NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

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 4

TITLE (4) Failure of Ball Valve and Door Seal Result in Inop[illegible]tainment Airlock Doors and Momentary Loss of Containment Integrity While Techni[illegible] its Containment.

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 8	2 6	8 8	8 8	0 3 2	0 0	0 9	2 3	8 8		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)							
POWER LEVEL (10)	1 0 0		20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
			20.405(a)(1)(i)		50.36(c)(1)	X	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, NRC Form 366A)
			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)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Gregory A. Dunn, Compliance Engineer, Extension 6484	AREA CODE 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	
E	N H	V T V	L 2 3 2	N							
B	N H	S E A L	X 9 9 9	N							

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 August 26, 1988 between 0313 and 0316, with the plant at power, the upper containment airlock inner door was opened to allow exit of a technician from containment while the upper airlock outer door was inoperable resulting in the loss of containment integrity. The upper airlock outer door was inoperable pending completion of retests following seal replacement. The seal had failed due to the formation of a blister. The technician was inside containment when the lower airlock failed requiring exit through the upper door. The upper air lock outer door was retested satisfactorily and returned to service at 0032 on August 27.

The lower airlock outer door was inoperable due to a failure of a 3-way ball valve stem, which inhibited deflation of one of the door seals. Contributing to this failure was the lack of valve preventive maintenance due to a spare parts restraint and a concern regarding retest performance during power operation. The lower airlock outer door ball valves were rebuilt and the door returned to operable status at 1900 on August 27.

To prevent recurrence, work orders will be initiated to rebuild the remaining airlock door 3-way ball valves. Additionally, repetitive tasks will be developed to rebuild airlock door 3-way ball valves at a frequency commensurate with door usage.

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Perry Nuclear Power Plant, Unit 1	0 5 0 0 0 4 4 0	8 8	— 0 3 2	— 0 0	0 2 OF 0 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

On August 26, 1988 between 0313 and 0316, the upper containment [NH] airlock [AL] inner door was opened to allow exit of a technician from containment while the upper airlock outer door was inoperable resulting in the loss of containment integrity. At the time of the event, the plant was in Operational Condition 1 (Power Operation) at 100% of rated power with reactor vessel pressure [RPV] at approximately 1005 psig.

On August 22, 1988 one seal on the upper containment airlock outer door developed a blister. Although a satisfactory "between the seals test" was subsequently performed, the seal was replaced. On August 25 at 2339, following seal replacement a pressure drop test was commenced to reestablish door operability. During the test, the inner door was maintained locked closed in accordance with Technical Specification 3.6.1.3 Action a.1. With one primary containment airlock door inoperable, this action statement requires that the operable door be maintained locked closed. At approximately 0145 on August 26, a chemistry technician entered containment through the lower airlock to perform daily reactor coolant sampling. At 0220 operators attempted to enter containment through the lower airlock. During operation of the door, only one of two door seals deflated leaving the door ajar and incapable of being fully closed or fully opened. Operators and the system engineer were unable to deflate the seal. At 0300 the Unit Supervisor (US) declared the lower airlock outer door inoperable. At that point, the chemistry technician was still inside containment with no operable airlock available through which to exit.

The plant shift supervisor discussed the situation, via telephone, with the Operations Manager and the Nuclear Regulatory Commission (NRC) Senior Resident Inspector and explored possible options available which would permit exit of the technician. The decision was made to exercise the option allowed for under 10 CFR 50.54(x), and open the upper containment airlock inner door. This Rule permits licensees to take reasonable action that departs from a technical specification in an emergency when this action is immediately needed to protect the public health and safety. In this instance, immediate action was considered necessary to protect the safety of the technician. The upper airlock was not scheduled to be returned to operability for another 20 hours and time to repair the lower airlock door was unknown.

At 0313 the upper airlock drop test was suspended and the inner door unlocked and opened allowing exit of the chemistry technician. The inner door was reclosed and subsequently relocked by 0316. The Control Room operators then notified the NRC operations center, in accordance with the reporting requirements of 10CFR50.72, that they had exercised 10CFR50.54(x).

On August 27 at 0032, the upper airlock was satisfactorily retested and declared operable. Troubleshooting of the lower airlock outer door identified a broken valve stem on the 3-way ball valve [VTV] which exhausts air from one of the seals. All four ball valves used in the door mechanism, including the subject valve, were rebuilt and the lower airlock outer door was returned to operable status at 1900 on August 27.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Perry Nuclear Power Plant, Unit 1	0 5 0 0 0 4 4 0	8 8	— 0 3 2	— 0 0	0 3 OF 0 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

The cause of the event was equipment failure. The lower airlock 1/2 inch 3-way ball valve (manufacturer: Contromatics of Litton Ind [L232]; Model No. NP-86413-1) stem failed during cycling operation. The failure is partially attributed to fatigue. Contributing to this problem was the failure to implement a vendor recommended preventive maintenance activity. Two preventive maintenance work orders to rebuild each set of lower airlock door ball valves, in accordance with these recommendations, were initiated in September of 1987 but were not worked by the time of the event. The work orders were identified as preventive maintenance but, as originally planned, required a plant shutdown to perform. This was thought to be necessary because work retests on one door may have impacted the operability of the redundant door. On August 11, two weeks prior to this event, maintenance was performed to correct sluggish operation of the lower airlock outer door linkage and ball valve. The upper airlock outer door was also out of service at this time because of a ruptured seal which required replacement. In order to quickly return the lower airlock door to service, restore containment access and considering the same retests required by the preventive maintenance, only minor adjustments were made to the linkage. No ball valve parts were reworked or replaced. Retests documented that, despite an improvement in the ball valve response, the air bleed off was still considered "slow". The vendor recommended in a 1986 correspondence that preventive maintenance be performed every 6 months or following 5000 valve cycles. The valve which failed had been installed for greater than three years and experienced an estimated 40,000 cycles. After an alternate method to perform the retest was developed, the job was replanned and the preventive maintenance was completed on the outer door as part of the August 27 valve repairs.

The upper airlock door seal (manufacturer: Presray; Part No. 698-18) failures resulted from the formation of blisters. Blisters are believed to have been formed by the movement of entrapped air in the seal outer fabric. This air moves to an area where complete bonding does not exist resulting in the formation of a blister. The seal blistering is considered a vendor supply problem in that it involves the bonding of outside layer of fabric.

The personnel airlocks are welded steel assemblies with double doors, each equipped with double gaskets or seals. The airlock doors are designed as pressure seating doors. Only one closed door in each airlock is required to maintain the integrity of the containment. During this event, the inner door of one airlock was opened for approximately three minutes while the outer door was inoperable. Technical Specification 3.6.1.3 contains a footnote which allows passage into and out of containment during power operation for up to 1 hour (cumulative) per year to repair an inoperable inner airlock door. Although this allowance did not specifically permit the sequence of events which occurred on August 26, its bases would bound any resulting effects on safe plant operation. Therefore, this event is not considered safety significant. Previous Licensee Event Reports have been submitted because of problems with containment airlocks but none involved similar circumstances.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Perry Nuclear Power Plant, Unit 1	0 5 0 0 0 4 4 0	8 8	— 0 3 2	— 0 0	0 4 OF 0 4

TEXT (If more space is required, use additional NRC Form 366A's) (17)

To prevent recurrence, the work order to rebuild the lower airlock inner door ball valves was replanned and is currently included as part of the rotating quarterly schedule. Two additional work orders will be initiated to perform this maintenance on the upper airlock doors. However, because these doors are used less frequently, this activity will be scheduled for a future outage. Additionally, repetitive tasks will be developed to rebuild the airlock door 3-way ball valves at a frequency commensurate with door usage. In accordance with the repetitive task program, rescheduling of these tasks will then require a written evaluation for impact on system operability.

The seal blistering problem was discussed with the manufacturer. Previous blistering problems, identified in the industry, had already resulted in changes to the seal manufacturing and testing processes. The manufacturer indicated that they had not been informed of any blistering problem since implementation of these program changes. It was determined that the subject seals had been shipped to Perry prior to implementation of this program. Seals currently in stock will be evaluated to determine whether additional manufacturer's testing will be necessary. However, current surveillance and preventive maintenance programs for air lock seals are considered adequate to identify blisters on installed seals. Additionally, one of the failed seals will be sent to the manufacturer for evaluation.

Management discussions conducted subsequent to this event indicated that an alternate approach to permit personnel exit from the containment while airlock doors are inoperable would be to enter Technical Specification 3.0.3 instead of exercising 10CFR50.54(x). This event, including options available to resolve a future similar situation, will be discussed as part of routine operator requalification training.

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