

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Washington Nuclear Plant - Unit 2 DOCKET NUMBER (2) 0 | 5 | 0 | 0 | 0 | 3 | 9 | 7 PAGE (3) 1 OF 6

TITLE (4) FAILURE TO COMPLY WITH A TECHNICAL SPECIFICATION ACTION REQUIREMENT WHEN INOPERABLE CONTROL ROD BLOCK INSTRUMENTATION EXCEEDED THE ALLOWED OUTAGE TIME

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													
1	1	1	5	9	4	9	4	--	0	1	8	--	0	1	0	3	0	2	9	5		

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)	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.405(C)	50.36(c)(1)	50.36(c)(2)	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(x)	77.71(b)	73.73(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
1	0	0																			

LICENSEE CONTACT FOR THIS LER (12)

NAME C.D. Mackaman, Technical Specialist TELEPHONE NUMBER 5 | 0 | 9 | 3 | 7 | 7 | - | 4 | 4 | 5 | 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS
A	A	A	L	S					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) X NO EXPECTED SUBMISSION DATE (15)

ABSTRACT (16)

A replacement Channel "A" Scram Discharge Volume (SDV) high water level control rod block level switch was installed during the Spring 1994 Refueling Outage and calibrated and tested on June 30, 1994 to verify operability. The switch failed the first quarterly channel functional test (CFT) on October 11, 1994. The switch was recalibrated and functionally tested several times to assure repeatability, and as a precaution, the surveillance frequency was increased. The CFT was successfully performed approximately two weeks later, but the switch failed the CFT on November 9, 1994 and was declared inoperable. During an evaluation of the repeat failure, it was discovered that the level switch is not designed to be adjustable, and the previous switch calibrations could have caused the switch actuation failures. As a result, on November 15, 1994, with WNP-2 in Mode 1 at 100% power, it was determined that the Channel "A" level switch had been technically inoperable from June 30, 1994 to November 9, 1994 without the Technical Specification required action having been performed. With only the Channel "B" level switch and trip function operable, the number of operable channels was less than that required by Technical Specification 3.3.6.b and Table 3.3.6-1, Trip Function 5.a.

Immediate corrective action was taken at 1527 hours on November 9, 1994 to place the Channel "A" SDV high water level control rod block trip function in the tripped condition. Actions were then taken to restore the Channel "A" level switch and trip function to operable status. The level switch and trip function were declared operable at 1914 hours on November 11, 1994.

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The root cause for this event was the failure to identify the nonadjustable design characteristic of the replacement SDV rod block level switch. Corrective actions include strengthening the substitution evaluation process, revision/re-evaluation of the replacement level switch substitution evaluations and information, obtaining the proper Operation and Maintenance (O&M) manual(s), and conducting maintenance shop briefings concerning this event.

Event Description

The Channel "A" Scram Discharge Volume (SDV) [JC, VSL] high water level control rod block level switch (CRD-LS-13E) [AA, LS] was replaced during the Spring 1994 (R-9) Maintenance and Refueling Outage and initially calibrated on June 30, 1994 to verify operability. The level switch is one of two Magnetrol float-type switches that actuate on increasing SDV water level to prevent (block) control rod withdrawal. The switch failed to actuate during the first quarterly channel functional test (CFT) surveillance at 1120 hours on October 11, 1994. The level switch was successfully recalibrated and declared operable at 1211 hours on October 11, 1994. On October 13, 1994, a Followup Operability Assessment concurred with the initial declaration of operability based on acceptable trip actuation repeatability, demonstrated during level switch recalibration. It was suspected that small suspended particulate caused transient binding of the float mechanism. Since this could not be verified (without breaking the level switch pressure boundary seal), it was concluded that the cause of the failure was indeterminate. As a precaution, the surveillance frequency was increased.

The level switch was verified to actuate properly during the first increased frequency CFT surveillance performance on October 27, 1994, but failed to actuate on the next performance on November 9, 1994. Consequently, the switch was declared inoperable at 1453 hours on November 9, 1994, and Problem Evaluation Request (PER) 294-0975 (a corrective action program document) was initiated to evaluate the condition. During the PER investigation of the repeat failure, discussions with the switch supplier (General Electric Company [GE]) and the manufacturer (Magnetrol) indicated that the level switch is not designed to be adjustable, and the previous switch calibrations could have caused the switch actuation failures. As a result, on November 15, 1994, with WNP-2 in Mode 1 at 100% power, it was determined that the Channel "A" level switch had been technically inoperable from June 30, 1994 to November 9, 1994 without the Technical Specification required action having been performed. With only the Channel "B" level switch and trip function operable, the number of operable channels was less than that required by Technical Specification 3.3.6.b and Table 3.3.6-1, Trip Function 5.a.

Immediate Corrective Actions

Immediate corrective action was taken at 1527 hours on November 9, 1994 to place the Channel "A" SDV high water level control rod block trip function in the tripped condition. Actions were then taken to restore the Channel "A" level switch and trip function to operable status. The level switch setpoint was revised to restore the switch to within the manufacturer's specifications. Following recalibration and testing, the switch and trip function were declared operable at 1914 hours on November 11, 1994.

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Further Evaluation and Corrective Actions

Further Evaluation

1. This event is being reported pursuant to the requirements of 10 CFR 50.73(a)(2)(i)(B) as "[a]ny operation or condition prohibited by the plant's Technical Specifications. . . ."
2. SDV water level is detected by both float-type level switches and differential pressure (dp) type level transmitters for the scram function. Separate float-type level switches actuate a high level alarm in the control room and establish a control rod withdrawal block condition before reaching the high level setpoint that would cause an automatic scram. This gives plant operators time to take corrective action before the automatic scram occurs.
3. The Channel "A" SDV rod block level switch was replaced during the R-9 refueling outage under a substitution evaluation. During the initial calibration, it was discovered that the replacement switch, which was supplied by GE and manufactured by Magnetrol, appeared to have somewhat different operating characteristics than the original switch. However, the GE equivalency evaluation stated that the level switch was an acceptable replacement. This application requires that the switch be welded in place, making it critical that the adjustment and setpoint tolerances be similar. The replacement switch was installed and calibrated under the assumption that the characteristics were similar to the original switch.

During the first switch failure (October, 1994) investigation, both GE and Magnetrol were contacted to provide switch drawings and operation and maintenance (O&M) instructions. Magnetrol informed the Supply System that the level switch had been provided to GE without an O&M manual, and it was expected that GE would provide a manual. After further prompting, Magnetrol provided a vendor guide for a similar switch, and GE acknowledged that the guide was acceptable for the troubleshooting application only.

During the second switch failure (November, 1994) investigation, GE and Magnetrol were contacted again to provide information relating to switch installation and calibration. Based on a conversation with Magnetrol, it was determined that the level switch provided is not designed to be adjustable. This was later confirmed in a letter from GE responding to technical inquiries regarding the supplied level switch. Level switches manufactured by Magnetrol have been routinely adjusted using surveillance procedures, and the switches have generally performed reliably since initial plant startup. The GE letter also stated that the switch was provided with two magnetic switch mechanisms that were designed to actuate simultaneously on high level. The SDV level rod block application did not require two switches, and the unused upper switch had been removed during the course of previous calibrations. Although the reset characteristics could be slightly affected, the removal of the upper switch assembly does not impact switch operability. However, the lower switch actuation point was found to have been set higher (11/32 inch) than that specified by Magnetrol, which could have impaired actuation repeatability and reliability. On this basis it was concluded that the Channel "A" SDV level rod block level switch had been inoperable since initial calibration.

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The replacement SDV level switch was installed at the reference elevation of the original switch to ensure consistent performance. However, it was later determined that the original switch had apparently not been installed at the elevation specified in the Instrument Master Data Sheet. The difference in elevation necessitated compensation by field adjustment of the new switch mechanism in a manner for which it was not designed. In addition, it was discovered that proper documentation for removal of the upper switch assembly had not been obtained. Use of the established configuration control process would have afforded an opportunity to evaluate the difference in operating characteristics during initial installation and calibration and could have identified that the replacement switch was nonadjustable and installed at an incorrect elevation. As part of the completed immediate corrective actions, the lower level switch was restored to the original configuration and the setpoint was modified to reflect the slight change in trip elevation. Although not required for operability, an additional corrective action is specified to reinstall the upper switch assembly.

The Maintenance Production Manager held briefings with Electrical, Mechanical, and Instrumentation and Control (I&C) shop personnel concerning the production group's involvement in this event and to re-emphasize the importance of Engineering approval for plant configuration changes. In addition, the usage limitation information for the replacement SDV level switches has been revised to emphasize the importance of installing the switch at the correct elevation and to inform the installer of the possibility that the setpoint may have to be revised.

4. The substitution evaluation for the replacement SDV rod block level switch relied on GE's 10CFR50, Appendix B program. Based on the equivalency evaluation supplied by GE, there were no changes to the switch function, mounting, electrical interface, mechanical interface, or accuracy. Since there appeared to be a difference in operating characteristics, additional information was requested from GE concerning the adequacy of the Supply System calibration procedure for the supplied rod block level switch and their justification for providing a nonadjustable level switch as "equivalent." In the January 10, 1995 response, GE reiterated that the replacement level switch is not designed to be adjustable. They further stated that this nonadjustable characteristic applies to the original switch, and that there was no mention of a difference in tolerance to setpoint adjustability because the actuation setpoints and accuracy are identical and not intended to be adjusted. The response did note; however, that the original type switches are apparently more tolerant of adjustment than the replacement switch. Therefore, based on the satisfactory performance history, the original type switches will tolerate the amount of adjustment specified in the Supply System calibration procedure.
5. An evaluation of the GE response was completed on January 27, 1995. Based on the evaluation, it was determined that the substitution evaluation process should have identified the nonadjustable characteristic of the replacement SDV rod block level switch. The GE part equivalency evaluation noted differences in the number of switches, which should have invoked a more questioning attitude during the substitution evaluation process that could have identified the nonadjustable characteristic of the replacement switch. Furthermore, the substitution evaluation process should have identified the need for an O&M manual for the replacement switch. The proper O&M manual would likely have described the characteristics of the replacement switch to the level of detail necessary for maintenance and/or technical personnel to have identified that the replacement switch was

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nonadjustable. Based on the satisfactory performance history, the GE response evaluation did not identify a need to revise calibration procedures for the original type level switches.

The substitution evaluations for the replacement SDV level switches have been revised/re-evaluated as necessary to reflect the nonadjustable characteristic. The Procurement Engineering Manual (SPES-1) was revised on January 13, 1995 to emphasize the need for a more questioning attitude when performing substitution evaluations. The revision also pointed out the advantages of consulting plant maintenance and/or technical personnel and applicable procedures when evaluating the acceptability of a proposed substitution. The Procurement Engineering Manual was further revised on February 15, 1995 to strengthen the requirement to obtain an O&M manual for substitute items that have different physical or functional attributes.

- There were no other structures, systems, or components inoperable at the time that contributed to this event.

Root Cause

The root cause for this event was the failure to identify the nonadjustable design characteristic of the replacement SDV rod block level switch. A contributing cause was the incorrect installed elevation of the switch, which necessitated field adjustment in a manner for which it was not designed.

Further Corrective Actions

- The upper switch assembly for the SDV rod block level switch (CRD-LS-13E) will be reinstalled by July 1, 1995.
- O&M manual(s) will be obtained for the replacement SDV level switches and placed in the Contract Vendor Information (CVI) reference files by March 31, 1995.
- The usage limitation information and Instrument Master Data Sheet information for applicable level switches manufactured by Magnetrol will be revised by April 15, 1995 to emphasize the importance of installing the switch at the correct elevation.

Safety Significance

There was minimal safety significance associated with this event. The SDV high water level control rod block level switch does not provide an active safety-related function. Separate redundant and diverse float-type level switches and level transmitters provide the active safety-related scram function. The SDV rod block level switch is safety-related only to assure system pressure integrity. The misadjustment of the Channel "A" rod block level switch did not affect the switch pressure integrity. Furthermore, only one operable SDV level rod block channel is necessary to initiate the rod block, and the redundant channel was available during the period that the Channel "A" switch and trip function were inoperable. With the exception of a 1.3 hour period on October 11, 1994 (when the Channel "B" level switch was being recalibrated), the Channel "B" SDV level rod block trip function was operable between June 30, 1994 and November 9, 1994. Since this event had no impact on the SDV high water level scram function or system pressure integrity, the event posed no threat to the health and safety of either the public or plant personnel.

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Similar Events

A review of previous LERs was performed for similar root causes resulting from material substitution process failures or inaccurate or incomplete vendor information, and none were identified. Furthermore, no events were found where a failure to identify a design characteristic caused a safety-related instrument to be incorrectly installed or calibrated. Instances were found where similar root causes and conditions resulted in safety-related component failures (e.g., LERs 88-037, 92-022, 92-027, and 94-003). However, the components and circumstances are generally unrelated, and none of the previous events involved instrumentation. Therefore, the corrective actions for these precursors would not have been expected to prevent this event.



WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

REGULATORY COMMITMENT IDENTIFICATION FORM
(FOR INTERNAL DISTRIBUTION ONLY)

Regulatory Agency NRC	Licensing Specialist C.D. Mackaman	Source Document/Date LER 94-018-01/03-03-95	
Outgoing Document Author C.D. Mackaman	Incoming Document Reviewer N/A	Mail Drop PE20	Ext 4451

Summary of Document

FAILURE TO COMPLY WITH A TECHNICAL SPECIFICATION ACTION REQUIREMENT WHEN INOPERABLE CONTROL ROD BLOCK INSTRUMENTATION EXCEEDED THE ALLOWED OUTAGE TIME

CONCURRENCE FOR COMMITMENTS LISTED BELOW

Commitment: LER Corrective Action #1 (PER 295-0975 Corrective Action # 6): Reinstall the upper switch assembly for the SDV rod block level switch (CRD-LS-13E).	Action Tracking No. PTL 112842	Assigned To K.L. Cutler	Supv. Name (Print) J.R. Sampson
		Scheduled Complete Date 07-01-95 <i>R-10 5/11</i>	Supv. Signature <i>J.R. Sampson</i>
		Hard Date <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
Commitment: LER Corrective Action #2 (PER 295-0975 Corrective Actions #8 and #11): Obtain O&M manual(s) for the replacement SDV level switches and place in the CVI reference files.	Action Tracking No. PTLs 112844 and 112847	Assigned To D.P. Giroux	Supv. Name (Print) P.S. Ingersoll
		Scheduled Complete Date 03-31-95	Supv. Signature <i>P.S. Ingersoll</i>
		Hard Date <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
Commitment: LER Corrective Action #3: The usage limitation information and Instrument Master Data Sheet information for applicable level switches manufactured by Magnetrol will be revised to emphasize the importance of installing the switch at the correct elevation, and inform the installer of the possibility that the setpoint may have to be revised. <i>C.I.</i>	Action Tracking No.	Assigned To C.M. Icayan	Supv. Name (Print) M.A. Widmeyer
		Scheduled Complete Date 04-15-95	Supv. Signature <i>M.A. Widmeyer</i>
		Hard Date <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
Commitment:	Action Tracking No.	Assigned To	Supv. Name (Print)
		Scheduled Complete Date	Supv. Signature
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