



**JUL 14 2006**

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Serial No. 06-610  
KPS/LIC/RS: RO  
Docket No. 50-305  
License No. DPR-43

**DOMINION ENERGY KEWAUNEE, INC.**  
**KEWAUNEE POWER STATION**  
**LICENSEE EVENT REPORT 2006-04-00**

Dear Sirs:

Pursuant to 10 CFR 50.73, Dominion Energy Kewaunee, Inc., hereby submits the following Licensee Event Report applicable to Kewaunee Power Station.

Report No. 50-305/2006-004-00

This report has been reviewed by the Plant Operating Review Committee and will be forwarded to the Management Safety Review Committee for its review.

If you have any further questions, please contact Mr. Richard Sattler at (920) 388-8121.

Very truly yours,

A handwritten signature in black ink, appearing to read "L. Hartz".

Leslie N. Hartz  
Site Vice President, Kewaunee Power Station

Attachment

Commitments made by this letter: NONE

IE22

cc: Regional Administrator, Region III  
U.S. Nuclear Regulatory Commission  
2443 Warrenville Road  
Suite 210  
Lisle, IL 60532-4352

Mr. D. H. Jaffe  
Project Manager  
U.S. Nuclear Regulatory Commission  
Mail Stop O-7-D-1  
Washington, D. C. 20555

NRC Senior Resident Inspector  
Kewaunee Power Station

<b>NRC FORM 366</b> <b>U.S. NUCLEAR REGULATORY COMMISSION</b> (6-2004)		<b>APPROVED BY OMB NO. 3150-0104</b> <b>EXPIRES 6-30-2007</b>																																								
<b>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)		Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0066), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.																																								
<b>FACILITY NAME (1)</b> <b>Kewaunee Power Station</b>		<b>DOCKET NUMBER (2)</b> <b>05000305</b>	<b>PAGE (3)</b> <b>1 of 5</b>																																							
<b>TITLE (4)</b> <b>Incorrect Assumption Regarding De-Rating of EDGs During Loaded Operation</b>																																										
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<b>POWER LEVEL (10)</b> <b>000</b>		<table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <tr> <td>20.2201(b)</td> <td>20.2203(a)(3)(ii)</td> <td>50.73(a)(2)(ii)(B)</td> <td>50.73(a)(2)(ix)(A)</td> </tr> <tr> <td>20.2201(d)</td> <td>20.2203(a)(4)</td> <td>50.73(a)(2)(iii)</td> <td>50.73(a)(2)(x)</td> </tr> <tr> <td>20.2203(a)(1)</td> <td>50.36(c)(1)(i)(A)</td> <td>50.73(a)(2)(iv)(A)</td> <td>73.71(a)(4)</td> </tr> <tr> <td>20.2203(a)(2)(i)</td> <td>50.36(c)(1)(ii)(A)</td> <td>50.73(a)(2)(v)(A)</td> <td>73.71(a)(5)</td> </tr> <tr> <td>20.2203(a)(2)(ii)</td> <td>50.36(c)(2)</td> <td>X 50.73(a)(2)(v)(B)</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">           OTHER Specify in Abstract below or in NRC Form 366A         </td> </tr> <tr> <td>20.2203(a)(2)(iii)</td> <td>50.46(a)(3)(ii)</td> <td>50.73(a)(2)(v)(C)</td> </tr> <tr> <td>20.2203(a)(2)(iv)</td> <td>50.73(a)(2)(i)(A)</td> <td>50.73(a)(2)(v)(D)</td> </tr> <tr> <td>20.2203(a)(2)(v)</td> <td>X 50.73(a)(2)(i)(B)</td> <td>50.73(a)(2)(vii)</td> </tr> <tr> <td>20.2203(a)(2)(vi)</td> <td>50.73(a)(2)(i)(C)</td> <td>50.73(a)(2)(viii)(A)</td> </tr> <tr> <td colspan="2"></td> <td>20.2203(a)(3)(i)</td> <td>50.73(a)(2)(ii)(A)</td> <td>50.73(a)(2)(viii)(B)</td> </tr> </table>				20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)	20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)	20.2203(a)(2)(ii)	50.36(c)(2)	X 50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)	20.2203(a)(2)(v)	X 50.73(a)(2)(i)(B)	50.73(a)(2)(vii)	20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)			20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)
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<b>NAME</b> <b>Rich Sattler</b>		<b>TELEPHONE NUMBER (Include Area Code)</b> <b>(920) 388-8121</b>																																								
<b>COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)</b>																																										
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX																																	
<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>					<b>EXPECTED SUBMISSION DATE (15)</b>		MONTH	DAY	YEAR																																	
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<b>ABSTRACT</b> <p>The Kewaunee emergency diesel generators (EDGs) are required to carry loads in excess of their continuous rating (2600 kW) following a design basis accident. To support EDG operability under these conditions, combustion air temperatures should not exceed limits set by the vendor via de-rating curves.</p> <p>At 21:54 on May 19, 2006, with the plant in HOT SHUTDOWN, it was discovered that an incorrect interpretation of the de-rating curves has resulted in the potential to operate the EDGs outside of the vendor recommended ratings during the initial diesel loading following a design basis accident.</p> <p>Both EDGs have been operated within the vendor ratings for the last three years and successfully completed an elevated load test following an overhaul verifying that no degraded condition existed prior to the elevated load test. Therefore, with outside air temperature at 44 degrees F, an initial determination was made that both EDGs were operable. A review showed that seven times in the last three years, outdoor air temperatures exceeded the 87.1 degrees F limit for the A EDG which should have resulted in an inoperability determination for the A EDG. At no time were the other EDG temperature limits exceeded. A subsequent operability recommendation established compensatory measures that extend operability to outside air temperatures of 97.8 degrees F (for A EDG), and 100.9 degrees F (for B EDG).</p> <p>This is considered a safety system functional failure.</p>																																										

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

FACILITY NAME (1)		DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
Kewaunee Power Station		05000305	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 5
			2006	- 004	- 00	

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

**Event Description**

At Kewanee Power Station (KPS), both emergency diesel generators (EDGs) are required to exceed their continuous operating load limit (2600 kW) during a loss of coolant accident (LOCA) with loss of off-site power (LOOP). Operation outside this continuous operating limit is acceptable provided the duration of the loading and the maximum combustion air temperatures are not exceeded.

At the time of the event, the EDGs had the following vendor recommended ratings:

Allowable Duration	Maximum load (kW)
Continuous	2600
2000 hrs/yr	2860
7 days/yr	2950
30 min/yr	3050

In 2000, KPS evaluated and implemented the EDG de-rating curves (which reduce the maximum allowed ratings in the table above as combustion air intake temperature increases).

At 21:54 on May 19, 2006, with the plant in HOT SHUTDOWN, KPS determined that the de-rating curves for the EDGs were incorrectly interpreted. This resulted in the potential to operate the EDGs outside of the vendor recommended ratings during the initial diesel loading (from 0 to 1 hours per Kewanee Updated Safety Analysis Report Table 8.2-1) following a design basis document.

A correct interpretation of the de-rating curves results in the following temperature limits (using actual EDG loadings for the first hour and at the current 2000 hr/yr rating for the remainder of a LOCA with LOOP):

EDG	EDG Loading	Max Combustion Air Temp (deg F)	Max Outdoor Air Temp (deg F)
A	Actual for the first hour - 2884.8 kW	104.5	87.1
	2000 hr/yr rating - 2864 kW	115.0	97.8
B	Actual for the first hour - 2838.4 kW	118.25	104.3
	2000 hr/yr rating - 2864 kW	115.0	100.9

Temperatures in the above table are not corrected for instrument inaccuracy.

Outside air is mixed with the EDG room air prior to the combustion air intake. Thus, heat generated from equipment in the room and from the EDG itself, contributes to the overall combustion air intake temperature.

A review shows that seven times in the last three years, outdoor air temperatures exceeded the 87.1 deg F limit for the A EDG which should have resulted in an inoperability determination for the A EDG. At no time during those three years were the other EDG temperature limits exceeded.

**LICENSEE EVENT REPORT (LER)**  
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**Event Analysis**

This event is being reported in accordance with 10CFR50.73(a)(2)(i)(B), "Any operation or condition which was prohibited by the plant's Technical Specifications", and 10CFR50.73(a)(2)(v), "Any event or condition that could have prevented the fulfillment of the safety function of structures or systems."

A review of the 10 meter meteorological tower historical data from 2003 to present determined the following instances where site temperature (corrected for instrument uncertainty), exceeded the A EDG limit:

Date & Time above A EDG Temp Limit	Date & Time below A EDG Temp Limit	Duration (hrs)	Max temp (deg F) during event	Plant Conditions
08/21/2003 12:47	08/21/2003 14:50	2.06	88.20	100% power
06/24/2005 11:04	06/24/2005 18:05	7.01	91.76	0% power (507.9 deg F Tavg)
07/24/2005 10:32	07/24/2005 14:52	4.34	90.93	100% power
07/31/2005 13:45	07/31/2005 17:41	3.93	87.60	100% power
08/01/2005 12:43	08/01/2005 16:35	3.85	88.27	100% power
08/08/2005 11:51	08/08/2005 13:10	1.31	88.41	100% power
08/09/2005 10:23	08/09/2005 14:14	3.85	91.34	100% power

At no time during the occurrences above was A EDG operating, so it was never operated when de-rating was required, and thus never operated outside the vendor recommended ratings.

Tech Spec LCO 3.7.b.2 states: "One diesel generator may be inoperable for a period not exceeding 7 days provided the other diesel is tested daily to ensure OPERABILITY and the engineered safety features associated with this diesel generator are OPERABLE."

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None of the above cases exceeded twenty four hours and B EDG was never concurrently inoperable. However, on three occasions, the following Train B engineered safety features were concurrently inoperable (for the durations shown):

- During the 6/24/05 event: turbine driven auxiliary feedwater pump [BA] (for 4.63 hrs), internal containment spray train B [BE] (for 1.33 hrs), component cooling train B [CC] (for 0.8 hrs), and residual heat removal (RHR) train B [BO] (for 1.02 hrs)
- During the 8/8/05 event: reactor protection system logic train B [JC] (for 0.28 hrs) and B train RHR / safety injection (SI) [BO/BQ] (for 1.31 hrs)
- During the 8/9/05 event: B train RHR/SI (for 0.23 hrs) and engineered safety features train B logic channel [JE] (for 1.48 hrs)

The three occasions above (involving inoperable concurrent Train B engineered safety features), should have resulted in entry into Tech Spec LCO 3.0.c, which did not occur. Tech Spec LCO 3.0.c states:

When a LIMITING CONDITION FOR OPERATION is not met, and a plant shutdown is required except as provided in the associated ACTION requirements, within one hour action shall be initiated to place the unit in a MODE in which the specification does not apply by placing it, as applicable, in:

1. At least HOT STANDBY within the next 6 hours,
2. At least HOT SHUTDOWN within the following 6 hours, and
3. At least COLD SHUTDOWN within the subsequent 36 hours.

**Safety Significance:**

The safety significance of this event is considered very low.

- Documentation from the EDG vendor indicates that operating outside of the ratings specified on the de-rating curves will not cause immediate catastrophic failure, but will result in accelerated wear of internal engine components and could ultimately result in the inability of the EDG to complete its mission time. The higher combustion air intake temperatures will not affect the ability of the EDGs to start and assume load.
- The calculated total core damage frequency (CDF) for events that would actuate SI combined with a loss of offsite power and a failure of both EDGs to operate during occurrences of ambient temperature exceeding the A EDG temperature limit is  $9.2E-8/\text{yr}$ .

This is considered a safety system functional failure because this was an event that could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat and mitigate the consequences of an accident.

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

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

**Cause:**

The cause evaluation of this event is in progress. The final cause determination will be provided in a supplemental report. Any changes to the corrective actions, based on the results of the final cause evaluation, will also be included in the supplemental report.

**Corrective Actions:**

- Changes were made to reduce the LOCA with LOOP load requirement on the A EDG to within the 2000 hr/yr limit (2864 kW).
- Compensatory actions with alarms and actions on increasing/decreasing ambient temperatures culminating with action to declare the affected EDG INOPERABLE at its temperature limit have been implemented.

**Similar Events:**

LER 1978-002, Head Correction For The Pressurizer Pressure Transmitters Had Not Been Applied

LER 2005-010, Inadequate Engineering Analysis to Support Service Water Pump Operability