

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)  
Washington Nuclear Plant - Unit 2

DOCKET NUMBER (2)  
0 5 0 0 0 3 9 7 1

PAGE (3)  
1 OF 0 5

TITLE (4)  
Limatorque Inc. Motor Operated Valve Equipment Qualification Deficiencies

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 NUMBER(S)
06	04	86	86	01	9	07	02	86		0 5 0 0 0 0
										0 5 0 0 0 0

OPERATING MODE (9) 4

POWER LEVEL (10) 0

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

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(e)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.36(a)(1)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(a)
<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.36(a)(f)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 365A)
<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	50.73(a)(2)(vi)
<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: W. S. Davison, Compliance Engineer

TELEPHONE NUMBER: 509 377-2501

AREA CODE: 509

Ext. 2726

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

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On April 15, 1986, a Limatorque electric motor operated valve actuator inspection program was in progress, during a refueling outage, when Residual Heat Removal valve 9 (RHR-V-9) actuator was discovered; 1) without the motor T-drain, 2) with a gearcase relief valve shipping cover in place, 3) with non-qualified lubricants, 4) with non-qualified control wiring, and 5) non-qualified wire splices. This inspection program was subsequently completed on June 4, 1986. Twenty-seven valves in the containment and steam tunnel areas were found with similar environmental qualification deficiencies. All deficiencies found were corrected prior to recommencing power operation. Plant Maintenance Procedures have been modified to include environmental qualification requirements. The reportability requirement of 10CFR50.73(a)(2)(vi) also applies to this event.

IE 22  
111

8607110020 860702  
PDR ADOCK 05000397  
S PDR

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Washington Nuclear Plant - Unit 2	DOCKET NUMBER (2)  0   5   0   0   0   3   9   7   8   6	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
			- 0   1   9	- 0   0   0	2	OF	0   5

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

Plant Conditions

Power Level - 0%  
Plant Mode - 4 - Cold Shutdown

Event

On April 15, 1986, while conducting a Motor Operated Valve (MOV) actuator inspection program during a plant refueling outage, Residual Heat Removal (RHR) System valve 9 (RHR-V-9) actuator was discovered to have the following environmental qualification deficiencies; 1) unqualified limit switch gear lubricants, 2) motor T-drain not installed, 3) gearcase relief valve shipping cover still in place, 4) non-qualified control wiring, and 5) non-qualified wire splices. The Limatorque Inc. actuators for WNP-2 were environmentally qualified with T-drains and relief valves in place. Since there is an alternate shutdown cooling mode which does not utilize RHR-V-9, this specific occurrence was not deemed reportable. However, to evaluate the extent of these issues, a total inspection of all Class 1E Containment, Steam Tunnel and Reactor Building MOV's subject to harsh environments was performed. The Limatorque Inc. model numbers involved in this event are: SMB-0, SMB-00, SMB-000, SMB-1, SMB-2, SMB-3, SMB-4, SB-0, SB-2, SB-3, SB-04, H-1BC.

The inspection was concluded on June 4, 1986. An analysis of the results found that 27 MOV's in Containment had deficiencies with more than one of the following items; 1) T-drains, 2) relief valves, 3) lubrication, 4) control wiring, or 5) wire splices. The 27 Containment and Steam Tunnel MOV's were located in the RHR, Main Steam (MS), Reactor Closed Cooling (RCC), Reactor Core Isolation Cooling (RCIC), Reactor Feedwater (RFW) and Main Steam Leakage Control (MSLC) systems. This event was at that time evaluated as reportable under guidelines of 10CFR50.73(a)(2)(v)(D) and 50.73(a)(2)(vi).

The root cause of the event was evaluated as being failure to implement design direction to ensure correct installation of the MOVs. Contributing causes were evaluated as being inadequate procedures which resulted in the failure of the Utility Startup Organization inspection program to identify and correct these deficiencies prior to licensing and the failure of the Utility Maintenance Department inspection programs to recognize and correct them in the period from initial licensing until the first refueling outage.

Immediate Corrective Action

Prior to Plant startup following the outage the following items were completed:

- o Relief valves and T-drains were installed in all cases noted as missing on the inspection.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Washington Nuclear Plant - Unit 2	DOCKET NUMBER (2)  0 5 0 0 0 3 9 7 8 6 - 0 1 1 9 - 0 0 0 3	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
						OF 0 5

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

- o Reactor Building MOV's were provided with qualified wiring and tests were performed which qualified the tape splices currently used.
- o Due to the expense involved, no attempt was made to qualify the original tape splices on the MOV's inside the containment and steam tunnel. Instead, they were provided with new environmentally qualified control wire and splices.
- o Limit switch gear grease was changed out to known qualified grease on all MOV actuators.
- o The splices on nine other class 1E motors (Primary Containment Cooling System Fans) were inspected and replaced with qualified material.

Further Evaluation and Corrective Action

- o The comprehensive MOV inspection resulted in the discovery of 120 MOVs in the Reactor Building with similar deficiencies which were corrected prior to plant startup.
- o The current Plant engineering program now contains the following features which function to prevent the recurrence of equipment qualification deficiencies of this nature: 1) specific equipment qualification review of all new designs by the Generation Engineering staff; 2) new design resource documents produced for use by Maintenance staff to establish environmental qualification requirements for maintenance of plant components; 3) complete review of all safety related spare parts by Technical staff to ensure correct equipment qualification.
- o Plant Maintenance Procedures have been modified to include environmental qualification requirements.
- o Limitorque MOV actuators were qualified for active inside containment and steam tunnel service with motor T-drain and gearcase relief valves in place. The T-drain design allows condensation during a LOCA to be drained from the motor housing and thus prevent MOV motor failures as a result of electrical insulation failure. As an additional design feature at WNP-2, moisture resistant LOCA seals are also used at conduit entries to mitigate just such moisture intrusion. The gearcase relief valve design prevents thermal expansion during accident conditions from forcing grease into the limit switch compartment or motor and causing operator failure due to shorting or grounding of the limit switches and/or motor. The T-drain and relief valve issues are primarily long term operability concerns. (Limitorque Report #600198 demonstrated that actuators with similar, though less durable Class H installation, retained operability without T drain installation. WNP-2 actuator motors are equipped with RH installation Systems.)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Washington Nuclear Plant - Unit 2	DOCKET NUMBER (2)  0 5 0 0 0 3 9 7 8 6	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		- 0 7 9	- 0 0 0	0 4	OF	0 5

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

- o Issues of concern with regard to limit switch gear grease, control wiring and wire splices deal primarily with radiation and thermal aging characteristics of the material. No observable degradation was found with the unqualified control wiring and tape splices which were replaced. Since WNP-2 has been in commercial operation for less than two years, the containment and steam tunnel MOV's have a minimal aging history. The valves in question either operate to their design position early into the design basis accidents, are required to operate in conditions which are less severe than their presently required environmental profile, or have alternate means available to perform the same function.

Safety Significance

As a result of this event, the operability of six systems required to function during an accident was challenged. These systems contained MOVs with installation configurations such that the limits of their ability to function in the environmental conditions expected during an accident were not specifically bounded by previous equipment qualification tests or analyses. However, subsequent analysis has provided reasonable assurance that all valves in the containment and steam tunnel areas would have functioned exactly as required during both initial and long term accident conditions with the exception of three valves for which alternate methods of performing the safety function exist. The motor operators for RHR-V-9, RCIC-V-63 and RCIC-V-76 could not be shown to have reasonable assurance of performing their safety function after the initial stages of a design basis LOCA. RHR-V-9 is the inboard suction isolation valve for the RHR shutdown cooling loops. If the valve were to have failed closed, alternate shutdown cooling could have been provided by opening two ADS valves (Automatic Depressurization System) and then operating the RHR system using the suppression pool suction. If RHR-V-9 had failed in the open position, containment isolation could have been achieved by closing the outboard isolation valve RHR-V-8. RCIC-V-76 is a one inch valve used to bypass around RCIC-V-63 (RCIC Turbine Isolation Valve) to provide warm up of the pipeline prior to turbine operation. If either or both of these RCIC valves had failed in the closed position, alternate vessel level control could have been provided by using the High Pressure Core Spray System (HPCS) or any of the low pressure systems in combination with ADS. If either or both of these RCIC valves failed in the open position, containment isolation could have been achieved by closing the outboard isolation valve RCIC-V-8. All of the class 1E MOVs in the Reactor Building are required to survive less severe environmental conditions during an accident and would have operated per their design requirements. The safety of the Public and plant personnel was unaffected by this event.

Similar Events

None

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Washington Nuclear Plant - Unit 2	DOCKET NUMBER (2)  0   5   0   0   0   3   9   7   8   6   -   0   1   9   -   0   0   0   5   OF   0   5	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

EIIS Information

Text Reference

EIIS Reference  
System            Component

RHR-V-9	BO	20
RCIC-V-67	BN	20
RCIC-V-76	BN	20
MS	SB	----
RCC	CC	----
RFW	JB	----
MSLC	SB	----



---

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

---

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

---

Docket No. 50-397

July 2, 1986

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

Subject: NUCLEAR PLANT NO. 2  
LICENSEE EVENT REPORT NO. 86-019

Dear Sir:

Transmitted herewith is Licensee Event Report No. 86-019 for WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the item of reportability, corrective action taken, and action taken to preclude recurrence.

Very truly yours,

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

CMP:mm

Enclosure:  
Licensee Event Report No. 86-019

cc: Mr. John B. Martin, NRC - Region V  
Mr. R. T. Dodds, NRC - Site (901A)  
Ms. Dottie Sherman, ANI  
INPO Records Center - Atlanta, GA  
Mr. C. E. Revell, BPA (M/D 399)

IE22  
11