Dominion Energy Kewaunee, Inc.
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Dominion

OCT 19 2012

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

Serial No. 12-667
LIC/GR/R0
Docket No.: 50-305
License No.: DPR-43

DOMINION ENERGY KEWAUNEE, INC.
KEWAUNEE POWER STATION
LICENSEE EVENT REPORT 2012-007-00

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

Report No. 50-305/2012-007-00

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. Jack Gadzala at (920) 388-8604.

Very truly yours,

A. J. Jordan
Site Vice President, Kewaunee Power Station

Attachment(s)

Commitments made by this letter: NONE

IE22
NRR

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

Mr. K. D. Feintuch
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NRC Senior Resident Inspector
Kewaunee Power Station

NRC FORM 366 U.S. NUCLEAR REGULATORYCOMMISSION
(10-2010)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

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 FOIA/Privacy Service (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@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.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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

4. TITLE
Minor Thru-Wall Leak at Weld in Safety Injection Suction Piping

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
										05000
08	20	2012	2012	-- 007 --	00	10	19	2012	FACILITY NAME	05000

9. OPERATING MODE
MODE 1

10. POWER LEVEL
100%

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (*Check all that apply*)

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☒ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☒ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☒ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☒ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (*include Area Code*)
Timothy W. Hanna	**(920) 388-8414**

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED
☐ YES (*If yes, complete 15. EXPECTED SUBMISSION DATE*) ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On August 20, 2012, with the Kewaunee Power Station (KPS) operating at 100% power, plant staff discovered a thru-wall leak on the common suction line for the Safety Injection (SI) pumps. The thru-wall leak was located at the weid between the SI-3 valve body and the piping upstream of SI-3. Both trains of SI were declared inoperable until SI-3 was closed, and the trains were returned to an Operable status.

This condition is being reported pursuant to 10 CFR 50.73(a)(2)(ii)(B), as any event or condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety, 10 CFR 50.73(a)(2)(v)(B) and (D), as any condition or event that could have prevented fulfillment of a safety function, and 10 CFR 50.73(a)(2)(vii), as any event or condition where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Kewaunee Power Station	05000305	2012	-- 007 --	00	2 OF 4

NARRATIVE

Event Description:

On August 20, 2012, at 1100 CDT, with the Kewaunee Power Station (KPS) in MODE 1, 100% power, plant staff discovered a thru-wall leak at the weld between the Safety Injection System (SI) [BQ] boric acid supply to the SI Pumps isolation valve (SI-3) [ISV] body and the piping [PSP] upstream of SI-3. No contributing structures, systems, or components were inoperable at the time of the event. Minor leakage (less than 1 drop per minute) was observed at the flaw location. Upon being informed of this condition, plant operators closed SI-3 at 1109 CDT to isolate the affected portion of the piping from the SI suction piping. The period from when the leak was discovered until it was isolated from the SI piping was less than 10 minutes.

This condition resulted in both Safety Injection Train A and Safety Injection Train B being inoperable per LCO 3.5.2, ECCS - Operating, Condition A, due to an inoperable common suction line. Because the inability to characterize the flaw, the required ECCS suction line was conservatively deemed to be unavailable and LCO 3.0.3 was entered per Condition C of LCO 3.5.2 until valve SI-3 was closed (within 10 minutes of discovery). This event was reported under 10CFR50.72(b)(3)(ii)(B) as an unanalyzed condition that significantly degrades plant safety, reference NRC Event Notification Number 48209 dated August 20, 2012.

Closing SI-3 restored both Safety Injection Train A and Safety Injection Train B to Operable status and LCO 3.0.3 was exited at 1109 CDT on 8/20/2012.

The Emergency Core Cooling System (ECCS) for KPS consists of safety injection and residual heat removal (RHR)[BP] pumps, accumulators [ACC], containment sump [RVR], RHR heat exchangers [HX], and the refueling water storage tank (RWST) [TK], along with the associated piping, valves, instrumentation, and other related equipment. KPS original design was for the SI pumps to take a common suction from the boric acid storage tanks and automatically transfer the pumps common suction to the refueling water storage tank when the lower volume high boric acid concentration boric acid storage tanks were empty. This automatic transfer feature has been removed and the SI pumps common suction aligned to the RWST, reference License Amendment 116, dated March 28, 1995, ADAMS Accession No. ML020770418. The thru-wall leak location is on the SI pumps common suction line between valve SI-3 and the boric acid storage tanks such that when SI-3 is closed the thru-wall leak is isolated from the SI pumps suction line from the RWST.

In Modes 1, 2, and 3, plant Technical Specification (TS) 3.5.2 "ECCS - Operating," requires two independent ECCS trains be operable, with each ECCS train consisting of an SI subsystem and an RHR subsystem. Each train includes the piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the RWST upon an SI signal and manually transferring suction to the containment sump. During an event requiring ECCS actuation, a flow path is required to provide an abundant supply of water from the RWST to the reactor coolant system (RCS) [AB] via the ECCS pumps and their respective supply headers to each of the two cold leg injection nozzles (SI pumps) and RCS vessel injection nozzles (RHR pumps). In the long term, this flow path may be switched to take its supply from the containment sump and to supply its flow to the RCS cold legs or reactor pressure vessel [RPV].

In Mode 4, plant TS 3.5.3 "ECCS Subsystems — Shutdown," requires one ECCS train be operable. In MODE 4, an ECCS train consists of a safety injection subsystem and an RHR subsystem. Each train includes the piping, instruments, and controls to ensure an OPERABLE flow path capable of taking suction from the RWST and transferring suction to the containment sump.

Because a thru-wall leak on the common SI pump suction line, potentially rendered both trains of SI inoperable, this condition is being reported pursuant to 10 CFR 50.73(a)(2)(ii)(B), 10 CFR 50.73(a)(2)(v)(B) and (D), and 10 CFR 50.73(a)(2)(vii). Pursuant to 10 CFR 50.73(a)(2)(ii)(B), as any event or condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety. Pursuant to 10 CFR 50.73(a)(2)(v)(B) and (D), as any condition or event that could have prevented fulfillment of a safety function. Pursuant to 10 CFR 50.73(a)(2)(vii), as any event or condition where a single cause or condition caused at least one independent train or channel to become inoperable in multiple systems or two independent trains or channels to become inoperable in a single system.

Event and Safety Consequence Analysis:

Current analyses do not support operability of the Safety Injection pumps with this thru-wall leak when aligned to the SI pumps common suction. The SI pumps are required during a design bases accident to makeup a loss of RCS inventory where the inventory loss is greater than the capacity of the charging pumps and less than that needed to depressurize the RCS to less than the shutoff head of the RHR pumps.

When the leak was discovered there was small white boric acid deposit at the upstream weld between SI-3, SI-2A and SI-2B. There was evidence of some wet boric acid at the weld, a small amount of boric acid on top, no boric acid on floor below, no discoloring. The area normally is covered by lagging but the lagging was recently removed and the area cleaned to remove old lagging residue.

Based on the above, there was minimal safety consequence associated with this condition.

Cause:

The cause of this event was determined to be most likely due to stress corrosion cracking at a stagnant borated line constructed of austenitic stainless steel.

A definite cause was not determined because the flaw cannot be adequately characterized at this time. The flaw cannot be adequately characterized because there is no qualified volumetric non-destructive examination technique available for this location as the valve is welded directly to a tee. The Dominion procedure for Ultrasonic Examination of Austenitic Stainless Steel Piping is not qualified for detection or length sizing of flaws when access is available to only one side of the weld as it is in this case. The two most prevalent mechanisms for 304 stainless steel considered were: 1) fatigue due to vibration or thermal cycling or, 2) Stress Corrosion Cracking. Fatigue appears unlikely because the line does not see flow and remains at constant temperature due to the heat tracing; therefore, sufficient cyclic stresses should not be present to induce fatigue failure. Stress Corrosion Cracking appears the most likely because there is Operating Experience indicating that stress corrosion cracking initiates in the heat affected zone of the base metal. The flaw in this case appears to be in the weld metal at the toe of the weld. It is still possible that the flaw initiated in the base metal and propagated to the weld metal.

Corrective Actions:

As an immediate corrective action, the section of piping, where the thru-wall leak was located, was isolated from the SI pump common suction line from the RWST returning the SI System to a fully operable condition.

Additional planned corrective actions include:

1. Repair the pipe to eliminate the flaw.

2. Characterize the flaw that caused the through wall leak and determining the affect of this leak on the SI System.

Similar Events:

A review of Licensee Event Reports covering the previous three years identified the following similar events:

- LER 2012-004, "Pressure Boundary Leakage from Socket Weld on ¾-Inch Pipe to Sample Valve RHR-600."