U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/95007(DRP)

Docket No. 50-255 License No. DPR-20

Licensee: Consumers Power Company
212 West Michigan Avenue
Jackson, MI 49201

Facility Name: Palisades Nuclear Generating Facility

Inspection At: Palisades Site, Covert, Michigan

Inspection Conducted: April 13 through May 27, 1995

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Inspection Summary
Inspection from April 13 through May 27, 1995 (Report No. 50-255/95007(DRP))

Areas Inspected: Routine unannounced safety inspection by resident and regional inspectors of personnel errors, current material condition, onsite event followup, maintenance activities, surveillance activities, engineering, emergency preparedness, past emergency actuations, emergency plan and procedures, emergency response facilities, organization, training, communications, chemistry confirmation measurements, chemistry quality control, REMP, water chemistry control, maintenance self assessments, chemistry and REMP audits, emergency preparedness audits, outage schedule, action on previous inspection findings, and LER followup.

Results: Of the 23 areas inspection, one violation and two unresolved items were identified. The violation pertained to ineffective corrective action (paragraph 5.2). The unresolved items pertained to cooling down the pressurizer (paragraph 1.1.1) and technical basis for extending of standard expiration dates (paragraph 4.2.2). The following is an assessment of performance during this inspection period:

Operations

On May 22, the reactor was manually scrammed from about 45 percent power following sequential loss of both main feed pumps. The resident inspector was in the control room at the time of this event and observed good performance by operators during the ensuing response. Particularly noteworthy was the

effective oversight provided by the shift supervisor, good communications among operators, and periodic status updates to assist in event coordination.

However, a series of personnel errors occurred during the early stages of the refueling outage. Although each event individually was of minimal safety significance, collectively the events indicate a weakness in the process for controlling plant activities in the areas of communications and attention to detail on the part of plant personnel.

The licensee's overall performance in this area was satisfactory.

Maintenance

Miscommunication between operations and maintenance occurred when only a partial tagout was desired, and a full tagout was issued. Control, coordination, and engineering support of a main feed pump test was very good.

Although an extensive pre-job brief for a overspeed test was provided to involved personnel, a voluminous amount of routine information concerning the test was also promulgated. This tended to dilute the emphasis on precautions, limitations, and key points and thereby reduced the effectiveness of the brief.

The licensee's overall performance in this area was considered good.

Engineering

An assessment of the GL 89-10 motor operated valve program indicated that management oversight of the program had improved significantly. Program documentation was acceptable.

Plant Support

The overall status of the emergency preparedness program was very good. Response facilities were in a state of operational readiness, and the Technical Support Center was being remodeled to improve its effectiveness. Audits and surveillances of the program were very good and satisfied regulatory requirements. The EP organization was adequately staffed. Emergency communications capability was adequate. However, EP training modules needed updating. The licensee demonstrated excellent performance in the NRC radiological and nonradiological confirmatory measurements program. Excellent primary and secondary systems water quality continued to be maintained. The trending of radiochemistry data to monitor reactor fuel performance was very good. Radiological and nonradiological measurements and laboratory quality control continued to be very good.

The licensee's overall performance in this area was considered good.

Safety Assessment and Quality Verification

In some instances, the maintenance self assessments appeared to be self critical and identified issues that needed improvement. However, there were some assessment that did not assess but provided status or verification that activities were in compliance.

Overall, the licensee corrected chemistry audit findings in a reasonable time. However, the inspector's review of Nuclear Performance Assessment Department (NPAD) audits in the REMP area, QT-91-06 and PT-92-07 (1991 and 1992, respectively) identified identical deficiencies that were identified by the inspectors with the sampling techniques for a particulate air filter in a very turbulent manner. The deficiencies identified in the 1991 and 1992 NPAD audits were not adequately corrected.

The audits and surveillances of the emergency preparedness program conducted between 1993 and 1995 of the EP program satisfied the requirements of 10 CFR 50.54(t) with respect to the scope. The overall quality of the audits reviewed was very good.

An independent safety review of the 1995 outage schedule conducted by the lead Operations Assessor in the Nuclear Performance Assessment Department (NPAD) with assistance from an outside contractor was thorough and comprehensive.

The licensee's performance in this area was considered satisfactory.

DETAILS

1.0 Operations (71707, 71750, 93702)

The plant operated at full power until May 22 when the reactor was manually scrammed from 88 percent power following the loss of both main feed pumps. The plant then entered a refueling outage that was scheduled to start May 28, 1995.

1.1 Personnel Errors

A series of personnel errors occurred during the initial phase of the refueling outage. These errors led to:

- excessive cooldown of the pressurizer vapor space
- inadvertent sluicing of two boric acid tanks
- securing auxiliary feedwater flow while adding hydrazine
- steam generators being inadvertently filled solid

Although individually each error was of minimal safety significance, **collectively these errors indicated a weakness in the process for controlling plant activities and inattention on the part of plant personnel.** Plant personnel identified each of these events and corrective actions were initiated. **Management classified these errors as precursors and initiated action to collectively address these errors.**

1.1.1 Pressurizer Vapor Space Cooldown

The pressurizer vapor space indicated a cooldown from 321°F to 211°F over a four minute period. Pressurizer liquid temperature remained at about 210°F during this period with primary pressure at 250 psia.

Operators were performing procedure SOP 1, "Primary Coolant System," to fill the pressurizer solid, degas, and then perform a pressurizer cooldown. When the pressurizer was believed solid, operators initiated a pressurizer cooldown. **Over the next four hours, pressurizer liquid temperature was lowered from 400°F to 230°F.** However, pressurizer vapor temperature had only dropped to 335°F. This indicated that a noncondensible gas bubble existed at the top of the pressurizer. At this point, operators had Chemistry reinitiation degassing of the pressurizer.

Resumption of degas vented off the hot (321°F) gas bubble, replacing the gas with cooler (211°F) liquid. The rising liquid enveloped the vapor space temperature detector, which then indicated the rapid temperature drop. This issue remains unresolved pending further review by the NRC and licensee (255/95007-01)

1.1.2 Other Personnel Errors

Later, during motor operated valve testing, two series valves were left open simultaneously. This allowed water to sluice from a full boric acid tank and equalize with another tank filled 20 percent with 3000 ppm boric acid. **The valves were intended to be opened simultaneously, but only for a very brief period. However, testing activities continued into a second shift, and this aspect of the information was not effectively communicated.** Plant management suspended motor operated valve testing pending evaluation of this event.

In preparing to add hydrazine to the steam generators, chemistry technicians lined up injection with the P-8A auxiliary feedwater pump. However, operators had shifted to the P-8C auxiliary feedwater pump. Consequently, the hydrazine was not injected. This error was identified when subsequent sampling of steam generators revealed a lack of hydrazine.

A steam generator filled solid following primary plant cooldown due to water from an operating condensate pump leaking past the closed 68 feedwater heater outlet valve. Operators had previously secured auxiliary feedwater pumps and secured from close monitoring of steam generator levels. **The full generators were discovered by an oncoming operator during shift turnover reviews.**

1.2 Current Material Condition

With minor exceptions, the material condition of the plant was considered satisfactory.

Although primary coolant pump (PCP) seals continued to operate within acceptable flow and pressure limits, some seal degradation was evident in varying degrees on all four PCPs. The greatest challenge to plant operators has been controlling plant evolutions to protect the seals on pump P-50B. Plant engineers have provided good support to operators in planning and in conducting evolutions that could have affected the PCP seals. The seals on at least three of the four PCPs were scheduled to be replaced during the 1995 refueling outage.

1.3 Onsite Event Followup

On May 22, the reactor was manually scrammed from 88 percent power following the loss of both main feed pumps. Reactor power had initially been at 88 percent when the A feed pump tripped. Reactor power was reduced to about 45 percent while operators attempted to stabilize steam generator levels with the remaining feed pump. Shortly thereafter, the B feed pump tripped and operators appropriately initiated a manual reactor scram.

Main feed pump A vibration had increased noticeably during the previous night but had subsequently stabilized and was being monitored by the engineering staff. Plant management reviewed the vibration analysis and

decided to reduce reactor power and remove the pump from service. However, mechanical failure of an auxiliary shaft in the A main feed pump, believed to be associated with the high vibration, caused the pump to trip on overspeed before this action was implemented.

Operators responded promptly to the event and were initially successful in recovering steam generator levels with the remaining pump. However, the B steam generator was overfed, causing the feed regulating valve to automatically shut as level rose past 84 percent. According to the plant's engineering analysis, the resultant drop in loading on the feed pump caused pump speed to briefly increase. Because the pump had initially been operating at maximum limit on the governor, the increase in speed was sufficient to react the overspeed trip setpoint and trip the pump. Subsequent testing of the B pump identified that the overspeed trip setpoint was only slightly below the value that had been set at during the previous refueling outage.

About six minutes elapsed from the time the first feed pump tripped until the second pump tripped. Operators were quick to recognize the loss of the second feed pump and immediately initiated a manual reactor scram. Appropriate emergency procedures were entered and methodically performed. The event was reported as required.

All systems operated as expected following the scram with the exception of the rod 25 bottom light. Correct rod position was verified using individual rod position indication. The unit was placed in hot shutdown, and preparations were made for early commencement of the refueling outage that had originally been scheduled to start May 27.

The resident inspector was in the control room at the time of this event and observed good performance by operators during the ensuing response. Particularly noteworthy was the effective oversight provided by the shift supervisor, good communications among operators, and periodic status updates to assist in event coordination.

2.0 Maintenance (62703, 61726)

2.1 Maintenance Activities

Portions of the following maintenance activities were observed or reviewed:

- Work Orders 24414954 and 24510431, Perform Various Preventive Maintenance Activities on Emergency Diesel Generator 1-2.

  The inspector observed good management oversight of this activity.

- WR 247594, Main Feed Pump Overspeed Test Post Maintenance Test

A special procedure was written to determine the overspeed trip setpoint of this pump as part of the evaluation of the May 22 reactor scram.

Control and coordination of the test by the shift supervisor was very good. Extensive engineering support was also noted. Procedures were evident and in use at the test location.

Although an extensive prejob brief was provided to involved personnel, a voluminous amount of routine information concerning the test was also promulgated. This tended to dilute the emphasis on precautions, limitations and key points and thereby reduced the effectiveness of the brief.

- Work Order 24303851, Repair Waste Gas Compressor

  A miscommunication between operations and maintenance personnel occurred when only a partial tagout was desired and a full tagout was issued.

- Work Order 24300767, Perform Maintenance on P-85B Evaporator Recirculation Pump

  A miscommunication between operations and maintenance personnel occurred when tagging was released by maintenance personnel before all the work was completed. The licensee took aggressive corrective action in light of previous tagging problems.

- Work Instruction WI-I-FC-933-96-01, Plant Process Computer Upgrade Project - Datalogger

  A personnel error occurred when a technician opened the wrong breaker cubicle door. A technician preparing to perform motor operated valve testing opened the door of a breaker cubicle adjacent to the desired breaker. This error was quickly caught by both the technician and operators in the area. No work was performed in the wrong cubicle. Another personnel error occurred when a crane was moved in the turbine building with the boom raised resulting in a collision between the boom and an overhead support structure. Fortunately, only superficial damage occurred. The cause was attributed to inattention on the part of the crane operator.

2.2 Surveillance Activities

Portions of the following surveillances were observed with no problems or concerns being identified:

- QO-15, Inservice Test Procedure - Component Cooling Water Pumps
- QO-5, Valve Test Procedure (Includes Containment Isolation Valves)
- MO-29, Engineered Safety System Alignment
- MO-33, Control Room Ventilation Emergency Operation.

3.0 Engineering (37700, 37551, 60846, 86700)

A September 1994 inspection of the Palisades GL 89-10 motor operated valve (MOV) program identified numerous deficiencies and concluded that plant management provided ineffective direction and oversight of the GL 89-10 program. On May 3, 1995, the NRC was briefed on GL 89-10 program status and subsequently performed a followup assessment.

This assessment indicated that management oversight of the program had improved significantly. Additional resources devoted to the program, such as augmented staffing and increased management attention, were effective. The schedules for MOV activities and program closure were well organized, and previously identified weaknesses were being appropriately addressed.

Based on MOV testing planned during the 1995 refueling outage, the plant appeared to be able to adequately validate design basis assumptions. Other aspects of the program, such as the periodic verification of MOV capability, also appeared to be acceptable.

A brief review of MOV program documents, test procedures, and the torque/thrust calculations used to determine appropriate thrust windows identified no concerns. Conservatism and proactiveness was noted in many aspects, such as the application of pullout efficiency to the opening and closing thrust calculations and the intent to measure torque in every diagnostic test. However, this conservatism was not applied in cases such as the assumption that load sensitive behavior was not applicable to the open stroke and in the use of flow cutoff thrust to calculate valve factor. Many of the calculational weaknesses noted during the previous inspection had been addressed. Overall, the program documentation was acceptable.

4.0 Plant Support

4.1 Emergency Preparedness (82701)

The inspector reviewed an Unusual Event that was declared on February 17, 1994, when a plant shutdown was required due to a through-wall leak on a check valve; and an Unusual Event that was declared on December 8, 1994, due to an auxiliary feedwater valve being inoperable.

Reviewed records indicated that classifications and notifications had been made properly and in a timely manner. Documentation packages for each event were detailed, complete and technically correct.

4.1.1 Emergency Plan and Procedures

Discussion with plant personnel indicated many implementing procedures were being reviewed and revised. The inspector discussed acceptable deviations to the Emergency Action Levels in NUREG-0654, including deletion of the Technical Specification Shutdown Unusual Event.

Licensee personnel indicated that Emergency Plan changes to address acceptable deviations would be forthcoming. Potential revisions of the Plan regarding dose assessment actions by Control Room personnel were also discussed.

4.1.2 Emergency Response Facilities

Tours were conducted through the Control Room, Technical Support Center (TSC), Operational Support Center (OSC), and Emergency Operations Facility (EOF). Each facility was well maintained and in an operational state of readiness. Required, current copies of the Emergency Plan and Emergency Plan Implementing Procedures and appropriate forms were present in the facilities.

The TSC was in the process of being remodeled. The new design removed several barriers to internal facility communication. A copy of the Emergency Plan was not available in the TSC, but there were no Emergency Plan or procedural requirements to have the Plan available.

New offsite field monitoring team vehicles were inspected and found operational.

Documents reviewed indicated that emergency equipment inventories and maintenance were very good, with timely corrective actions taken where deficiencies were identified.

4.1.3 Organization

Site duties were adequately shared between two Emergency Planners, who reported to the Emergency Planning Administrator, who reported to the Director of Nuclear Services, who reported to the Vice President, Nuclear Operations. The reporting chain for Emergency Preparedness did not include the plant organization. Corporate office Emergency Planning staff, including the Emergency Planning Administrator, was in the process of being relocated to the site.

4.1.4 Training

Records indicated that drills and exercises were formally critiqued and significant critique items selected for corrective action as appropriate.

Three individuals with positions in the emergency response organization were interviewed and found to be knowledgeable of the duties and responsibilities of the positions. **Two individuals interviewed were unable to discuss aspects of the NRC incident response program (see Inspection Follow-up Item 50-255/94009-03 in Section 6.0 of this report).**

The inspector reviewed the "Emergency Employee Augmentation Listing" and the training "Requirement Status" printout. No Emergency Response Organization (ERO) personnel were out of qualification; however, 16

individuals were identified as beyond the 12 month retraining period but still within the 3 month allowable "grace period." Discussion indicated these individuals were in various stages of requalification training.

The inspector attended emergency notification training for auxiliary operations candidates. The instructor provided good examples and responses to perceptive questions by the students.

Review indicated that some EP lesson plans had not been revised since 1991, and the most recent were dated 1993. Lesson plans were scheduled to be reviewed by the EP training instructor by the end of 1995, beginning during the 1995 outage.

4.1.5 Communications

The primary offsite emergency communications method was by commercial phone. Also available was Consumers Power Centrex phone system, two radiation monitoring team (RMT) cellular phones, FTS 2000 telephones and the plant radio. The plant radio system was capable of communicating with the Sheriff's Department in Paw Paw, MI, Power Control in Jackson, MI, and the State Police in South Haven, MI. Communications diversity was adequate.

4.2 Chemistry and Radiological Environmental Monitoring Programs (84750)

4.2.1 Chemistry Confirmatory Measurements

The licensee demonstrated **excellent performance in the NRC radiological and nonradiological confirmatory measurements** program. The inspectors submitted nonradiological chemistry samples to the licensee, which were analyzed by the licensee in the concentration ranges of typical plant samples using routine methods and instruments. The inspectors also compared gamma isotopic measurements of primary coolant (filter and filtrate), a liquid sample from a safety injection tank, and a prepared particulate air filter sample on the licensee's three high purity germanium detectors and on the NRC detector in the NRC Region III laboratory.

The licensee achieved agreements in all comparisons. Some minor biases were observed in the radiological comparisons, but the biases were conservative versus the NRC results. The licensee's radiochemist was monitoring instrument performance well.

Laboratory practices and laboratory housekeeping were very good with minor exceptions. The inspectors found lighting in the PASS area to be poor. This deficiency was quickly corrected. A lack of lighting could lead to difficulties in obtaining a sample.

4.2.2 Chemistry Quality Control

Chemistry quality control was very good, with the exception of control of chemistry standards. All required comparison programs were properly implemented. Some performance problems were noted in the nonradiological program with a significant number of disagreements being attributed to technician errors in preparing dilutions. The laboratory supervisor was aware of the weakness and was taking measures to improve performance.

Control charts for laboratory and inline chemistry instruments were properly maintained. Additionally, post accident sampling system (PASS) quality control was very good, and chemistry comparisons verified that the PASS samples were representative of primary coolant.

Although overall analytical performance was excellent and no performance problem was identified concerning the adequacy of chemistry data, the inspectors identified **weaknesses in the control of nonradiological chemistry standards.** The licensee allowed the expiration dates of standards to be extended (indefinitely) beyond the manufacturer's certified date or licensee's initially assigned expiration date. No technical basis for this extension was available. The following problems were noted with the control of standards:

- concerns were identified with the implementation of control of standards
- weaknesses in the supervisory approval and documentation
- weaknesses in labelling
- prepared reagents being assigned expiration dates beyond that of the parent standard/reagent
- weaknesses in traceability to the parent standard/reagent.

The technical basis of the extension of expiration dates and the implementation of this process remain unresolved pending additional information and review (255/95007-02).

4.2.3 Radiological Environmental Monitoring Program (REMP)

Overall, **oversight of contractor performance in the REMP was poor.** The 1992, 1993, and 1994 Annual Environmental Operating Reports indicated that samples were collected and analyzed in accordance with the licensee's Off-site Dose Calculation Manual (ODCM). Samples which were not obtained were documented in the report as required, but documentation was poor in addressing reasons for the occurrences and methods to prevent recurrence. The report did not indicate any abnormal radiological release to the environment.

The inspector identified **poor sampling techniques in the routine air sample collection.** Although sampling equipment was in excellent material condition, sample collection techniques were deficient. The sample collector removed the particulate air filter in a very turbulent manner which undermined the integrity of the sample, and the replacement filter was incorrectly installed in the sample holder. The labeling and tracking of filters was also in need of improvement. Following the inspectors' observations, the licensee revised Health Physics Procedure No. 10.10, "Palisades Radiological Environmental Program Sample Collection and Shipment," to address the concerns by providing explicit instruction for sample removal and replacement. Additionally, the licensee's REMP coordinator committed to quarterly accompaniments with the collector and review of all offsite sample collectors' techniques. The inspector's review of Nuclear Performance Assessment Department (NPAD) audits of this area identified a concern. This is further discussed in Section 5.2 of this report.

4.2.4 Water Chemistry Control Program

Primary and secondary water chemistry has been well maintained. Steam generator (SG) chemistry improved notably from the last inspection. During the end of April 1995, a small condenser leak appeared to degrade the SG chemistry minimally. However, the intrusion has been well tracked and has appeared to subside. During the upcoming refueling outage, the licensee planned to inspect the condenser and to isolate any identified leaks.

Prior to the occurrence of the condenser tube leak, steam generator sodium, chloride, and sulfate levels averaged about 0.5 parts per billion (ppb), 1.5 ppb, and 0.5 ppb, respectively. Industry median values for chloride and sulfate levels were 2 and 3 ppb, respectively. The intrusion increased the chloride and sulfate levels to 2 and 1.5 ppb, respectively. The licensee monitored the chloride-to-sodium ratio to ensure a neutral crevice pH. Steam generator iron levels continued to be very low (less than about 0.5 ppb).

5.0 Safety Assessment and Quality Verification

5.1 Maintenance Self Assessments

The inspectors reviewed the following recent self assessments performed by the maintenance department:

- Work Order Control Process--May 1995
- Work Order Backlog--May 1995
- Control Room Deficiency Management Plan--May 1995
- Planning and Scheduling--January 1995
- Assessment Report for "Review of PPAC Reports with Expired Grace Dates"-March 1995
- Assessment Report for "PPACs on Identical Equipment with Same Activity But With Different Intervals"--March 1995

- Assessment Report for "Switching and Tagging Order Status"-February 1995
- Assessment Report for "C-2A Rework"-February 1995

In some instances, the self assessments appeared to be self critical and identified issues that needed improvement. During this inspection, the inspectors did not verify the effectiveness of the licensee's actions to resolve identified issues. However, there were some assessments that did not assess but provided status or verification that activities were in compliance. Two assessment reports that pertained to the review of PPACs with expired grace dates and to the switching and tagging order status could have been more effective. The assessment of PPACs with expired grace dates consisted of verifying that justification forms existed and did not review the adequacy of the rescheduling justifications. The other PPAC pertaining to switching and tagging orders (STO) was an effort to document the status of open STOs and did not address an assessment of the area.

5.2 Chemistry and REMP Audits

The inspectors reviewed audits performed in the chemistry and REMP program areas. Audits were performed as required, and findings were technically based and were in good detail. Overall, the audits focussed on sample collection and laboratory performance, which were found to be very good. Discussions with the audit teams indicated that additional emphasis would be placed on plant and systems water chemistry.

Overall, the licensee corrected chemistry findings in a reasonable time. However, the inspector's review of Nuclear Performance Assessment Department (NPAD) audits in the REMP area, QT-91-06 and PT-92-07 (1991 and 1992, respectively) identified identical deficiencies that were identified by the inspectors during this inspection (see paragraph 4.2.3). The inspector identified that a sample collector removed a particulate air filter in a very turbulent manner. A subsequent 1993 NPAD audit did not identify any concerns with sampling; however, a different sample collector was observed by the auditors. The deficiencies noted in the 1991 and 1992 audits were not adequately corrected. **The failure to correct the sampling deficiencies is considered a violation** of 10 CFR 50, Appendix B, Criterion XVI, which states that measures be established to ensure that deficiencies are promptly identified and corrected (50-255/95007-03(DRP).

5.3 Emergency Preparedness Audits

The inspectors reviewed audits and surveillances of the emergency preparedness program. The audits and surveillances conducted between 1993 and 1995 of the EP program satisfied the requirements of 10 CFR 50.54(t) with respect to their scope. An assessment of the effectiveness of the licensee's interfaces with State and local emergency response agencies was performed as a subsequent surveillance, and had been made available to offsite officials. The overall quality

of the audits reviewed was very good. Heavy emphasis was placed on performance based auditor activities, such as observing drills and exercises, or ongoing periodic equipment inventories and operability tests. The audits and surveillances reviewed were:

- Audit Report No. PA-95-01, dated March 31, 1995
- Audit Report PA-94-01, dated March 7, 1994, and
- Audit Report PA-93-21, dated November 3, 1993.
- Surveillance NPAD-/P-94-057

5.4 Outage Schedule

Plant management discussed the results of an independent safety review of the 1995 outage schedule. The review was conducted by the lead Operations Assessor in the Nuclear Performance Assessment Department (NPAD) with assistance from an outside contractor. The NPAD review of the outage schedule was thorough and comprehensive. Overall, the review found that the licensee had adequate controls in place to manage risk during shutdown and low power operations. Some minor items were identified to management for followup.

6.0 Action on Previous Inspection Findings (92901, 92902, 92903, 92904)

(Closed) Violation 255/92015-1a: While removing the reactor vessel head, the licensee failed to adhere to the requirements of procedure RVG-M-2 "Removal Of Reactor Vessel Head" by not using a calibrated load cell and by exceeding the prescribed procedural maximum allowable lift weight.

In response to this violation, the licensee performed a review of all the reactor disassembly/reassembly permanent maintenance procedures. Procedure RVG-M-2 "Removal Of Reactor Vessel Head" was revised to ensure that operators used the correct type of load cell when lifting the reactor vessel head and to ensure that the load cell was within was within its calibration periodicity. Additionally, this procedure was revised to contain specific hold points to verify that indicated loads will not exceed those that are expected. The inspectors reviewed and were satisfied with the licensee's corrective actions.

(Closed) Violation 255/92015-1b: While removing the upper guide structure, the licensee failed to adhere to the requirements of procedure RVI-M-1 "Removal and Storage of The Upper Guide Structure" by not using a calibrated load cell and by exceeding the prescribed procedural maximum allowable lift weight.

In response to this violation, the licensee performed a review of all the reactor disassembly/reassembly permanent maintenance procedures. Procedure RVI-M-1 "Removal and Storage Of The Upper Guide Structure" was revised to ensure that operators used the correct type of load cell when lifting the upper guide structure and to ensure that the load cell was within its calibration periodicity. Additionally, this procedure was

revised to contain specific hold points to verify that indicated loads will not exceed those that are expected. The inspectors reviewed and were satisfied with the licensee's corrective actions.

(Closed) Violation 255/92015-1c: Power was lost to the "C" safeguards bus causing a subsequent loss of shutdown cooling.

Corrective actions included conducting training that clarified licensee management's expectations regarding the manipulation of plant equipment by non-operations department personnel inside and outside of tagging boundaries. Training was also conducted that defined the duties and responsibilities of Auxiliary Operators while supporting other work groups. Additional training on the breaker testing requirements contained in Administrative Procedure 4.02 "Control of Equipment Status" was also conducted. This training covered the importance of procedural compliance and the Manual Transfer Trip feature of 2400/4160V bus feeder breakers which causes them to trip when the breaker is placed in the test position. Additionally, caution placards that alerted operators to the Manual Transfer Trip feature of these breakers were relocated to readily visible places within the cubicles that housed these breakers. The inspectors reviewed and were satisfied with the licensee's corrective actions.

(Closed) Violation 255/92015-1d: Inadvertent Engineered Safety Actuation Caused By Inadequate Test Procedures.

In response to this violation, the licensee revised procedures to add sufficient detail to ensure a proper connection between the Data Acquisition System to the plant sequencers. Labeling of the test plugs on the plant sequencers was revised to be consistent with plant drawings. Additionally, plant drawings were updated to identify all wires in the test cables and their associated termination points in the test cable plugs. The inspectors were satisfied with the licensee's corrective actions.

(Closed) Violation 255/92015-1e: Inadvertent Actuation Of Left Channel Normal Shutdown Sequencer During The Performance Of Special Test T-325 "Timing of Emergency Diesel Generator 1-1 Start Sequence.

In response to this violation, the licensee conducted training on procedural compliance with all operating shifts. The individual responsible for this violation was also administratively disciplined. The inspectors reviewed and were satisfied with the licensee's corrective actions.

(Closed) Violation 50-255/93016-05: The maintenance procedure used to verify that control rod rack extensions were properly uncoupled was inadequate. The licensee has since scheduled corrective actions for this item.

(Closed) Violation 255/93020-03a: Failure to develop procedures to identify trends in radiochemistry to assure that reactor fuel was performing properly.

The chemistry and engineering groups' fuel integrity tracking procedures and assessments were very good. The licensee completed a comprehensive industry evaluation to ensure that proper radioisotopes were trended and evaluated. Revision 1 to procedure number CH 1.10, "Fuel Integrity Monitoring," provided acceptable data collection and assessment criteria. Additionally, the licensee provided the radiochemistry trends to an industry contractor for review and assessments. The licensee's current estimate of 1-3 leaking fuel rods appeared consistent with the radiochemistry indicators.

(Closed) Unresolved Item 255/94008-01: The licensee's program for performing containment closeout was not fully effective.

In response, the licensee agreed to respond in writing describing what actions had been planned to ensure that future containment closeouts will be more effective. The inspectors reviewed the licensee's response dated September 19, 1994 and were satisfied with the proposed corrective actions.

(Closed) Unresolved Item 255/94008-02: RI-47, "Rod Withdrawal Prohibit Interlock Matrix Check" Rev.6.

Immediate corrective actions included reviewing remaining test procedures to verify their performance in the proper mode and to ensure that no unanticipated mode changes were directed. The importance of pre-job briefings and questioning attitudes was emphasized to all plant personnel. Permanent corrective actions included incorporating "lessons learned" from this evolution into the licensee's training program. Procedures RI-47 and SOP-6 were revised to clarify the definition of a control rod withdrawal and to specify the required plant conditions for control rod withdrawal. Additionally, AP 10.41 "Procedure Initiation and Revision" was revised to encourage the consideration of multiple user reviews when a proposed procedure involves more than one department or discipline. The inspectors were satisfied with the licensee's proposed corrective actions.

(Closed) Violation 255/94008-3: The spent fuel crane unexpectedly stopped during preoperational testing for the dry fuel storage project.

In response, the licensee implemented a design change which corrected the miswiring in the relay control panel. The new L-3 control box switches were restored to their proper configuration and function. The design change was verified with detailed test instructions which fully tested the bypass/interlock functions of the radio control box switches. The licensee also reviewed other post modification tests from modifications in the last two years where reliance was placed on existing maintenance work instructions/procedures or Technical Specification procedures. This review determined that these procedures

contained adequate post modification testing and that this violation did not constitute a generic problem. Additionally, a "lessons learned" letter concerning the use of existing maintenance procedures for post modification testing was issued to the licensee's engineering department.

(Closed) Inspection Follow-up Item 255/94014-50: Fuel oil transfer pump surveillance procedure MO-7C did not verify pump operability because it lacked quantitative acceptance criteria.

As corrective action, Surveillance Test Procedure MO-7C, "Fuel Oil Transfer Pumps," was revised to include discharge pressure acceptance criteria. The basis document for MO-7C was revised to explain transfer pump testing and how the test demonstrates transfer pump operability. Surveillance Test Procedures MO-7A-1(2), Attachment 6, "P-18A(B) Fuel Oil Transfer Pump Test," was revised to have the fuel oil transfer pumps volumetric flow rate checked on a quarterly period to verify that the pumps can meet minimum flow requirements. Vibration readings are also taken every quarter.

(Open) Inspection Follow-up Item 50-255/94009-03: Training for key emergency response personnel did not cover the incident response program of the NRC or other federal agencies. A letter was issued by the Emergency Planning Administrator to Site Emergency Directors and Emergency Operations Facility (EOF) Directors on May 9, 1994 providing essentials of the NRC incident response program. An attachment was also added to Lesson Plan NO0336-4, "Emergency Preparedness Orientation", to provide basic training on NRC incident response, but this training had not been presented. Two individuals interviewed were unable to discuss the NRC incident response program or the Federal Radiological Monitoring and Assessment Center (FRMAC). This item will remain open.

(Closed) Inspection Follow-up Item 255/95004-03: control of packing replacements on air operated valves. The licensee acknowledged that vendor specific packing configurations had not been evaluated for other valve styles, however this type assessment would be part of the AOV program under development. The performance of valves after packing replacement was confirmed by post maintenance testing that was assigned and reviewed by engineers administering the inservice testing program as part of the work order process.

7.0 Licensee Event Report (LER) Follow-up (40500, 92700, 81502)

Through direct observations, discussions with licensee personnel, and review of records, the following event report was reviewed to determine that reportability requirements were fulfilled, and that corrective action to prevent recurrence had been or would be accomplished:

(Closed) LER (255/91014-03): Several safety related circuits were routed with opposite channel cables. The licensee identified the cable routing errors during the Palisade's Configuration Control Project (CCP) reviews. This event involved 40 circuits which were believed to be

safety related and routed with opposite channel circuits. A number of these circuits were later identified as nonsafety related. The LER identified 15 safety related wiring schemes that did not meet Palisade's channel separation requirements. Five of the separation errors were corrected and the licensee concluded the remaining 10 schemes did not create an unreviewed safety question. Palisade's FSAR stated that the plant was not designed to IEEE 384, "Criteria for Independence of Class 1E Equipment and Circuits." In addition, the FSAR stated that, "A few circuits have been discovered that are not separated as described below. When deviations from separation requirements are identified they are evaluated for acceptability as-is or rerouted." The inspectors reviewed the licensee's safety evaluation and engineering analysis for each of the identified cable separation schemes. The safety evaluations and engineering analyses were satisfactorily performed. The inspectors concluded that the current cable routings did not create an unreviewed safety question. From the engineering reviews, the inspectors determined that the identified schemes were not routed with any redundant circuits.

(Closed) LER (255/93013): Loss of Emergency Onsite AC Power Due To Both Emergency Diesel Generators Being Simultaneously Inoperable

Corrective action for this LER included submitting a revision to the electrical section of Palisades Technical Specifications which will emulate the NUREG 1432 "Standard Technical Specifications for CE Plants" electrical section. This revision will be incorporated in the conversion to Standard Technical Specifications scheduled for submittal in April 1996.

(Closed) LER (255/94013): Unsupported Reactor Coolant Pump Instrument Tubing Identified As Being Outside the Plant Design Basis Due To Lack of Supports:

On April 27, 1994, a 30-foot section of ½-inch Reactor Coolant Pump (RCP) instrumentation tubing was found without supports. The unsupported section did not meet the stress analysis requirements outlined in instrument tubing Specification M-195(Q) and was therefore outside of its design basis. The discovery prompted further walkdown inspections revealing that all 4 RCPs had instrument tubing support deficiencies of a similar nature. These sections of tubing were declared inoperable and were subsequently analyzed and repaired prior to startup from the 1994 forced outage.

The inspectors reviewed the root cause analysis and corrective actions performed due to this LER. The probable root cause of these tubing support deficiencies included a combination of design issues (lack of isometrics for these installations), maintenance issues (improper tubing support reassembly following equipment maintenance), and programmatic issues (inadequate inspection program).

In response, a walkdown by plant personnel of the majority of small bore piping and instrument tubing in safety related systems was organized and completed. Deficient supports were repaired prior to plant heatup from the 94 forced outage and the remaining deficiencies were scheduled for repair during the 95 REFOUT. Additionally, Palisades has generated system walkdown guidelines and implemented further controls on maintenance activities to provide direction with respect to hanger and support issues. Furthermore, to consolidate the various hanger and support programs and processes a technical point of contact for hanger discrepancies has been established. These actions were reviewed by the NRC and found acceptable.

(Closed) LER (255/94016): The licensee revised its boron analysis procedure to implement gravimetric methods. The revised analytical method appeared acceptable, and the event review appeared very good. Subsequently, the licensee estimated experimental errors from the previous, volumetric method. The resultant calculation indicated that the boric acid storage tanks may have been below the Technical Specification (TS) required 6.25 weight percent boron (B) concentration (i.e. 10,900 parts per million (ppm) B). The licensee calculated concentrations of 10677 ppm B (tank A) and 10534 ppm B (tank B) for March 18, 1991, and 10760 ppm B (tank B) for November 29, 1993. Although the error corrected concentrations appeared to have been outside of TS limits, the values were initially determined to be within the TS requirements using acceptable analytical techniques and equipment and were within an acceptable margin of sampling and analytical error. Boron concentrations were reviewed for the current cycle, with no problems identified.

8.0 Exit Interview (71707)

The inspectors met with licensee representatives denoted in section 1 at the conclusion of the inspection on May 26. The inspectors summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection was proprietary.

9.0 Persons Contacted

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 Director
R. B. Kasper, Maintenance Manager
R. C. Miller, Deputy Engineering and Modifications Manager

C. R. Ritt, Administrative Manager
R. M. Rice, System Engineering Manager
M. P. Knopp, Chemistry Superintendent
D. J. Malone, Radiological Services Manager
D. G. Malone, Shift Operations Superintendent
R. A. Vincent, Licensing Administrator
D. J. Vanderwalle, Plant Support Engineering Manager

* Denotes those attending the exit interview conducted on May 26, 1995. The inspectors also had discussions with other licensee employees, including members of the technical and engineering staffs, reactor and auxiliary operators, and shift engineers.