

Commonwealth Edison Company
LaSalle Generating Station
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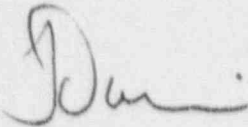
ComEd

August 29, 1997

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

Licensee Event Report #97-001-00, Docket #050-374 is being submitted to your office in accordance with 10 CFR 20.2201(b).

Respectfully,



Fred Dacimo
Plant General Manager
LaSalle County Station

Enclosure

cc: A. B. Beach, NRC Region I Administrator
M. P. Huber, NRC Senior Resident Inspector - LaSalle
C. H. Mathews, IDN Senior Resident Inspector - LaSalle
F. Niziolek, IDN Senior Reactor Analyst
INPO - Records Center

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1): LaSalle County Station Unit Two	DOCKET NUMBER (2) 05000374	PAGE (3) 1 of 7
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TITLE (4) Potential for Missing Fuel due to Discovery of a Broken Fuel Rod in the LaSalle Unit 2 Spent Fuel Pool

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
07	17	97	97	001	00	08	29	97	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)
POWER LEVEL (10) 000	

<input checked="" type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2003(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2003(a)(4)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> OTHER
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(vii)	(Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.2003(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME R. Karas, System Engineer	TELEPHONE NUMBER (Include Area Code) (815) 357-6761 Extension 2251
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH 03	DAY 16	YEAR 98
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines 16)

On July 17, 1997, a broken section of a fuel rod was discovered in a pool storage cell believed empty. A storage canister in a cell three feet away originally contained two full length fuel rods from a 1989 fuel bundle reconstitution and the broken section is postulated to be a portion of one of the stored rods. Since current plant conditions do not allow fuel moves, initial inspections could not positively identify the broken section.

Quarterly Special Nuclear Material (SNM) inventories did not identify the broken section due to its location in the holding cell. The broken rod in the canister was not questioned, since the rod was known to have a severed end.

This Licensee Event Report (LER) is made per 10 CFR 20.2201(b) for missing fuel. Although fuel is not known to be missing, not all fuel pellets can be positively accounted for until fuel movement is allowed.

Radiological hazards from stray pellets or gaseous releases were evaluated as negligible. An assessment by Nuclear Fuel Services confirmed that adequate margin to fuel pool criticality is maintained. Plans are underway to assess SNM procedures, perform further inspections, place the two rods and pellets in a covered container, and train personnel. Once plant conditions allow fuel moves, a complete root cause evaluation, and additional corrective actions will be provided to supplement this notification.

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TEXT CONTINUATION

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PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

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

A. CONDITION PRIOR TO EVENT

Unit(s): Two Event Date: 07/17/97 Event Time: 1545 Hours
Reactor Mode(s): N Mode(s) N e: Defueled Power Level(s): 0%

B. DESCRIPTION OF EVENT

On July 17, 1997, while working in the Unit 2 fuel pool as part of ongoing spent fuel pool cleanup project work, fuel handlers noticed a section of a fuel rod approximately three feet in length resting in the bottom of an empty control blade storage cell. The fuel rod section was discovered by dropping a lighted camera into the bottom of the cell as part of the preparation for lowering a component into the location. This event has been conservatively reported under 10 CFR 20.2201(b) due to the potential for missing fuel. 10 CFR 20.2201 specifies notification by phone within 30 days of discovery of stolen, lost or missing fuel, with a 30 day follow-up LER report. The phone notification required by 10 CFR 20.2201(a)(ii) was made on July 31, 1997.

The cladding of the broken fuel rod section is intact, including the upper end plug and spring, and is located at the bottom of the empty cell SR3-A-2, leaning against one of the cell walls. It is not known at this time if all of the fuel pellets are contained within the cladding.

The cell containing the broken section is approximately three feet away from a storage cell for defective fuel (SR3-B-0) containing a fuel rod storage canister. The canister originally contained two fuel rods that had been removed from a fuel bundle (LYF289) during a fuel bundle reconstitution campaign in May, 1989 (see Figure 1 for a drawing of the canister). It is believed that the broken fuel rod section was the upper portion of one of these two rods. This is the only storage location that contains individual fuel rods at LaSalle.

A review of past Nuclear Component Transfer Lists (NCTLs) indicated that the fuel rods were originally placed in the canister on May 30, 1989, in the Unit 1 fuel pool when fuel bundle LYF289 was reconstituted. This reconstitution removed the failed rod, its severed lower end plug, and its intact symmetric fuel rod. Two fresh rods were reloaded into the bundle, allowing use of that bundle in the subsequent fuel cycle. The canister containing the two removed rods was later moved to the Unit 2 fuel pool on November 19, 1990, in preparation for the Unit 1 fuel pool re-rack. Attachment A shows a timeline of significant events.

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The current configuration of the rods in the canister shows one fuel rod protruding approximately 18 inches from the canister, while the other one is sunken further inside the canister with a broken end visible some distance below the surface. The second rod was known to have a severed lower end plug, therefore, the exposed broken end was expected, and not considered abnormal during quarterly inventories of Special Nuclear Material (SNM). It was believed at that time that the rod was originally placed in the canister upside down.

The canister is configured to hold each rod in a separate, enclosed tube, obscuring the lower section of the intact rod, and the entire failed rod (except the very top) from view. It was believed that the first rod protruded from the canister due to being partially stuck out. With the discovery of the broken section in the nearby cell, it has now been verified that the second rod was originally placed in the canister with its broken lower end plug at the bottom, and an intact upper end plug at the top. Consultations with General Electric confirm that the container is designed such that a rod will protrude approximately 18 inches from the top. At sometime after being placed in the container and moved to the Unit 2 pool, it was believed that the section was broken off, landing in the nearby cell where it has been discovered. However, this has not been confirmed. It was believed that the condition in the canister (with one rod protruding and the other depressed) has existed at least since 1995, and may have existed prior to that year as well.

An initial visual inspection was performed on July 17, 1997, in an attempt to identify the broken rod and verify the pellets remained contained in the broken section. No serial number would be present on the broken section, as it is the top section of a fuel rod (serial numbers appear on the bottom section). Additionally, gamma scan data showed that although the activity level near the broken section was nearly identical to the activity level of the rods in the canister (approximately 250 R/hr), it cannot be positively concluded that all the pellets remained in the broken section. It is possible that some pellets could have been scattered in nearby cells, if the rod was broken due to an impact. Using existing procedures, the floor of the cell containing the broken section was scanned with a camera, revealing no indications of stray pellets. This broken section, from the top down, would normally consist of a 2.2 inch end plug, a 9.48 inch plenum spring, six inches of natural U-235 and approximately 17 inches of 3.40 percent enriched U-235, assuming the broken section is a portion of one of the rods removed from fuel bundle LYF289.

Further inspections in this cell were suspended to ensure that the fuel was not disturbed. Current plant conditions do not allow irradiated fuel movement, due to several ventilation systems and secondary containment being inoperable. These systems are not anticipated to be returned to service for several months. It is currently not possible to conclude that the broken section either contains all its pellets, or that it originated from the second rod in the canister. Until the second rod is removed from the canister and measured, the possibility that the broken section may have come from another fuel bundle cannot be ruled out.

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Immediate actions were taken to quarantine the eight cell area containing the broken section and fuel rod holder until a special procedure can be developed, with additional precautions, to continue visual inspections. These planned visual inspections will scan the eight cell area for stray fuel pellets, as well as re-scan the fuel rod holder. The cell containing the broken section will also be re-scanned, with movements limited to preclude the possibility of disturbing the rod segment.

C. CAUSE OF EVENT

Until plant conditions allow fuel movement, it is not possible to identify the cause of the event. It is postulated that the section was broken off the failed rod in the canister, probably by fuel handling activities either at the time of the canister's transfer from the Unit 1 fuel pool to the Unit 2 fuel pool, or sometime thereafter. Further investigations are ongoing to evaluate how the rod was broken and why the condition went undetected.

Failure to identify the broken section was caused by a lack of SNM inventory procedures to require documentation of the visual configuration of disassembled, or partial items that are not contained in a sealed container. Quarterly inventories performed subsequent to the postulated breakage of the broken section identified no abnormalities because the original configuration of the fuel rods in the canister was not documented in sufficient detail. Personnel performing the inventories assumed the current configuration was correct. This was based on the knowledge that one of the rods was missing a lower end plug, and the assumption that the intact rod protruded due to binding in the container.

A complete root cause analysis will be performed and documented in a supplemental report once fuel moves are allowed and a complete examination of the broken section and the two rod in the canister is possible.

D. SAFETY ANALYSIS

There are two potential safety consequences associated with missing fuel, as related to this event. First, when the exact location of fuel is not known, there is a potential that it is located in an area that could present a radiological hazard to workers. Based on the configuration of the broken section, its probable path from the fuel rod canister, and the activity associated with the broken rod section (all fuel rods on-site currently exhibit low activity levels, due to the fact that neither unit has operated since late September, 1996). The radiological hazard has been determined to be minimal. The fuel pool provides adequate shielding, even if some pellets have fallen to the bottom of the pool. Additionally, a gaseous release from the broken section, if disturbed, is not possible, based on the fact that the gaseous isotopes contained in all fuel on-site has decayed to negligible levels due to the extended outages. However, if a gaseous release were to occur, current analyses show that an impact in the fuel pool that breaks ten fuel rods that have previously decayed for six months would result in a dose that is bounded by the current bundle drop accident analysis, even with ventilation systems unavailable.

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The second potential safety concern is the possibility of an unplanned criticality. If the pellets were to migrate to a cell containing a complete assembly, a criticality concern would exist that is not addressed in the current fuel pool criticality analyses of record. A special evaluation has been performed by ComEd, verifying that if an entire rod (or two rod halves), containing the worst case enrichment, gadolinium, and exposure contained in irradiated bundles in either the Unit 1 or Unit 2 fuel pool were to migrate to the worst case intact bundle in either pool, the result would still maintain adequate margin to the Technical Specification 5.6.1.1.a limit for fuel pool criticality of 0.95 Keff. Additionally, if the pellets from an entire rod were to migrate to another bundle and pile up at the bottom of that cell, this same analysis shows that adequate margin is also maintained.

E. CORRECTIVE ACTIONS

1. A corporate assessment of the LaSalle SNM procedures will be conducted to identify any potential weaknesses with the Nuclear Materials program. The results will be used as input in revising current procedures, including development of a method to ensure the configuration of partial components is documented and verified. (NTS #374-180-97-SCAQ00001.01)
2. Additional visual inspections will be performed to scan the eight cell area for stray pellets. (NTS #374-180-97-SCAQ00001.02)
3. Once fuel moves are possible, the two rods in the canister and the broken section will be placed into a covered container in the fuel pool to prevent any future disturbances, and the location of all fuel pellets will be identified by available means. (NTS #374-180-97-SCAQ00001.03)
4. All fuel handling and nuclear engineering personnel have been briefed on this event and on the quarantine of Unit 2 fuel pool for fuel handling activities. Training will be performed as necessary when a final root cause has been established. (NTS #374-180-97-SCAQ00001.04)
5. Additional corrective actions will be provided in a supplement to this notification when additional information related to the root cause of the event is available to positively identify the broken section. (NTS #374-180-97-SCAQ00001.05)

F. PREVIOUS OCCURRENCES

None.

G. COMPONENT FAILURE DATA

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

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Attachment A

Timeline of Significant Events

- May 30, 1989 Two fuel rods (one with severed lower end plug) removed from fuel bundle LYF289 and placed in fuel rod storage canister in Unit 1 fuel pool cell C-21-1.
- Quarterly Fuel inventories visually confirm presence of two fuel rods in storage canister in Unit 1 fuel pool cell C-21-1.
- November 19, 1990 Fuel rod storage canister containing two fuel rods moved from Unit 1 fuel pool to Unit 2 fuel pool cell SR3-B-0.
- Quarterly Fuel inventories visually confirm presence of two fuel rods in storage canister in Unit 2 fuel pool cell SR3-B-0.
- Unknown Time (Postulated) Top portion of fuel rod in storage canister breaks off and lands in storage cell SR3-A-2.
- July 17, 1997 Broken fuel rod segment found in storage cell SR3-A-2.

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FIGURE 1

