Commonwealth Edison Company
LaSalle Generating Station
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ComEd

March 17, 2000

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

LaSalle County Station, Unit 2
Facility Operating License No. NPF-18
NRC Docket No. 50-374

Subject: Licensee Event Report No. 00-002-00

In accordance with 10 CFR 50.73(a)(2)(i), Commonwealth Edison (ComEd) Company is submitting Licensee Event Report No. 00-002-00, Docket No. 050-374.

Should you have any questions concerning this letter, please contact Mr. Frank A. Spangenberg, III, Regulatory Assurance Manager, at (815) 357-6761, extension 2383.

Respectfully,

for

Charles G. Pardee
Site Vice President
LaSalle County Station

Attachment: Licensee Event Report

cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector - LaSalle County Station

IE22

NRC FORM 366 (6-1998) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-
EXPIRES 06/30/2001

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): LaSalle County Station, Unit 2

DOCKET NUMBER (2) 05000374

TITLE (4) Clerical Errors During Construction Result in Missed Augmented Weld Examinations for Residual Heat Removal System Welds RH-2005-28 and 29

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	17	00	00	002	00	03	17	00	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9): 1

POWER LEVEL (10): 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

☐ 20.2201(b)	☐ 20.2203(a)(2)(v)	☒ 50.73(a)(2)(i)	☐ 50.73(a)(2)(viii)
☐ 20.2203(a)(1)	☐ 20.2003(a)(3)(i)	☐ 50.73(a)(2)(ii)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(i)	☐ 20.2003(a)(3)(ii)	☐ 50.73(a)(2)(iii)	☐ 73.71
☐ 20.2203(a)(2)(ii)	☐ 20.2003(a)(4)	☐ 50.73(a)(2)(iv)	☐ OTHER
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(1)	☐ 50.73(a)(2)(v)	Specify n Abstract below or
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(vii)	in NRC Form 366A

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Danny Bost, Site Engineering Manager	(815) 357-6761 Extension 2208

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)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
☐ YES (If yes, complete EXPECTED SUBMISSION DATE)	☒ NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines 16)

On February 17, 2000, Commonwealth Edison Company (ComEd) determined that two Category D welds on Unit 2 had not been inspected per the schedule provided in Generic Letter 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," dated January 25, 1988. These inspections are augmented inspection requirements of the LaSalle County Station Inservice Inspection (ISI) program, and a requirement of Technical Specification 4.0.5.f. Since one weld was examined during the seventh refueling outage, it currently meets its surveillance requirement. A Notice of Enforcement Discretion was requested and approved on February 18, 2000, for the missed surveillance on the other weld. An exigent Technical Specification amendment was docketed on February 22, 2000, in order to defer inspection of the missed weld until the next refueling outage.

The root cause of the missed weld inspections is human error in the form of clerical errors in 1983. Corrective actions included performance of deterministic and probabilistic evaluations, which demonstrated that the structural integrity of the affected systems was not adversely impacted by these missed weld inspections.

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor, 3323 Megawatts Thermal Rated Core Power

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

A. CONDITION PRIOR TO EVENT

Unit(s): 2 | Event Date: 02/17/00 | Event Time: 1527 Hours
Reactor Mode(s): 1 | Power Level(s): 100
Mode(s) Name: Run

B. DESCRIPTION OF EVENT

The results of a root cause investigation conducted at the Quad Cities Station due to Intergranular Stress Corrosion Cracking (IGSCC), indicated that improper implementation of the Inductive Heat Stress Improvement (IHSI) process was a factor in the weld cracking that was discovered. Subsequently an investigation was performed at Commonwealth Edison Boiling Water Reactors. This investigation included a review of IGSCC weld examination data and IHSI implementation data. On February 17, 2000 during the LaSalle County Station Unit 2 review, a clerical error was discovered involving two IGSCC susceptible welds in the Residual Heat Removal (RHR)[BO] Shutdown Cooling return piping. The two welds involved are RH-2005-28 and RH-2005-29, which connect the upstream piping and downstream elbow to valve 2E12-F090A, "A RHR SDC Return Header Manual Stop Valve."

A detailed review of the IHSI records determined that welds RH-2005-30 and RH-2005-33 were treated instead of welds RH-2005-28 and RH-2005-29, respectively. These errors went undetected when the remaining balance of the IGSCC weld population was subjected to the Mechanical Stress Improvement Process (MSIP). It was believed that these two welds had already been stress relieved. Consequently, the two welds were never subjected to any stress improvement process.

Implementing the stress improvement process is not a requirement for welds susceptible to IGSCC, however, based on having no stress improvement, the two welds should have been categorized as IGSCC Category D, vice Category B, in accordance with NRC Generic Letter (GL) 88-01. The examination schedule for Category D welds would have required that the two welds be examined every two refueling cycles. The subject welds should have been examined by the third, fifth, and seventh refueling outages. Examinations of weld RH-2005-28 were performed during the seventh refueling outage with no indication of cracking noted. Weld RH-2005-29 was examined in the third refueling outage with no indication of cracking noted.

Technical Specification (TS) Section 3.4.8, "Structural Integrity," requires that the structural integrity of ASME Code Class components be maintained in accordance with TS 4.4.8. TS 4.4.8 in turn requires that TS 4.0.5 be followed. TS 4.0.5.f requires that the ISI program for piping be performed in accordance with the NRC positions on schedule, methods, personnel, and sample expansion included in GL 88-01.

The schedule of examinations for welds RH-2005-28 and 29 has not been executed in accordance with the Category D schedule in GL 88-01. This constitutes a missed Surveillance requirement. However, since weld RH-2005-28 was examined during the seventh refueling outage, it currently meets its surveillance requirement.

A Notice of Enforcement Discretion was requested and approved on February 18, 2000, for the missed surveillance on weld RH-2005-29. An exigent Technical Specification amendment was docketed on February 22, 2000, in order to defer inspection of the weld until the next refueling outage.

This event is being reported pursuant to 10CFR50.73(a)(2)(i)(B), as a condition prohibited by the plant's Technical Specifications.

C. CAUSE OF EVENT

The root cause of the missed weld inspections is human error in the form of clerical errors in 1983. A contributing factor in these errors was a failure to utilize the ISI isometric drawings for weld location and configuration information. This necessitated the development and use of a separate set of location and configuration sketches with a cross-reference listing to tie the IHSI implementation to the ISI weld nomenclature. A second contributing factor is an apparent lack of self-checking in the preparation and review of the 1983 IHSI final report.

D. SAFETY ANALYSIS

The safety significance of this event is minimal. Welds RH-2005-28 and RH-2005-29 are required to be considered as Category D in accordance with the augmented inspection program, which follows the recommendations of GL 88-01. Category D welds are those made of susceptible materials that have not received an IGSCC mitigation treatment. The technical basis in BWRVIP-75 for extending weld examination frequencies from every other refueling cycle to once every six years states:

"In the 33 plants that responded to the survey, there are currently 432 Category D welds that have been examined 1325 times. There are 169 welds currently being effectively treated with Hydrogen Water Chemistry (HWC). There has been one known Category D weld reported to be cracked in the last 8 years. The one known crack was detected at Hope Creek in 1997. The cracking (three pinholes) occurred in a dissimilar weld at a safe-end to nozzle with nickel-based alloy 182. The owner determined that this weld had experienced multiple repairs. Other than this weld repair, no other Category D cracking has been reported."

The 432 welds provide data across multiple systems, from different plants, representing a diverse cross section of operating conditions, providing the conclusion that Category D welds have behaved and continue to behave without cracking, except as noted for the Hope Creek case. Unlike the Hope Creek weld, RH-2005-28 and RH-2005-29 are not dissimilar metal welds; they involve only stainless steel base and weld metal and neither weld has had any documented weld repairs. Hydrogen Water Chemistry, however, has not yet been implemented on Unit 2.

A review of the LaSalle County Station Unit 2 reactor water chemistry reveals that it has been maintained in accordance with guidance given in EPRI Report TR-103515-R1, "BWR Vessel and Internals Project Technical Basis for Revisions to Generic Letter 88-01."

The weld on the upstream side of the valve, RH-2005-28, is also a Category D weld. Its operating environment is similar to that for RH-2005-29. Weld RH-2005-28 was inspected in 1987 and again in 1996 with no recordable indications. It is reasonable to postulate that weld RH-2005-29 has behaved similarly and is therefore not expected to be flawed.

If the foregoing bases should prove to be precluded due to weld-unique conditions (e.g., weld fit-up problem, inside diameter grinding, etc.) and the weld is actually flawed, safety is still not jeopardized. Austenitic stainless steel is a tough and ductile material and flaw tolerant. Additionally, IGSCC has an irregular crack form. These attributes lead to the conclusion that this piping will leak before it breaks. EPRI Report NP-4991, "Application of the Leak-before-Break Approach to BWR Piping," provides supporting information. A plant-specific critical flaw evaluation was performed to assess the weld using the loads from the LaSalle County Station piping stress reports. The conclusion to be drawn is that if weld RH-2005-29 is flawed, and should the flaws propagate through the weld or wall of the pipe, it will create a leak that would be readily detected by RCS leakage detection instrumentation well in advance of the pipe break and the unit could shutdown with no significant impact on safety. In the event of a break at this location, the consequences remain bounded by the current Emergency Core Cooling System (ECCS) Loss of Coolant Accident (LOCA).

Additionally, a risk assessment was performed as part of a defense-in-depth evaluation of weld RH-2005-29. The analysis included the following.

1. Estimate of the nominal pipe rupture frequency of a routinely inspected weld.
2. The conditions at the time of the last inspection in 1990.
3. Estimate of the relative increase in pipe rupture frequency incurred due to the missed inspections.
4. Calculation of the conditional probability of core damage and large early release given a break in the line.
5. Estimate of the risk of continued operation.
6. Evaluation of competing risks associated with plant shutdown to perform inspection.

The risk assessment is based on the latest LaSalle County Station plant-specific Probabilistic Safety Assessment (PSA) for internal events and the EPRI sponsored piping reliability Markov model developed for a risk-informed ISI assessment. The results using this information indicate change in the risk resulting from continued operation is low:

- Change In Core Damage Frequency (CDF) ≅ 5E-9/year, and
- Change In Large Early Release Frequency (LERF) ≅ 7E-11/year.

These values are well below the risk increase thresholds considered acceptable for permanent plant changes as delineated in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated July 1998. The competing risks, associated with alternative actions involving shutting down the reactor for a forced outage, have been evaluated as part of the LaSalle County Station internal events PSA and is estimated to be approximately 2E-7 per manual shutdown, which is a factor of approximately 40 times higher than the risk of continued operation with weld RH-2005-29 uninspected until Fall 2000.

E. CORRECTIVE ACTIONS

1. Deterministic and supporting probabilistic evaluations regarding the structural integrity of weld RH-2005-29. (completed)

2. An extent of condition review was performed with no additional missed welds found on either Unit. (completed)

3. Revised the ISI database to reflect the change in IGSCC category for welds RH-2005-28 and RH-2005-29 from category "B" to category "D" and revised the ISI schedule database to require examination of the welds in L2R08 and in each successive second refueling outage. (completed)

F. PREVIOUS OCCURRENCES

A review of Licensee Event Reports over the previous five years found no previous or similar occurrences.

G. COMPONENT FAILURE DATA

Since no component failure occurred, this section is not applicable.