

# CATEGORY 1

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 FACIL: 50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe      05000397  
 AUTH. NAME      AUTHOR AFFILIATION  
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 RECIPIENT NAME      RECIPIENT AFFILIATION

SUBJECT: LER 98-014-00: on 980807, completion of TS 3.8.1.F required shutdown due to inoperability of EDG-2 was noted. Caused by degraded voltage regulator for DG-2. Replaced voltage regulator & associated SCRs. With 980902 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 • Richland, Washington 99352-0968

September 2, 1998  
GO2-98-158

Docket No. 50-397

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

Gentlemen:

Subject: **NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21,  
LICENSEE EVENT REPORT NO. 98-014-00**

Transmitted herewith is Licensee Event Report No. 98-014-00 for WNP-2. This report is submitted pursuant to 10 CFR 50.73 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 Mr. Paul Inserra at (509) 377-4147.

Respectfully,

PR Bemis  
Vice President, Nuclear Operations  
Mail Drop PE23

Enclosure

cc: EW Merschoff, NRC RIV  
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**LICENSEE EVENT REPORT (LER)**

<b>FACILITY NAME (1)</b> Washington Nuclear Plant - Unit 2	<b>DOCKET NUMBER (2)</b> 50-397	<b>PAGE (3)</b> 1 OF 3
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**TITLE (4)**  
Completion of Technical Specification 3.8.1.F Required Shutdown Due to Inoperability of EDG-2

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV. NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
08	07	98	98	014	00	09	02	98	N/A	

<b>OPERATING MODE</b>	1	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)</b>								
<b>POWER</b>	70	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)					
		<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)					
		<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> OTHER					
		<input type="checkbox"/> 20.405(a)(1)(iii)	<input checked="" type="checkbox"/> X	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)					
		<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/>	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)					
		<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/>	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)					

**LICENSEE CONTACT FOR THIS LER (12)**

<b>NAME</b> Bill Pfitzer, Licensing Engineer	<b>TELEPHONE NUMBER (Include Area Code)</b> 509-377-2419
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**COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
Und	DG	voltage regulator	S407	Yes	Und	DG	SCR	S407	Yes

<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>				<b>EXPECTED</b>	<b>MONTH</b>	<b>DAY</b>	<b>YEAR</b>
<input type="checkbox"/> YES (If yes, completed EXPECTED SUBMISSION DATE).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> NO				

**ABSTRACT:**  
 On August 4, 1998, while performing the emergency diesel generator 2 (EDG-2) monthly operability test, EDG-2 reactive load (MVAR) oscillations were observed. The oscillations were anomalous and unexpected, and as a result EDG-2 was shutdown and declared inoperable in accordance with Technical Specification (TS) 3.8.1.B. Subsequent troubleshooting and repair efforts for the EDG-2 voltage regulation system failed to restore EDG-2 to an operable condition, and at 1550 on August 7, 1998 plant shutdown was initiated as required by TS 3.8.1.F.

Troubleshooting to isolate the cause for the reactive load oscillations determined that the voltage regulator for DG-2 had degraded.

The voltage regulator and associated silicon control rectifiers (SCRs) for EDG-2 have been replaced, and the removed components have been sent to an offsite test facility for functional evaluation and failure analysis.

The safety significance of this event is considered low.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Washington Nuclear Plant - Unit 2	50-397	98	014	00	2 OF 3

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

Event Description

On August 4, 1998, while performing the emergency diesel generator 2 (EDG-2)[DG] monthly operability test, EDG-2 reactive load (MVAR) oscillations were observed. The oscillations were anomalous and unexpected, and as a result EDG-2 was shutdown and declared inoperable in accordance with Technical Specification (TS) 3.8.1.B. Subsequent troubleshooting and repair efforts for the EDG-2 voltage regulation system failed to restore EDG-2 to an operable condition, and at 1550 on August 7, 1998 plant shutdown was initiated with entry into Mode 3 at 2233 on August 7, 1998, in accordance with the requirements of TS 3.8.1.F.

An event notification call was made to the NRC Headquarters Operations Officer at 1907 PDST on August 7, 1998 after plant shutdown was initiated per the requirements of 10 CFR 50.72(b)(1)(i)(A). Event number 34619.

Immediate Corrective Action

A plant shutdown was initiated and maintenance activities were initiated to replace the EDG-2 voltage regulator.

Further Evaluation

The troubleshooting efforts for EDG-2 focused primarily on the components of the voltage regulation system. As a result of these activities it was decided to replace the EDG-2 voltage regulator [RG] and SCRs. Subsequently it was decided that the replacement activities, including the required post-maintenance testing, could not be performed in the remaining time, or in the plant conditions, allowed by plant Technical Specifications, therefore plant management directed commencement of a plant shutdown.

Cause of Event

Troubleshooting to isolate the cause for the reactive load oscillations determined that components in the voltage regulation system had degraded.

Further Corrective Action

The EDG-2 voltage regulator and associated components have been replaced.

The voltage regulator and associated SCRs removed from EDG-2 have been sent to a vendor test facility for functional evaluation and failure analysis.



**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Assessment of Safety Consequences

A plant shutdown was initiated and the plant was subsequently taken to Mode 4 within the required time limits of TS 3.8.1.F. The remaining Division 1 and 3 diesel generators were tested in accordance with TS 3.8.1.B to ensure the proper operation of the voltage regulators. Both Division 1 and 3 diesel generators operated normally with no voltage control anomalies noted. Therefore, the safety significance of this event is considered low.

Similar Events

There have been no LERs reporting a similar failure of EDG voltage regulator or SCRs.

A search of the EPIX database revealed a total of 30 hits associated with diesel generator voltage regulator failures. Most failures were associated components external to the static exciter (i.e. relays, motor operated potentiometers or blown fuses). One of the reported failures described degraded SCRs and another reported bridge diode failures. Two of the reported problems were with 'Electric Products' voltage regulators, the vendor supplying the subject components of this report. Of these two failures, one was a blown fuse and one was a failure in a model not used at WNP-2. This does not indicate a significant failure trend in static exciter SCRs or Electric Products voltage regulators.

A search of WNP-2 problem evaluation requests revealed several problems dealing with various EDG regulator anomalies over past years. Although several voltage regulation circuit related problems have been documented, none match the high reactive load swing problem in this report.



