NRC Form 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

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LICENSEE EVENT REPORT (LER)

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TITLE (4)

Containment Boundary Isolation Valves Discovered Misconfigured for an Indeterminate Reason

EVENT DAY (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)
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0 3	1 8	9 3	9 3	- 0 2	0 1	0 8	2 5	9 3		0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)				
POWER LEVEL (10)	0 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)	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 (AREA CODE)
C. H. Whittemore, Compliance Licensing	6 1 5 8 4 3 - 7 2 1 0

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 March 18, 1993, at approximately 2030 Eastern standard time, during the performance of a routine containment integrity surveillance, five 1/2-inch drain valves (four component cooling water system and one essential raw cooling water system) were found by the test personnel to be misconfigured. None of the valves had the required locking device installed, and two of the valves were open approximately one turn. The valves were immediately closed and locking devices were procured and installed. Investigation identified several possible causes for the condition which included procedure weaknesses and configuration control/performance/process weaknesses. Corrective actions to address these causes include procedure reviews and revisions, extensive plant configuration verification efforts, Operations performance improvement initiatives, and process improvements. Revision 1 to this LER provides additional information and revised corrective actions concerning this event.

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

I. PLANT CONDITIONS

Unit 2 was in Mode 5 in a forced outage.

II. DESCRIPTION OF EVENT

A. Event

On March 18, 1993, at approximately 2030 Eastern standard time (EST), during the performance of a routine containment integrity surveillance, five 1/2-inch drain (EIIS Code DRN) valves (EIIS Code V) were found by the test personnel to be misconfigured. Four of the valves are drain valves inside containment for the excess letdown heat exchanger (EIIS Code HX) component cooling system (CCS) (EIIS Code CC) piping. The other valve is a drain valve in the essential raw cooling water (ERCW) (EIIS Code BI) system for the lower compartment coolers (EIIS Code BK), control rod drive mechanism coolers (EIIS Code CD), and reactor coolant pump motor coolers (EIIS Code AB). None of the valves had locking devices, and two valves were found to be approximately one turn open. The routine containment integrity surveillance instructions (SIs) require all five valves to be closed and secured. The Unit 2 assistant shift operations supervisor (ASOS), assisted by the test personnel, closed and locked the valves.

B. Inoperable Structures, Components, or Systems That Contributed to the Event

None.

C. Dates and Approximate Times of Major Occurrences

1. March 19, 1992 — A containment isolation valve leak-rate test verified the valves to be closed, capped, and secured.

2. May 1, 1992 — A containment integrated leak-rate test was performed, and the valves were returned to the line-up required by the SI, i.e., closed and capped.

3. May 1-6, 1992 — Valve alignment checklists for the valves were performed, verifying the valves to be closed and capped.

4. May 1-7, 1992 — The containment integrity verification surveillance was performed. The valves were verified closed, capped, and secured.

Because the above checklists were being performed concurrently and do not contain verification times for individual valves, it is inconclusive as to the order the checklists were performed on these valves.

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5. March 18, 1993 A routine surveillance verifying the integrity of containment was performed.

D. Other Systems or Secondary Functions Affected

None.

E. Method of Discovery

The event was discovered during routine performance of a containment integrity surveillance.

F. Operator Actions

The test personnel (auxiliary unit operator [AUO]) that discovered the conditions informed the Unit 2 ASOS. The ASOS and AUO investigated the condition and immediately closed the valves and then proceeded to procure locking devices. The valves were secured before the end of the shift. The AUO and ASOS reported that the caps were still intact and not leaking.

G. Safety System Responses

None required.

III. CAUSE OF EVENT

A. Immediate Cause

The immediate cause of this event was the failure to maintain configuration control in that five containment boundary isolation valves were not locked, and two of the valves were open approximately one turn.

B. Root Cause

Investigation of this event identified several possible causes for each of the conditions, i.e., valves unlocked and valves not fully closed, as listed below. While it could not be determined which of these causes resulted in the given conditions, corrective actions are being taken to address each of the causes.

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Relative to the valves not being secured:

1. Procedure/drawing inadequacies and inconsistencies existed. The valve alignment checklists were being performed during the same time frame as the containment integrity verification SI. The valve alignment checklist may have been performed subsequent to the "Verification of Containment Integrity" SI for the subject valves. Since the valve alignment checklist did not require the valves to be locked, the locks may have been removed after the containment integrity verification SI was completed. This seems to be the most plausible explanation; however, failure to further investigate this type of disagreement between the procedure and the as-found component configuration represents lack of appropriate sensitivity to configuration management issues. It was also determined that the associated plant drawings do not indicate the locked closed requirement for these and similar valves that are required to be locked closed.

2. The containment integrity SI may have been incorrectly performed, leaving the valves unlocked.

Relative to the valves found open:

1. The valves may have been inadvertently manipulated or bumped open. It should be noted that these are T-handle valves.

2. SIs or valve checklist instructions may have been improperly performed.

IV. ANALYSIS OF EVENT

This condition was discovered while performing a routine containment integrity surveillance during a shutdown; the previously documented movement and closure of these valves was during the routine containment integrity surveillance that was performed in May 1992. It is assumed that these valves could have been misconfigured from approximately May 1992 until March 1, 1993; Unit 2 was operating in Mode 1 at full power for most of this period.

The ERCW drain valve is inside containment on the supply line to the lower compartment coolers and was found closed and capped.

The four component cooling system (CCS) drain valves are inside containment and can be isolated by two motor-operated automatic containment isolation valves. Two of these drain valves were found to be approximately one turn open.

With two CCS drain valves partially open, the inboard side of the containment penetrations must be assumed to be effectively open to the containment atmosphere because no credit can be taken for the caps. The caps are not constructed of the same quality level as the containment penetrations and are not considered containment isolation barriers.

While this condition constituted some degradation of the containment integrity provisions for the subject penetrations, it is considered very unlikely that any containment atmosphere leakage would have occurred as a result of the numerous other barriers that were in place, i.e., threaded caps, CCS water-filled penetration and lines, outboard motor-operated valves, and CCS filled pressurized Class C piping outside containment. Further, any postulated leakage would have been filtered by either the annulus emergency gas-treatment system or auxiliary building gas-treatment system. Therefore, this event is not considered to have resulted in any adverse safety consequences.

V. CORRECTIVE ACTION

A. Immediate Corrective Action

Each valve was placed in the correct position and secured.

B. Corrective Actions to Prevent Recurrence

The following corrective actions are being taken to address potential causes.

1. Procedures that manipulate valves, breaker positions, or fuse removal, etc., will be reviewed to ensure that configurations for common components are consistent. Procedures that require revisions as the result of the review mentioned above will be revised before their use supporting restart of the respective units from the current outages.

2. Nuclear Engineering (NE) will revise the appropriate engineering drawings to remove all references to locked/secured valves.

3. A systematic verification of the configuration of required components will be performed on each unit. Primary and secondary process system components will be verified to be correctly configured before restart of their respective units.

4. A more positive method of locking T-handle valves will be developed.

5. To minimize the potential for inadvertent valve manipulation, e.g., bumping, the sequence for containment closeout and containment integrity verification closeout will be revised. Containment integrity verification will be performed sufficiently late in the schedule (as near as practicable to the administrative closure of containment).

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6. Management's expectations regarding the initiation of the appropriate corrective action document on finding components in other than expected configurations will be communicated to Operations personnel.

7. Extensive actions are ongoing to strengthen the SQN configuration control process and implementation including: clear definition of expectations and ownership for Operations personnel; verification process and training upgrades; procedure and drawing reviews/revisions to ensure correct component configuration; additional training on consistent methods for verifying various types of components; and plant/design review to ensure that plant components requiring configuration control are captured in procedures.

8. SQN has developed a procedure that will be used to control all secured valves. This procedure has incorporated those valves that NE has identified as being required to be secured because of design basis criteria and also those valves that have been identified by plant operations that are administratively required to be secured.

VI. ADDITIONAL INFORMATION

A. Failed Components

None.

B. Previous Similar Events

A previous event was identified that involved mispositioned and inadequately secured valves. LER 50-328/91007 dated December 10, 1991, describes the discovery of three partially open ERCW test-connection valves that were required to be closed and secured for containment integrity. The root cause of this event was indeterminate. Procedures affecting these valves were also inconsistent in the locking requirements. The corrective action associated with this event focused only on the procedures directly affecting the three ERCW test valves. Another corrective action associated with the previous event had not yet been implemented. Containment valves that should be secured, according to design criteria, were to be identified and indicated as secured on the appropriate flow diagrams. This action is scheduled to be completed by April 30, 1993. Either of these corrective actions could possibly have prevented the subject valves from not being properly secured. The generic problem of unsecured valves as a result of procedure inconsistencies was not recognized at the time of this previous event. Initiatives are ongoing to effect improvements in the site corrective action programs to promote thorough evaluation and bounding of the extent of condition and timely implementation of comprehensive corrective actions.

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Several additional occurrences were identified involving mispositioned valves. Causes included: different techniques used, broken valve position indicators, inaccurate valve indicators, personnel errors, broken valve stems, and inadequate procedures. The causes in most cases were well defined and corrective actions were specific to the cause. As indicated by corrective action 5, broad initiatives are ongoing to improve overall SQN control of configuration.

VII. COMMITMENTS

1. Procedures that manipulate valves, change breaker position, or require fuse removal will be reviewed by May 28, 1993, to ensure that configurations for common components are consistent.

2. Procedures that require revisions as the result of the review mentioned above will be revised before their use supporting restart of the respective units from their current outages.

3. NE will revise the appropriate engineering drawings to remove all references to locked/secured valves. This will be accomplished by November 15, 1993.

4. A systematic verification of the configuration of required components will be performed on each unit before its respective restart. Primary process system components will be verified to be correctly configured before restart of respective units.

5. Appropriate procedures will be revised so that containment integrity verification will be performed sufficiently late in the schedule (as near as practicable to the administrative closure of containment) to minimize the potential for undetected inadvertent bumping or jarring of equipment. This will be accomplished before restart of the respective units from their current outages.

6. A more positive method of locking T-handle valves will be developed by June 4, 1993.

7. Management's expectations regarding the initiation of the appropriate corrective action document on finding components in other than expected configurations will be communicated to Operations personnel by May 17, 1993.