Commonwealth Edison
LaSalle County Nuclear Station
2601 N. 21st. Rd.
Marseilles, Illinois 61341
Telephone 815/357-6761

May 21, 1993

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Dear Sir:

Licensee Event Report #93-011-00, Docket #050-373 is being submitted to your office in accordance with 10CFR50.73(a)(2)(iv).

G. F. Spedl
Station Manager
LaSalle County Station

GFS/mg/grv

Enclosure

xc: Nuclear Licensing Administrator
NRC Resident Inspector
NRC Region III Administrator
INPO - Records Center
IDNS Resident Inspector

240059

IE22 1/1

LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
LaSalle County Station Unit 1	0 5 0 0 0 3 7 3	1 of 0 4

Title (4)

Manual Scram Due to Disconnected Linkage on Valve Positioner on a Heater Drain Valve

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 Names	Docket Number(s)
									None	0 5 0 0 0
0 4	2 3	9 3	9 3	0 1 1 1	0 0	0 5	2 1	9 3		0 5 0 0 0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)							
1	___ 20.402(b)	___ 20.405(c)	X 50.73(a)(2)(iv)	___ 73.71(b)				
POWER LEVEL (10) 0 9 9	___ 20.405(a)(1)(i)	___ 50.36(c)(1)	___ 50.73(a)(2)(v)	___ 73.71(c)				
	___ 20.405(a)(1)(ii)	___ 50.36(c)(2)	___ 50.73(a)(2)(vii)	___ Other (Specify in Abstract below and in Text)				
	___ 20.405(a)(1)(iii)	___ 50.73(a)(2)(i)	___ 50.73(a)(2)(viii)(A)					
	___ 20.405(a)(1)(iv)	___ 50.73(a)(2)(ii)	___ 50.73(a)(2)(viii)(B)					
	___ 20.405(a)(1)(v)	___ 50.73(a)(2)(iii)	___ 50.73(a)(2)(x)					

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER
	AREA CODE
Mike Gronek, Technical Staff Engineer, Extension 2447	8 1 5 3 5 7 - 6 7 6 1

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
X										

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
___ Yes (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On April 23, 1993 Unit 1 was in Operational Condition 1(Run) at 99 percent power. At 0833 hours, the "12A" Low Pressure Feedwater Heater (LP Heater) High Level Alarm was received in the Control Room, followed by auto isolation of the "A" LP heater string. The loss of feedwater heater(s) procedure was entered and reactor power reduction to 900 MWe was immediately started.

At 0835, the "12C" and "12B" LP heaters alarmed on high level followed by auto isolation of the "C" and "B" strings. The LP heater bypass valve, 1CB007, was opened. In anticipation of a low reactor water level condition and the possibility of entering Reactor Instability Region, the Shift Engineer directed a manual scram.

Cause of the event was a disconnected feedback linkage on the 1HD065A valve positioner due to a loose jam nut. The exact cause of the jam nut not being tight is not known.

Instrument Maintenance training is being changed and a tailgate session will be conducted to include the lessons learned from this event. Air supply for the 11 and 12 heaters emergency drain valves has been isolated as an interim measure. A query will be made to the industry for similar events associated with this type and model control valve positioner.

This event is reportable pursuant to 10CFR50.73(a)(2)(iv) due to the manual scram.

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: 04/23/93 Event Time: 0833 Hours

Reactor Mode(s): 1 Mode(s) Name: Run Power Level(s): 99%

B. DESCRIPTION OF EVENT

At 0833 on April 23, 1993, with Unit 1 in Operational Condition 1 (RUN) at 99% power, the "12A" Low Pressure Feedwater Heater (LP Heater)(HD)(SM) alarmed for high level (+3"). Immediately following the alarm, heater level increased to the trip level of +4" (for a period of 10 seconds or more), which resulted in the auto closure of the "A" LP heater string isolation valves 1CB005A and 1CB006A, and the "A" string heater drain pump forward valve 1HD045A. LaSalle Operation Abnormal (LOA-FW-01), "Loss of a Feedwater Heater(s)" procedure was entered and a reactor power reduction to 900 MWe was immediately started.

At 0835, the "12C" and "12B" heaters level increased to the alarm point and finally the trip point, resulting in auto closure of 1CB005B/C, 1CB006B/C, and 1HD045B/C. In addition, the Nuclear Station Operator (NSO - Licensed Reactor Operator) started the CRAM array control rod insertion when the LP heater strings isolated due to the heater level reaching the trip point.

At 0836, Operations opened the heater string bypass valve, 1CB007 in accordance with LOA-FW-01.

In anticipation of a low reactor water level condition resulting from the loss of LP heater strings and the possibility of entering the Reactor Instability Region, the Shift Engineer (SE - Licensed Senior Reactor Operator) directed the Unit 1 NSO to manually scram the reactor at 0837, and LaSalle General Procedure (LGP) 3-2, "Reactor Scram", was entered.

The 11 and 12 heaters are operated with the emergency drain valves full open and the normal drain valves closed due to inadequate flow capacities for the 11 heater normal drain valves because of original design problems.

Following the scram, the following equipment abnormalities were identified.

1. The Scram Discharge Volume Vent Valve 1C11-F380 closed but had dual light indication due to a misaligned limit switch. The redundent valve 1C11-F388 operated properly.

B. DESCRIPTION OF EVENT CONTINUED

2. The A feedwater heater string isolation valves 1CB005A and 1CB006A tripped their respective feed breakers upon closing. The Limitorque torque switches rotated past the open contact point. This caused the breakers to trip on thermal overload.

3. The Unit 1 Station Air Compressor (SAC) failed to load and the Unit 2 SAC was started. A work request was written to check the inlet valve and associated controllers.

4. The 1A Circulating Water Pump tripped on the bus transfer from the Unit Aux transformer to the system aux transformer following the turbine/generator trip. Two other circulating water pumps were on at the time and did not trip. This is not unusual due to the motor's design and no problems were identified upon investigation of trip.

C. APPARENT CAUSE OF EVENT

Investigation revealed that the feedback linkage on the 12A Heater Emergency Drain Valve 1HD065A positioner unthreaded and came apart. A jam nut, located on the feedback linkage, was found loose. A loose jam nut would allow the linkage to vibrate apart. The exact cause of the jam nut not being tight is not known. Without feedback force and control air, the valve positioner provided a full closed air signal to the top of the 1HD065A actuator, thus causing the valve to close. With 1HD65A full closed, level in the "12A" heater began to increase until level switch 1LS-HD069 actuato thus causing valves 1CB005A and 1CB006A to close as designed. After the "A" string isolated, the other strings isolated due to the increase in condensate flow through then, which increased the extraction steam condensing rate and overloading the heater shell side drains. After the isolation, the unit was manually scrammed on the direction of the SE.

The exact cause of the nut being loose could not be determined. There were three postulated scenarios for this condition to exist:

a. Installation deficiency
b. Vibration, and
c. Work in the area.

D. SAFETY ANALYSIS OF EVENT

The safety consequences of this event were minimal. The actions taken by Operating Personnel during this event were proper. All Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC)(BN) were available but not required during this event. All required actuations occurred as expected. Loss of Feedwater Heaters is an analyzed plant transient, as noted in the Updated Final Safety Analysis Report (UFSAR), which is included in Operator Initial and Requalification Training. The four minor equipment abnormalities did not impact safety on the operators ability to respond to the transient.

E. CORRECTIVE ACTIONS

1. Operating entered LOA-FW-01, "Loss of Feedwater Heater(s)", in response to the perturbation to regain control of the transient, including opening the low pressure heater bypass valve 1CB007, and inserting the CRAM arrays.

2. In anticipation of low reactor water level due to the loss of feedwater and the possibility of entering the Reactor Instability Region, the reactor was manually scrammed and LGP 3-2, "Reactor Scram", was entered.

3. A physical inspection was performed and it was discovered that the 1HD065A was full closed and that the feedback linkage on the valve positioner had come loose.

4. An inspection of the other Unit 1 feedwater heater valves revealed similar loose jam nuts on four valve feedback linkage assemblies. These were subsequently tightened by Instrument Maintenance Personnel. The cause of the loose jam nuts was investigated. Work was performed on two of the valves in January 1993, but no work had been conducted on the other two valves since initial startup of Unit 1in 1982.

5. The Instrument Maintenance Training Program, Module 15 - "Classroom and Laboratory", is being changed to include the lessons learned from this event. This will be tracked to completion by Action Item Record (AIR) #373-180-93-0030901.

6. A Tailgate Session will be held with the Instrument Maintenance Department to discuss the importance of jam nuts and other retaining devices that can be observed during routine activities. This will be tracked to completion by AIR #373-180-93-0030902.

7. The air supply has been isolated as an interim measure for the Unit 1/Unit 2 11/21 and 12/22 feedwater heater emergency drain valves. By isolating the air, positioner or booster relay failure would not cause the emergency valves to close.

8. A query will be made on the Nuclear Network for similar events associated with Masoneilan, Model #7401-702, Control Valve Positioners. The purpose of this inquiry is to identify industry failure information that may be applicable to this event. This will be tracked to completion by AIR #373-180-93-0030903.

9. The limit switches were adjusted for the 1C11-F380 per Work Request L22456.

10. The torque switches for the 1CB005A and 1CB006A will be tested during L1R06 by the MOV group to determine cause of problem. This will be tracked by AIR 373-180-93-0030904.

F. PREVIOUS EVENTS

None.

G. COMPONENT FAILURE DATA

MANUFACTURER	NOMENCLATURE	MODEL NUMBER	MFG PART NUMBER
Masoneilan	Control Valve	7401-702	

SHEET 7

EVENT SUMMARY AND CAUSE CODES

DVR Number
Q1-L-93-032

- [ ] Lost generation
- [ ] Cost > $25,000
- [ ] Hazard or Spill
- [ ] Personnel injury

- [ ] Reactor trip
- [ ] ESF actuation
- [ ] NRC reportable
- [x] LER
- [ ] PSE

- [ ] NRC violation, level___
- [ ] GSEP event, class_____
- [ ] Tech Spec LCO
- [ ] Potential or future loss
- SALP functional area__

Component type | Failure mode | Department

X Unknown
X
X
X

Licensed? L or blank | Level | Department | Type | Detail code

A
A
A

Type | Detail Code | Department

B
B
B

Type | Detail code

C

Type of deficiency | Detail code | Procedure type

D
D
D

Type | Detail code | Department

E
E
E