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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 93-001-00: on 930310, determined that previously performed surveillance testing had not been fully adequate to demonstrate operability of hoists. Caused by error by nonlicensed util personnel. Calibration revised. W/930409 ltr.

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April 9, 1993
G02-93-082

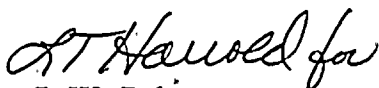
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**Subject: NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21
LICENSEE EVENT REPORT NO. 93-011**

Transmitted herewith is Licensee Event Report No. 93-011 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Sincerely,

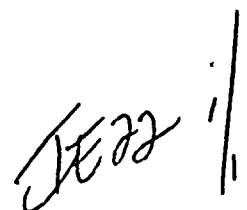


J. W. Baker
WNP-2 Plant Manager (Mail Drop 927M)

JWB/CLF/jd
Enclosure

cc: Mr. J. B. Martin, NRC - Region V
Mr. R. Barr, NRC Resident Inspector (Mail Drop 901A, 2 Copies)
INPO Records Center - Atlanta, GA
Mr. D. L. Williams, BPA (Mail Drop 399)

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LICENSEE EVENT REPORT (LER)																																		
FACILITY NAME (1) Washington Nuclear Plant - Unit 2															DOCKET NUMBER (2) <div style="display: flex; justify-content: space-between; width: 100%;"><div>0 5 0 0 0 3 9 7</div><div>1 OF 7</div></div>																			
TITLE (4) <div style="text-align: center; padding: 10px;">SURVEILLANCE REQUIREMENTS FOR REFUELING PLATFORM INADEQUATELY IMPLEMENTED DUE TO ANALYSIS DEFICIENCIES AND SURVEILLANCE REQUIREMENT MISINTERPRETATION</div>																																		
EVENT DATE (5)					LER NUMBER (6)					REPORT DATE (7)					OTHER FACILITIES INVOLVED (8)																			
MONTH			DAY		YEAR		YEAR		SEQUENTIAL NUMBER		REVISION NUMBER		MONTH			DAY		YEAR		FACILITY NAMES										DOCKET NUMBERS(S)				
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OPERATING MODE (9)					THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																													
POWER LEVEL (10)					20.402(b)					20.405(c)					50.73(a)(2)(iv)					77.71(b)														
0 9 0					20.405(a)(1)(i)					50.36(c)(1)					50.73(a)(2)(v)					73.73(c)														
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					20.405(a)(1)(iii)					X 50.73(a)(2)(i)					50.73(a)(2)(viii)(A)																			
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LICENSEE CONTACT FOR THIS LER (12)																																		
NAME C. L. Fies, Licensing Engineer															TELEPHONE NUMBER																			
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<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO																																		
ABSTRACT (16)																																		
<p>On March 10, 1993, it was determined that previously performed surveillance testing had not been fully adequate to demonstrate operability of hoists associated with the refueling platform. As a result of inadequacies in the previous test method, testing of load-related hoist interlocks and cutoffs did not ensure they would operate within Technical Specification limits. The affected features include: the overload cutoff, hoist loaded interlock, redundant hoist loaded interlock, slack cable cutoff for the main hoist, and the overload cutoff for the frame mounted and monorail hoists.</p> <p>The root causes of this event are: 1) an error by nonlicensed utility personnel that resulted in misinterpretation of testing requirements for the slack cable cutoff, and 2) inadequate consideration of instrument loop uncertainties when determining setpoints and specifying test weights used to verify operation of hoist interlocks and cutoffs. As corrective actions, calculations are being performed, and calibration and test procedures will be revised to meet Technical Specification requirements. As a general corrective action projects to improve surveillance procedure and setpoint calculation adequacy are</p>																																		

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Abstract (Cont'd)

in progress. The described condition did not result in unavailability of the refueling platform protective features, or result in setpoint errors of sufficient magnitude to appreciably increase the likelihood of equipment damage. Consequently, the condition described in this report did not have an adverse effect on plant or public safety.

Plant Conditions

Operational Mode - 1 (Power Operation)
Power Level - 90%

Event Description

On March 10, 1993, it was determined that previously performed surveillance testing had not been fully adequate to demonstrate operability of hoists associated with the refueling platform. Technical Specification 3/4.9.6 requires periodic testing of protective interlocks and cutoffs associated with the refueling platform hoists. These requirements were not fully implemented during previous testing due to: 1) inadequate consideration of instrument uncertainties when determining setpoints and specifying test weights used to verify operation of the refueling platform interlocks and cutoffs, and 2) misinterpretation of slack cable cutoff test requirements for the main hoist.

As a result, testing of load-related hoist interlocks and cutoffs did not ensure that they would operate within Technical Specification limits. The affected features include: the overload cutoff, hoist loaded interlock, redundant hoist loaded interlock, slack cable cutoff for the main hoist, and the overload cutoff for the frame mounted and monorail hoists. Operability of the uptravel electrical stop and downtravel electrical cutoff protective features were not affected by the condition described in this report, and were adequately demonstrated by previous testing.

Immediate Corrective Action

Operability requirements for the refueling platform are only applicable during refueling operations involving handling of control rods and fuel assemblies within the reactor pressure vessel. WNP-2 was operating at power when the condition described in this report was identified, and was not involved in activities that required the refueling platform to be operable. Consequently, no immediate corrective actions were necessary.

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Further Evaluation, Root Cause, and Corrective Action

A. Further Evaluation

1. The condition described in this report is reportable pursuant to the requirements of 10CFR50.73(a)(2)(i)(B) as an operation or condition that is prohibited by Technical Specifications. Operability of load-related refueling platform hoist interlocks and cutoffs was not fully demonstrated during prior plant operations when the refueling platform was required.
2. Failure to fully implement refueling platform Surveillance Requirements was identified by a project engineer on March 10, 1993, during preparation of documentation for an anticipated plant modification involving replacement of the refueling platform mast. In order to support the modification, load-related hoist interlock and cutoff setpoints were calculated for the existing mast on a preliminary basis. These preliminary calculations identified problems with the method used to calibrate and test load-related refueling platform hoist interlocks and cutoffs. These calculations were necessary because formal setpoint calculations had not been used to determine hoist interlocks and cutoffs for the existing refueling mast.

Operability of the load-related refueling platform hoist interlocks and cutoffs is demonstrated by lifting a series of test weights and verifying proper interlock and cutoff feature operation. The test weights previously used to verify operation of these interlocks and cutoffs were sized to include consideration of weight contributions due to the hoist cable and refueling mast, but did not consider the effects of instrument accuracy or drift. As a result, the test weights were oversized, and setpoint verifications for the load-related interlocks and cutoffs that were performed using these test weights were not accurate. Failure to consider instrument loop uncertainties also resulted in incorrect calibration data for instrumentation associated with these interlocks and cutoffs.

The project engineer's review also identified a second discrepancy associated with the slack cable cutoff for the main hoist. Technical Specifications require the slack cable cutoff feature to operate when the load on the main hoist is less than 50 pounds. In order to assure this cutoff occurs before the main hoist load is less than 50 pounds, the slack cable cutoff setpoint must account for instrument accuracy and drift. Calibration and surveillance procedures for the slack cable cutoff incorrectly set and verified operation of this feature at a load of less than 50 pounds. This discrepancy resulted due to misinterpretation of the slack cable cutoff Surveillance Requirement that has existed since initial procedure development.

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3. As previously identified, the affected hoist interlocks and cutoffs include: the overload cutoff, hoist loaded interlock, redundant hoist loaded interlock, slack cable cutoff for the main hoist, and the overload cutoff for the frame mounted and monorail hoists. The effect that the identified deficiencies had on these protective features is described below:

Overload Cutoff - Main Hoist - The main hoist overload cutoff interlock is designed to prevent damage to either the fuel bundles or reactor internals by stopping hoist travel when excessive force is applied. The maximum setpoint value for the overload cutoff is established in Technical Specifications as 1250 pounds. In order to assure that hoist travel is stopped at 1250 pounds, or less, this interlock must be set at a value below 1250 pounds in order to account for uncertainties in the calculation. The overload cutoff could have been set as high as 1441 pounds using the previous test method.

Hoist Loaded Interlock - Main Hoist - The hoist loaded interlock provides a control rod block and indication to the refuel bridge operator that a load is attached to the hoist. The maximum setpoint value for the hoist loaded interlock is established in Technical Specifications as 535 pounds. In order to assure that hoist travel is stopped at 535 pounds, or less, this interlock must be set at a value below 535 pounds in order to account for uncertainties in the calculation. This interlock could have been set as high as 670 pounds using the previous test method.

Hoist Loaded Redundant Interlock - Main Hoist - The hoist loaded redundant interlock prevents upward movement of the refuel mast if the grapple is not closed and the hoist is loaded. The maximum setpoint value for the redundant hoist loaded interlock is established in Technical Specifications as 600 pounds. In order to assure that hoist travel is stopped at 600 pounds, or less, this interlock must be set at a value below 600 pounds in order to account for uncertainties in the calculation. This interlock could have been set as high as 736 pounds using the previous test method.

Slack Cable Cutoff - Main Hoist - The slack cable cutoff is designed to stop hoist travel when there is 50 pounds or less on the main hoist. The purpose of this feature is to prevent the hoist cable unwinding from the drum. In order to assure that hoist travel is stopped at 50 pounds or less decreasing, the slack cable cutoff must be calibrated to a value higher than 50 pounds. However, the slack cable setpoint value was previously misinterpreted, and was set and verified at a value below 50 pounds in calibration and surveillance procedures. Additionally, the slack cable cutoff setpoint did not consider instrument uncertainties.

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Overload Cutoff - Frame Mounted and Monorail Hoists - Overload cutoffs for the frame mounted and monorail hoists are designed to prevent uplifting over the reactor vessel if a control rod is withdrawn and a load is attached to the hoist. The maximum setpoint value for these overload cutoffs are established in Technical Specifications as 535 pounds. In order to assure that hoist travel is stopped at 535 pounds, or less, the cutoffs must be set at a value below 535 pounds in order to account for uncertainties in the calculation. The maximum possible load for these hoists has not been calculated, but was also in excess of Technical Specification limits.

B. Root Cause

Two root causes have been identified for the condition described in this report. The first root cause was misinterpretation of the slack cable cutoff Surveillance Requirement. As a result of this misinterpretation, the slack cable cutoff was set and verified at a value that was below the required setpoint in calibration and surveillance procedures. This misunderstanding involved an error by non-licensed, utility personnel during the initial development of the surveillance procedure. The second root cause resulted from inadequate analysis of setpoints for load-related interlocks and cutoffs associated with the refueling platform hoists. Setpoints for these interlocks and cutoffs were not determined within formal calculations, and informal calculations did not provide adequate consideration of instrument loop uncertainty when developing setpoints and determining test weight specifications.

C. Further Corrective Action

1. The following corrective actions will be taken prior to declaring the refueling platform hoists operable. This equipment is expected to be used during the refueling outage scheduled to begin on April 30, 1993.
 - a. Setpoint calculations for load-related interlocks and cutoffs associated with the refueling platform will be performed. These calculations will include consideration of instrument loop uncertainties.
 - b. The following procedures will be changed to incorporate results of the interlock and cutoff calculations:
 - 1) PPM 10.25.6, Refueling Platform Maintenance and Testing
 - 2) PPM 10.25.72, Calibration of Load Cell Switches for Refuel Platform

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- 3) PPM 10.27.14, Refueling Main Hoist Load Cell and Slack Cable Pressure Switch Calibration
 - 4) PPM 7.4.9.1, Refuel Interlocks
 - 5) PPM 7.4.9.6, Refuel Platform Crane and Hoist Interlock Surveillance
- c. New test weights will be fabricated, as specified within the interlock and cutoff setpoint calculations.
2. In response to previous events involving setpoint calculation deficiencies and procedural implementation of Technical Specification Surveillance Requirements, the following corrective actions have been initiated:
- a. A project team is currently performing a technical and compliance review of the WNP-2 Surveillance Testing Program. This review will ensure that procedures used to satisfy Technical Specification Surveillance Requirements are technically accurate, and that each Surveillance Requirement is satisfied within plant procedures. LER 93-010 provides a more detailed description of this project.
 - b. An extensive Setpoint Verification Program is in progress. This effort will review/evaluate calculations in order to identify and correct setpoint calculation deficiencies that may exist.

Safety Significance

WNP-2 has not experienced an event involving equipment damage resulting from incorrect interlock and cutoff setpoints for the refueling platform hoists. Although incorrect setpoints could have resulted in hoist loads in excess of Technical Specification limits, these increases were not of sufficient magnitude to appreciably affect the likelihood of damage to reactor vessel internal components, fuel bundles, or the refueling platform hoists. Consequently, the condition described in this report did not have an adverse effect on safe operation of the plant, or the health and safety of plant personnel or the general public.

Similar Events

Previous instances involving procedures that were not adequate to satisfy Surveillance Requirements have recently been reported in LERs 91-13, 91-18, 91-19, 91-28, 91-36, 92-02, 92-35, 93-08, and 93-10. Previous instances involving inadequate setpoint calculations have been reported in LERs 87-26, 88-23, 89-06, 92-02, 92-06, 92-09, 92-14, and 93-03. Corrective actions have been initiated in response to these previous events in order to resolve programmatic deficiencies involving setpoint calculations and procedural implementation of Technical Specification Surveillance Requirements.

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EIIS Information

Text Reference

Refueling Platform
 Control Rod
 Fuel Bundle
 Hoists

EIIS Reference
System Component

DB	FHM
AA	JC
AC	---
DB	HOI