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PECO ENERGY

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10CFR 50.73

February 1, 1995
Docket No. 50-353
License No. NPF-85

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Licensee Event Report
Limerick Generating Station - Unit 2

This LER reports a partial Group VIC Primary Containment and Reactor Vessel Isolation Control System (PCRVICS) actuation, an Engineered Safety Feature, after a ±20 VDC power supply for a Ventilation Radiation Monitor was intermittently lost due to an indeterminate cause.

Reference:	Docket No. 50-353
Report Number:	2-95-002
Revision Number:	00
Event Date:	January 6, 1995
Report Date:	February 1, 1995
Facility:	Limerick Generating Station P.O. Box 2300, Sanatoga, PA 19464-2300

This LER is being submitted pursuant to the requirements of 10CFR50.73(a)(2)(iv).

Very truly yours,

Robert W Boyce

DMS:cah

cc: T. T. Martin, Administrator Region I, USNRC
N. S. Perry, USNRC Senior Resident Inspector, LGS

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

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)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Limerick Generating Station, Unit 2	05000 353	1 OF 5

TITLE (4) Partial Group VIC PCRVICS Actuation, an ESF, After a ±20 VDC Power Supply for a Ventilation Radiation Monitor was Intermittently Lost due to an Indeterminate Cause

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
										05000
01	06	95	95	-- 002 --	00	02	01	95	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
			20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)
POWER LEVEL (10)	62%		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
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
			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 (Include Area Code)
J. L. Kantner, Manager - Experience Assessment, LGS	(610) 718-3400

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).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On 01/06/95 output power from the -20 VDC module of the power supply E/SX-M1-2PS1D was lost initiating a partial Group VIC (Primary Containment Sampling/Recombiner) Primary Containment and Reactor Vessel Isolation Control System (PCRVICS) actuation, an Engineered Safety Feature (ESF). The fuse for the suspect power supply was verified not to be blown, the power supply was reset to restore the -20 VDC power, and the Group VIC PCRVICS isolations were reset. The consequences of this event were minimal. The partial Group VIC PCRVICS actuations initiated as designed, and Operations personnel returned all systems to normal within 90 minutes. The partial Group VIC PCRVICS isolations were initiated from a trip of the Reactor Enclosure and Refuel Floor high radiation (upscale) trip logic in the 'D' Ventilation Radiation Monitors. This trip was caused by the loss of -20 VDC from the power supply in the Trip Auxiliary Unit. The exact cause of the power supply failure is indeterminate, however, two items stand-out. First, the -20 VDC tripped on a drive inhibit signal. Second, the 120 VAC power cord was extremely loose. The corrective actions that have been or will be taken include replacement of the suspect power supply, inspection of appropriate 120 VAC power cords, an analysis of the suspect power supply, and a Nuclear Network inquiry.

Unit Conditions Prior to the Event:

Unit 2 was in Operational Condition 1 (Power Operation) operating at 62% power level in end-of-cycle coastdown. There were no structures, systems, or components out of service which contributed to this event.

Description of the Event:

On January 6, 1995, at 1530 hours, output power from the -20 VDC module of the power supply E/SX-M1-2PS1D was lost initiating a partial Group VIC (Primary Containment Sampling/Recombiner) Primary Containment and Reactor Vessel Isolation Control System (PCRVICS) actuation (EIIS:JM), an Engineered Safety Feature (ESF), as designed.

Loss of this power supply resulted in the automatic closure of the following "normally open" PCRVICS valves.

1. Primary Containment Hydrogen/Oxygen (H2/O2) Combustible Gas Analyzer (CGA) (EIIS:BB) Sample Line Isolation Valves: SV-57-241, 242, 243, 244, 245, and 259. This caused the CGA which monitors the drywell atmosphere to isolate and recirculate its gas flows.

2. Main Steam Line (EIIS:SB) Bypass Leakage Barrier Block Valve, HV-41-243.

3. Recirculation Pump (EIIS:AD) Seal Bypass Leakage Barrier Block Valve, HV-46-228.

4. Instrument Air (EIIS:LD) to Primary Containment Instrument Gas (PCIG) (EIIS:LK) Bypass Barrier Block Valve, HV-59-241.

Also, the following "normally closed" PCRVICS valves received a signal to close and remain closed.

1. Drywell to 'B' Hydrogen Recombiner Inboard Primary Containment Isolation Valve (PCIV), HV-57-263.

2. Suppression Pool to 'B' Hydrogen Recombiner Inboard PCIV, HV-57-264.

3. Low Flow Nitrogen Make-up (EIIS:LK) PCIV, HV-57-216.

4. Suppression Pool from 'B' Hydrogen Recombiner Outboard PCIV, HV-57-269.

5. 'B' Hydrogen Recombiner Outboard Inlet Valve, FV-C-DO-201B.

In addition to the above actuations, the "normally closed" Nitrogen Purge to Instrument Air Bypass Leakage Barrier Vent Valve, HV-57-267, and the Instrument Air to PCIG Bypass Barrier Vent Valve, HV-59-243, both received an automatic open signal and opened.

On January 6, 1995, at 1550 hours, the fuse for the suspect power supply was verified not to be blown, and the power supply was reset to restore the -20 VDC power. By 1700 hours on January 6, 1995, the Group VIC PCRVICS isolations were reset in accordance with General Plant (GP) Procedure, GP-8, "Primary and Secondary Containment Isolation Verification and Reset." The duration of the isolations was 90 minutes. A four hour notification was made to the NRC at 1823 hours on January 6, 1995, in accordance with the requirements of 10CFR50.72(b)(2)(ii) since this event resulted in the automatic actuation of an ESF. Accordingly, this report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(iv).

Analysis of the Event:

The actual consequences of this event were minimal. There was no release of radioactive material to the environment as a result of this event. The partial Group VIC PCRVICS actuations initiated as designed, and Operations personnel reset the isolation signal and returned all systems to normal within 90 minutes. Had Operations personnel not been able to reset the isolation signal, manual restoration of the isolation valves could have been completed in accordance with Transient Response Implementation Plan (TRIP) procedure T-102, "Primary Containment Control," which directs, when required, the actions to bypass the isolation signal and reopen the isolation valves.

As a result of the partial Group VIC PCRVICS actuations, the Primary Containment H2/O2 CGA for monitoring the drywell atmosphere was isolated and recirculated its gas flow for approximately 90 minutes. During this event, the Primary Containment H2/O2 CGA for monitoring the suppression pool atmosphere was in operation. No abnormal H2/O2

concentrations were identified during this event by the suppression pool H2/O2 CGA. Additionally, no abnormal H2/O2 concentrations were identified prior to or following this event by either the drywell or suppression pool Primary Containment H2/O2 CGAs. Also, alternate sample pathways were available for manual alignment in the event a CGA was required to monitor the drywell atmosphere for H2/O2 concentrations.

Cause of the Event:

The partial Group VIC PCRVICS isolations were initiated from a trip of the Reactor Enclosure and Refuel Floor high radiation (upscale) trip logic in the 'D' Ventilation Radiation Monitors. This trip was caused by the intermittent loss of -20 VDC from the power supply E/SX-MI-2PS1D (General Electric (GE) Part No. 112D1902) to the two relays (i.e., D12A-K91D and -K92D) in the Trip Auxiliary Unit Z2D. These relays became de-energized and the electrical contacts opened in the PCRVICS logic to initiate the isolation signal.

The exact cause of the power supply failure is indeterminate, however, two items stand-out. First, the -20 VDC tripped on a drive inhibit signal. This causes the power supply output to go to zero and requires de-energization (i.e., for up to 40 seconds) in order to facilitate a reset. This trip occurs during an overvoltage condition or a loss of AC power input. This was the state the power supply was in when the fuse was pulled and inspected. When the fuse was reinstalled, the power supply reset. The second item is that the 120 VAC power cord was extremely loose. An investigation revealed that it was very possible that the connector could have momentarily broken contact. A search through the station calibration sheets for this power supply revealed no previous observations of a loose power cord. Also, the suspect power supply was moved (i.e., in and out) a couple of times with no apparent affect.

Corrective Actions:

1. The suspect power supply was replaced on January 13, 1995. The removed power supply was then bench tested under load while monitoring voltage output without incident. Also, the overvoltage and overcurrent settings were verified to be correct.

2. In response to the loose power cord, an inspection of the remaining Nuclear Monitoring System ±20 VDC power supply 120 VAC input connections will be performed to ensure adequate tightness. This action is expected to be completed by March 1, 1995.

3. The suspect power supply will be sent to the manufacturer, GE, for analysis, rework, and recertification, as required. An evaluation of this item is expected to be completed by October 31, 1995, and any actions will be implemented as necessary.

4. A Nuclear Network inquiry is currently in progress to identify if any industry concerns exist with the suspect GE power supply. This information will be evaluated, and any actions will be implemented as necessary.

Previous Similar Occurrences:

None