U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos:	50-282, 50-306, 72-10
License Nos:	DPR-42, DPR-60, SNM-2506
Report No:	50-282/97005, 50-306/97005, 72-10/97005
Licensee:	Northern States Power Company
Facility:	Prairie Island Nuclear Generating Plant
Location:	1717 Wakonade Drive East Welch, MN 55089
Dates:	February 21 - April 4, 1997
Inspectors:	S. Ray, Senior Resident Inspector R. Bywater, Resident Inspector G. Pirtle, Plant Protection Analyst
Approved by:	J. Jacobson, Chief, Projects Branch 4 Division of Reactor Projects

9705120180 970501
PDR ADOCK 05000282
Q PDR

EXECUTIVE SUMMARY

Prairie Island Nuclear Generating Plant, Units 1 & 2
NRC Inspection Report 50-282/97005, 50-306/97005, 72-10/97005

This inspection included aspects of licensee operations, maintenance, engineering, and plant support performed by the resident inspectors and a review of a security incident performed by a regional plant protection analyst.

Operations

- The inspectors noted good performance and control of Unit 2 restart activities, including reactivity management during this period. (Section O1.3) However, an inadvertent reactivity addition occurred at the start of the next inspection period. This event will be discussed in detail in the next Resident inspection report.

- A violation was identified for filling the Unit 2 accumulators on March 18, 1997, using Procedure C18, Section 5.2, when the plant was operating in Mode 4. The procedure allowed filling accumulators per Section 5.2 only in Modes 5 or 6. Control room operators understood that performing this activity required closing both of the safety injection (SI) to reactor coolant system cold leg isolation valves and that Technical Specifications (TS) required these valves open for operability of the SI system. No allowed outage time was specified in the TS for both valves inoperable. Therefore, the operators assumed it was acceptable to use the 1 hour specified in TS 3.0.C as an allowed outage time for both valves closed, and filled the accumulators. The operators did not understand that this was a condition prohibited by the TS and was reportable per 10 CFR 50.73 until informed by the inspectors. (Section O1.4)

- A quality services audit identified that decommissioning funding calculations were nonconservative and resulted in funding below NRC-required minimum levels. This was considered a Non-cited Violation. (Section O7.1)

Maintenance

- The inspectors concluded that the licensee's command, control, and coordination of the integrated leakage rate test and integrated safety injection test was very good. (Section M1.1)

- A quality services inspector identified another example of a heavy loads control violation that the inspectors identified in Inspection Report (282)306/97002. The licensee's corrective actions for heavy loads control programmatic deficiencies will be evaluated as part of the inspectors' review of the previous violation. (Section M3.1)

- An Inspection Followup Item was identified to review the licensee's interpretation of the Technical Specification allowances for the interval between surveillance tests. (Section M7)

Engineering

- The inspectors reviewed licensee activities associated with new plant license conditions to resolve cooling water system post-seismic event performance issues. The first of the license conditions were acceptably implemented by the end of this inspection period. (Section E8.2)

Plant Support

- The inspectors observed timely and conservative preparations for potential plant flooding due to rising river level. (Section P1.1)

- A violation was cited because on February 24, 1996, a contractor security supervisor falsified a record required be NRC regulations in an effort to cover up an error the supervisor had made. (Section S.1)

Report Details

Summary of Plant Status

Unit 1 operated at or near full power for the entire inspection period except for brief power reductions for various testing and maintenance activities. Unit 2 remained in a refueling outage until March 28, 1997, when the unit was started up. The generator was placed on the grid on March 30, 1997. There were no dry spent fuel storage cask activities during the period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments

a. Inspection Scope (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of plant operations. These reviews included observations of control room evolutions, shift turnovers, operability decisions, logkeeping, etc. Updated Safety Analysis Report (USAR) Section 13, "Plant Operations," was reviewed as part of the inspection.

b. Observations and Findings

The inspectors observed proper control room manning, adequate attention to control panels, good use of communication protocols, good turnovers, and detailed shift briefs in which all members of the crew contributed.

c. Conclusions

Plant operations were generally conducted conservatively and in accordance with procedures with the exception of the deliberate entry into a condition prohibited by Technical Specifications discussed in Section O1.4.

O1.2 Excessive Draining of Reactor Coolant System (93702)

On March 6-7, 1997, during the conduct of activities near the end of the Unit 2 refueling outage, the licensee inadvertently drained more water than desired from the reactor coolant system. This event was the subject of a special inspection (306/97006) and thus will not be evaluated in this report.

O1.3 Plant Startup

a. Inspection Scope (71707)

The inspectors observed portions of the Unit 2 startup on March 27 through 29, 1997. Procedures reviewed included the following:

- 2C1.2, "Unit 2 Startup Procedure," Revision 16
- D30, "Post Refueling Startup Testing," Revision 27

b. Observations and Findings

The inspectors observed the pre-evolution briefing conducted prior to the Unit 2 reactor startup on March 27, 1997. An extra reactor operator and senior reactor operator, in addition to the normal crew complement, were assigned to perform the startup. Other plant activities were to be kept at a minimum. Nuclear engineering personnel were also present and personnel roles and responsibilities were emphasized with regard to reactivity management.

The inspectors observed the withdrawal of shutdown and control rod banks and dilution to criticality. The reactor was made critical at 2:41 p.m. on March 27.

During the night of March 27-28, while preparing the reactivity computer for performing physics testing per D30, problems were encountered with the output signal of the 2N44 excore neutron detector. The licensee decided to shutdown the unit and investigate the problem with 2N44. The detector was replaced on March 28 and the reactor was made critical again at 10:04 p.m.

On March 29, the inspectors observed the licensee perform rod worth measurements of control rod banks and shutdown banks using the rod swap methodology. The test engineer made observations of core reactivity and neutron flux on the reactivity computer and provided instructions to the reactor operator for the desired rod manipulations. The reactor operator provided repeat-backs of the instructions in all cases and resolved a couple of instances when the rod movement instruction was not clearly articulated by the engineer. The reactor operator was continuously monitoring core response to his rod manipulations under the supervision of a senior reactor operator. The results of the startup testing were in good agreement with predicted values for rod worth, critical boron concentration, and isothermal temperature coefficient.

c. Conclusions

Control and performance of reactor startup activities was generally good. The licensee demonstrated good reactivity controls and a good operations and engineering personnel interface during the inspection period; however, an inadvertent reactivity addition occurred at the start of the next inspection period. This event will be discussed in detail in the next Resident inspection report.

O1.4 Entry into Technical Specifications (TS) 3.0.C to Fill Unit 2 Accumulators

a. Inspection Scope (92901)

On March 18, 1997, the General Superintendent of Plant Operations informed the inspectors that Unit 2 control room operators made a deliberate entry into TS 3.0.C during the previous shift to fill the accumulators. The inspectors reviewed the circumstances of the event, drawings, logs, and Procedure C18, "Engineered Safeguards System," Revision 34.

b. Observations and Findings

Procedure C18 required that the containment atmosphere temperature be greater than 70 degrees F, the minimum allowable temperature for accumulator pressurization. Because containment atmosphere temperature was less than 70 degrees F at the time, filling the accumulators was delayed. A decision was made to perform the fill when the RCS was at 335 degrees F and there was a bubble in the pressurizer. At these conditions, TS 3.3.A.1.g(1) required the safety injection (SI) isolation valves to be in the open position with their motor control center breakers locked in the off position.

On March 18, 1997, Unit 2 was in Mode 4 (Intermediate Shutdown) and the licensee used Procedure C18 to fill the accumulators with a SI pump, in preparation for startup. The control room operators used Section 5.2, "Raising Accumulator Level (Cold or Refueling Shutdown)," which required closing the SI to reactor coolant system (RCS) isolation valves (MV-32171 and MV-32173). TS 3.3.A.2.d allowed one valve inoperable for 72 hours, however, the condition of two valves inoperable was not addressed. Although Procedure C18, Section 5.2, required that the unit be in Cold or Refueling Shutdown, control room operators elected to enter the procedure, close both valves, and enter TS 3.0.C. The operators expected that filling the accumulators would take less than one hour and assumed that TS 3.0.C provided a one hour allowed outage time with both MV-32171 and MV-32173 closed. Actually, TS 3.0.C was intended only to allow time for a controlled shutdown when the plant was in a condition not allowed by the normal TS limiting conditions for operation. It was not intended to be used as an allowed outage time for those conditions.

c. Conclusions

Title 10 of the Code of Federal Regulations, Part 50, Appendix B Criterion V, required that activities affecting quality be prescribed by documented procedures of a type appropriate to the circumstances and shall be performed in accordance with these procedures. Procedure C18, Section 5.2 required that the unit be in the Cold or Refueling Shutdown when this section was performed. The Unit 2 was in neither of these conditions. Therefore, this was considered an example of a failure to follow procedure (50-282(306)/97005-01a).

The inspectors also concluded that the licensee did not understand that entry into TS 3.0.C was a condition prohibited by the TS and reportable to the NRC. Operations shift management considered the one hour specified in TS 3.0.C as an allowed outage time, concluded that the evolution planned would take less than one hour, and did not intend to initiate action to place the unit in a condition in which the safety injection system was not required to be operable.

The inspectors considered the action to be nonconservative and that it demonstrated a significant lack of appreciation of the TS requirements to maintain operability of the emergency core cooling system.

O1.5 Discovery of a Mispositioned Valve

a. Inspection Scope (92901)

On April 1, 1997, the inspectors were informed that during the night before, operators had discovered that valve CV-31204, "Letdown Divert to Purification," was in the "Volume Control Tank" (VCT) position on Unit 1. The valve was normally in the "Divert" position. The inspectors reviewed the circumstances of the event.

b. Observations and Findings

Neither the licensee nor inspectors could determine conclusively how or when the valve got into the wrong position. A review of the reactor logs determined that the valve had been in the correct position at 7:58 a.m. on March 30 because a mixed bed ion exchanger had been briefly placed in service to reduce RCS lithium concentration and the evolution had been successful indicating letdown flow was going through the purification system. The valve was discovered to be in the wrong position at 9:00 p.m. on March 31.

The licensee determined that the most likely cause of mispositioning of CV-31204 was a mistake made during the daily RCS leak rate surveillance SP 1001AA, "Reactor Coolant System Leakage Test," Revision 24. That surveillance had been performed twice in the time between 7:58 a.m. March 30 and 9:00 p.m. March 31. During performance of that test, operators frequently placed valve CV-31205, "Letdown Divert to Holdup Tank," in the "VCT" position to prevent invalidation of the test due to diversion of letdown. The two valves were located close together on the control board and had similar names and functions and identical position nomenclature (VCT/Auto/Divert).

The inspectors observed that SP 1001AA had a precaution that stated the test would be voided if letdown diverted to the holdup tanks but did not contain instructions to prevent the diversion by placing CV-31205 into the "VCT" position. Interviews with operators revealed that some made it a regular practice to position CV-31205, some did it only when VCT level was near the point of automatic diversion of letdown to the holdup tanks, and some seldom manipulated the valve.

c. Conclusions

Surveillance Procedure SP 1001AA did not contain instructions for the manipulation of valve CV-31205 although many operators routinely changed its position as part of the surveillance. Title 10 of the Code of Federal Regulations, Part 50, Appendix B Criterion V, required that activities affecting quality be prescribed by documented procedures of a type appropriate to the circumstances and shall be performed in accordance with these procedures. Manipulation of CV-31205 to preclude diversion of letdown to the holdup tanks was not included in SP 1001AA. Therefore, this was considered an example of a failure to follow procedure (50-282(306)/97005-01b).

O6 Operations Organization and Administration

O6.1 Management Changes

On March 7, 1997, the licensee announced that Mr. Terry Silverberg had been selected as General Superintendent of Plant Operations. Mr. Silverberg was a Shift Manager with an active Senior Reactor Operator License.

O7 Quality Assurance in Operations

O7.1 Underfunding of Decommissioning Funding

On December 20, 1996, the licensee issued a letter to the NRC stating that a quality services audit had determined that the decommission funding calculations starting in 1993 had been nonconservative, resulting in under funding below the NRC minimum required levels specified in 10 CFR 50.75, "Reporting and Recordkeeping for Decommissioning Planning," Section (b). The letter also described the licensee's intended corrective actions. The inspectors referred the issue to the NRC Office of Nuclear Reactor Regulation staff for a determination of the enforcement aspects of the finding.

The NRC staff determined that the finding constituted a violation of 10 CFR 50.75(b) but that the violation was licensee-identified, adequate corrective actions had been initiated, and the issue was not safety-significant. Thus this licensee-identified and corrected violation is being treated as a Non-Cited Violation (50-282(306)/97005-02), consistent with Section VII.B.1 of the NRC Enforcement Policy.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments

a. Inspection Scope (61726, 62707)

The inspectors observed all or portions of the following maintenance and surveillance activities. Included in the inspection was a review of the surveillance procedures (SP) or work orders (WO) listed as well as the appropriate Updated Safety Analysis Report (USAR) sections regarding the activities. The review included a verification that the surveillance activity fulfilled the appropriate Technical Specification requirement and was not contrary to any description in the USAR.

• SP 2102	22 Turbine-Driven Auxiliary Feedwater Pump Test, Revision 50
• SP 2301	22 Turbine-Driven Auxiliary Feedwater Pump Autostart and Functional Testing, Revision 5
• SP 2071.4	Integrated Leakage Rate Test (ILRT) Prerequisites to the Containment Vessel Integrated Leakage Rate Test, Revision 6
• SP 2071.5	Integrated Leakage Rate Test Final Preparations and Test Procedure, Revision 12
• SP 2083	Unit 2 Integrated Safety Injection Test with a Simulated Loss of Offsite Power, Revision 21
• SP 2750	Post Outage Containment Closeout Inspection
• WO 9611234	12 Diesel-Driven Cooling Water Pump Annual Inspection
• WO 9700571	Auxiliary Feedwater Benchmark Testing
• WO 9701474	Replace Reactor Head Vent Valve

b. Observations and Findings

All maintenance and surveillance activities observed were performed properly. Significant observations on specific activities are discussed below.

- For SP 2071.4, the licensee identified an error in the procedure. The error involved the administrative control of the containment boundary and RCS vent path. If undetected, it would have resulted in a violation of requirements for containment boundary control. A procedure deviation was written to correct the condition. The inspectors considered the identification of this issue good. The inspectors will review final resolution of RCS vent path and containment boundary considerations for ILRT at a later date (IFI 50-282(306)/97005-03).

- For SP 2083, the inspectors noted good command, control, and coordination

of activities. This complex test required the coordinated effort of many people, including operations, engineering, and maintenance personnel, to establish the test conditions and monitor systems as the test was performed.

c. Conclusions

Inspector-observed maintenance and surveillance activities were generally well conducted with good communications, proper pre-job planning, safe work practices, and coordination between departments.

M3 Maintenance Procedures and Documentation

M3.1 Control of Heavy Loads with Mobile Cranes

a. Inspection Scope (62703, 92902)

On February 25, 1997, a licensee quality services inspector identified that the maintenance workers had used a forklift to remove a concrete trench cover over a pipe chase containing residual heat removal and safety injection system piping. The licensee determined that the heavy cover had been removed without implementing the controls in licensee Procedure D58, "Control of Heavy Loads," Revision 26. The inspectors reviewed the circumstances of the event.

b. Observations and Findings

This event was very similar to one which had occurred a few days earlier on February 19, 1997. That event was discussed in Inspection Report 282(306)/97002, Section M3.1. In both cases, the licensee's procedure, D58, was inadequate in that it did not contain instructions for controlling heavy load lifts with other than permanently installed lifting devices. For the February 19 event, the NRC issued a Notice of Violation dated February 25, 1997. In addition, during a pre-decisional enforcement conference on March 18, 1997, regarding another heavy load lifting event which occurred on February 3, 1997, discussed in Inspection Report 282(306)/97002, Section M1.2, the licensee also discussed the two additional events. Licensee corrective actions discussed in the pre-decisional enforcement conference, in the response to the Notice of Violation, and in the associated LER (282(306)/97-01), addressed all three heavy load events and the heavy load control program in general.

Since the February 25 event occurred before the licensee had adequate time to implement corrective actions for the February 19 event, the inspectors consider the event a second example of the same violation cited in the Notice of Violation dated February 25 and a separate citation will not be issued. The LER is discussed in Section M8.1 of this report.

c. Conclusions

Because the three heavy load events indicated problems both in procedure adequacy and implementation, the licensee implemented numerous corrective actions as discussed above. Effectiveness of the corrective actions will be reviewed when the violation is closed out.

M7 Quality Assurance in Maintenance Activities

a. Inspection Scope (92902)

On April 3, 1997, the inspectors were informed that licensee quality services personnel and scheduling personnel had a disagreement regarding the interpretation of the Technical Specification (TS) allowances for the interval between surveillances. The inspectors reviewed the issue.

b. Observations and Findings

Technical Specification 4. SURVEILLANCE REQUIREMENTS, stated:

4.0 Applicability

A. Each Surveillance Requirement shall be performed within the specified time interval with the following exceptions:

1. Specified time intervals between tests may be adjusted plus or minus 25% to accommodate normal test schedules.

2. The intervals between tests scheduled for refueling shutdowns shall not exceed two years.

However, the Surveillance Requirements did not actually specify a "time interval between tests" such as 31 days from which to calculate the plus or minus 25%. They merely specified a frequency such as "monthly" with no definition of what "monthly" means. In addition, the TS did not have a Basis section for 4.0.

In practice the licensee used a "fixed" surveillance program which scheduled each test on a particular repeating day such as "the third Wednesday of each month." The licensee defined the start of a surveillance month as the first Sunday of that calendar month. Thus for monthly surveillances, the program was such that they were scheduled either exactly 28 or 35 days (4 or 5 weeks) apart depending on the number of weeks in the month. The licensee also conservatively used 7 days (one week) as the 25% allowance for monthly tests. However, they applied the 25% to an interval of as long as 35 days to start with.

It was licensee scheduling personnel's belief that TS 4.0 allowed them to adjust the schedule for one monthly test by minus 7 days and the next monthly test by plus 7 days. That could result in as much as 49 days (7 weeks) between the actual performance of monthly tests. A licensee quality services inspector found cases where as much as 43 days had elapsed between monthly tests.

The inspectors had two concerns; was it acceptable for surveillance schedules be adjusted minus 25% for one performance and plus 25% for the next performance, and what was the base interval from which the schedule can be adjusted. For example, was it acceptable to add 25% to a monthly surveillance that was already scheduled 35 days from the last scheduled performance.

c. Conclusions

In order to resolve the questions in interpretation, the inspectors initiated a request for technical assistance to the NRC Office of Nuclear Reactor Regulation and consider the issue an Inspection Followup Item (50-282(306)/97005-03) pending a response to that request.

M8 Miscellaneous Maintenance Issues (92700, 92902)

M8.1 (Closed) Licensee Event Report (LER) 282(306)/97-01: Transporting a Heavy Load over Irradiated Fuel or Safe Shutdown Equipment without Establishing the Required Conditions. This LER discussed three events, one discussed in Inspection Report 282(306)/97002, Section M1.2, one discussed in Section M3.1 of the same report, and one discussed in Section M3.1 of this report. A violation (306/97002-04) was issued for the inadequate procedure which lead to two of the events and the other event was the subject of an apparent violation (EA 97-073). Thus the LER will be closed to avoid duplication of tracking and licensee's corrective actions will be reviewed when the violation and apparent violation are closed.

M8.2 (Closed) Licensee Event Report (LER) 282(306)/97-02: Failure to Submit Relief Requests for Limited Inservice Inspection Examinations. This issue was previously discussed in Inspection Report 282(306)/97003, Section M4.1. A Notice of Violation was issued in that report for the issue (282(306)/97003-01(a)&(b)). The licensee's corrective actions will be reviewed when the violation is closed. Therefore the LER is closed to avoid duplication.

M8.3 (Closed) Inspection Followup Item 282(306)/97002-03: Verification of Ability to Operate the Cooling Water System from the Control Room. This issue was previously discussed in Inspection Report 282(306)/97002, Section M1.1. The inspectors were concerned that there was no routine test to demonstrate the ability of the cooling water pumps to be started and stopped from the control room. This was part of the system design basis described in Section 10.4.1.1 of the Updated Safety Analysis Report.

During this inspection period the system engineer completed revision 15 to Preventive Maintenance Procedure PM 3002-2-12, "12 Diesel Cooling Water Pump

Annual Inspection," and Revision 16 to PM 3002-2-22, "22 Diesel Cooling Water Pump Annual Inspection," to add steps to test the ability of the pumps to be started and stopped from the control room. In addition, the inspectors observed the successful performance of the starting and stopping of the 12 diesel cooling water pump during the performance of the PM.

The actions discussed above were sufficient to resolve the concern.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Review of Updated Safety Analysis Report (USAR) Commitments (37551)

While performing the inspections discussed in this report, the inspectors reviewed the applicable portions of the USAR that related to the areas inspected and used the USAR as an engineering/technical support basis document. The inspectors compared plant practices, procedures, and/or parameters to the USAR descriptions as discussed in each section. The inspectors verified that the USAR wording was consistent with the observed plant practices, procedures, and parameters, or where not consistent, the licensee had completed safety evaluations in accordance with 10 CFR 50.59.

E6 Engineering Organization and Administration

E6.1 Management Changes

On March 19, 1997, the licensee announced some changes in the system engineering organization. Mr. Ted Amundson was named to a temporary position as a second General Superintendent of Engineering, managing the mechanical disciplines. Mr. Ken Albrecht, continues as a General Superintendent of Engineering, managing the electrical and instrumentation and control disciplines. Other changes in supervisory positions were also announced.

E8 Miscellaneous Engineering Issues (92700, 92903)

E8.1 (Open) Licensee Event Report (LER) 282(306)/96-10: Determination that the Auxiliary Feedwater Pumps are not Protected Against Runout for all Accident Conditions. This issue was previously discussed in Inspection Reports 282(306)/96006, Section O1.3; 282(306)/96007, Section E1.1; and 282(306)/96010, Section E8.1.

During this inspection period the licensee intended to resolve the design questions on Unit 2 by installing flow restricting orifices as discussed in the "Corrective Action" section of the LER. However, it was subsequently determined that orifices would reduce auxiliary feedwater (AFW) flow below design minimums for some events and therefore was not an acceptable solution.

The licensee evaluated several other options and eventually decided to set the AFW pump low discharge trips to 800 psig on Unit 2 and adjust the time delays to prevent spurious trips during pump startup. However, during the evaluation of the issue, the licensee discovered that the Updated Safety Analysis Report (USAR) analysis for the loss of feedwater anticipated transient without reactor scram (ATWS) accident analysis (USAR Section 14.8.3.2) apparently assumed that AFW flow would be delivered continuously throughout the event. USAR Figure 14.8-19, Revision 0, indicated that steam generator pressure would drop below 800 psig at about 10 minutes into the event which would result in a loss of the AFW pumps due to the low pressure trip. The licensee reported this issue to the NRC via the Emergency Notification System on March 25, 1997.

A modification was subsequently implemented which defeated the low pressure trip on the turbine-driven AFW pump during an ATWS event on Unit 2. It was determined that the pump would still be protected from runout conditions because, as the discharge pressure dropped below 800 psig, the driving steam supply pressure would also drop correspondingly and the pump would slow down. The licensee then requested vendor calculations to verify that the margin of safety in the loss of feedwater ATWS event would not be reduced due to the changes in the AFW system. A letter was issued to the NRC dated March 22, 1997, in which the completed and planned actions to resolve the issues related to the AFW pumps were discussed.

At the end of the inspection period, the licensee had limited Unit 2 to below 40% power (the power below which the automatic ATWS mitigation system is not credited). Unit 1 continued to operate at full power under an operability evaluation which depended on operator intervention to maintain sufficient backpressure on the AFW pumps to prevent runout conditions or tripping. This evaluation was performed in accordance with the guidance of NRC Generic Letter 91-18.

This issue will be one of the subjects of an upcoming System Operational Performance Team Inspection which will be documented in Inspection Report 282(306)/97008.

E8.2 (Open) Enforcement Action 96-402: Failure to Identify that an Unreviewed Safety Question Existed in a Safety Evaluation of the Emergency Cooling Water Intake Line. This issue has been extensively discussed in Inspection Reports 282(306)/95014, Section 3.13; 282(306)/96007, Section E2.1; 282(306)/96015 (entire report); 282(306)/96016, Section E1.1; and 282(306)/97002, Section E1. It was also the subject of a pre-decisional enforcement conference on November 22, 1996, and the resulting Notice of Violation and Proposed Imposition of Civil Penalty $50,000, dated January 23, 1997. The licensee paid the penalty on February 17, 1997, and responded to the violation in a letter dated February 24, 1997.

A license amendment request dated January 29, 1997 was submitted to resolve the issue. After several telephone conversations, meetings, requests for additional information, a letter to the NRC dated March 3, 1997, containing statements of

intent for heatup of Unit 2, NRC Confirmatory Action Letter (CAL No. NRR-97-001) dated March 6, 1997, and seven supplements to the original request, the NRC approved an amendment on March 25, 1997, which authorized continued operations of both units on an interim basis provided three additional conditions listed in Appendix B of the amendment were met.

The inspectors verified that the first of the license conditions was implemented when a dedicated licensed operator was posted in the control room for the purpose of identifying the occurrence of an earthquake.

This violation will remain open pending additional NRC review of the effectiveness of the corrective actions discussed in the violation response letter of February 24, 1997.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls (71750)

During normal resident inspection activities, routine observations were conducted in the areas of radiological protection and chemistry controls using Inspection Procedure 71750. No discrepancies were noted.

P1 Conduct of Emergency Preparedness Activities (71750)

During normal resident inspection activities, routine observations were conducted in the area of emergency preparedness using Inspection Procedure 71750. No discrepancies were noted.

P1.1 Preparation for Flooding

a. Inspection Scope (71750)

During the inspection period, Spring flooding of the Mississippi River near the plant was predicted to be at levels which might be higher than previous years. The inspectors monitored plant preparations for potential flooding.

b. Observations and Findings

The plant established a task force to review flood procedures and other preparations issues. Near the end of the inspection period the predicted crest was about 685 feet at the plant location. Normal river level was 674.5 feet. That crest would be about 1.5 feet higher than the 1993 flood which was discussed in Inspection Report 282(306)/93010, Section 1.c. It would also be about 1.5 feet higher than lowest portion of the plant access road (Sturgeon Lake Road). However, a road improvement project was already well underway to widen and heighten that road, and the new higher portion was expected to be able to be put into service if needed.

The task force did a detailed review of Abnormal Procedure AB-4, "Flood," and made several enhancements based on experience with the 1993 flood. The task force also reviewed the emergency plan implementing procedures for floods. A Notice of Unusual Event was not expected to be needed but would be required if river level reached 686 feet.

The licensee entered AB-4, "Flood," Revision 10 on March 30, 1997, when water level reached greater than 678 feet.

c. Conclusions

The inspectors observed timely and conservative preparations for potential flooding. At the end of the inspection period the river level at the plant was 679.2 feet and rising.

S1 Conduct of Security and Safeguards Activities (71750, 81001)

During normal resident inspection activities, routine observations were conducted in the areas of security and safeguards activities using Inspection Procedure 71750. No discrepancies were noted. Additional inspection was performed by a Region III plant protection analyst as discussed below using Inspection Procedure 81001.

S1.1 Falsification of Logs

a. Inspection Scope (81001)

The inspector reviewed licensee documents pertaining to an investigation of alleged alteration and falsification of a visitor sign in log for the Independent Spent Fuel Storage Installation (ISFSI) by a contractor security supervisor on February 24, 1996. This issue was previously discussed in NRC Inspection Report 282(306)/96006 and considered for escalated enforcement (EA 97-088).

b. Observation and Findings

On February 23, 1996, during the day shift, a group of five visitors toured the ISFSI. Section 5.1.b of ISFSI procedure SAP 1.7, "ISFSI Personnel, Vehicle, and Material Control," required pre-authorization for visitors to enter the ISFSI which is documented on a form that includes, among other things, the visitor's signature. Section 6.2 of the ISFSI security plan requires visitors to the ISFSI to be logged on a visitor log sheet.

Approximately 4:00 a.m. on February 24, 1996, the oncoming night shift supervisor noticed that the visitor pre-authorization forms had not been signed by the visitors. The night shift supervisors advised the day shift supervisors that the forms needed the required signatures. On February 24, 1996, the junior day shift supervisor removed the visitor sign in log sheet (required by Section 6.2 of the ISFSI security plan) that correctly showed that visitors had entered the ISFSI, and replaced it with an altered visitor log sheet that incorrectly showed that no visitors

had entered the ISFSI. When the night shift supervisors returned to work later on the 24th, the day shift supervisors advised them that there had not been a tour of the ISFSI so it did not matter if the pre-authorization forms were signed (Note: Visitors had toured the ISFSI on February 23, 1996, and this fact was known by both day shift supervisors).

On February 25, 1996, the night shift supervisors suspected that the records had been altered, verified that the ISFSI had a visitor tour on February 23, 1996, and notified contractor security managers of their concern. An investigation was initiated on February 25, 1996, by the licensee's security contractor. The junior day shift supervisor retained the original visitor sign in log sheet until it was returned by him on February 26, 1996, during an investigation of the incident.

On February 29, 1996, the two day shift security supervisors resigned. The licensee considered the resignations as "for cause" because it appeared that the supervisor caused the record to be falsified. The security staff changed the protected and vital area security locks and keys. The two security supervisors' unescorted access authorization was subsequently denied.

When the security staff became aware of the issue, the incident was logged as a security event and the NRC was advised of the pending investigation.

c. Conclusions

On February 24, 1996, the junior day shift security shift supervisor removed a visitor sign in log sheet (required by Section 6.2 of the Independent Spent Fuel Storage Installation (ISFSI) security plan) that correctly showed that visitors had entered the ISFSI on February 23, 1996, and replaced it with an altered visitor log sheet that incorrectly showed that no visitors had entered the ISFSI on February 23, 1996. The actions taken by the security supervisor caused the licensee to be in violation of Section 6.2 of the ISFSI security plan. The record (ISFSI visitor log) was material to the NRC in that such records are routinely reviewed to confirm compliance with requirements of the ISFSI security plan. The supervisor's actions constitute a violation (72-10/97005-04) of Section 6.2 of the ISFSI security plan, 10 CFR 50.5(a) and 10 CFR 50.9(a).

F1 Control of Fire Protection Activities (71750)

During normal resident inspection activities, routine observations were conducted in the area of fire protection activities using Inspection Procedure 71750. The inspectors identified abandoned fire suppression sprinkler piping located in a cable tray in the relay and cable spreading room. The inspectors identified this to the fire marshall who had the piping removed. The sprinkler system had been abandoned in place several years ago when a carbon dioxide system was installed. The fire marshall suspected that the piping may have been an interference during other modification activities and was not appropriately removed. The inspectors considered this an example of a housekeeping weakness.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of the licensee management at the conclusion of the inspection on April 4, 1997. Additional information was provided to the licensee on April 29, 1997. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

X2 Pre-Decisional Enforcement Conference Summary

On March 18, 1997, a Pre-Decisional Enforcement Conference was conducted in the NRC Region III Office in Lisle, Illinois. A list of attendees is included at the end of this report and a copy of the licensee's presentation materials is included as an attachment. The purpose of the conference was to discuss NRC Enforcement Action EA-97-073, involving an apparent violation of NRC requirements for the control of heavy loads at the Prairie Island Plant.

Three events involving control of heavy loads were discussed at the conference. Two of the subject events were previously discussed in Inspection Report 282(306)97002. A third event is discussed in Section M3.1 of this report and all of the events were discussed in detail in LER 282(306)/97-01. The apparent violation involved the movement on February 3, 1997, of a 21 ton reactor coolant pump motor rotor over the open reactor vessel, which was loaded with irradiated fuel. Both doors of the containment building maintenance and personnel airlocks were open and the inservice purge ventilation system was operating, contrary to procedural requirements.

The licensee discussed short and long term corrective action plans to resolve deficiencies in the heavy loads program. These actions were summarized in the licensee's presentation materials and in LER 282(306)97-01.

The NRC informed the licensee that the information provided would be used to determine what enforcement action, if any, would be taken in response to the apparent violation and that the enforcement decision would be transmitted under separate correspondence.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Sorensen, Plant Manager
K. Albrecht, General Superintendent Engineering
J. Goldsmith, General Superintendent Design Engineering
R. Held, Outage Planner
J. Hill, Manager Quality Services
G. Lenertz, General Superintendent Plant Maintenance
J. Maki, Outage Manager
D. Schuelke, General Superintendent Radiation Protection and Chemistry
T. Silverberg, General Superintendent Plant Operations
M. Sleigh, Superintendent Security
P. Valtakis, General Superintendent Plant Operations (Acting)

ATTENDEES AT PRE-DECISIONAL ENFORCEMENT CONFERENCE MARCH 18, 1997

Licensee

E. Watzl, President, NSP Generation
J. Gonyeau, Sr. Consultant
J. Sorensen, Plant Manager
M. Wadley, Vice President, Nuclear Generation

NRC

A. Beach, Regional Administrator
B. Berson, Regional Counsel
R. Bywater, Resident Inspector
H. Clayton, Director, Enforcement and Investigations Coordination Staff
J. Grobe, Deputy Director, Division of Reactor Projects
J. Hannon, Project Director, Projects Directorate III-1, NRR (via telecon)
J. Jacobson, Chief, Reactor Projects Branch 4
M. Leach, Deputy Director, Division of Reactor Safety (Acting)
S. Ray, Senior Resident Inspector
E. Schweibinz, Project Engineer
B. Wetzel, Project Manager, NRR (via telecon)

INSPECTION PROCEDURES USED

IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observations
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 81001:	Independent Spent Fuel Storage Installation
IP 92700:	Onsite Follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92901:	Followup - Operations
IP 92902:	Followup - Maintenance
IP 92903:	Followup - Engineering
IP 93702:	Prompt Onsite Followup of Events

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

282(306)/97005-01a	VIO	Failure to Follow Procedure for Filling Accumulators
282(306)/97005-01b	VIO	Failure to Follow Surveillance Procedure
282(306)/97005-02	NCV	Underfunding of Decommissioning Fund
282(306)/97005-03	IFI	RCS Vent and Containment Boundary Control During ILRT
282(306)/97005-04	IFI	Technical Specification Surveillance Interval Requirements
72-10/97005-05	VIO	Security Supervisor Falsified ISFSI Visitor Log Sheet

Closed

282(306)/97-01	LER	Transporting a Heavy Load over Irradiated Fuel or Safe Shutdown Equipment without Establishing the Required Conditions
282(306)/97-02	LER	Failure to Submit Relief Requests for Limited Inservice Inspection Examinations
282(306)/97002-03	IFI	Verification of Ability to Operate the Cooling Water System from the Control Room

Discussed

282(306)/96-10	LER	Determination that the Auxiliary Feedwater Pumps are not Protected Against Runout for all Accident Conditions
EA 96-402	VIO	Failure to Identify and Unreviewed Safety Question Existed in a Safety Evaluation of the Emergency Cooling Water Intake Line
EA 97-073	EEI	Transporting a Heavy Load over Irradiated Fuel or Safe Shutdown Equipment without Establishing the Required Conditions

LIST OF ACRONYMS USED

AFW	Auxiliary Feedwater
ATWS	Anticipated Transient Without Scram
CAL	Confirmatory Action Letter
CFR	Code of Federal Regulations
CW	Circulating Water
EA	Enforcement Action
EEI	Escalated Enforcement Issue
EQ	Environmentally Qualified
IFI	Inspection Followup Item
ILRT	Integrated Leakage Rate Test
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
ISI	Inservice Inspection
ISTS	Improved Standardized Technical Specifications
LCO	Limiting Conditions for Operation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
NRC	Nuclear Regulatory Commission
NSP	Northern States Power Company
PDR	Public Document Room
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
SI	Safety Injection
SP	Surveillance Procedure
SRO	Senior Reactor Operator
USAR	Updated Safety Analysis Report
TS	Technical Specifications
URI	Unresolved Item
VCT	Volume Control Tank
VIO	Violation
WO	Work Order

AGENDA

NRC - NSP Pre-Decisional Enforcement Conference
March 18, 1997

- *Heavy Load Event of Feb. 3, 1997*
  - *Causes*
  - *Safety Significance*
- *Heavy Load Event of Feb. 19, 1997*
  - *Causes*
  - *Safety Significance*
- *Heavy Load Event of Feb. 25, 1997*
  - *Causes*
  - *Safety Significance*
- *Corrective Actions*
  - *Completed Short Term*
  - *Planned Long Term*

Heavy Load Event of Feb. 3, 1997

- *22 RCP Motor Rotor lifted using polar crane (See Figure 1.)*
- *Reactor Vessel head off*
- *Refueling Cavity flooded*
- *Both doors of Containment Maintenance and Personnel Airlocks open*
- *Inservice Purge Ventilation System*

Causes of February 3rd Event

- Procedure D58, Control of Heavy Loads, not adequately applied before making the lift.
- Job planning by system engineer and maintenance personnel did not identify the need for special requirements to make this lift.
- Personnel did not have an adequate understanding of D58, Control of Heavy Loads, procedure.
- Communication between maintenance, engineering and operations personnel not adequate due to limited knowledge of D58 requirements.

Safety Significance of Feb. 3rd Event

- Rigging met all safety factor requirements.
- All rigging and lifting fixtures were properly inspected prior to the lift.
- Load was in vicinity of core for approximately 2 minutes.
- Inservice Purge Forced Ventilation uses PAC filters.
- Inservice Purge Forced Ventilation would have automatically isolated by Hi Rad on 2R11/12 and 2R12.
- Calculated thyroid dose from the release of gas from 1 fuel element is 3.9 rem at site boundary.
- Load was safely moved again on Feb. 5th after OC reviewed procedure was put in place.

Heavy Load Event of Feb. 19, 1997

- *21 Circ Water Pump internals and 22 Circ Water Pump Motor lifted using mobile crane (See Figure 2).*
- *Load did not go over any safe shutdown equipment.*
- *Work Order procedures did not identify a safe load path.*

Causes of February 19th Event

- *D58, Control of Heavy Loads, did not contain guidance for moving heavy loads with the use of mobile cranes.*
- *The initial interpretation of NUREG-0612, "Control of Heavy Loads," and other original documents was not applied to mobile cranes.*

Safety Significance of Feb. 19th Event

- *Mobile crane inspection sticker posted inside cab was checked before lift to ensure annual inspection requirements were met.*
- *Work Order did include component weights.*
- *Work Order did require crane to be grounded and nearby 345 KV line to be isolated and grounded.*
- *Rigging met all safety factor requirements.*
- *All rigging was properly inspected prior to the lift.*
- *Pre-job brief discussed safe load path (but not proceduralized).*
- *21 Circ Water Pump motor was safely moved after the OC reviewed procedure was put in place.*

Heavy Load Lift Event of Feb. 25, 1997

- *Concrete trench cover lifted using forklift (See Figure 3).*
- *Load lifted over Train A RHR discharge piping to SI pump suction and RWST to charging pump piping.*
- *Discovered by NSP QC Inspector after lift was completed.*

Causes of February 25th Event

- D58, Control of Heavy Loads, did not contain guidance for moving heavy loads with the use of forklifts.
- Initial interpretation of NUREG-0612, "Control of Heavy Loads," and other original documents was not applied to forklifts.

Safety Significance of Feb. 25th Event

- RCS Inventory was at top of hot legs.
- Train B RHR was operating; Train A was available.
- Three other make-up paths available to the RCS:
  - * RWST to RHR
  - * RWST to SI
  - * Normal make-up to CVCS
- Rigging of this load followed standard rigging requirements.
- Load lifted to 1 inch above floor, then moved to side and set down.
- Load was safely moved back after OC reviewed procedure was put in place.

Corrective Actions Completed

Corrective Actions Completed	Date Completed
Movement of 22 RCP motor rotor placed on hold.	2/4/97
Specific procedure written for moving 22 RCP motor rotor and reviewed by OC.	2/5/97
Training performed for PI and traveling maintenance riggers and repairmen on requirements of D58.	2/6/97
Engineering, maintenance and operations personnel informed of event to increase awareness of D58 and management's expectation to follow the procedure.	2/8/97
Checklist developed and posted at permanent crane controls to determine if D58 requirements should be applied.	2/12/97

Corrective Actions Completed (cont.)

Corrective Actions Completed	Date Completed
Procedure written and reviewed by OC for lifting 21 Circ Water Pump motor.	2/21/97
All outstanding outage Work Orders reviewed to identify any heavy load lifts requiring preparation of procedures.	2/26/97
Maintenance Standards Implementing Procedure MSIP-6003 written to screen all lifts using permanent or portable lifting devices.	2/27/97
Procedure written and reviewed by OC for replacing RHR trench cover.	2/28/97
Maintenance personnel trained on MSIP-6003.	2/28/97
Construction personnel trained on MSIP-6003.	3/3/97
Management received draft investigative report from ERTF and evaluated short term and long term corrective actions.	3/5/97

Corrective Actions Completed (cont.)

Corrective Actions Completed	Date Completed
■ Interim revision to D58 issued to require any load >1799 lbs. transported over safe shutdown equipment or irradiated fuel to have a written procedure reviewed by QC.	3/6/97
■ Perform heavy load familiarization training including the MSIP-6003 screening procedure for engineering, QC and operations personnel.	3/17/97

Planned Long Term Corrective Actions

- Perform comprehensive review of all source documents and related correspondence to determine scope of heavy loads program, including mobile cranes, and then incorporate into human factored procedures.
- Assign single heavy loads program owner.
- Conduct a job task analysis of the heavy loads program.

Planned Long Term Corrective Actions (cont.)

- *Maintenance, Operations and Engineering Training PACs will review D Sections in order to identify any tasks not included in the initial and continuing training programs.*
- *Outage Planning Team to develop methods that will identify heavy loads in future outage planning and scheduling.*

FIGURE 1

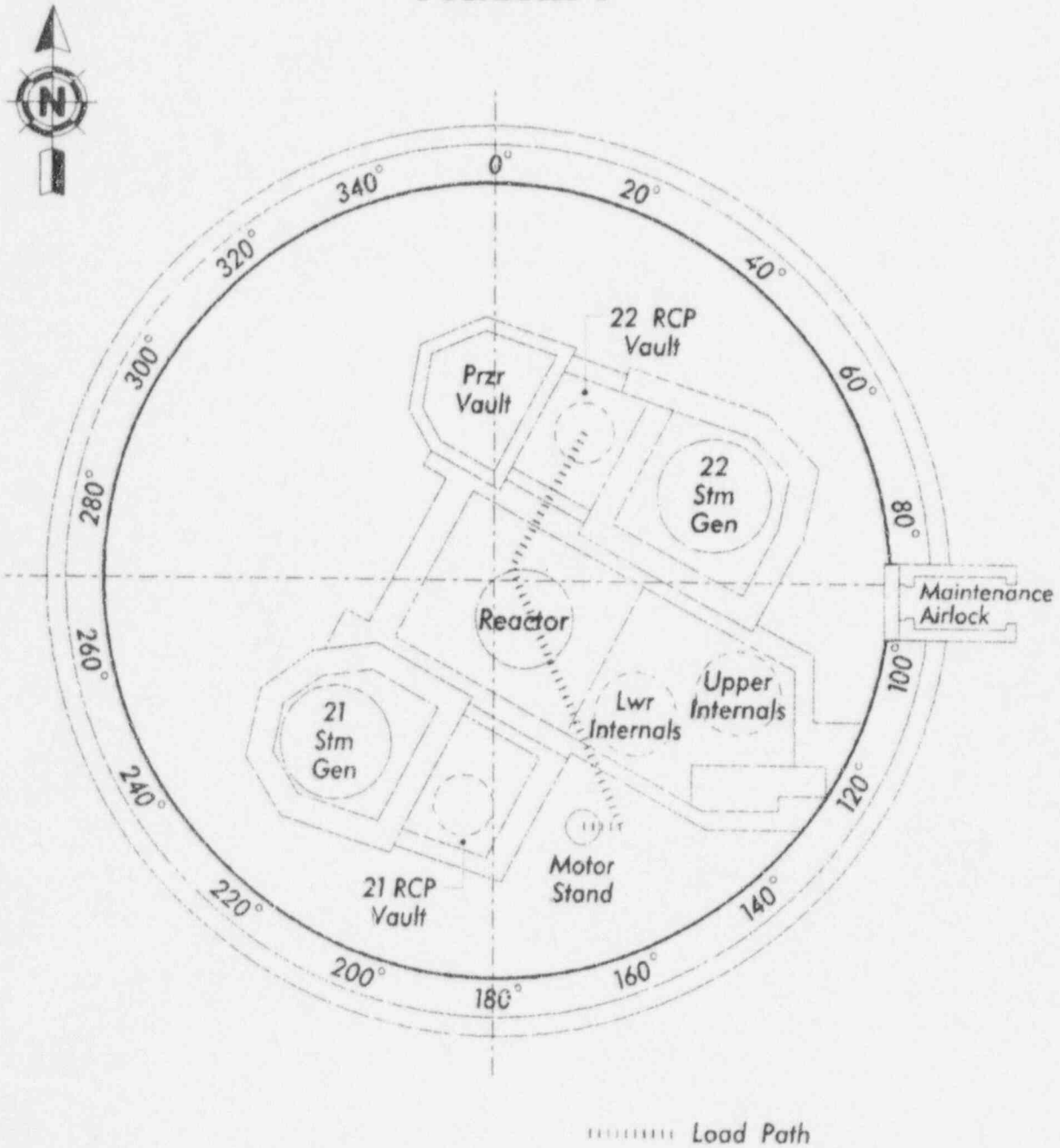
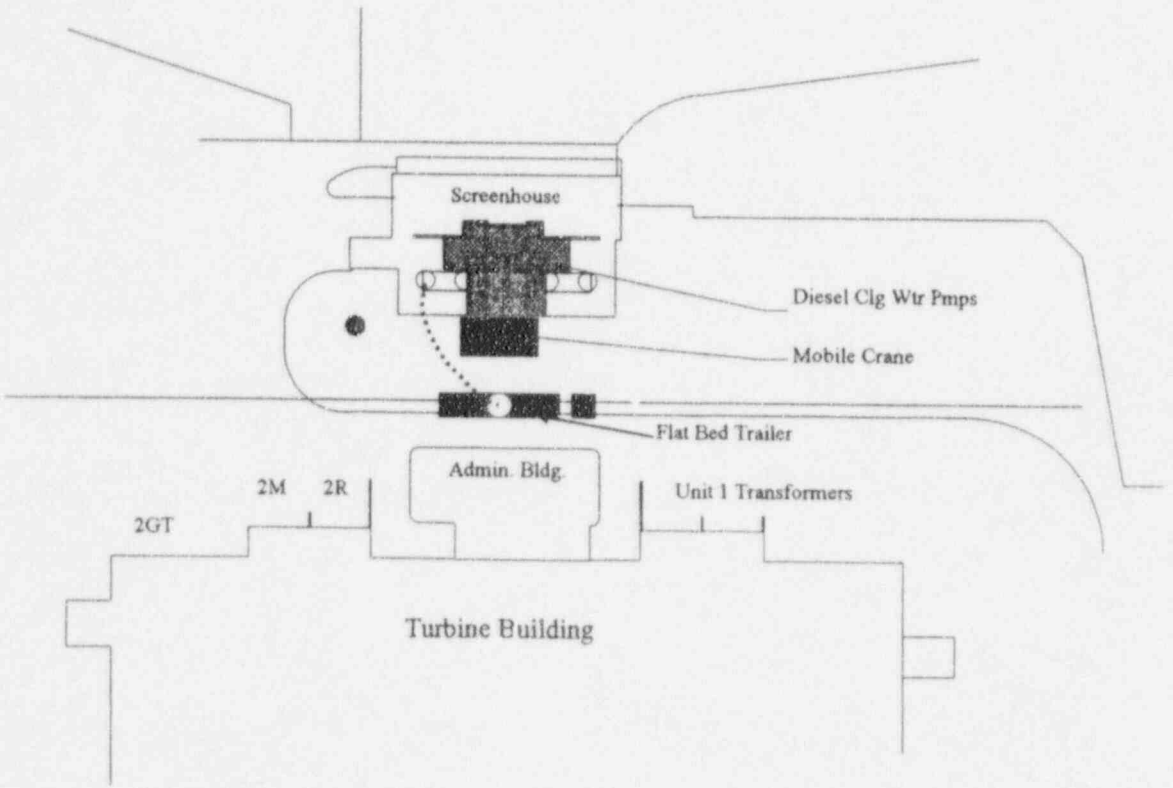

N
0°
20°
40°
60°
80°
100°
120°
140°
160°
180°
200°
220°
240°
260°
280°
300°
320°
340°
22 RCP Vault
Przr Vault
22 Stm Gen
Maintenance Airlock
Reactor
Lwr Internals
Upper Internals
21 Stm Gen
Motor Stand
21 RCP Vault
Load Path

FIGURE 2

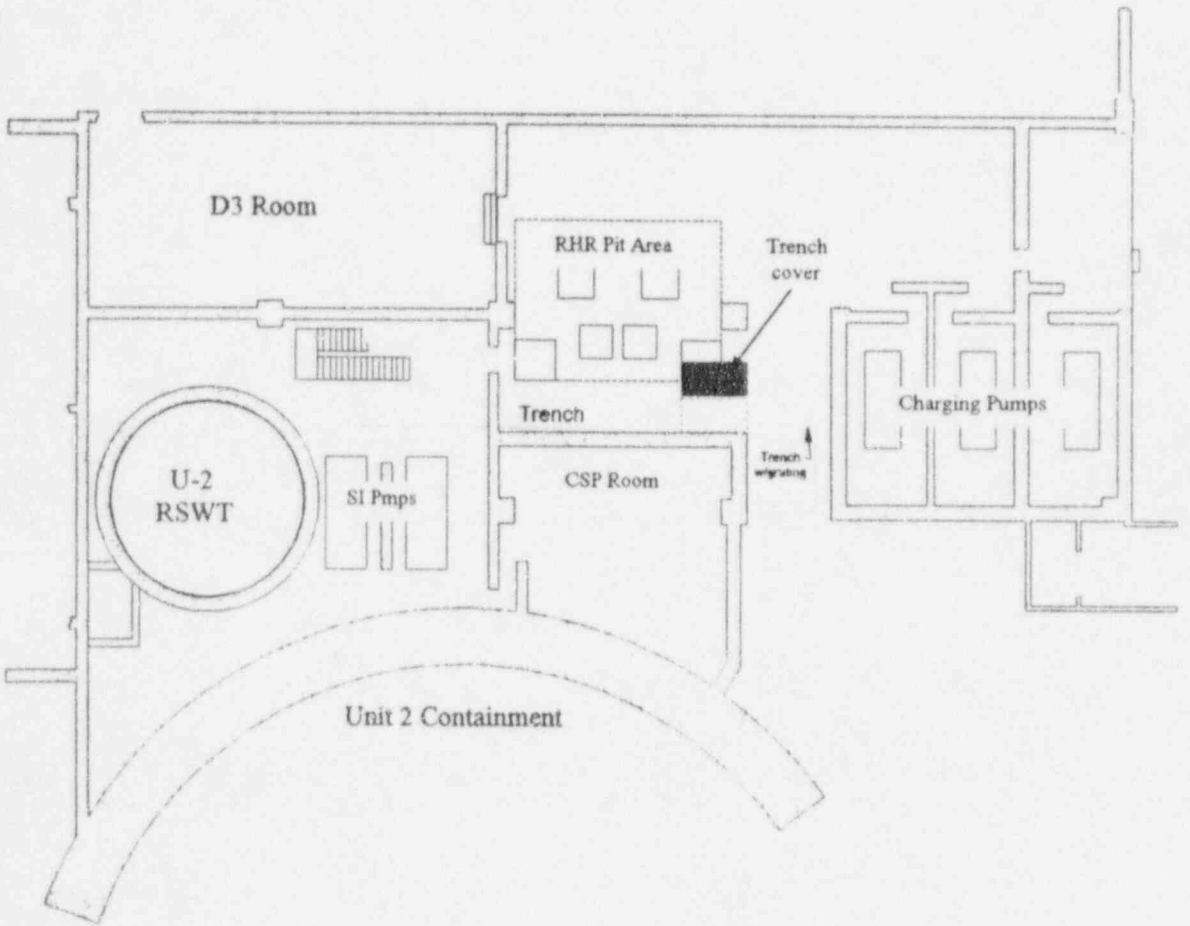
Plant Screenhouse



..... Load Path

FIGURE 3

Unit 2 Aux Bldg Trench



Heavy Loads

ERTF 97-01
Long Term Corrective Action
Issue 16

Joseph Gonyeau PE
Senior Nuclear Consultant
Prairie Island NGP

Major Elements

- Comprehensive Review
- Evaluate Program Adequacy
- Revise Program and Procedures as appropriate
- Several stages including outage consideration

Scope

- Generic Letter
- NUREG-0612 / ANSI B30.2-1976
- Phase I and II SERs
- Bulletin 96-02
- NSP-NRC Correspondence
- D58 and D sections involving heavy lifts
- Design Basis Topical Reports

Preliminary Observations

- Spent fuel / Fuel in core / Safe SD SSCs
- Operation vs. shutdown conditions
- Redundancy
- Overhead and gantry cranes
- Use of drawings
- Typical loads
- Opportunity for error

Anticipated Changes

- Procedural - human engineering considerations and address potential experience level shifts
- D58 and related D sections to address typical lifts with drawings to reduce opportunity for error
- Mobile and other lifting considerations
- Design basis - consolidate further
- WO Process review - Heavy Loads TBD

Timeline

- Preliminary Review
- Detailed Review
  - Documents
  - Calculations
  - Correspondence
- Unit 1 outage procedures
- Design Basis Documents
- General procedures - Process