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

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April 14, 1997

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

Licensee Event Report #97-010-00, Docket #050-373 is being submitted to your office in accordance with 10 CFR 50.73(a)(2)(ii).

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Fiespectfully,

Fred Dacimo Plant General Manager LaSalle County Station

Enclosure

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



NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (5-92)						APPROVED BY OMB NO. 3150-0104 EXPIRES 05/31/95								
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines 16)

On March 18, 1997, all Unit 1 Division 2 equipment was declared inoperable because the safety related cables in the Unit 1 Division 2 Cable Spreading Room (CSR) could be damaged by the sprinkler system piping during a Safe Shutdown Earthquake (SSE) event. Hangers were identified missing during an engineering walk down of the CSR. The missing hangers were replaced to restore the sprinkler system to the "as designed" condition. A seismic "two over one" evaluation has demonstrated that the "as designed" condition of the sprinkler system will not prevent the function of any plant feature required for safe shutdown during a SSE. The Unit 1 Division 2 equipment was declared operable on March 29, 1997.

The root cause of the event was incomplete installation and inspection during construction of the plant.

Seismic "two over one" evaluations for the other safety related areas protected by sprinkler systems have determined that no other equipment required for safe shutdown during a SSE would have been impacted by sprinkler system piping. Therefore, if the SSE would have occurred at power operation, all other safety related divisions would have been free from damage (e.g., Unit 1 Division 1 & 3 and Unit 2 Division 1, 2 & 3).

NRC FORM 366 U.S. NUCLEAR REG (5-92)	AATORY COMMISSION	TORY COMMISSION APPROVED BY OMB NO. 3150-0104 EXPIRES 05/31/95				
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION		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 AN BUDGET, WASHINGTON, DC 20503				
FACILITY NAME (1) DOCKET NUMBER (2		LER NUMBER (6) PAG				
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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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): 1	Event Date: 03/18/97	Event	Time: 0053 Hours
Reactor Mode(s): 4	Mode(s) Name: Cold	Power	Level(s): 0%
	Shutdown		

#### B. DESCRIPTION OF EVENT

On March 18, 1997, it was identified that the Unit 1 Division 2 Cable Spreading Room (CSR) sprinkler system piping [KP] may adversely impact safety related cables contained in Seismic Class 1E cable trays located within the room in the event of a Safe Shutdown Earthquake (SSE). The condition was identified while evaluating the effects of missing sprinkler system hangers that were noted on March 12, 1997, during an engineering walk down of the CSR. The sprinkler system in its "as found" condition was determined to be operable from a fire protection standpoint, however, the uncertainty regarding seismic capability resulted in potentially not satisfying the design basis description in the FSAR and UFSAR. Specifically, FSAR Section Appendix B, "Conformance to Regulatory Guides," states that "those portions of structures, systems, or components (SSC) whose continued function is not required but whose failure could reduce the functioning of any plant feature required for safe shutdown to an unacceptable safety level are designed and constructed so that the SSE would not cause such failure." UFSAR Section 9.5.1.3, states that "the fire protection system is designed so that failure of the system or parts of the system does not result in failure of Seismic Category 1 systems." Upon notification of this condition, the Shift Manager (SRO) conservatively declared all Unit 1 Division 2 equipment inoperable. At that time, Unit 1 was in Cold Shutdown.

The immediate corrective actions focused on (1) restoring the Unit 1 Division 2 sprinkler system to the "as designed" condition, (2) ensuring the operability of Unit 1 Division 2 equipment during an SSE, and (3) inspecting the remaining sprinkler systems to confirm operability from both a fire protection and seismic standpoint. The hangers missing from the Unit 1 Division 2 CSR sprinkler system were installed to establish the "as designed" condition.

During investigation of this event, it was determined that the sprinkler system piping (non-seismic Class II SSC) in safety-related areas had not been seismically analyzed to demonstrate that the seismic Class I SSCs will not be adversely affected (commonly referred to as a "two over one" evaluation).

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A seismic "two over one" evaluation of the "as designed" condition was performed and demonstrated that the Unit 1 Division 2 CSR sprinkler system would not reduce the function of any plant feature required for safe shutdown during a SSE

During the walk down of the other sprinkler systems protecting safety related areas, other missing hangers were identified. An operability evaluation was performed for the "as found" condition of these sprinkler systems (i.e., each sprinkler system in safety related areas except the Unit 1 Division 2 CSR). The evaluation concluded that these sprinkler systems would not reduce the function of any plant feature required for safe shutdown during a SSE.

The Unit 1 Division 2 equipment was declared operable on March 29, 1997.

This event is reportable in accordance with 10 CFR 50.73(a)2(ii) due to the plant being in an condition that was outside the design basis.

A supplemental report will be issued to address the potential extent of this condition beyond fire protection sprinkler system piping for other piping and equipment that may have not been adequately evaluated for "two over one" commitments.

#### C. CAUSE OF EVENT

The fundamental cause of this event is human performance problems.

The specific cause of the missing sprinkler system hangers is incomplete installation and inspection. This conclusion is based on observations during the visual inspections. The observations indicate that the hangers were located "as designed" when there was no immediate interference or obstruction (e.g., cable tray, HVAC duct, etc.). However, if the "as designed" hanger location was obstructed, it appears that the installer placed the hanger in a readily accessible location, or decided not to install the hanger assuming the system was adequately supported based on installation experience. These obstructions also contributed to the failure to recognize the missing hangers during installation or subsequent periodic inspections.

The specific cause of not previously analyzing sprinkler system piping in safety related areas from a "two over one" perspective was the failure to recognize that the supports were not installed per ANSI B.31.1. As a result, the sprinkler system piping was not bounded by the "two over one" assessment for Non-Category I pipe that was performed for LaSalle in 1981 (Sargent & Lundy Report No. EMD-4266-027-211). Implicit to this assessment is the assumption that all nonsafety related pipe in safety related areas was installed in accordance with ANSI B.31.1. However, as required for plants reviewed against Appendix A to APCSB BTP 9.5-1, the provision of ANSI B.31.1 supports for fire protection piping

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was limited to standpipes serving hose stations (to ensure water can be supplied for manual fire fighting in areas required for safe plant shutdown in the event of a SSE). As indicated by the LaSalle SER (Section 9.5-1), the original design and installation of sprinkler system piping at LaSalle, including supports, was in accordance with NFPA 13-1976. As such, unlike piping for standpipe and hose stations, sprinkler system piping supports were not provided in accordance with ANSI B.31.1.

In summary, ANSI B.31.1 piping had been previously reviewed and determined to satisfy "two over one" criteria. The fire protection sprinkler system piping is not ANSI B.31.1 and, as such, was not originally reviewed to satisfy "two over one" criteria.

## D. ASSESSMENT OF SAFETY CONSEQUENCES

The safety significance of this event is minimal. A "two over one" evaluation for all other safety related areas protected by sprinkler systems has determined that no other equipment required for safe shutdown during a SSE would have been impacted by non-seismic sprinkler system piping. Therefore, if the SSE would have occurred while at power operation, all other redundant safety related divisions would have been free from damage (e.g., Unit 1 Division 1 & 3 and Unit 2 Division 1, 2 & 3). Additionally, there was no significant seismic activity during this period and Unit 1 Division 2 was not actually challenged by the hanger configuration.

## E. CORRECTIVE ACTIONS

- 1. The Unit 1 Division 2 CSR sprinkler system hangers were restored to the "as designed" condition on March 27, 1997. (DCP 97-00121)
- 2. A seismic "two over one" analysis performed on March 28, 1997, demonstrated that the "as designed" condition of the Unit 1 Division 2 CSR sprinkler system piping would not reduce the function of any plant feature required for safe shutdown during a SSE.
- 3. A seismic "two over one" analysis is being performed to determine the potential impact of the "as found" condition on Unit 1 Division 2 CSR sprinkler system.
- 4. The supports for each sprinkler system protecting equipment in safety related areas were walked down to document the "as found" versus "as designed" conditions. All hanger deficiencies were documented, spans created by the missing hangers were compared to NFPA 13-1976 hanger spacing criteria, and each system was evaluated for operability from both a fire protection and seismic standpoint. In addition, systems found to have no missing hangers were also evaluated for operability. The "as found" condition of each system was determined to be operable from a fire protection standpoint. However, additional analysis for six sprinkler systems is being performed to further substantiate the seismic operability determination. This analysis will be complete by June 1, 1997. Though not expected, conclusions which invalidate a previously documented operability evaluation will be documented in a supplemental LER.

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- 5. Action requests have been submitted to restore the "as designed" condition for the other sprinkler systems protecting equipment in safety related areas that were found to have missing hangers. The hangers will be installed prior to startup of Unit 1 and Unit 2, as applicable.
- 6. A single report capturing all seismic "two over one" evaluations performed for fire protection piping will be prepared to ensure compliance with Regulatory Guide 1.29, "Seismic Design Classification." This report will be complete by August 1, 1997.
- 7. An investigation regarding the extent of this condition beyond fire protection sprinkler piping will be performed. A supplemental report providing the results of this investigation will be submitted by August 29, 1997.
- F. PREVIOUS OCCURRENCES

LER NUMBER TITLE

None.

G. COMPONENT FAILURE DATA

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