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SUBJECT: LER 90-004-00: on 900208, inoperability of HPCS sys caused by equipment failure.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

March 9, 1990

Docket No. 50-397

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 90-004

Dear Sir:

Transmitted herewith is Licensee Event Report No. 90-004 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.

Very truly yours,

C. M. Powers

C. M. Powers (M/D 927M)
WNP-2 Plant Manager

WSD:lr

Enclosure:
Licensee Event Report No. 90-004

cc: Mr. John B. Martin, NRC - Region V
Mr. C. J. Bosted, NRC Site (M/D 901A)
INPO Records Center - Atlanta, GA
Ms. Dottie Sherman, ANI
Mr. D. L. Williams, BPA (M/D 399)

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

NRC Form 366 (6-89)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Plant Conditions

- a) Plant Mode - 1 (Power Operation)
- b) Power Level - 93%

Event Description

On February 4, 1990, at 0117 hours, the High Pressure Core Spray (HPCS) System Diesel Generator output circuit breaker 4-DG3 tripped during performance of the Technical Specification operability surveillance test. When the generator was synchronized with the Division Three 4160 volt emergency electrical bus (SM-4), the generator rapidly loaded to greater than 3000 KW. Efforts by Plant Operators to control the electrical load were followed by a trip of circuit breaker 4-DG3. At 0225 hours, after resetting the 4-DG3 reverse power trip protective relay and completing an evaluation of the circumstances associated with the trip, the operability surveillance was successfully completed without incident. After discussion with Plant technical and maintenance personnel, a troubleshooting plan to investigate for possible equipment fault was written and initiated.

On February 8, 1990, at 0518 hours, the High Pressure Core Spray (HPCS) Diesel Generator was declared inoperable for performance of corrective maintenance in the form of troubleshooting the electronic governor system. The HPCS System was then declared inoperable and the LCO Action requirements of WNP-2 Technical Specification sections 3/4.5.1 "Emergency Core Cooling Systems" and 3/4.8.1.1 "Electrical Power Systems" were entered and complied with. At 1209 hours, as a result of troubleshooting efforts, an equipment failure was identified. The "droop switch" for the diesel speed governor was discovered to be faulty and to require replacement. The failure of this switch would cause the observed governor response and render the operator actions to control synchronized loading ineffective.

Immediate Corrective Action

Repair planning efforts were immediately started by Plant maintenance and technical staff personnel. Temporary repair was accomplished by bypassing the speed governor mode selector (droop switch) such that the Diesel Generator will be continuously maintained in the droop mode of operation. On February 10, 1990, at 0032 hours, after completion of post repair surveillance testing, the HPCS Diesel Generator and the HPCS System were declared operable.

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Further Evaluation and Corrective ActionA. Further Evaluation

1. Since the HPCS System is considered to be a single-train system that performs a safety function, inoperability of the system is reportable per the requirements of 10CFR50.72(b)(2)(iii) and 10CFR50.73(a)(2)(v) as a "condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to ... shut down the reactor and maintain it in a safe shutdown condition ... or mitigate the consequences of an accident."

The inoperability of the HPCS system is a unique event at WNP-2. Unlike the other Emergency Core Cooling Systems, HPCS System inoperability is reportable even though all requirements of technical specification LCO action statements are being complied with. This is so because it is classified as a "single-train" Emergency Core Cooling System. As such, its inoperability is reportable any time it is required to be able to perform its safety function by plant conditions.

2. There were no structures, components or systems that were inoperable at the start of this event that contributed to the event.
3. The cause of the reverse power trip of the 4-DG3 circuit breaker was equipment failure in the form of a faulty speed governor mode selector switch (droop switch) which caused electrical load instability while the unit was synchronized with the utility grid. This resulted in the inoperability of the HPCS Diesel Generator for troubleshooting and the inoperability of the HPCS System during the repair task.
4. An engineering evaluation was performed which verified that the nominal reduction in generator output, while operating in the droop mode on an isolated bus, was acceptable.
5. The reverse power trip of the HPCS DG was evaluated as a non-valid failure per NRC Regulatory Guide 1.108, since this function is bypassed during accident conditions and is part of the generator synchronizing circuitry.

B. Further Corrective Action

1. A new droop switch will be procured and installed in the HPCS Diesel Generator governor control circuitry to restore the design configuration of the diesel engine speed governor control circuitry to normal.

LICENSEE EVENT REPORT (LER)
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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Safety Significance

This event has no safety significance. At all times during the event, the requirements of the WNP-2 Technical Specifications were complied with. The operability of the redundant ECCS Divisions 1 and 2 and the Reactor Core Isolation Cooling (RCIC) System were assured while the HPCS system was inoperable (a maximum of 14 days is allowed). The entire period of inoperability was less than two days. The actions of the plant operators were prompt and correct to ensure the plant was maintained within the bounds of the technical specifications and, therefore, within the bounds of the operational safety analysis. Since no safety significance is associated with this event, it posed no threat to the health and safety of the public or plant personnel.

Similar Events

There were four instances of HPCS system inoperability that were evaluated as similar to this LER. LER 84-030, "Unscheduled Lockout of the High Pressure Core Spray Diesel Generator (HPCS-DG)", documented an event during which a technician inadvertently locked out the HPCS Diesel Generator during surveillance activity by incorrect placement of an electrical jumper. The corrective action consisted of revising the procedure to add a caution note and to designate the proper contacts to be jumpered.

LER 85-022, "HPCS System Inoperable", documented an event during which plant personnel inadvertently disconnected system initiation logic while repairing two sheared off HPCS initiation status lamp sockets. Corrective action consisted of notifying plant operations, maintenance and technical personnel to place additional reliance on electrical wiring diagrams, connection diagrams and approved vendor manuals when appropriate.

LER 89-030, "High Pressure Core Spray System Inoperable Caused by Suppression Pool Pump Suction Valve Failure Due to Motor Operator Manufacturing Error", documented an event during which the HPCS system was declared inoperable due to failure of the suppression pool pump suction valve motor operator during performance of the operability surveillance. The corrective actions associated with this LER consisted of: checking other valve motor operators during the next refueling outage, revising the plant maintenance procedures to add instructions for inspection of the motor operators, adding precautions to plant procedures regarding disposition of valves found difficult to operate, and initiation of a 10CFR21 report.

LER 89-043, "Inoperability of the High Pressure Core Spray System Caused by Equipment Failure", documented an event during which the test return valve to the suppression pool, HPCS-V-23, was found to be unable to close beyond the ten percent open position causing apparent malfunction of the minimum flow valve, HPCS-V-12. The corrective actions associated with this LER consisted of completion of failure analysis and determination of the root cause of the HPCS-V-23 failure after repair of the valve.

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EIIS InformationText ReferenceEIIS Reference

System Component

HPCS Diesel Generator
High Pressure Core Spray System
Circuit Breaker 4-DG3
SM-4
Electronic Governor
Droop Switch
RCIC
Status Lamp Sockets
Suppression Pool Pump Suction
Valve Motor Operator
HPCS-V-23
HPCS-V-12

EB DG
BG ---
EB 52
EB ---
EB 65
EB SEL
BN ---
BG IL

BG MO
BG V
BG V