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 MANDATORY 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 (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, D. 20503.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
WATERFORD STEAM ELECTRIC STATION UNIT 3	05000 382	1 OF 5

TITLE (4)
TS 3.6.3 Noncompliance Due To Design Error Associated with the CARs CIVs

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
									N/A	05000
11	14	97	97	-029-	00	12	15	97	N/A	05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

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

	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
T.J. GAUDET, LICENSING MANAGER	(504) 739-6666

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
X YES (If yes, complete EXPECTED SUBMISSION DATE).	NO		03	30	98

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

On November 14,1997, with Waterford 3 in Mode 1 and at 100% power, a condition was discovered wherein the normally closed inside and outside Containment Isolation Valves for the Containment Atmosphere Release System are subject to a single failure which could result in failure of the isolation valves to automatically close or remain closed upon receipt of a Containment Isolation Actuation Signal. The provisions of TS action statement 3.6.3b require inoperable automatic isolation valves to be closed and deactivated. The valves were closed, except briefly during surveillance testing, but were not deactivated as specified. This circumstance was discovered while performing the quarterly surveillance test procedure. The procedure had been recently revised due to the failure to test safety related logic circuits pursuant to Generic Letter 96-01 (see LER 97-029-00). At the time of this event, TS 3.6.3 had been previously entered. The applicable valves remain inoperable per TS action 3.6.3b. The preliminary root cause is an inadequate design. Various plant modifications are being considered to resolve this condition. This condition did not compromise the health and safety of the public.

REPORTABLE OCCURRENCE

This event involves a failure to comply with the Limiting Condition for Operation (LCO) required by Technical Specification (TS) 3.6.3 with respect to Containment Atmosphere Release System (CARS) Containment Isolation Valves (CIVs) [ISV]. A design error was identified which compromised the licensing basis of these automatic CIVs. Based on this condition, these valves were determined to be inoperable. Consequently, the B train containment isolation valves should have been considered inoperable in the past and at least one of the valves should have been de-energized in accordance with the ACTION statement. The failure to comply with a TS LCO and its associated action requirements is reportable pursuant to 10CFR50.73(a)(2)(i)(B) as a condition prohibited by TS.

INITIAL CONDITIONS

At the time of this event, Waterford 3 was in Mode 1 with the reactor at 100% power. CIVs CAR-201A(B) had been declared inoperable on November 13, 1997, because associated Engineering Safety Features Actuation Signal (ESFAS) contacts had not been previously tested pursuant to Generic Letter 96-01 (See LER 97-029-00). TS 3.6.3 Limiting Conditions for Operation (LCO) were in effect.

EVENT DESCRIPTION

The CARS provides the capability for controlled purging of the containment to aid in cleanup following a Loss of Coolant Accident. The CARS Train B has a motor operated valve, CAR-201B, inside containment and a pneumatic valve, CAR-202B, outside containment. CAR-201B receives a close signal via relay K209B and an open signal via an ONX relay energized when the associated CARS exhaust fan starts. CAR-202B receives an open and close signal via relay K210B. In addition, CAR-202B closes automatically upon receipt of a high radiation signal. Train A is similar except that it has a manual containment isolation valve outside containment which is administratively controlled during normal plant operations in accordance with the TS. The containment

isolation valves in both trains are normally closed. The valves are only opened momentarily (approximately 10 minutes) during quarterly stroke testing in accordance with OP-903-094, "ESFAS Relay Testing." The valves automatically close on receipt of a CIAS.

On November 14, 1997, at about 0545, while performing OP-903-094, CAR-201B closed as expected then immediately reopened. Subsequent investigations revealed that while performing OP-903-094, the Train B valves do not have the capability to withstand a single failure. For example, if the valves receive a CIAS during the time they are open and the CARS exhaust fan has received a start signal and the K210 relay associated with CAR-202B fails, then the associated penetration will not isolate. Under this scenario, CAR-201B will receive a close signal from the K209B relay and an open signal from the ONX relay. In consequence, CAR-201B would cycle from closed to open. Valve CAR-202B will not close due to the postulated K210B relay failure. The loss of capability to withstand a single failure is only credible during the performance of OP-903-094 when these CIVs are opened.

The Train A is not susceptible to the single failure scenario described above.

CAUSAL FACTORS

The investigation into this event is not yet complete. Preliminary investigations, however, indicate the root cause of this event is inadequate design. A contributing cause is inadequate TS Surveillance Test procedures (see LER 97-029-00).

CORRECTIVE MEASURES

Corrective measures taken or planned include:

1. Valve CAR-201B was declared inoperable. Pursuant to Technical Specification 3.6.3, the Train B penetration was isolated by deactivating CAR-201B in the closed position.

2. Various plant modifications are being considered to address the single failure vulnerability.

3. Final Corrective Action will be provided in a supplement to this LER.

SAFETY SIGNIFICANCE

CARS Train B has a design deficiency in which the capability to withstand a single failure is not maintained for all plant configurations. If the CIVs receive a CIAS during the time they are opened for quarterly surveillance testing and the CARS exhaust fan has received a start signal and the K210 relay associated with CAR-202B fails, then the associated penetration will not isolate. This vulnerability does not exist on CARS Train A, nor does it exist on CARS Train B during normal operations when the CIVs are closed. There is no single failure that could open the valves during normal operation.

Given the single failure scenario, plant safety is not compromised because of the low probability of occurrence of such an event during the 10 minute duration of the TS Surveillance test. The time frame for the scenario is within the range of limitations prescribed by TS 3.6.1.1, "Containment Integrity," and TS 3.6.3, "Containment Isolation," which have LCO Action time limitations of 1 and 4 hours, respectively. Furthermore, CAR-202B closes automatically upon receipt of a high radiation signal. Because of the low probability of concurrent accident prerequisites and automatic closure of CAR-202B upon receipt of a high radiation signal, this condition did not compromise the health and safety of the public.

SIMILAR EVENTS

No previous similar reportable events were identified at Waterford 3 during the last two years that involved a single failure vulnerability and the failure to comply with TS 3.6.3.

ADDITIONAL INFORMATION

Energy Industry Identification System (EIIS) codes are identified in the text within brackets [ ].