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ESSION NBR:9104040231 DOC.DATE: 91/03/29 NOTARIZED: NO DOCKET #
ACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
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SUBJECT: Responds to NRC 910227 ltr re violations noted in Insp Rept 50-397/91-01 on 910122-25.Corrective actions:Tech Spec change request submitted to remove scram accumulator check valve surveillance & acceptance criteria procedure revised.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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March 29, 1991
G02-91-062

Docket No. 50-397

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Gentlemen:

Subject: NUCLEAR PLANT NO. 2, OPERATING LICENSE NO. NPF-21
NRC INSPECTION REPORT 91-01
RESPONSE TO NOTICE OF VIOLATION

The Washington Public Power Supply System hereby replies to the Notice of Violation contained in your letter dated February 27, 1991. Our reply, pursuant to the provisions of Section 2.201, Title 10, Code of Federal Regulations, consists of this letter and Appendix A (attached).

In Appendix A, the violation is addressed with an explanation of our position regarding validity, corrective action and date of full compliance.

In Appendices B and C, the information requested in the Notice of Violation Cover Letter is provided.

Very truly yours,

GD Bouchey

G. D. Bouchey, Director
Licensing & Assurance

SLW/bk
Attachments

cc: JB Martin - NRC RV
NS Reynolds - Winston & Strawn
PL Eng - NRR
DL Williams - BPA/399
NRC Site Inspector - 901A

1/1

IE01

APPENDIX A

During an NRC inspection conducted on January 22 - 25, 1991, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions", 10 CFR Part 2, Appendix C (1991), the violation is listed below:

> 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," requires, in part, that procedures shall include appropriate quantitative acceptance criteria for determining that important activities have been satisfactorily accomplished.
>
> Contrary to the above, at the time of the inspection, Surveillance Procedure No. 7.4.1.3.5.3, "Control Rod Scram Accumulator Check Valve Operability Check," did not include quantitative acceptance criteria to assure that an appropriate pressure is maintained for an appropriate time period in order to demonstrate that the valves are operable as required by Technical Specification 4.1.3.5-2.
>
> This is a Severity Level IV violation.

Validity of Violation

The Supply System acknowledges the validity of this violation in that quantitative acceptance criteria should have been included in Surveillance Procedure PPM 7.4.1.3.5.3.

The cause of this violation is an unclear WNP-2 Plant Technical Specification and its associated Technical Specification basis. WNP-2 Technical Specification Surveillance 4.1.3.5.b.2 requires that, with no Control Rod Drive (CRD) Pumps operating, the time that each CRD Scram Accumulator Check Valve maintains its associated accumulator pressure above its alarm setpoint (940 psig) be measured and recorded for up to ten minutes. Neither the WNP-2 Technical Specifications nor the associated bases contain any information pertaining to the actual time for which each accumulator must be held above the low accumulator pressure alarm setpoint (with no CRD Pump running).

Surveillance Procedure 7.4.1.3.5.3 was first issued (Revision 0) in April 1985 and it required all 185 accumulators to remain above their low accumulator pressure setpoint for at least 10 minutes with no CRD pump running. This procedure was revised in June 1985 (Revision 1) to require each accumulator check valve to hold its accumulator above its low accumulator pressure setpoint for 10 minutes with no CRD pump running. The Revision 1 procedure criteria was satisfied by repeated tests until each of the 185 accumulators stayed above the low accumulator pressure alarm setpoint for at least ten minutes. During each of the subsequent tests only those accumulators which had previously failed were considered part of the test. In addition, accumulators which had previously passed did not always hold for the ten minutes. Because of the random nature of the failures, the procedure was again revised in May of 1986 (Revision 2) to be in literal compliance with WNP-2 Technical Specifications to require only the time that each accumulator remained above its low pressure setpoint be measured and recorded.

These procedure changes were based on the following. With a CRD Pump running, the charging water header pressure is maintained and the accumulator check valve plays no role in a scram. The CRD pumps at WNP-2 were also operating reliably. Secondly, if the operating CRD pump tripped off, the Plant Abnormal Procedure PPM 4.1.1.2 "Complete Loss of CRD Drive Flow" requires the Reactor Operator to place the Reactor Mode Switch in "Shutdown" when the second scram accumulator alarm is received. From a scram initiation signal, all control rods are fully inserted within a few seconds. (The average scram insertion time from notch 48 to notch 5 must be equal to or less than 3.497 seconds.) Based on the expectation that the abnormal procedural controls would be implemented in a matter of seconds and the short scram insertion time, the time the accumulator check valves held accumulator pressure was determined to be a commercial risk and not a safety risk.

Corrective Steps Taken/Results Achieved

1. A Technical Specification Change Request has been submitted to remove the scram accumulator check valve surveillance from the WNP-2 Plant Technical Specifications.

2. Plant Procedure PPM 7.4.1.3.5.3 has been revised to include quantitative acceptance criteria. The acceptance criteria are based on the administrative controls described above. One criterion is that each scram accumulator check valve must hold its associated accumulator pressure above the N_2 low pressure setpoint for one minute. The other criterion is that any scram accumulator check valve which does not hold its accumulator above the low pressure setpoint for 10 minutes for three consecutive surveillance tests will be reworked and retested with a 10 minute hold time acceptance criteria.

3. Supply System Engineering is currently working to determine the minimum scram accumulator pressure hold time and will establish the basis for that time. It is intended that this evaluation will be completed prior to Plant restart following the Spring 1991 Maintenance and Refueling Outage. When the minimum hold time is available, Surveillance Procedure PPM 7.4.1.3.5.3 will (if necessary) be revised and re-performed. Plant restart from the upcoming outage is currently scheduled for early June 1991.

Corrective Action to be Taken

1. No further corrective actions are required.

Date of Full Compliance

Full compliance was achieved on March 26, 1991 when PPM 7.4.1.3.5.3 was revised to include quantitative acceptance criteria.

APPENDIX B

This Appendix addresses the background, actions taken since the onset of the problem, the appropriateness of past actions, and current plans regarding scram accumulator leakage problems as indicated by numerous control room trouble alarms. The same issues associated with periodic surveillance tests are addressed in Appendix C.

Background

The control rod scram accumulators are comprised of two pressure retaining cylinders, one for storing Nitrogen (N_2) gas and the second for storing high pressure water. The N_2 cylinder is connected to the water cylinder and within the water cylinder the N_2 is separated from the water by a piston. The N_2 cylinder is filled from a nitrogen manifold header and then isolated from the header. High pressure water is continuously supplied to the water cylinder by one of two Control Rod Drive (CRD) pumps through a charging water header. The nitrogen/water combination provides the necessary driving force needed to scram control rods at low reactor pressures.

There is a Control Room annunciator alarm "Rod Accumulator Trouble" associated with the accumulators. Two conditions can cause the alarm, one is for low N_2 pressure (less than 940 psig) and the other is for high water level (5 cc) on the N_2 side of the water cylinder piston. When an alarm condition is present, the specific accumulator at fault can be identified on the Main Control Room core map display by a small amber accumulator trouble light.

During normal operations with a CRD pump running, the numerous control room alarms referred to in the Inspection Report are caused by N_2 leakage through the associated gas fittings used to pressurize the N_2 cylinder, or by water leakage past the water cylinder piston. During normal operations, alarms cannot be due to accumulator check valve leakage because the running CRD pump maintains the charging water header pressure higher than accumulator pressure, which means that the check valve is open.

In August 1989, the Plant Technical System Engineer initiated a special log for Plant Operators to note CRD accumulator problems. Since that time there have been 1294 accumulator alarms recorded. The bulk of the problems reported are due to water leakage past the water cylinder piston (971) from 86 different accumulators. There have been 345 N_2 alarms from 97 different accumulators. When a particular accumulator is noted as troublesome due to N_2 alarms, Plant Operators initiate a Maintenance Work Request to repair the accumulator.

Prior to August 1989, Control Room Operators logged each alarm in the Operators Log, and the Maintenance Work Request process was used to address problems.

Actions taken since the onset of the problem

A. In the Spring of 1989, CRD System Engineering responsibilities were divided to separate out the Hydraulic Control Units (HCUs), which include the scram accumulators, to provide a more focused resource.

B. In August 1989, the special logging program to record all accumulator alarms was established.

C. An HCU Maintenance Program was developed in the Summer of 1989. The program includes accumulator overhauls, check valve inspections, equipment qualification maintenance, and filter cleaning and replacement. This program was implemented in the Spring 1990 Maintenance and Refueling Outage with the overhaul of all 370 scram solenoid pilot valves and all 370 scram valves. These valves had the highest priority due to equipment qualification requirements.

D. Other BWR Plants are being consulted through General Electric to get information on successful techniques used to fix N_2 gas leakage problems.

E. Since August of 1989, at least 19 N_2 gas leakage accumulator problems have been fixed. Once repaired, gas leakage problems with these accumulators have not recurred.

Current assessment of the appropriateness of past actions

The appropriateness of past actions must be judged by an assessment of the current situation. It is the Supply System's assessment that actions to date have not impacted the ability of the Control Rod Drive System Scram Accumulators to perform their safety function. All required Technical Specification Control Rod Drive Scram insertion times have been met. There has never in the history of WNP-2 been a failure of a control rod to scram. It is also our assessment that current maintenance plans to overhaul the HCUs are appropriate.

Plant management in 1989 recognized the need for increased attention to HCU maintenance and applied more resources. Since that time a maintenance plan has been developed and initiated. The highest priority work has been completed. Exploratory work is planned in the Spring 1991 Maintenance and Refueling Outage to examine the five worst-case accumulators with water leakage problems. Based on the results of this work the maintenance plan will be reevaluated. In addition, the System Engineer is working with General Electric and other BWR Plants to keep current on developments in this area.

A Problem Evaluation Request (PER) was not issued in this case by the System Engineer because a plan, reviewed and approved by management, was already in place to address the issue of numerous accumulator alarms. The process does not require a PER if sufficient actions are being taken through other approved Plant processes.

Current plans regarding accumulator leakage

Exploratory work on the five worst accumulator water leakers is planned for the Spring 1991 Maintenance and Refueling Outage. Based on the results of the exploratory work, the HCU Maintenance Plan will be reevaluated and revised as appropriate.

Plans for reducing alarms due to N_2 accumulator fitting leakage include trending of alarm data to identify worst performers, repair of worst performers, and a review of other BWR Plant practices concerning N_2 accumulator leakage repairs.

APPENDIX C

This Appendix addresses the background, actions taken since onset of the problem, appropriateness of past actions, and current plans regarding scram accumulator leakage problems as indicated by periodic surveillance testing.

Background

The WNP-2 Plant Technical Specifications require that the time each scram accumulator stays above the low N_2 gas pressure setpoint (940 psig), with no Control Rod Drive Pump operating, be measured and recorded for up to 10 minutes. At WNP-2, this surveillance has been performed yearly since 1985. Each year some of the scram accumulator pressures bleed off to a pressure below the low N_2 pressure setpoint prior to the end of the ten minute measurement period. The key component in the pressure retaining capabilities of a scram accumulator is the check valve between the accumulator and charging water header. Table 1 presents a compilation of the yearly test results.

Table 1
Initial Surveillance Test Results for each Year beginning in 1985

Year	Number of Accumulators that did not hold Pressure for 10 Minutes	Number of Accumulators that went below Low Pressure Setpoint within Time Range				Number of Ball Ck Valves Repaired
		0-1 min	1-3 min	3-6 min	6-10 min	
1985	15	0	1	2	12	0
1986	34	0	5	6	23	2
1987	17	0	0	8	9	5
1988	26	0	5	10	11	0
1989	36	0	9	16	11	0
1990	39	0	5	16	18	0

Actions taken since the onset of the Problem

Supply System Engineering is working to determine the minimum scram accumulator pressure hold time and to establish the basis for that time. It is intended that this task will be accomplished prior to the end of the Spring 1991 Maintenance and Refueling Outage, currently scheduled for early June 1991.

Plant Procedure PPM 7.4.1.3.5.3 has been revised to include quantitative acceptance criteria. The criteria is based on current administrative controls which require the Reactor Operator to place the Reactor Mode Switch in the "Shutdown" position as soon as the second accumulator trouble alarm comes in following a loss of all CRD pumps. It is expected that this action would take place within a few seconds of receiving the second accumulator trouble alarm. The criteria are 1) all scram accumulator check valves must hold its associated accumulator pressure above the N_2 low pressure setpoint for greater than 1 minute, and 2) any scram accumulator check valve that does not hold for 10 minutes for three consecutive surveillance tests will be reworked and retested with a 10 minute acceptance criteria.

Appropriateness of Past Actions

The WNP-2 FSAR in section 4.6.1.1.2.4.2.2 states the following: "Charging water header pressure is not essential to successfully scram the plant. Each of the accumulators are prevented from leaking back to the charging water header by a check valve. Therefore, the pressure required to scram each rod is maintained. The integrity and leak tightness of these check valves is routinely tested as part of the surveillance test program. In addition, when the reactor is at rated power, no accumulator pressure is necessary to scram the plant."

WNP-2 Plant Technical Specification 3.1.3.5 requires that the reactor mode switch be placed in shutdown (this action causes a reactor scram) if more than one control rod scram accumulator is inoperable, and no control rod drive pump is operating. At WNP-2 this requirement is implemented by operational procedural guidance contained in Abnormal Conditions Procedure 4.1.1.2, "Complete Loss of all CRD Drive Flow", and use of this procedure is also covered in Licensed Operator training.

Past practices at WNP-2 regarding check valve maintenance, were based on the premise that, with no control rod drive pumps operating, the reactor operator would place the Reactor Mode Switch in the "Shutdown" position within seconds of the second accumulator trouble alarm. There is no new information now available that changes this premise. Therefore, based on our administrative controls, scram accumulator holds times down to one minute are acceptable. Also, it is our conclusion that current surveillance testing at WNP-2 is in compliance with Technical Specifications.

However, because of increased sensitivity to Technical Specification requirements, revisions to a surveillance procedure like those done in 1985 and 1986 for PPM 7.4.1.3.5.3 would be more carefully scrutinized in our current environment and would also require a more substantial justification. Furthermore, in a case like this, the NRC would be asked to comment before such changes would be made. The Supply System's implementation of 10CFR50.59 has also been improved and now requires more justification for changes. Also, the Supply System has just completed a thorough review of the WNP-2 Plant Technical Specifications as part of our plans to implement "Improved Technical Specifications". Part of the review process involved a detailed review to establish, and when necessary, development of the Technical Specification bases. Even though this information is not yet incorporated in the WNP-2 Plant Technical Specifications, it is available as an aid in interpreting current specification requirements.

Current Plans regarding Accumulator Leakage (Check Valve leakage only)

The Supply System will perform corrective maintenance as required by the new surveillance acceptance criteria.

The Supply System recently participated in a workshop sponsored by Oak Ridge National Laboratory entitled, "Managing Aging of BWR Control Rod Drive Mechanisms". As a result of attendance at the workshop, we have requested and received copies of other BWR utilities HCU diagnostic and maintenance procedures. These procedures are being reviewed, and compared to our practices, by the Plant Technical System Engineer.