Commonwealth Edison Company
LaSalle Generating Station
2601 North 21st Road
Marseilles, IL 61341-9757
Tel 815-357-6761

ComEd

March 7, 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

In Licensee Event Report (LER) #97-001, Commonwealth Edison (ComEd) Company committed to provide a supplemental report to provide additional information related to the cause of the reported event. ComEd has completed the review of the event and is submitting LER #97-001-01, Docket No. 050-374 to fulfill our previous commitment.

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,

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 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 05/31/95

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.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1):	DOCKET NUMBER (2)	PAGE (3)
LaSalle County Station Unit Two	05000374	1 of 7

TITLE (4) 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	01	03	07	00	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	N
POWER LEVEL (10)	000

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

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

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Amy Goss, Reactor Engineer	(815) 357-6761 Extension 2246

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

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 July 17, 1997, a broken section of a fuel rod was discovered in a fuel 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. The broken section is a portion of one of the stored rods. The broken section has been recovered and is being stored in the storage canister. No additional fuel components were found at the bottom of the storage cells, and all components have been accounted for.

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.

Because the fuel pellets were recovered, there are no safety consequences associated with having the broken fuel rod in the spent fuel pool. Although the cause of the event could not be positively established, SNM procedures have been assessed to identify weaknesses, and both Reactor Engineering and Fuel Handling personnel have been trained on the event.

This Licensee Event Report (LER) was originally made per 10 CFR 20.2201(b).

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System (EIIS) 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) Name: 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 41-inch long section of a fuel rod 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 was originally 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 rod segment was found at the bottom of cell SR3-A-2, leaning against one of the cell walls. The cladding of the broken fuel rod section is intact, including the upper end plug and spring. It has since been confirmed that all of the fuel pellets are contained within the cladding.

Cell SR3-A-2 is approximately three feet away from a defective fuel storage cell (SR3-B-0), which contained 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 an as-found drawing of the canister). The broken fuel rod section was the upper portion of one of these two rods. The storage canister has since been moved to cell SR3-B-1. 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.

At the time that the broken rod segment was discovered, the storage canister contained one fuel rod protruding approximately 18 inches from the canister, while the other one was 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 the time of the inventories that the rod was originally placed in the canister upside down.

The canister is configured to hold each rod in a separate, enclosed tube. The lower section of the intact rod, and the entire failed rod (except the very top) are obscured from view. 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 is believed that the section was broken off and landed in the nearby cell where it was later discovered. It is not known how long the condition in the canister (with one rod protruding and the other depressed) existed.

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 could not be positively concluded that all the pellets remained in the broken section. 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 uranium and approximately 17 inches of 3.40 percent enriched U-235.

At the time, further inspections in the cell were suspended to ensure that the fuel was not disturbed. Plant conditions did not allow irradiated fuel movement due to several ventilation systems and secondary containment being inoperable. Immediate actions were taken to quarantine the eight cell area containing the broken rod section and the fuel storage canister, until a special procedure could be developed to continue the inspections.

The ventilation systems and secondary containment did not become available until the first quarter of 1999. A special procedure was then developed to perform the rod recovery and inspections. Per the procedure, the fuel rod segment was picked up and placed into a transfer tube. The tube was then put in the fuel rod storage canister with the other fuel rods. A visual search for stray fuel pellets was then performed within and underneath the SR3 storage cells. No pellets were found. Finally, a gamma scan was performed inside, around, and underneath the SR3 storage cells to look for indication of the presence of additional fuel components. The count rates showed no indication of such items.

In order to perform adequate inspections of the storage cells, the fuel storage canister had to be withdrawn from its cell location. It was subsequently discovered that the storage canister had been sitting on top of an 18-inch tall extension can. The storage canister was placed back into a cell (SR3-B-1) without the extension can underneath it. The top of the intact fuel rod (that protrudes eighteen inches out of the storage canister) is now flush with the top of the storage racks. There are no longer any fuel rods protruding above the top of the spent fuel pool storage racks.

C. CAUSE OF EVENT

Although it cannot be verified, it is postulated that the section was broken off during fuel handling activities sometime after the canister was transferred from the Unit 1 fuel pool to the Unit 2 fuel pool. The protrusion of the fuel rods from the canister may have contributed to the segment being broken off. It is not known whether the use of the extension can was a conscious decision on the part of fuel handling and/or reactor engineering at the time that the canister was transferred. It may have been used in an effort to facilitate the performance of future fuel pool piece counts.

Failure to identify the broken section was caused by the lack of a requirement in the SNM inventory procedures to document the visual configuration of disassembled or partial items that are not contained in sealed containers. Quarterly inventories had identified no abnormalities because the original configuration of the fuel rods in the canister was not documented in sufficient detail. Personnel performing the inventories simply assumed that the rod configuration within the canister was correct. This was based on the knowledge that one of the rods was missing a lower end plug.

None of the information that was gathered during the analysis and rod recovery was able to point to a definitive cause for the event.

D. SAFETY ANALYSIS

Because all fuel pellets were recovered, there are no safety consequences associated with having the broken fuel rod in the spent fuel pool.

E. CORRECTIVE ACTIONS

1. LaSalle SNM procedures were assessed by both LaSalle and corporate personnel to identify any potential weaknesses with the Nuclear Materials program. The results were used as input in revising station procedures, including development of a method to ensure the configuration of partial components is documented and verified. (Complete)

2. Additional visual inspections were performed to scan the eight cell area for stray pellets. No stray pellets were found. (Complete)

3. The broken section was placed into the storage canister in the fuel pool to prevent any future disturbances. All fuel pellets and components have been accounted for. (Complete)

4. All fuel handling and reactor engineering personnel were briefed on this event and on the quarantine of Unit 2 fuel pool for fuel handling activities. (The quarantine has been lifted since the fuel is properly stored.) Training was performed to communicate the final cause determination. (Complete)

F. PREVIOUS OCCURRENCES

None.

G. COMPONENT FAILURE DATA

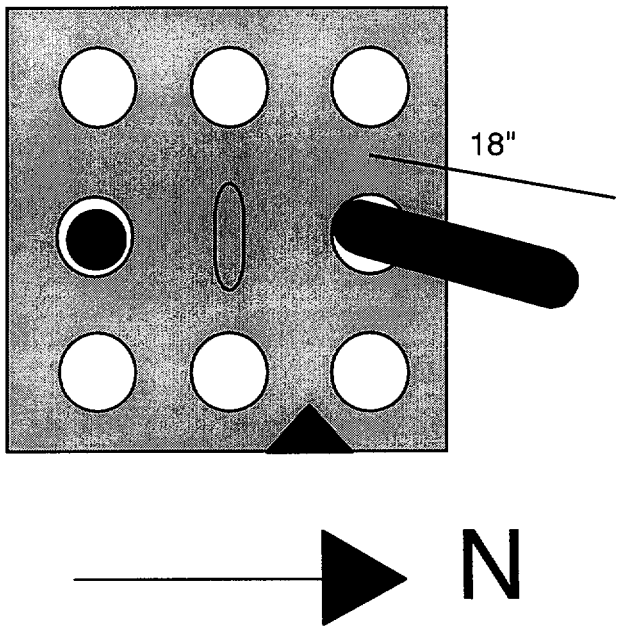
Since no component failure occurred, this section is not applicable.

Attachment A

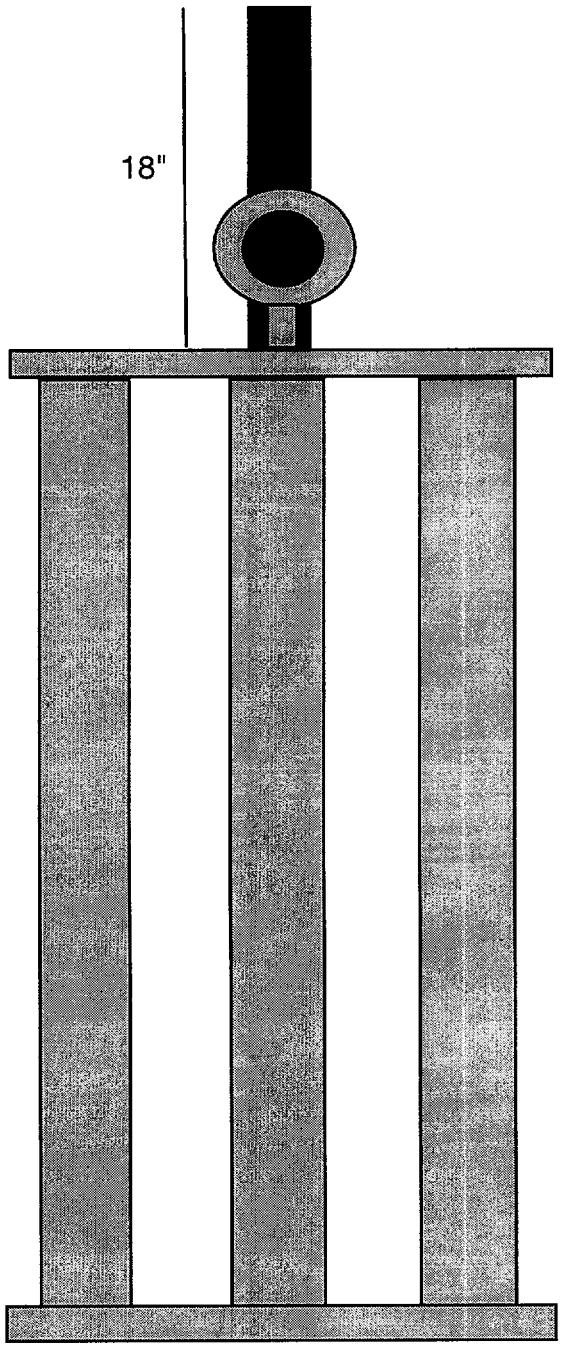
Timeline of Significant Events

• 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.
• August 6, 1999	Broken fuel rod segment recovered and placed in fuel rod storage canister.
• October 24, 1999	Fuel rod storage canister moved to storage cell SR3-B-1 during cells inspections.

FIGURE 1



Fuel Rod Holder With
2 Fuel Pins Inside
(Top View)



Elevation of Fuel Rod Holder With
2 Fuel Pins Inside looking North