NRC-00-058

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
Kewaunee Nuclear Power Plant
North 490, Highway 42
Kewaunee, WI 54216-9511
920-388-2560

July 31, 2000

10 CFR 50.73

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Reportable Occurrence 2000-004-01

In accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System," the attached Licensee Event Report (LER) for reportable occurrence 2000-004-01 is being submitted. This report does not contain any new commitments.

Sincerely,

Mark L. Marchi
Vice President-Nuclear

GIH

Attach.

cc - INPO Records Center
US NRC Senior Resident Inspector
US NRC, Region III

IE22

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(6-1998)

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001

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.

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TITLE (4)

Unplanned ESF Actuation Caused By Radiation Monitor R-15 Detector Failing – Repeat Occurrence

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
04	15	2000	2000	-- 004 --	01	07	31	2000		05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	N
POWER LEVEL (10)	097

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

	20.2201(b)		20.2203(a)(2)(v)		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)	X	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)
Gary I. Harrington – Licensing Leader	(920) 388-8559

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
X	IL	DET	N330	Y					

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 15 single-spaced typewritten lines) (16)

The following event is reportable as an unplanned actuation of steam generator blowdown isolation valves which are engineered safety features (ESF) equipment. On April 15, 2000, while the plant was operating at full power, radiation monitor system channel R-15, "Condenser Air Ejector Gas Radiation Monitor," failed. As a result, inadvertent blowdown isolation occurred. R-15 failed due to a failed radiation detector. The detector was replaced and tested. The monitor was returned to service when the detector was replaced and tested on April 16, 2000 at 1430.

The consequence of the failure was that steam generator blowdown and blowdown sample isolation actuated as designed. During the monitor's unavailability the normal continuous steam generator tube leakage monitoring capability was inhibited. Compensatory actions were initiated in accordance with requirements. Since the design function of the system was fulfilled and compensatory actions were initiated, there were minimal safety consequences to this event. The blowdown isolation (motor operated) valves were not adversely challenged by the additional operation caused by the failure.

This event is a repeat occurrence. A previous detector failure occurred on March 16, 2000. The cause of these failures has not been conclusively determined. Initial evaluations of the failures suspected moisture intrusion as the cause. However, manufacturer testing could not isolate the failure mechanism to moisture intrusion. Therefore, the definitive cause remains unknown.

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

DESCRIPTION OF EVENT

This report describes an inadvertent actuation of the steam generator [SG] blowdown isolation valves [ISV] that are engineered safety features (ESF)[JE] components. The event occurred on April 15, 2000, at 2045, with the plant at full power. The event occurred when radiation monitor system [IL] channel R-15, "Condenser Air Ejector Gas Radiation Monitor," failed. The failure caused steam generator blowdown isolation.

Blowdown isolation valves BT-2A, BT-3A, BT-2B, and BT-3B closed as designed. Blowdown sample line isolation valves BT-31A, BT-31B, BT-32A and BT-32B also closed as designed. All of the valves are designated containment [NH] isolation valves. BT-2A, BT-2B, BT-3A and BT-3B also have an ESF function to close on Auxiliary Feedwater (AFW)[BA] pump [P] start signals to ensure adequate AFW flow to the steam generators in the event of a loss of main feedwater [SJ] or safety injection. The AFW system was not in operation at the time nor was the AFW system challenged by the R-15 failure.

In response to the situation, the operating shift personnel implemented operating procedure A-RM-45, "Abnormal Radiation Monitoring System." In accordance with the procedure, shift personnel verified that automatic actuations occurred as designed.

CAUSE OF EVENT

The ESF actuation was caused by a failure of channel R-15 radiation monitor. The monitor failed due to a radiation detector [DET] failure. The detector is a GM tube type detector. The specific cause of why the detector failed is unknown. However, moisture intrusion into the detector causing an internal short is suspected because the detector's sealing surface was broken. The detector that failed was recently repaired and only in service for one day. The previous event, reported as Licensee Event Report (LER) 2000-003-00, resulted from a failed detector that was only in service for approximately two and one half hours.

Various lab tests conducted by Kewaunee's radiation monitoring system vendor have been inconclusive. The vendor tests have been in applications similar to the detector application at Kewaunee. However, the testing has

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been unable to isolate the failure to moisture intrusion. One issue that has been concluded is that the failure mechanism has been isolated to the detector itself.

ANALYSIS OF THE EVENT

This report is being submitted in accordance with 10CFR50.73(a)(2)(iv) as an actuation of steam generator blowdown isolation valves which are ESF components. The circuitry that initiates closure of the blowdown isolation valves on a high radiation signal is not an engineered safety feature. Blowdown isolation is considered an ESF function because the isolation valves receive a signal to close when an AFW pump receives a signal to start. The blowdown and blowdown sample valves are containment isolation valves. This event was reported in accordance with 10CFR50.72(b)(2)(ii) on April 15, 2000 at 2228 Central Standard Time (CST).

There were no elevated radiation levels present at the time of the event. Therefore, there were no safety implications associated with this event. Additionally, radiation monitor channel R-19, the steam generator blowdown sample radiation monitor, remained available and was returned to service once blowdown and blowdown sampling was restored. The automatic actuation signals provided by R-15 are duplicated by R-19. However, R-15 is more sensitive to radiological in-leakage to the steam generators than R-19.

The R-15 radiation monitor is relied upon to provide timely and the most sensitive steam generator tube leakage indication to the control operators. With R-15 out of service, the capability to monitor steam generator leakage on a continuous basis was inhibited. Compensatory air ejector sampling had been established per the Off-site Dose Calculation Manual (ODCM). At the time of the event, steam generator tube leakage was approximately 7.9 gallons per day (gpd). This is significantly below the allowed Technical Specifications operating limit of 150 gpd. Also, the leakage is significantly below the steam generator leakage monitoring program limiting action level of 30 gpd.

There was no inordinate challenge to the blowdown valves due to the inadvertent actuation. The valves are motor operated and they operated properly.

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CORRECTIVE ACTIONS

The failed detector was replaced, tested and the monitor returned to service on April 16, 2000, at 1430. In the interim, while R-15 was not available to monitor for steam generator leakage, compensatory actions to monitor for leakage were established according to the requirements of the ODCM.

Subsequent to the detector failure on March 16, 2000, the Nuclear Research Corporation vendor had been contacted to provide assistance in determining the failure mechanism for the detector. Subsequent to this event, the vendor was contacted again and arrangements were made to bring vendor representatives on site for additional assistance.

To date, Kewaunee's instrument and control engineering staff continues to evaluate the acceptability of the detectors we have available for installation. The equipment vendor is also being consulted as to the available options to ensure continued operation of the radiation detectors. Kewaunee is currently in a scheduled refueling outage and it is our intent to have the problems we have encountered with our detectors resolved prior to startup.

ADDITIONAL INFORMATION

The failure of the detector and radiation monitoring channel does not constitute a safety system functional failure as defined by NEI 99-02, rev 0. The failure resulted in the instrument actuating its design protective feature. The mitigation feature of the system was satisfied as a consequence of the instrument failure.

SIMILAR EVENTS

- LER 95-004-00, "Key Switch Failure on Radiation Monitor R-19 Results in Partial Steam Generator Blowdown Isolation."
- LER 1999-005-00, "Internal Power Supply Failure for Radiation Monitor R-19 Results in Steam Generator Blowdown Isolation."
- LER 2000-003-00, "Unplanned ESF Actuation Caused By Radiation Monitor R-15 Detector Failing."

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EQUIPMENT FAILURES

Radiation Monitor: Manufactured by Nuclear Research Corporation (APTEK NRC), M# ADM-610A V5 GM Detector, MD-12E, GM Tube Type: TGM N108-FL/500V