NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. 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

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1):	DOCKET NUMBER (2)	PAGE (3)
Braidwood Unit 1	05000456	1 of 4

TITLE (4) Main Steam Safety Valves (MSSVs) tested in excess of required setpoint due to suspected metallic bonding.

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
09	03	98	98	004	00	10	02	98	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	01
POWER LEVEL (10)	072

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

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(iii)	☐ 73.71(b)
☐ 20.2203(a)(1)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(iv)	☐ 73.71(c)
☐ 20.2203(a)(2)(i)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(v)	☐ OTHER
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)	☐ 50.73(a)(2)(vii)	
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)
☐ 20.2203(a)(2)(iv)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(ii)	☐ 50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Jim Kuchenbecker, System Engineering Supervisor	(815) 458-2801 Extension 2243

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	HBC	Valve	C568	Yes						

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE)		NO		06	28	99

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

During setpoint verification testing of Unit One Main Steam Safety Valves (MSSVs), 5 valves lifted in excess of their setpoints by greater than the 3% Technical Specification tolerance. Following the identification of the test failures, the appropriate Limiting Condition of Operation Action Requirement (LCOAR) was entered in each case. The valves were adjusted as necessary and retested to place them in the accepted tolerance range prior to exiting the LCOARs.

The root cause of the MSSV test failures has not yet been determined, however a suspected cause of the high initial lift phenomenon is associated with metallic bonding between the disc and nozzle seats caused by differences in the coefficient of expansion between the disc and the nozzle. The investigation is on-going and a supplement to this report will follow when additicnal information is obtained.

Corrective actions include further evaluating a disc removed from one of the valves and reviewing historical data to assess the cause of the test failures. An evaluation of the safety consequences concluded that the acceptance criteria for the applicable Updated Final Safety Analysis Report (UFSAR) accident scenarios were not exceeded. This event is being reported pursuant to 10CFR50.73(a)(2)(i)(B).

A. **PLANT CONDITIONS PRIOR TO EVENT:**

Unit(s): 01 Event Date: 9/3/98 Event Time: 0456 HOURS
Reactor Mode(s): 01 Power Level(s): 072 RCS [AB] Temp./Press. NOT / NOP

B. **DESCRIPTION OF EVENT:**

There were no systems or components inoperable at the beginning of this event that contributed to the severity of the event.

This event is being reported pursuant to 10CFR 50.73(a)(2)(i)(B), "Any operation or condition prohibited by the plant's Technical Specifications."

On September 3, 1998, setpoint verification testing (Trevitesting) of 20 Unit 1 Main Steam (SB) Safety Valves (MSSVs) was initiated. The MSSVs are tested individually during each cycle as part of the station's In-Service Testing (IST) Program. The IST Program requires testing of 20% of the valves (4 valves), however the station routinely tests all 20 valves. The tests verify that the actual MSSV lift settings are in accordance with Technical Specification 3/4.7.1.1, Table 3.7-2. The Technical Specifications allow a +/- 3% tolerance on the as found lift setting, but require all tested valves to be set to +/- 1% in the as left condition. The test determines each valve's actual lift setting using normal system pressure with assistance from a hydraulic testing device.

Results from the Trevitesting revealed that 5 out of 20 valves lifted in excess of their setpoints by greater than the 3% Technical Specification tolerance. The specific valves and the amount the valves lifted in excess of the setpoint are; 1MS014B (+7.5%), 1MS016B (+9.7%), 1MS017C (+6.1%), 1MS016D (+7.5%), and 1MS014D (+7.8%).

Following the identification of the valve test failures, Limiting Condition of Operation Action Requirement (LCOAR) 7.1.1-1a, "Plant Systems Turbine Cycle Test Valves," was entered for each valve failure. Second lift tests were performed on each valve prior to performing any adjustments and all lifted within the 3% Technical Specification limit. The valves were subsequently adjusted as needed and additional lift tests were performed until the requirements stated in the station's procedure, BwMP 3305-107, "Main Steam Safety Valves Lift Point Verification Using the Furmanite Trevitest System," were satisfied (two consecutive lift tests within +/- 1% of the required setpoint). Following the successful execution of the testing, the LCOARs were exited for each valve.

C. CAUSE OF EVENT:

The root cause of the MSSV failures has not yet been determined, however industry experience has shown that the high initial lift phenomenon may be due to metallic bonding between the disc and nozzle seats caused by differences in the coefficient of expansion between the disc and the nozzle. The investigation of the high initial lift phenomenon is on-going and a supplement to this report will follow when additional information is obtained.

D. ASSESSMENT OF SAFETY CONSEQUENCES:

The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. These valves also provide protection against over-pressurizing the reactor coolant pressure boundary by providing a heat sink for the removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser (SD) and Circulating Water (KE) System, is not available.

The design basis for the MSSVs is to limit the secondary system pressure to ≤110% of design pressure for any Anticipated Operational Occurrence (AOO), or accident considered in the Design Basis Accident and transient analysis. The events that challenge the relieving capacity of the MSSVs, and thus RCS pressure, are those characterized as decreased heat removal events, which are presented in the Updated Final Safety Analysis Report (UFSAR), Section 15.2. Of these, the full power turbine trip without steam dump is the limiting AOO with respect to secondary system pressure. This Loss of Load event along with the Small Break LOCA and Spurious SI events were evaluated by ComEd's Nuclear Fuels Management (NFM) group utilizing A1R07 Trevitest data. The evaluation indicated that the acceptance criteria for the above-mentioned events were not exceeded.

E. CORRECTIVE ACTIONS:

An evaluation of the recent Trevitest data was performed by Nuclear Fuels Management. This evaluation concluded that the acceptance criteria for the applicable UFSAR accident scenarios were not exceeded.

Five valves, four of which had initial valve lifts within the 3% criteria, were rebuilt during the current refueling outage (A1R07). The fifth valve, 1MS016B, is one of the population exhibiting a high initial lift setting. An on-site representative from Consolidated Dresser, Incorporated, the valve manufacturer, will perform the lapping of the valve surfaces to ensure they are reconditioned as required. The disc from 1MS016B and a disc from one of the other four valves (to be used as a comparison) will be further evaluated. The results from this evaluation will be assessed to validate the industry experience. This action

was assigned a due date of 2/15/99 (NTS#45618098SCAQ0004A03).

A review of past MSSV rebuild work packages, procedure revisions, and differences between Braidwood and Byron MSSV maintenance practices will be conducted to assess whether these factors could have contributed to the MSSV test failures. Based on this review, changes will be incorporated into the rebuild procedure. This action is scheduled for completion by 3/1/99 (NTS#45618098SCAQ0004A04).

A supplemental report is expected to be submitted by June 28, 1999, following the evaluation of the investigation results and other industry developments (NTS#45618098SCAQ0004A08).

F. PREVIOUS OCCURRENCES:

Test failures were encountered during previous outages at Braidwood Station. Following the identification of these failures, all of the valves were successfully set to within +/- 1% of the Technical Specification requirements.

G. COMPONENT FAILURE DATA:

MANUFACTURER	NOMENCLATURE	MODEL	MFG. PART NO.
Dresser	Main Steam Safety Valve (MSSV)	3707R	