



NOV 07 2008

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Serial No. 08-0681
LIC/RR/RO
Docket No.: 50-305
License No.: DPR-43

DOMINION ENERGY KEWAUNEE, INC.
KEWAUNEE POWER STATION
LICENSEE EVENT REPORT 2008-001-00

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

Report No. 50-305/2008-001-00

This report has been reviewed by the Facility Safety 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 Repshas at (920) 388-8217.

Very truly yours,

Stephen E. Scace
Site Vice President, Kewaunee Power Station

Attachment(s)

Commitments made by this letter: NONE

JE22
NRR

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

Mr. P. S. Tam
Sr. Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North, Mail Stop O8-H4A
11555 Rockville Pike
Rockville, MD 20852-2738

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: 80 hrs. 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, (3150-0104), 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.

1. FACILITY NAME Kewaunee Power Station	2. DOCKET NUMBER 05000305	3. PAGE 1 OF 4
--	--	---------------------------------

4. TITLE
Pressurizer PORV and Reactor Coolant System Vent Valves Appendix R Spurious Operation Concern

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	11	2008	2008	-- 001	-- 00	11	07	2008	FACILITY NAME	05000
									FACILITY NAME	05000

9. OPERATING MODE N	10. POWER LEVEL 100	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: <i>(Check all that apply)</i>							
<input type="checkbox"/> 20.2201(b) <input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(vii)									
<input type="checkbox"/> 20.2201(d) <input type="checkbox"/> 20.2203(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(A)									
<input type="checkbox"/> 20.2203(a)(1) <input type="checkbox"/> 20.2203(a)(4) <input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B) <input type="checkbox"/> 50.73(a)(2)(viii)(B)									
<input type="checkbox"/> 20.2203(a)(2)(i) <input type="checkbox"/> 50.36(c)(1)(i)(A) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(ix)(A)									
<input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(iv)(A) <input type="checkbox"/> 50.73(a)(2)(x)									
<input type="checkbox"/> 20.2203(a)(2)(iii) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.73(a)(2)(v)(A) <input type="checkbox"/> 73.71(a)(4)									
<input type="checkbox"/> 20.2203(a)(2)(iv) <input type="checkbox"/> 50.46(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(v)(B) <input type="checkbox"/> 73.71(a)(5)									
<input type="checkbox"/> 20.2203(a)(2)(v) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input type="checkbox"/> 50.73(a)(2)(v)(C) <input type="checkbox"/> OTHER									
<input type="checkbox"/> 20.2203(a)(2)(vi) <input type="checkbox"/> 50.73(a)(2)(i)(B) <input type="checkbox"/> 50.73(a)(2)(v)(D)									
Specify in Abstract below or in NRC Form 366A									

12. LICENSEE CONTACT FOR THIS LER

NAME Ethan Brand	TELEPHONE NUMBER (include Area Code) (920) 388-8527
-----------------------------------	--

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On September 11, 2008, while responding to a question during a NRC Triennial Fire Protection Inspection, the control cabling for pressurizer PORV PR-2B was found to be vulnerable to spurious operation due to hot shorts in the event of a fire in the relay room as defined in NRC guidance and NRC endorsed NEI guidance for circuit analysis for reactor coolant system high-low pressure interfaces. Additionally, on October 15, 2008, a similar condition was identified for pressurizer and reactor head vent valves.

A fire in the relay room would require use of an Appendix R fire shutdown procedure that would deenergize the PR-2B and vent valves' 125-volt direct current (DC) circuits. The procedural action to deenergize the valves was previously accepted by the NRC as a post-fire mitigating action for these high-low pressure interface valves. Subsequently, modifications were made to the valves' cabling to enhance protection from a hot short by routing cabling in dedicated conduit. However, some of the cabling was left in cable trays in the relay room. Spurious opening of the valves could be postulated as follows: Control cable for the valves has fire damage resulting in an internal short between conductors; and, an external cable-to-cable hot short occurs with the power supply cable and another energized DC cable in the same cable tray (two concurrent DC hot shorts of the proper polarity from the same battery). This event is possible because current procedural guidance does not deenergize all of the DC cables in the cable tray containing the PORV and vent valve control and power cables.

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Kewaunee Power Station	05000305	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 4
		2008	- 001 -	00	

NARRATIVE

Event Description:

On September 11, 2008, while responding to a question during a NRC Triennial Fire Protection Inspection, the control cabling for pressurizer PORV PR-2B [PCV] was found to be vulnerable to spurious operation due to hot shorts in the event of a fire in the relay room (Fire Zone AX-30) as defined in NRC circuit analysis guidance for reactor coolant system (RCS) high-low pressure interfaces contained in Generic Letter 86-10. This was reported in Event Notification #44482 on September 11, 2008 per 10 CFR 50.72(b)(3)(ii)(B).

A review of other RCS high-low pressure interfaces was completed to confirm if the design change (DCR 2055) scope was implemented as intended by routing cables in conduit. A similar issue as found for PR-2B was identified for the pressurizer and reactor coolant system head vent valves [FSV] PR-33B, RC-45B, and RC-49. This also involves a hot short concern for a fire in the relay room. This was reported in Event Notification #44572 on October 15, 2008 per 10 CFR 50.72(b)(3)(ii)(B).

Pressurizer PORV PR-2B

A fire in the relay room would require use of shutdown procedure AOP-FP-002, "Fire In Alternate Fire Zone." The relay rack RR-176 [RK] is deenergized by opening the Circuit 12 feed breaker [BKR] from Train B DC distribution cabinet BRB-104 [CAB]. This will deenergize the PR-2B 125-VDC circuit. The procedural action to deenergize the PORV was accepted as a post-fire mitigating action by the NRC in the Appendix R Safety Evaluation Report (references: (1) Letter from WPSC to NRC, dated June 26, 1981, and (2) Letter from NRC to WPSC, dated December 22, 1981). Subsequently, as identified in NRC Inspection Report No. 50-305/87013 (DRS) for Appendix R, dated June 10, 1987, the Station stated it planned to make modifications to the valve cabling [CBL] in a design change to enhance protection of the valves' cabling from a hot short by routing cabling in dedicated conduit [CND]. However, some of the cabling was left in cable trays in the relay room following completion of the modification.

Some of the control cable is routed in a cable tray from the control room to relay room cabinets. The 125-VDC power supply cables are routed in the same cable tray. The remainder of the control cabling is routed in dedicated conduit from the relay room to the containment.

There are other 125-VDC cables in the same cable tray that contain 1S6C1228, the control cable for PR-2B solenoid SV33731, and 1S6C1229, the 125-VDC PR-2B power supply cable. Based on Generic Letter 86-10, Section 5.3.1, spurious opening of PR-2B by solenoid valve (SV33731) could be postulated as follows: Cable 1S6C1228 experiences fire damage resulting in an internal short between conductors. Concurrently, an external cable-to-cable hot short occurs between 1S6C1229 and another energized DC cable in the same cable tray (i.e., two concurrent DC hot shorts of the proper polarity from the same battery on 1S6C1229). The guidance in the fire shutdown procedure does not deenergize all of the DC cables in the tray containing 1S6C1228 and 1S6C1229. Therefore, PR-2B could be postulated to spuriously open due to fire.

Cabling for the other PR-2B solenoid valve SV33113 and pressurizer PORV PR-2A was reviewed. That control cabling was appropriately routed alone in the conduit in accordance with DCR 2055.

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Kewaunee Power Station	05000305	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 4
		2008	- 001 -	00	

NARRATIVE

Event Description: (continued)

Pressurizer and Reactor Head Vent Valves RC-33B, RC-45B, and RC-49

Valves PR-33B and RC-45B are each in series with RC-49, so a fire would need to cause spurious opening of RC-49 and one of the other valves in series. Similar to the pressurizer PORV, a fire in the relay room would require use of shutdown procedure AOP-FP-002, "Fire In Alternate Fire Zone." The valve circuits are either individually deenergized by removing fuses in RR-176, or RR-176 is completely deenergized by opening the Circuit 12 feed breaker from Train B DC distribution cabinet BRB-104.

The 125-VDC power cable from RR-176 that supplies all three of the subject vent valves is routed in a cable tray in the relay room. However, there are other 125-VDC cables in the tray. Spurious opening of PR-33B and RC-49 or RC-45B and RC-49 could be postulated as follows: Control cable for PR-33B or the control cable for RC-45B and the control cable for RC-49 experience fire damage resulting in an internal short between conductors (creates a closed circuit that can result in opening each valve if power is available) and external cable-to-cable hot shorts occur between the power cable and other energized DC conductors in the same cable tray (i.e., concurrent DC hot shorts of the proper polarity from the same battery on the control cable, affecting any two valves in series). The current procedural guidance does not deenergize all of the DC cables in the tray containing the power cable. Therefore, the pressurizer vent or reactor head vent high-low pressure interface could be spuriously breached due to a fire.

Event and Safety Consequence Analysis:

The originally accepted post-fire mitigating action was to deenergize the PORV and RCS vent valves via opening a breaker or pulling fuses. As an enhancement, the station made modifications to the PORV and vent valve cabling in design change, DCR 2055, for protection from a hot short by routing a portion of the circuit in dedicated conduit. However, a portion of the circuit in the relay room connecting to the control room was left in cable trays. The design change was developed by the original architect/engineer for the plant and implemented in the 1987 timeframe. From a review of the modification package, there is very little design information identified and no discussion as to why only a portion of the PORV and vent valve circuits were rerouted in dedicated conduit.

In the Station Appendix R analysis, PORV PR-2B is required to remain closed to control RCS pressure and inventory. A postulated spurious opening of the PORV due to a fire would have a significant adverse affect on the ability to control pressure and inventory. A risk assessment for potential spurious opening of the pressurizer PORV was performed. The conclusion, with conservative assumptions, shows that the condition of concern cannot be characterized as being a risk significant event (i.e., Incremental Core Damage Probability Deficit is significantly less than 1.0E-4).

Similarly, in the Appendix R analysis, the pressurizer and reactor head vent valves are required to remain closed to control RCS pressure and inventory. The vent lines contain a flow restriction orifice such that RCS flow from inadvertent actuation is less than the flow capacity of one charging pump. Therefore, the depressurization transient is expected to be bounded by the PORV PR-2B spurious opening. However, for RCS makeup, the Appendix R analysis assumes that the RCP seals leak at 44 gallons per minute and credits only charging pump C. Therefore, makeup from the charging pump cannot be assumed to mitigate the head vent discharge flow.

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

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Kewaunee Power Station	05000305	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 4
		2008	- 001	- 00	

NARRATIVE

Event and Safety Consequence Analysis: (continued)

The Station fire protection program is based on a defense-in-depth philosophy. The primary combustible in the relay room is cable insulation. This cabling is qualified to IEEE 383 flame test requirements. Therefore, self-ignited cable fires are not postulated and the tendency to propagate fire is minimized. The room also has functional automatic fire detection, comprised of multi-sensor smoke detectors. This will permit detection of a fire in its early stages, such that manual actuation of the fixed CO₂ fire suppression system and fire brigade response can be effective in extinguishing the fire. The relay room also has restricted personnel access and administrative restrictions on transient combustibles and hot work. The current procedural guidance for deenergizing the PORV and the vent valves reduces the possibility of a spurious operation in the event of a fire that damages cables. External DC hot shorts of the proper polarity could cause the PORV or vent valves to spuriously open, which must be considered in the case of RCS high-low pressure interfaces. However, the NRC acknowledges in RIS 2004-03, Rev. 1 and Generic Letter 86-10 that a failure involving two concurrent, cable-to-cable, DC hot shorts of the proper polarity has a low probability of occurrence. The PORV and vent valve circuit protection inadequacy represents a degradation of the Appendix R safe shutdown capability. However, it does not have a significant adverse affect on the Station fire protection program defense-in-depth philosophy.

Cause:

The cause of this condition is believed to be an incorrect assumption that deenergizing the PORV and vent valve circuits alone would be sufficient to prevent spurious operation. Thus, the PORV and vent valve cable rerouting partially in conduit was viewed as a betterment item. The modification was developed by the original architect/engineer for the plant and originally implemented in the 1987 timeframe. Given the lack of detail in the modification information, no conclusive cause could be determined why only a portion of the PORV and vent valve circuits were rerouted in dedicated conduit.

Corrective Actions:

Immediate actions were to post a fire watch for the relay room. The posting of a one-hour roving fire watch and the active detection system provides adequate compensatory measures to detect a fire in its incipient stage such that rapid extinguishment can occur prior to the spurious operation of PR-2B or a combination of RC-33B and RC-49 or RC-45B and RC-49.

Additional evaluations to determine if plant modifications, procedure changes, or a determination of acceptability of the condition, will be performed during the implementation of the NFPA 805 transition for Kewaunee Power Station.

Similar Events:

None.