

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the 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, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)
CONSUMERS ENERGY COMPANY - PALISADES NUCLEAR PLANT

DOCKET NUMBER (2)
05000255

PAGE (3)
1 OF 3

TITLE (4)
REDUCTION IN SERVICE WATER FLOW THROUGH CONTAINMENT AIR COOLERS VHX-1 AND VHX-2

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
10	31	1999	1999	003	00	11	30	1999		05000
										05000

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
N	000	20.2201(b)	20.2203(a)(2)(v)	X	50.73(a)(2)(i)
		20.2203(a)(1)	20.2203(a)(3)(i)		50.73(a)(2)(ii)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)
		20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)
		20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)
		20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)

LICENSEE CONTACT FOR THIS LER (12)

NAME Daniel G. Malone, Regulatory Activities Administrator	TELEPHONE NUMBER (Include Area Code) (616) 764-2463
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
E	BI	VALVEC	A391 V085	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE).			01	31

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

On October 31, 1999, with the plant in Refueling Shutdown, the Containment Air Cooler (CAC) [CLR] service water [BI] discharge check valves [V] associated with CACs VHX-1 and VHX-2 were discovered to have incurred severe damage to their internal components, including detachment of the check valve disc from the disc arm. The disc itself was found in both cases to be wedged in the respective check valve outlet port in an orientation which was largely obstructing the outlet. As a result of the associated reduction in service water flow through the corresponding CACs, CAC VHX-1 and CAC VHX-2 may have been inoperable for a period of time in excess of the Technical Specification allowed outage time for this equipment. In accordance with this assumption, this occurrence is reportable pursuant to 10CFR50.73 (a)(2)(i)(B), as a condition prohibited by Technical Specifications.

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

EVENT DESCRIPTION

On October 31, 1999, with the plant in Refueling Shutdown, visual examination of Containment Air Cooler (CAC) service water discharge check valves (CK-SW407, CK-SW408, CK-SW409 and CK-SW410) was performed. This examination revealed significant damage to the check valves' internal components, including detachment of the check valve disc from the disc arm in three of the four check valves. Two of the detached discs were found wedged in their respective check valve outlet ports, largely blocking the valve outlets in the service water flow path associated with CACs VHX-1 and VHX-2. The other detached disc was found in the bottom of its valve body, in a non-obstructing orientation.

Technical Specification 3.4.1 (a) requires that the reactor shall not be made critical unless CACs V1A (VHX-1), V2A (VHX-2) and V3A (VHX-3) are operable. Technical Specification 3.4.3 allows two CACs to be simultaneously inoperable for no more than 24 hours. Based upon the as-found condition of the check valves, CACs VHX-1 and VHX-2 may have been inoperable for a period of time in excess of the allowed outage time. In accordance with the above assumption, this occurrence is reportable pursuant to 10CFR50.73 (a)(2)(i)(B), as a condition prohibited by Technical Specifications.

ANALYSIS OF EVENT

On September 15, 1999, a sudden unexplained drop of approximately 400 gpm was indicated on containment service water flow instrumentation. This reduction in indicated flow was regarded at the time as most likely the result of variance in the indication, and was not regarded as a genuine reduction in service water flow. It now appears likely that this was the time of occurrence of the failure of either CK-SW407 (VHX-1) or CK-SW408 (VHX-2). Prior to September 15, 1999, overall service water flow indication to containment had remained at expected values even though it can now be presumed that one of the two check valves had already failed prior to September 15, 1999.

The safety function of each check valve is to remain open in order to pass a minimum of 1600 gpm of service water flow through its respective CAC to limit post accident containment pressure and temperature. Despite the as-found condition of CK-SW407 and CK-SW408, they were observed during non-intrusive check valve testing on October 29, 1999, to be capable of passing significant flow. Indicated flow in this non-accident service water alignment through VHX-1 and VHX-2 was observed at 1450 gpm and 700 gpm, respectively. These flow observations suggest that CACs VHX-1 and VHX-2 may have retained a substantial portion of their required capability, even if unable to be regarded as

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operable with a verifiable flow rate in excess of 1600 gpm to each under accident service water flow conditions.

SAFETY SIGNIFICANCE

The limiting analyzed scenario with respect to adverse containment parameters is the response to a postulated Main Steam Line Break (MSLB) event. Analysis of this event considering the impact of reduced flow through two CACs is in progress. A supplement to this LER will be submitted when the analysis is completed.

ROOT CAUSE

The excessive wear of the check valve internals appears to be caused by disc fluttering as a consequence of the relatively low service water flow through the check valves which is experienced during normal plant operation. The normal flow rate through a CAC with its accident condition high capacity outlet valve closed is only approximately 1000 gpm. The flow rate needed to maintain the check valves in the full open position has been calculated to be approximately 1300 gpm.

CORRECTIVE ACTIONS TAKEN

Each of the check valves has been refurbished and enhancements have been incorporated to provide a high degree of confidence that the check valves will remain intact for the duration of the forthcoming operating cycle.

In addition, alternatives are being explored to increase service water flow through the check valves to minimize fluttering of the internals and hence reduce the opportunity for excess wear.