift during power operations. This exceeded shift manning requirements during refueling and was considered a strength.

Palisades implemented a 12 hour rotating shift schedule during the outage. Each crew's first shift following off days was spent off watch reviewing plant conditions, status of outage work, and preparing for future work activities. This was considered a strength.

To reduce distractions in the control room, the status board and communications center for refueling operations were maintained in the shift supervisor's office. The inspector concluded that communications regarding refueling activities were appropriate.

A training department member was assigned to augment the day shift crew. This reduced distractions on the crew and was considered a strength.

1.2 Fuel Handling Observations

Core reload was delayed several days due to problems with the refueling machine. The licensee made the appropriate repairs and successfully tested the refueling machine before core reload was commenced.

Fuel handling activities were further delayed due to failure of the fuel handling transfer cart winch.

Other related observations were:

- Proper communications were established between personnel in containment and the fuel handling building.
- Operations management oversight was observed in containment and the fuel handling building.

- Reactor engineering and system engineering oversight was present during fuel moves.

- Appropriate procedures were used and logs maintained during the fuel moves.

1.3 Containment Closeout Inspection

Containment cleanliness deteriorated during the outage. There were trip hazards on the refueling floor and a lack of fall protection on the west side of the refueling cavity inside of the debris free zone. To correct this, supervisors were assigned to tour containment and look for problems. Reminder notes were placed in the daily bulletin. As the outage concluded, extraneous material was removed from containment and conditions improved.

The inspector's assessment of a containment closeout inspection was favorable. Control of debris was very good with virtually no loose material present. Only approved items were left in containment and these were appropriately secured. Personnel performing the inspection were thorough and followed a procedure that provided adequate guidance. Two minor items noted by the inspector were peeling safety tape on some ladder rungs and a foam bench seat mounted on the fuel manipulator crane platform.

The inspector's observation of a post refueling videotape of the containment sump indicated that the debris screens were clean and in good condition. The sump itself was free of debris except for some sludge buildup on the floor. Plant personnel stated that this sludge is removed at periodic intervals.

1.4 Manual Reactor Trip During Control Rod Drop Timing Test Due To A Leak On A Primary Coolant System Flow Instrument

On August 15, 1995, operators manually tripped the reactor when an 11 gpm leak started at a swagelock fitting on primary coolant system flow transmitter DPI-0112BB. At the time of the leak, the plant was in Hot Standby and all control rods (with one exception) were latched and at the 2.5 inch position. One control rod was being withdrawn to perform rod drop time testing. An operator was dispatched to close the root valves for DPI-0112BB to stop the leak. However, the operator closed the incorrect valve due to a labelling error. This resulted in a "A" channel RPS low flow pre-trip alarm. Based on the indications of multiple RPS channels tripping, the shift supervisor ordered a manual reactor scram. The cause of the leak was due to incorrect installation of the swagelock fitting several years ago. The licensee checked a large sample of other similar swagelock fittings and found no other installation problems. In addition, no labelling discrepancies were found on local isolation valves for other instruments. However, the licensee found other labelling discrepancies on a few other root isolation valves located on the primary system piping. Because the root

valves represent personnel hazards from a dose and temperature perspective, and were inaccessible at power, the licensee would correct the labelling during the next cold shutdown opportunity.

1.5 Initial Cycle 12 Criticality

On August 17, 1995, plant operators made the reactor critical for the first time in cycle 12. The inspector observed that the estimated critical boron concentration was within the predicted target band. The performance of the operating crew was good. There were good communications and professionalism exhibited during the evolution.

The plant again went critical on August 19, 1995, following a brief shutdown to make repairs to the rod control system (see below).

1.6 Control Rod Withdrawal When Given An Insertion Demand

On August 17, 1995, during low power physics testing following initial criticality for cycle 12, an unexpected control rod motion occurred. Group 4 rods had been pulled as part of the first phase of low power physics testing. When reinserting the group 4 rods to their original position, group 4 rods no. 40 and no. 41 both moved out upon an insertion demand. Rod control was in manual sequential. Plant operators placed rod control to manual individual and rod no. 41 inserted; however, rod no. 40 continued to rise when given an insertion demand. The licensee declared rod no. 40 inoperable and commenced boration to subcritical conditions (critical boron concentration with all rods out plus 100 ppm). Plant operators later tripped the reactor when initial troubleshooting of the as-found condition identified a short circuit between the lower and raise control rod circuitry. This issue will be assessed in more detail in the next routine inspection report.

1.7 Other Observations

During plant heatup the licensee exceeded the administrative requirement for maintaining containment building air pressure below one psig. The maximum pressure attained was just over 1 psig. The technical specification limit is less than 3 psig. The licensee was unable to use the normal vent path due to a blockage in the release path. This blockage is located in the vent gas collection header (VGCH) and is one of the oldest and most problematic operator workarounds being tracked by the licensee. As a result, the licensee implemented a temporary modification to reroute the containment vent path around the blockage. The licensee has a plan to locate and attempt to free the blockages during the next few months.

2.0 MAINTENANCE

NRC Inspection Procedures 62703 and 61726 were used to perform an inspection of maintenance and testing activities. The findings showed maintenance was adequate.

2.1 Weaknesses In Foreign Material Control

As indicated in the last inspection report, there were weaknesses noted in the control of foreign material within the debris free zones of the reactor cavity and spent fuel pool. Two additional examples of weak FME control are detailed below. The two procedures governing foreign material exclusion were MSM-M-20, "Maintenance Cleanliness Guidelines" and MSM-M-47, "Foreign Material Exclusion in the Spent Fuel Pool Area and Reactor Cavity". The licensee acknowledged that these plant procedures governing FME could be improved and that actions have been assigned to improve in this area. Pending completion of the licensee's actions, the issue of foreign material control is considered an unresolved item (255/95009-01 (DRP)).

2.1.1 Oil Inadvertently Sprayed Into Reactor Cavity

A health physics worker inadvertently sprayed less than one gallon of oil into the reactor cavity while attempting to rinse the upper guide structure. In preparing to spray the upper guide structure with flushing water, workers connected a hose that had been stowed in containment to the water source used for washdown. However, this hose had earlier been used to remove oil from the reactor coolant pumps. The hose had not been drained of its residual oil and was not labeled. When the water supply was turned on, it flushed the residual oil into the reactor cavity.

Chemistry personnel promptly sampled the cavity water. The results showed no deleterious effects. While as little as 250 ml of oil would disrupt the water chemistry, samples routinely taken of primary coolant water have not shown any evidence of oil. The identification and response to the problem by Operations and Chemistry was timely and thorough.

2.1.2 Plastic Bag Found Inside High Pressure Safety Injection Pump

Safety injection pump P-66A failed a routine surveillance test as differential pressure was in the required action range and pump vibration was in the alert range. When the pump was disassembled for inspection, a yellow plastic bag was found wrapped around the pump shaft and lodged in the first stage impeller. The pump was not required to be operable since reactor was shutdown at the time.

Plant workers inspected the pump and found no further signs of degradation. The rotating element was overhauled and the pump was reassembled. The pump was satisfactory testing and returned to operable status.

The licensee evaluated possible locations where the bag may have entered the system and evaluated operability of the other safeguards pumps. The inspector reviewed the licensee's investigation and operability of the other pumps and had no further concerns.

2.2 Inadvertent Safety Injection Actuation

An inadvertent safety injection (SI) actuation occurred during performance of surveillance procedure RO-12, "Containment High Pressure (CHP) and Spray System Tests", Revision 23. A second inadvertent SI actuation occurred during restoration from this test. One contributing reason was that the test steps where the errors occurred were new portions of the test that had not received an adequate review by persons performing the test.

The test setup (step 5.4.3) required two wires to be lifted (from relay TVX-L terminal two) to prevent the CHP signal from energizing the safety injection relays. The technician lifted these two wires from the terminal as directed, but then taped them together. This allowed the CHP SI signal to be transmitted when the test pressure signal was applied. The procedure did not specify separating the two wires once they were lifted from the terminal.

All safeguards equipment operated as expected and the surveillance test was suspended.

The second inadvertent SI actuation occurred during recovery from the suspended test. While landing a wire, the technician shorted the circuit when his screwdriver touched the terminal block. All safeguards equipment again operated as expected.

The crew used appropriate procedures to verify proper operation of SI equipment and to subsequently restore the equipment to the required status following both inadvertent SI actuations.

2.3 Emergency Diesel Generator 1-1 Overhaul

The inspectors witnessed selected portions of the first major disassembly of diesel 1-1 after over 20 years of standby service, which included 3830 hours of operation. Internals of the engine and turbocharger were inspected for evidence of abnormal wear. In general, the condition of the engine and its components was good. The following observations were noted:

- The lower half of the connecting rod bearings showed some areas of overlay removal, apparently the result of the hydraulic effect of compressed oil. This was more pronounced on bearings 2R, 3L and 4L. In addition, several round "stains" were noted on 3L. The latter was not consistent with the observations of the other bearings. None of these indications were considered detrimental.

- Well healed, scuffing marks were noted on the bore of liners 1L, 1R, 2R, and 3R. Similar marks were present in their respective piston. These marks were probably the result of the 1985 overheating event.

- Of more significance was the evidence of engine exhaust recirculation into the air intake. The turbocharger fan blades were coated with a layer of fine carbon residue. This foreign material could reduce the efficiency of the turbocharger and has the potential for creating an imbalanced condition. In addition, the inlet valves of cylinder heads 1L and 7R had a thick (1/32" to 1/16") coating of carbon grit. The presence of this foreign material could result in valve sticking and subsequent mechanical failure. The licensee will be considering changes in exhaust or inlet location to prevent these abnormal conditions from recurring. In addition, cylinder head 7R had an indication of water leakage (rust mark on seat). The licensee will attempt to determine the source of the water. The inspector will continue to follow the licensee's actions in this area. Pending the licensee's evaluation of the engine exhaust recirculation issue, this will be an inspector followup item (255/95009-02 (DRS)). Also, pending the licensee's evaluation of the water in cylinder 7R, this will be an inspector followup item (255/95009-03 (DRS)).

2.3.1 Emergency Diesel Generator 1-1 Integrated Testing

During the July 11 performance of Procedure T-302, "Overspeed Trip Test", the licensee identified that an incorrect overspeed trip spring had been installed during the EDG overhaul as a result of a procurement error. The proper replacement was ordered and installed on July 12. The test was then completed satisfactorily.

2.3.2 Other Emergency Diesel Generator Observations

The licensee completed maintenance outages on both EDG 1-1 and EDG 1-2 during the current refueling outage. Following the maintenance outages, the inspector observed several outstanding work requests that had not been addressed. Some appeared minor and were over one year old. One example was a work request initiated on April 14, 1994, to replace the belly tank level switch on EDG 1-2 with a functional equivalent. The inspector followed up and noted the licensee had scheduled those various work requests for later this year. Although the licensee performed extensive maintenance on both EDGs during this refueling outage, the licensee acknowledged that opportunities were missed to address some of the long-standing minor issues on the EDGs.

2.4 Other Maintenance Observations

- WI-TGS-I-008 (Revision 1), Testing of DEH Runback Circuit

The responsible engineer provided a very good prejob brief to all personnel involved in the test. Good coordination and control of this activity was also observed.

3.0 ENGINEERING (37551, 37700, 73753)

NRC Inspection Procedures 37551 and 73753 were used to perform an inspection of engineering activities. The findings showed performance was adequate, however, an example of unacceptable performance was identified in paragraph 3.1 below.

3.1 Reactor Protection System (RPS) Logic Trip Function For Containment High Pressure Was Inoperable

On July 28, 1995, while performing RPS circuit checkouts after connector replacements, the licensee discovered that the RPS logic trip function for containment high pressure was inoperable. A detailed review of this event was performed and documented in special NRC inspection report 255/95010(DRS).

3.2 Steam Generator (SG) Inspection Performed Appropriately

The NRC inspector observed portions of SG eddy current testing. Testing was performed in accordance with commitments to Generic Letter 95-03. Testing was conservative and exceeded requirements.

Review of the licensee's inspection program, procedures, analysis guidelines, examiners certifications, and graphics and inspection data concluded that Palisades SG performance is good and the inspection program is conservative. The program utilized state of the art equipment and inspection techniques.

Results of the last three SG inspections have not identified any significant tubing degradation. The majority of the degradation found to date appears to be wear, caused by the tubes' contact with antivibration bars or bat wing supports. This type of wear is common among recirculating type SGs and reduces with time in operation. No SG tubes required repair.

3.3 Palisades Reactor Vessel Annealing Meeting Summary

A meeting was held at Palisades on June 28 to discuss the reactor vessel annealing planned for the 1998 refueling outage. The vessel will be annealed using an indirect gas heating system. Ducktwork and exhaust ventilation will be routed through the equipment and/or escape hatch. Inside the reactor vessel there will be five heating zones with two independent burners per zone. Palisades currently plans on a controlled thermal profile during heatup with a 7-day soak at 850°F and a 25°F/hr. cooldown. Temperature inside the rig at the source will be approximately 1400°F.

Consumers predicts approximately an 80 percent or greater recovery from the annealing; however, it estimates only 40 percent recovery is required to reach its target of 2011, which includes recapturing the construction period. NRC staff raised concerns over adequate fire protection planning for onsite storage of the large quantities of

combustible gas required for annealing.

Walkthroughs of systems, structures and components within containment, potentially affected by the proposed annealing, were conducted with NRC staff. The content and schedule for the Application for Approval for Thermal Annealing (AFATA) was discussed. NRC staff raised concerns over the content and timetable proposed by Consumers Power Company (CPCO) for NRC approval of AFATA. If data from the June 1996 Marble Hill annealing demonstration is needed to support AFATA, the proposed June 1996 approval date would be unrealistic.

Planning efforts for performance of vessel annealing were thorough and in compliance with NRC Draft Regulatory Guide 1027. Examples of good planning efforts include utilization of mockups to demonstrate feasibility and reduce exposure for placement of thermocouples within the annulus and selection and placement of pressure vessel materials in surveillance capsules, located in high neutron flux regions, to get additional information on the amount of recovery for annealed vessel materials. A key element is Palisades' participation in the Marble Hill annealing demonstration project. Data obtained during this effort will serve to validate thermal and stress analytical models to be used in Palisades' AFATA.

3.4 Review of Information Notice (IN) 94-66, Supplement 1, "Overspeed Of Turbine-Driven Pumps Caused By Binding In Stems Of Governor Valves"

The inspectors reviewed the applicability of IN 94-66, Supplement 1, "Overspeed of Turbine-Driven Pumps Caused by Binding in Stems of Governor Valves," at the Palisades Plant. The licensee has not had any experience with governor valve stem binding or corrosion problems associated with its turbine-driven auxiliary pump. Pump components are inspected during routine preventive maintenance activities and pump performance is monitored during routine surveillance testing.

3.5 Action On Previous Inspection Findings

3.5.1 (Closed) Violation 50-255/92-026-01: Lack of controls resulted in an operating procedure revision in conflict with system design requirements. The appropriate procedures were revised to correct the specific problem and to address system operating limits in each system design basis document as described in Event Report (E-PAL) 93-001. The inspector reviewed the closed out E-PAL and the referenced procedures. The changes made were appropriate to address this issue.

3.5.2 (Closed) Violation 50-255/93-013-01: Activities affecting quality were not receiving required independent verifications. An event report, E-PAL-93-031, was initiated to revise Administrative procedure 5.23. The inspector reviewed Revision 2 of this procedure; Attachment 1 was revised to list the specific activities that required Independent Verification. A recent work order performing a pump alignment was also reviewed and it had the appropriate independent verification of the pump to motor alignment.

3.5.3 (Closed) Violation 50-255/94-014-54: Allowing the condensate storage tank temperature to exceed 120 degrees F. This violation did not require a response as the corrective actions had been reviewed as discussed in inspection report 255/94014.

3.5.4 (Open) IFI (50-255/94014-64): Vendor recommendations for EDG not fully evaluated by Systems Engineering. The inspectors reviewed Corrective Action C-PAL-94-0728 which evaluated the diesel generator vendor recommended maintenance practices against the licensee's current practices. Justifications for deviations from the vendor recommendations were included. Presently the nuclear utilities in the ALCO Owners Group are working to develop a maintenance program for their standby diesel generators based on their cumulative experience. The group includes a vendor representative. The vendor should concur with the developed program, once it is established, if it is not in accordance with the vendor's maintenance manual recommendations, in order for this issue to be resolved.

4.0 PLANT SUPPORT

NRC Inspection Procedures 71750 and 83750 were used to perform an inspection of plant support activities. The findings showed performance was adequate.

4.1 Opening in Vital Area Boundary

The inspectors identified that the main steam line penetration through the turbine building/auxiliary building wall contained an opening that was greater than the allowable size for an opening in a vital area barrier. A security officer was posted at the opening as an immediate compensatory measure and a condition report was initiated to document the finding and corrective action. Subsequently, the licensee determined that the penetration was not a viable pathway and relieved the security watch.

5.0 PERSONS CONTACTED AND MANAGEMENT MEETINGS

The inspectors contacted various licensee operations, maintenance, engineering, and plant support personnel throughout the inspection period. Senior personnel are listed below.

At the conclusion of the inspection on August 21, 1995, the inspectors met with licensee representatives (denoted by *) and summarized the scope and findings of the inspection activities. The licensee did not identify any of the documents or processes reviewed by the inspectors are proprietary.

R. A. Fenech, Vice President, Nuclear Operations
*T. J. Palmisano, Plant General Manager
*K. P. Powers, Engineering and Modifications Manager
R. M. Swanson, Director, NPAD
*D. W. Rogers, Operations Manager

D. P. Fadel, Engineering Programs Manager
*J. P. Pomaranski, Deputy Maintenance Manager
*H. L. Linsinbigler, Project Management and Modifications Manager
S. Y. Wawro, Planning Manager
K. M. Haas, Safety & Licensing Manager
*R. B. Kasper, Maintenance Manager
*C. R. Ritt, Administrative Manager
R. M. Rice, System Engineering Manager