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SUBJECT: LER 96-008-00:on 961205,failure to comply with TS action requirement for emergency core cooling sys actuation instrumentation occurred due to unidentified inoperability condition.PMR will be conducted.W/970106 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM
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January 6, 1997
GO2-97-003

Docket No. 50-397

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

Gentlemen:

Subject: **NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21**
LICENSEE EVENT REPORT NO. 96-008-00

Transmitted herewith is Licensee Event Report No. 96-008-00 for WNP-2. This report is submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) and discusses the items of reportability, corrective action taken, and action to preclude recurrence.

Should you have any questions or desire additional information regarding this matter, please call me or Ms. L. C. Fernandez at (509) 377-4147.

Respectfully,

R L Webring

R. L. Webring
Vice President, Operations Support/PIO
Mail Drop PE08

RLW/CDM
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4)
FAILURE TO COMPLY WITH A TECHNICAL SPECIFICATION ACTION REQUIREMENT FOR THE EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION DUE TO UNIDENTIFIED INOPERABILITY CONDITION

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)
12	05	96	96	- 008	- 00	01	06	97		05000
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

POWER LEVEL (10)				
100	20.402(b)	20.405(C)	50.73(a)(2)(iv)	73.71(b)
	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
W.A. Pfitzer, Technical Specialist	AREA CODE 509 377-2419

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
D	BG	PS	382	YES					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (16)

On December 5, 1996 with the plant in Mode 1 at 100% reactor power, it was determined that WNP-2 may have failed to comply with a Technical Specification action requirement for the Emergency Core Cooling System (ECCS) Actuation Instrumentation. Based on subsequent analysis, it was determined that the pressure switches designed to initiate the High Pressure Core Spray (HPCS) system on high containment drywell pressure had exceeded their Technical Specification allowable values on several occasions during the period from June 10, 1996 through November 24, 1996. Contrary to ECCS Actuation Instrumentation Technical Specification 3.3.3.b, action was not taken within 24 hours to perform Action 30 of Table 3.3.3-1 because the inoperability condition had not been identified. Action 30 requires that the inoperable instrumentation channel(s) be placed in the tripped condition within 1 hour or the HPCS system be declared inoperable. In accordance with Technical Specification 3.5.1, the HPCS system can be inoperable for up to 14 days before additional action is required.

The root cause of this event was a program deficiency in that no warehouse controls were placed on the issuance of the pressure switches. A Plant Modification Request (PMR) was initiated which would have prompted the appropriate engineering analysis prior to installation of the switches, but the PMR was later canceled in 1989 and no process tie existed between the PMR and the switches. This resulted in the replacement pressure switches not being installed in the vented configuration as required.

To ensure operability of the HPCS system high drywell pressure trip function, immediate corrective action was taken to vent the associated drywell pressure switches to the reactor building atmosphere and verify the setpoints in accordance with the Channel Functional Test (CFT) surveillance procedures. Further corrective actions have been completed to establish a limitation on use for the affected pressure switches and requiring an engineering evaluation be performed prior to use in other applications to ensure the replacement pressure switches are correct for the application.

This event posed no threat to the health and safety of either the public or plant personnel.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION			
FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8) Year / Number / Rev. No.	PAGE (3)
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TITLE (4) FAILURE TO COMPLY WITH A TECHNICAL SPECIFICATION ACTION REQUIREMENT FOR THE EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION DUE TO AN UNIDENTIFIED INOPERABILITY CONDITION

Event Description

On December 5, 1996 with the plant in Mode 1 at 100% reactor power, it was determined that WNP-2 may have failed to comply with a Technical Specification action requirement for the Emergency Core Cooling System (ECCS) Actuation Instrumentation.

During an investigation of a setpoint drift problem related to pressure switches MS-PS-47B and 47C [PS], it was discovered that the pressure switch cases were not vented to the reactor building atmosphere as assumed in their setpoint calculation. These pressure switches are the Channel B and C sensors, respectively, for High Pressure Core Spray (HPCS) system [BG] initiation on high containment drywell pressure. Based on further investigation, it was determined that the pressure switch cases for MS-PS-47A and 47D [PS], which are the Channel A and D sensors, respectively, were also not vented to the reactor building atmosphere as assumed in the setpoint calculation. The Technical Specification trip setpoint for these pressure switches is ≤1.65 psig and the allowable value is ≤1.85 psig.

An unvented and sealed pressure switch case is subject to pressure changes within the case due to ambient temperature variations and, because the trip setpoint and allowable value are close to atmospheric pressure, these temperature variations can create internal pressure changes which could affect the switch setpoint. At low setpoint pressures, an increase in internal case temperature will cause an increase in internal case pressure. This increased case pressure acts against the sensed drywell pressure to shift the setpoint in the nonconservative direction such that a higher drywell pressure would be required for HPCS system initiation. Moreover, the switch setpoint can also be affected by changes in atmospheric pressure. Following each pressure switch calibration, an unvented case is effectively sealed by installation of the cover plate. With the pressure switch case unvented and sealed, a change in atmospheric pressure between calibrations will be evident by a setpoint drift observed at the next calibration. A high atmospheric pressure at the time the pressure switch case is sealed following calibration will result in a shift in the setpoint in the nonconservative direction (higher drywell pressure required to initiate HPCS) as the atmospheric pressure within the drywell and reactor building decreases between calibrations.

On December 15, 1996, an analysis of the temperature and atmospheric pressure effects described above determined that the pressure switches for the HPCS system high drywell pressure trip function had exceeded their Technical Specification allowable values on several occasions during the period from June 10, 1996 through November 24, 1996. Contrary to ECCS Actuation Instrumentation Technical Specification 3.3.3.b, action was not taken within 24 hours to perform Action 30 of Table 3.3.3-1 because the inoperable condition had not been identified. Action 30 requires that the inoperable instrumentation channel(s) be placed in the tripped condition within 1 hour or the HPCS system be declared inoperable. In accordance with Technical Specification 3.5.1, the HPCS system can be inoperable for up to 14 days before additional action is required.

Immediate Corrective Actions

To ensure operability of the HPCS system high drywell pressure trip function, immediate action was taken on December 5, 1996 to vent pressure switches MS-PS-47A, 47B, 47C, and 47D to the reactor building atmosphere and verify the setpoints in accordance with the Channel Functional Test (CFT) surveillance procedures 7.4.3.3.1.53 and 7.4.3.3.1.54. The pressure switches were vented by removing the vendor installed case vent caps.

Further Evaluation and Corrective Actions

Further Evaluation

1. Pursuant to 10 CFR 50.73(a)(2)(i)(B), this event is being reported as a condition prohibited by the WNP-2 Technical Specifications.

2. Pressure switches MS-PS-47A, 47B, 47C, and 47D were replaced during the Spring 1996 (R-11) maintenance and refueling outage as they were approaching their qualified life. The original Static-O-Ring (vendor) supplied pressure switch model (12NAA5X10TT, or TT) was replaced with a new model (12N6BB4NXC1AJJTTX12, or X12) because the original model could no longer be procured Quality Class 1. The new model pressure switch differed from the original model in that the diaphragm material was changed from kapton to stainless steel and the new model included a vendor supplied integral air-tight conduit seal and case vent port. The case vent port was capped but, at the customer's option, the cap could be removed to vent the pressure switch case. The vendor provided the option to cap (unvent) the pressure switch case for those applications where the pressure switch is expected to remain functional in extreme environments. The original pressure switch did not include an integral air-tight conduit seal.

   Revision 0 of the setpoint calculation for MS-PS-47A, 47B, 47C, and 47D established the setpoint limits for the original pressure switch model TT based on the device being vented to the reactor building atmosphere. Revision 1 of the calculation addressed the changes resulting from replacement of the original pressure switch model with the new model X12. The revised calculation assumed that the new pressure switch model would be vented. However, the new pressure switch model was not installed in a vented configuration because of the presence of the integral air-tight conduit seal and the failure to uncap the vent port. Hence, the temperature and atmospheric pressure effects on the new pressure switches were larger than assumed in the setpoint calculation. Based on an analysis of these effects, it was determined that pressure switches MS-PS-47A, 47B, 47C, and 47D had exceeded their Technical Specification allowable values on several occasions during the period from June 10, 1996 through November 24, 1996.

   As discussed above, the effects from changes in atmospheric pressure relative to the atmospheric pressure present at the time of calibration were introduced by the failure to uncap the vent port. The setpoint drift problem observed following installation of the new pressure switch model has been attributed to the failure to uncap the vent port and the effects from changes in atmospheric pressure. Thus, it is believed that proper venting of the pressure switches will resolve the setpoint drift phenomenon and restore the pressure switches to reliable operation. To validate this conclusion and ensure continued operability, the setpoints for pressure switches MS-PS-47A, 47B, 47C, and 47D will be verified weekly until the pressure switches exhibit a pattern of acceptable setpoint drift in accordance with the administrative limits of the CFT surveillance procedure.

3. The new pressure switch model X12 was used to replace pressure switches MS-PS-47A, 47B, 47C, and 47D during the R-11 outage. The new pressure switches were installed in the field in an unvented configuration because the work order for installation and calibration did not include instructions to remove the vent cap. Furthermore, there was no explicit design document requirement to remove the vent cap because there was no engineering evaluation (substitution

evaluation, design change evaluation, or equivalent change evaluation) performed which assessed replacement of the original pressure switch model TT with the new model. This evaluation was not performed because no warehouse controls were placed on the issuance of the pressure switches.

In 1984, Plant Modification Request (PMR) 84-1125-0 was issued to replace Static-O-Ring pressure switch model TT with model 12N6BB4NXC1AJJTTX6 (X6) as the original model could no longer be procured Quality Class 1. In 1988, before any of the new model pressure switches were installed, Static-O-Ring issued a 10 CFR Part 21 notification against the X6 model pressure switch because of setpoint drift due to process permeation through the diaphragm. Static-O-Ring subsequently replaced model X6 with model X12 to resolve the 10 CFR Part 21 concern. The only change was that the diaphragm material was changed from kapton to stainless steel. On March 9, 1989, Supply System Substitution Evaluation 567, Revision 0, was prepared to authorize model X12 as a replacement for model X6. The substitution evaluation identified that a PMR was required for installation of the new model pressure switch. However, this requirement was not entered into the Material Management System (MMS) as a "Limitation on Use" because at the time there was no procedural requirement to do so. As an unrelated action, the substitution evaluation procedure (SPES-1, Section 7.47) was revised approximately two years later, on June 15, 1991, requiring a "Limitation on Use" (includes entry in the MMS) for items where a PMR is required for installation.

On August 3, 1989, PMR 84-1125-0 was canceled for unknown reasons. This effectively eliminated the requirement for an engineering evaluation of the differences between the original pressure switch model and model X6. Substitution Evaluation 567, Revision 0, only addressed the differences between pressure switch model X6 and model X12 (i.e., the change from a kapton to a stainless steel diaphragm). Because the PMR was canceled and no warehouse controls were placed on issuance of the pressure switches, no engineering evaluation was performed which authorized the use of either models X6 or X12 as a replacement for pressure switches MS-PS-47A, 47B, 47C, and 47D. If the MMS had contained a useage limitation against the pressure switches requiring a PMR for installation, this limitation would have ensured that the appropriate engineering evaluation (i.e., substitution evaluation, design change evaluation, or equivalent change evaluation) was performed and adequate instructions were provided for installation. A "Limitation on Use" has been entered into the MMS to ensure that Static-O-Ring pressure switch model X12 is installed in the plant only after a proper engineering evaluation has been performed. Additionally, an engineering evaluation was completed on November 27, 1996 to verify that Static-O-Ring pressure switch model X12 is the correct model for the MS-PS-47A, 47B, 47C, and 47D application.

The revision to the substitution evaluation procedure provides assurance that since June 15, 1991 the MMS has been updated with a "Limitation on Use" whenever a substitution requires a PMR for installation. However, there could be other cases where material was procured for a PMR prior to the procedure revision such that a PMR useage limitation was not entered into the MMS, the material was stored in the warehouse (not installed in the plant), and then the PMR was canceled. To address this possibility, a search of the Plant Tracking Log (PTL) was conducted for similar cases. No similar cases were found. A review of open and canceled PMRs will also be performed to ensure there is no material ordered for a PMR which does not have a limitation on use.

Root Cause

The root cause of this event was a program deficiency in that no warehouse controls were placed on the issuance of the pressure switches. This resulted in no engineering analysis being done to address changes between pressure switch model TT and X12 designs. This resulted in pressure switches MS-PS-47A, 47B, 47C, and 47D not being installed in the vented configuration as required.

Further Corrective Actions

A review of the procurement and PMR processes will be conducted and process improvements will be made as necessary to assure that disposition of materials procured for PMRs which are later canceled is addressed.

Safety Significance

This event had minimal safety significance and posed no threat to the health and safety of either the public or plant personnel.

Pressure switches MS-PS-47A, 47B, 47C, and 47D are the sensors for HPCS system initiation on high drywell pressure. The primary purpose of the HPCS system is to maintain reactor vessel inventory following small break loss of coolant accidents (LOCAs) that do not depressurize the reactor vessel. The HPCS system also provides spray cooling heat transfer during LOCAs where the core becomes uncovered. No credit is taken for the HPCS system high drywell pressure initiation function in the design basis accident (DBA) or transient analyses. The high drywell pressure initiation function is retained for overall redundancy and diversity of the HPCS function. The HPCS system is assumed to be initiated on low reactor vessel water level in the DBA and transient analyses. Furthermore, based on analysis, during the time the pressure switch vents were capped, the HPCS system would have initiated on high drywell pressure at a pressure ≤ 2.50 psig. The Technical Specification allowable value for HPCS system initiation on high drywell pressure is ≤ 1.85 psig and the design basis analytical value is ≤ 2.00 psig. Both the allowable value and the analytical limit provide significant margin to the primary containment design pressure.

Similar Events

There have not been any previous similar reportable events at WNP-2 involving improper use of materials procured for a PMR which was subsequently cancelled.