

Dominion Energy Kewaunee, Inc.  
N490 Highway 42, Kewaunee, WI 54216-9511



FEB 10 2006

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

Serial No. 05-653  
KPS/LIC/RR: RO  
Docket No. 50-305  
License No. DPR-43

**DOMINION ENERGY KEWAUNEE, INC.**  
**KEWAUNEE POWER STATION**  
**LICENSEE EVENT REPORT 2005-012-01**

Dear Sirs:

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

Report No. 50-305/LER 2005-012-01

The original LER contained a corrective action that is not contained in this supplement. The action to develop an analytical system flow model for the Emergency Core Cooling System is not applicable to the cause of this event.

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 Rick Repshas at (920) 388-8217.

Very truly yours,

Michael G. Gaffney  
Site Vice President, Kewaunee Power Station

Attachment

Commitments made by this letter: NONE

JE22

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

**LICENSEE EVENT REPORT (LER)**

(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.

FACILITY NAME (1)

**Kewaunee Power Station**

DOCKET NUMBER (2)

**05000305**

PAGE (3)

**1 of 3**

TITLE (4)

**Residual Heat Removal Pump Run-out Upon Loss of Instrument Air While Aligned for Sump Recirculation**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
06	10	2005	2005	-- 012 --	01	02	10	2006	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check all that apply) (11)						
POWER LEVEL (10)				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)		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)		50.73(a)(2)(i)(B)	X	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)		

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

NAME

**Rachaelle Braenne - Technical specialist - I&C Maintenance**

TELEPHONE NUMBER (Include Area Code)

**(920) 388-8839**

**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

**SUPPLEMENTAL REPORT EXPECTED (14)**

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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**ABSTRACT**

On June 10, 2005 with the Kewaunee Power Station in refueling shutdown mode, a possible run-out condition of the residual heat removal (RHR) pumps was identified. The possible run-out condition exists upon loss of instrument air (IA) to the RHR flow control valves (RHR-8A(B)). These flow control valves are fail-open air operated valves that are not supplied by a safety related IA source. This issue is a concern only if internal containment spray (ICS) pump operation is required during the post loss of coolant accident (LOCA) containment sump recirculation phase.

This is reportable in accordance with 10 CFR 50.73(a)(2)(vii) as a condition causing one independent train in multiple systems to become inoperable. The cause of this condition is inadequate consideration of component failure modes for the accident scenario of RHR supplying ICS while in containment sump recirculation. This resulted in a failure to recognize the consequences of the RHR-8A(B) valve failing open while ICS is being supplied from RHR during containment sump recirculation. Procedure revisions for appropriate operator actions and contingencies have been completed to eliminate the potential run-out condition for the RHR pumps. This report does not involve a safety system functional failure since containment spray is not needed during the post LOCA recirculation phase. The post LOCA containment sump recirculation phase is the phase of the event in which the concern for RHR pump runout exists, with runout occurring if a RHR pump is supplying the suction of a containment spray pump with the RHR pump flow control valves failed to the full open position.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Kewaunee Power Station	05000305	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 3
		2005	-- 012	-- 01	

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

### Event Description:

On June 10, 2005 with the Kewaunee Power Station in refueling shutdown mode, a possible run-out condition of the residual heat removal (RHR) pumps [BP] [P] upon loss of instrument air (IA) [LD] to the RHR flow control valves (RHR-8A(B)) [FCV] was identified. These valves are fail-open air operated valves that are not supplied by a safety related IA source. This issue is a concern only if the internal containment spray (ICS) pump [BE] [P] operation is required during the post loss of coolant accident (LOCA) containment sump recirculation phase. The station operators were directed to throttle RHR flow to 1500 gpm using RHR-8A(B) for the operating train in accordance with operating procedure ES-1.3, Transfer to Containment Sump Recirculation following a LOCA. For the recirculation standby RHR train, if the flow control valve fails open while flow is being supplied to an ICS pump, there is a possibility of RHR pump run-out. If valve RHR-8A(B) fails open due to loss of IA pressure, the operators would not be able to control RHR pump flow rate.

The main concern is that operating procedure ES-1.3 directs alignment of RHR pump discharge in series with an ICS pump in the event that spray flow is required after alignment for sump recirculation. Review of the large break LOCA accident scenario with maximum safeguards available (2 trains emergency core cooling (ECCS) and spray running) indicates that spray flow could be required for approximately 15 minutes or more after the refueling water storage tank (RWST) empties. If RHR-8A(B) fails open due to loss of instrument air while RHR/ICS are in this alignment, the RHR pump could experience run-out conditions with a potential for pump damage.

If RHR-8A and RHR-8B were both failed open due to loss of instrument air during the containment sump recirculation phase, operating procedure ES-1.3 actions would result in the operator aligning the running train of RHR through the associated ICS pump without starting the ICS pump (idle). This results in RHR flow through the vessel injection line and flow through the idle spray pump. This alignment was not tested in preoperational test procedure PT-SI-02, and no other test or calculation has been located to determine the RHR pump flow rate in this alignment. Reviews of PT-SI-02 test results, calc C10996 piping friction loss results, along with assumptions for differential pressure across the idle spray pump, indicate that RHR pump flow rates in this alignment could reach or exceed run-out conditions.

In the event of a LOCA, with the loss of non safety related IA pressure, the RHR pump flowrate would not be controllable as directed in the emergency procedures. In the event that spray flow would be required to mitigate the accident after entering the sump recirculation phase, series alignment to ICS pump suction from RHR pump discharge could result in the RHR pump reaching run-out flow conditions and potentially damage the pump.

### Event Analysis and Safety Significance:

This is reportable in accordance with 10 CFR 50.73(a)(2)(vii) as a condition causing one independent train in multiple systems to become inoperable.

RHR pump run-out would only be a concern if ICS is required as part of the containment sump recirculation actions. Current analysis does not credit this alignment during the post LOCA recirculation phase. Other system alignments allowed by procedure would be self-limiting with respect to RHR pump run-out flow

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

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

conditions with RHR-8A(B) failed open. ICS would not be required following transfer to containment sump recirculation unless containment pressure conditions warranted continued ICS flow. A basic premise of safeguards system design, which is confirmed by Kewaunee Updated Safety Analysis Report (USAR) accident analysis, is that containment pressure will reach a peak pressure early in the accident and then steadily decrease. The USAR accident analysis does not credit ICS operation during the sump recirculation phase of the accident. Therefore, for any accident that is within the plant's design basis, ICS spray will not be required to relieve high containment pressure during the sump recirculation phase of accident response.

This report does not involve a safety system functional failure. The post LOCA containment sump recirculation procedure aligns one train of RHR for recirculation and the other redundant train of RHR in standby mode. Loss of IA to the RHR flow control valves would not affect the recirculation train, as ICS was not lined up to this train. ICS could then be aligned to the standby RHR train procedurally, with steps to close the RHR flow control valve to prevent a runout condition of the RHR pump.

**Cause:**

The cause of this condition is inadequate consideration of component failure modes for the accident scenario of RHR supplying ICS while in containment sump recirculation. This resulted in a failure to recognize the consequences of the RHR-8A(B) valve failing open while ICS is being supplied from RHR during containment sump recirculation.

**Corrective Actions:**

1. Technical Specification TS 3.3.c.1.A.1.(ii) was changed (License Amendment 184) to delete the words "and from the containment sump" from the last sentence. This removed the requirement that the ICS pumps must be capable of taking suction from the containment sump.
2. Station procedures were revised to:
  - a. Include contingency actions that can be taken from the control room to reduce/stop ICS flow, i.e., stopping the ICS pump, if RHR pump cavitation or run-out conditions are observed after establishing ICS flow, and
  - b. Verify RHR-8A(B) are closed with a contingency action to not start ICS flow if RHR-8A(B) cannot be closed (due to a loss of IA) and to delete the contingency actions that open ICS pump Motor Operated Valves of the operating train.

**Similar Events:**

None