THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

P.O. BOX 97 ■ PERRY, OHIO 44081 ■ TELEPHONE (216) 259-3737 ■ ADDRESS-10 CENTER ROAD
FROM CLEVELAND: 479-1260 ■ TELEX: 241599
ANSWERBACK: CEI PRYO

Al Kaplan

VICE PRESIDENT
NUCLEAR GROUP

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PERRY NUCLEAR POWER PLANT

March 23, 1990
PY-CEI/NRR-1156 L

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
LER 90-003

Dear Sir:

Enclosed is Licensee Event Report 90-003 for the Perry Nuclear Power Plant.

Very truly yours,

Al Kaplan
Vice President
Nuclear Group

AK/njc

Enclosure: LER 90-003

cc: T. Colburn
NRC Resident Inspector

U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Perry Nuclear Power Plant, Unit 1	0 5 0 0 0 4 4 0	1 OF 0 5

TITLE (4): Failure to Perform Required Valve Testing Results in Inoperable Safety Systems and Subsequent Entry Into Technical Specification 3.0.3

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)
										0 5 0 0 0
0 2	2 2	9 0	9 0	— 0 0 3	— 0 0	0 3	2 4	9 0		0 5 0 0 0

OPERATING MODE (9)	1
POWER LEVEL (10)	1 0 0

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

	20.402(b)		20.405(c)		50.73(a)(2)(iv)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)
	20.405(a)(1)(iii)	X	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)

	73.71(b)
	73.71(c)
	OTHER (Specify in Abstract below and in Text, NRC Form 366A)

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (AREA CODE)
Henry L. Hegrat, Compliance Engineer, Extension 6855	2 1 6 2 5 9 - 3 7 3 7

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 fifteen single-space typewritten lines) (16)

On February 22, and 23, 1990, it was discovered that stroke time measurements required by Technical Specification 4.0.5 and ASME Section XI guidelines had not been performed in both directions for motor operated valves in several safety related systems. The affected systems were declared inoperable, and Technical Specification 3.0.3 was entered on both occasions due to the lack of an action statement applicable to the resulting configuration. Prior to the initiation of the plant shutdown, however, the affected valves were successfully tested and the associated systems were restored to operable status.

The cause of the event was a program deficiency. Inconsistent application of ASME Section XI requirements resulted in the failure of surveillance instructions to require stroke time measurement in both open and closed directions for these valves, which performed active functions in both directions.

In order to prevent recurrence, the Inservice Testing Program has been completely reviewed to ensure stroke time measurement is completed for all active valve functions. In addition, procedural enhancements are being implemented to ensure subsequent instruction revisions will not inadvertently remove the provisions for required testing. Finally, all appropriate personnel will be trained to the details of this event, as well as the resulting procedural modifications.

On February 22, 1990, at 1810 all three loops of the Low Pressure Coolant Injection [BO] (LPCI) subsystem, both loops of Containment Spray [BE] (CS) subsystem and the Reactor Core Isolation were discovered to have been inoperable in excess of the time allowed by Technical Specification (TS) action statements 3.5.1.d.3, 3.6.3.2.b and 3.7.3 respectively. Both LPCI and CS are subsystem operating modes of the Residual Heat Removal (RHR) [BO] system. On February 23, 1990 at 1715, both trains of the Drywell Vacuum Relief [BF] (DRV) system were discovered to be inoperable resulting in a condition requiring entry into TS 3.0.3. Additionally, all four trains of the Containment Vacuum Relief [BF] (DVR) system were discovered to be inoperable in excess of the time allowed by TS 3.6.5.1.c. At the time of both of these events, the plant was in Operational Condition 1 (Power Operation) with reactor power at approximately 100 percent of rated thermal power. The Reactor Pressure Vessel [RPV] was at saturated pressure and temperature conditions at approximately 1025 psig.

During review of a procedure revision to Surveillance Instruction (SVI-E12-T2004) "Residual Heat Removal Cold Shutdown Valve Stroke and Exercise Test" on February 20, 1990, it was identified that the instruction required the stroke time of the motor operated LPCI injection valves (1E12-F042A, B and C) to be measured in only the closed direction. On February 22, 1990 after a through review of the ASME Boiler and Pressure Vessel Code, Section XI guidelines for inservice testing of valves, it was determined that because these valves have an active (open) function in addition to an isolation function, they should have been stroke-time tested in both the open and closed directions. A review of the inservice testing requirements for all other Emergency Core Cooling (ECCS) system valves was conducted concurrently with the ASME review. Through this review, nine other motor operated valves were identified that were not tested in both the open and closed directions as prescribed by the ASME code.

All 12 of the affected valves are listed as follows with the inadequately tested functions and associated Technical Specification;

Valve Number	Valve Function Inadequately Tested	TS Affected
E12-F027A and B	LPCI/CS outboard isolation valves, open	3.5.1/3.6.3.2
E12-F028A and B	CS inboard isolation valves, open	3.6.3.2
E12-F040, F049	RHR "A" to Radioactive Waste, closed	3.5.1
E12-F042A, B & C	LPCI inboard isolation valves, open	3.5.1
E12-F048A and B	RHR heat exchanger bypass valve, closed	3.6.3.2
E51-F013	RCIC pump discharge valve, open	3.7.3

Upon notification of the condition to the control room at 1810 on February 22, 1990, all three loops of the LPCI system, both loops of the CS system and the RCIC system were declared inoperable. Because action statements were not provided for all of these conditions in TS, the plant entered TS 3.0.3.

The ability to adequately test each of the affected valves in the current plant condition was evaluated by the plant operations and technical staff. It was determined that all the affected valves could be fully stroke time tested without difficulty except for 1E12-F042A, B and C. With these valves open, the reactor coolant pressure boundary is isolated from the low pressure piping of the RHR system by only a single check valve in each line. The surveillance to verify operability of these valves is not normally performed under pressurized conditions. Plant management considered submitting a request for Enforcement Discretion with respect to the completion of the stroke time testing. Discussion with the NRC resident and Region III indicated that Enforcement Discretion would not be granted due to the extensive length of time until the next testing opportunity.

After operators verified positive indication that the check valves were properly seated (permanently installed pressure indication for the volume between the isolation valve and the check valve indicated less than 50 psig), a decision was made by plant management to perform the required testing. The testing plan (including appropriate safety precautions and direction to operations personnel) was approved by plant management and completed with the results being entered in the Unit Log. TS 3.0.3 was exited at 2138; all other testing was completed and Limiting Conditions for Operation (LCO) cleared at 2243.

As a result of this event an additional review of the in-service testing (IST) program was conducted on February 23, 1990. Six additional valves were identified that were not tested in both the open and closed direction as directed in the ASME code.

These six valves are listed as follows with the inadequately tested function and associated Technical Specification.

Valve Number	Valve Function Inadequately Tested	TS Affected
M16-F010A and B	DVR isolation valve, open	3.6.5.3
M17-F015	CVR isolation valve, open	3.6.5.1
M17-F025	CVR isolation valve, open	3.6.5.1
M17-F035	CVR isolation valve, open	3.6.5.1
M17-F045	CVR isolation valve, open	3.6.5.1

Upon notification of the condition to the control room at 1715, both trains of the DVR system and all four trains of the CVR system,were declared inoperable. Because action statements were not provided in TS for having both trains of the DVR system inoperable the plant entered TS 3.0.3. After evaluation of plant conditions, testing was approved and conducted with all results being recorded in the Unit Log. Testing was completed for the DVR system at 1800 and TS 3.0.3 was exited; the remaining testing was completed and all LCO's cleared at 1835.

The root cause of the failure to test these valves is a program deficiency involving the preparation and review of the IST surveillance procedures. Perry Administrative Procedure (PAP-1101) "Inservice Testing of Pumps and Valves," Section 6.2.2.11.e, states, in part, the following: "Stroke time performance shall be verified upon exercising a valve in the direction to fulfill its design function. Also, stroke time performance shall be verified upon exercising a valve in the direction to fulfill its safety function if different for [sic] system design function." Review of the history of affected procedures from 1985 through the present time indicates that requirements for stroke time testing have been inconsistently applied to various valves. Personnel preparing revisions to these procedures were not aware of the specific requirements in ASME Section XI and PAP-1101 for stroke time measurement for all active valve functions. As a result, surveillance instructions for several valves which function actively in both the open and closed directions did not have provisions for stroke time measurement in both directions. Additionally, these inadequacies were not discovered during the instruction review and approval process.

The LPCI subsystem of the RHR system is designed to supply water to the RPV during a large break Loss Of Coolant Accident (LOCA). Other ECCS systems available to supply coolant to the RPV in the event of a LOCA are the High Pressure Core Spray [BG] (HPCS), and the Low Pressure Core Spray [BM] systems. The CS subsystem of the RHR system is designed to spray coolant into the containment and suppression pool vapor space, to reduce containment pressure to below design limits with bypass leakage from all leakage paths from the containment. The RCIC system is designed to ensure that sufficient reactor water inventory is maintained to permit adequate core cooling to take place when the RPV is isolated or the normal feedwater system is lost. The CVR system is available for any postulated situation requiring relief of a vacuum inside containment, with the bounding scenario being an inadvertent actuation of CS during normal plant operation. The DVR system is designed to prevent a high containment to drywell differential pressure from flooding the drywell with suppression pool water.

Prior to the event, all of the affected valves were stroke tested at the required frequency with stroke times measured in at least one direction. This stroke testing demonstrated the ability of each valve to fully travel to its intended position for each active function. Additionally, Motor Operated Valve Analysis and Testing System (MOVATS) testing data demonstrates that these motor operated valves have similar stroke times for both the open and close direction. Since all of the valves performed as required when tested, it has been determined that all of the affected components and systems would have performed their required safety function. This event is not considered safety significant.

A similar occurrence had occurred on November 29, 1989, when a review of Surveillance Instruction (SVI-E22-T2001), "HPCS Pump and Valve Operability Test," revealed that a prior temporary change deleted provisions for inservice testing of a check valve in the HPCS system. In this situation, the function of the check valve was to provide thermal relief for the volume between two isolation valves in a test return line. In this application, the failure to test this valve did not impact the operability of the HPCS system. The cause for this event was determined to be an inadequate procedure caused by errors in preparation and review during the processing of the procedure change. At the time, this event was considered an isolated occurrence; accordingly, corrective actions were aimed at correcting the immediate problem, and large scale programmatic reviews were not required.

In order to prevent recurrence deficient procedures discovered in this event have been modified as necessary, and appropriate systems have been reviewed to ensure that valves with dual functions are tested in both directions as required by ASME Section XI and Technical Specification 4.0.5. Additionally, an independent review of the ASME Code requirements and Perry's Inservice Testing and Inspection Program is being completed to ensure conformance with all applicable codes and standards. Modifications to the training programs are being evaluated to ensure system engineers who have responsibility for surveillance instruction changes are adequately trained in ASME code requirements. The program for review and approval of surveillance instructions involving pump and valve operability has been modified to ensure reviews by personnel knowledgeable in ASME Section XI requirements are completed prior to instruction approvals.

Energy Industry Identification System Codes are identified in the text as [XX].