

CATEGORY 1

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FACIL:50-305 Kewaunee Nuclear Power Plant, Wisconsin Public Service 05000305
AUTH.NA/IE AUTHOR AFFILIATION
HARRINGTON,G. Wisconsin Public Service Corp.
MARCHI,M.L. Wisconsin Public Service Corp.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 98-001-00:on 980108,two component cooling water pumps out of service simultaneously were noted.Caused by lack of questioning attitude among plant staff.Addl guidance has been provided to operations staff.W/980209 ltr.

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Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
600 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002
1-920-433-5544 fax

February 9, 1998

10 CFR 50.73

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

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Reportable Occurrence 98-001-00

In accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System," the attached Licensee Event Report (LER) for reportable occurrence 98-001-00 is being submitted.

Sincerely,

M. L. Marchi
Manager - Nuclear Business Group

GIH

Attach.

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

9802170067 980209
PDR ADOCK 05000305
S PDR



10001

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: 50.0 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, DC 20503.

FACILITY NAME (1)

Kewunee Nuclear Power Plant

DOCKET NUMBER (2)

05000305

PAGE (3)

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TITLE (4)

Two Component Cooling Water Pumps Out of Service Simultaneously - TS Violation

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
01	08	98	98	001	00	02	09	98	N/A	05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
POWER LEVEL (10)	097	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)(iii)	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)(iii)	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

Gary I Harrington - Engineering and Technical Support - Plant Licensing

TELEPHONE NUMBER (Include Area Code)

(920) 388-8559

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).

X NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

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

On 1/8/98, while the plant was at full power, a condition prohibited by the Technical Specifications (TS) was inadvertently entered. Two component cooling water pumps (CCW), one of which is required to be operable at all times during plant operation, were inoperable for approximately one minute.

Subsequent to repairing the "A" CCW pump and prior to declaring it operable, the "B" CCW pump's manual discharge isolation valve was closed momentarily. This was done to stop the "B" pump in order to retest the "A" pump. Closing the discharge valve prior to stopping a CCW pump is an historical practice to prevent mechanically shocking the CCW system due to rapid check valve closure. The practice was accepted without considering the potential impact on TS requirements. This practice has been employed historically without question following pump maintenance.

Although a formal declaration of operability had not been completed on the repaired pump when the operable pump's discharge valve was closed, the repaired pump's condition was acceptable for satisfying its required functions.

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

DESCRIPTION OF EVENT

On 1/8/98, while the plant was at full power, a condition prohibited by the Technical Specifications (TS) was inadvertently entered. Two component cooling water (CCW)[CC] pumps [P], one of which is required to be operable at all times during plant operation, were inoperable for approximately one minute.

Prior to the event, the "A" CCW pump was replaced with a spare pump. Subsequent to replacing the pump, a performance test was conducted which demonstrated the pump flow and pressure characteristics. The performance test was conducted using Design Change Request (DCR) procedure #2701-1, "Component Cooling Pump 'A' Replacement - Retest." This test provided sufficient evidence to conclude that the pump operating characteristics were in compliance with design requirements. Subsequent to the performance test, further testing was completed to obtain base line data for the normal surveillance testing. The additional testing was conducted using Surveillance Procedure (SP) 31-168, "Component Cooling Pump and Valve Test - IST." SP 31-168 is the surveillance procedure used to satisfy routine periodic in-service test (IST) requirements. The IST performance test was also completed satisfactorily.

The testing noted above was logged as being completed at 1630 hours on 1/7/98 in both the Control Room and Shift Supervisor logs. Both log entries noted that, "Component Cooling Pump A remains OOS" [out of service]. The reason for maintaining the out-of-service status of the pump was logged as, "pending seal repairs." After replacing and testing the "A" pump, it was noted that the mechanical seal on the pump had higher than normal expected leakage. In addition to the seal leak, two other conditions were noted by the maintenance group: the inboard bearing lubrication system had a minor oil leak, and the inboard bearing temperature was slightly higher than expected.

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During the time the "A" pump was being replaced, the "B" pump was operating. After "A" pump was replaced, it was started and the "B" pump was stopped. In order to test the "A" pump it had to be operated at various flows to establish performance curves to verify its design capability. Single pump operation is required to develop the curves. Each CCW pump is sized to provide approximately 100% of the full CCW system loads. Kewaunee's CCW system uses common pump suction and discharge piping. Therefore, running the pumps in parallel would preclude the ability to obtain necessary surveillance data. The instrumentation in the system also limits the ability to obtain independent flow data on a single pump when both are operating. Procedure DCR #2701-1 was developed to operate the "A" pump independent of "B" pump and gather the performance test data using available instrumentation. While the "A" pump was being tested, "B" pump remained in standby.

Following the initial tests of "A" pump, the pump was removed from service to repair the leaking seal and oil leak. After these repairs, "A" was restarted and "B" stopped. The sequence of stopping "B" resulted in closing its manual discharge isolation valve [ISV]. This resulted in both pumps being inoperable simultaneously. The "A" pump had not been declared operable at the time "B" discharge valve was closed to accommodate the pump shift.

Kewaunee normally operates with one CCW pump running and the other in standby. The normal practice for shifting pumps is to close the discharge valve of the pump to be stopped, but only after the second pump is started, and then stopping the pump to be placed in standby. The reason for closing the discharge valve is to prevent mechanical shock to the CCW system caused when the check valve downstream of the pump to be stopped closes, 'check valve slam.' After the pump is stopped, the valve is immediately reopened. As near as can be determined, this practice was instituted prior to plant commercial operation. The practice is presumed to have been initiated to preclude challenges to the system due to repeated mechanical shocks to the system. An early record of the practice can be found in a 1973 normal operating procedure for the CCW

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system. Kewaunee began commercial operation in 1974. Shifting the pumps in this manner is still considered acceptable and is the preferred method for shifting pumps for routine operations and surveillance.

At the time the pumps were shifted to retest the "A" pump after the seal was replaced, the operating shift crew did question whether shifting the pumps should be completed with the discharge valve open on the pump to be stopped. This question was based upon the guidance provided in procedure DCR #2701-1. DCR #2701-1 had specifically stated that the pumps were to be shifted allowing the discharge check valve to slam. This guidance was placed in the DCR procedure since it was recognized that the replacement pump had never been operated, there was no guarantee that it would perform as required. Therefore, a check valve slam was considered acceptable to preclude removing both CC pumps from service simultaneously.

The operating crew viewed the seal replacement as a routine maintenance activity. They followed the normal post-maintenance testing practice which led to this event. They did not recognize that closing the discharge valve of the "B" pump would result in both pumps being inoperable and in violation of the TS. They considered the seal leak, bearing temperature and oil leak as potential operability concerns. It was their understanding that the conditions were acceptable. They understood the pump to be operable based on the tests conducted as part of the DCR. However, they did not make a declaration of operability and felt a retest of the pump using SP 31-168 was necessary.

The practice of shifting pumps in the manner described was accepted by the operating shift following routine maintenance. This has likely been occurring since the practice was first adopted in 1973. Although the personnel involved in the development of the DCR procedure recognized the need for allowing the check valve slam, they failed to recognize the routine post-maintenance test practice.

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CAUSE OF THE EVENT

This event was caused by lack of a questioning attitude among the plant staff. Up to the date of this event, shifting pumps in accordance with the past practice had been accepted without question. Plant staff have not questioned the operability status of the off-going pump as it relates to the TS requirements when the discharge valve is closed.

A number of factors have contributed to the staff's acceptance of shifting pumps in this manner following maintenance: 1) the staff's awareness of the basis for closing the discharge valve, i.e. preventing check valve slam, 2) the short period of time the valve is closed to accomplish the task, approximately one minute, 3) while the valve is closed, an operator is continually standing by to re-open the valve; staff had assumed that this is acceptable when returning a pump to service.

A combination of accepting the historical practice for shifting the pumps and misunderstanding the pump's status resulted in this event. The duty Shift Supervisor (SS) understood the "A" CCW pump was capable of performing its intended function when the operating crew shifted the pumps. His interpretation of the status was based on satisfactory completion of the DCR and surveillance tests. The SS's understanding of the bearing temperature and oil leak were that they would not cause the pump to be inoperable. Although the SS indicated he felt that the "A" CCW pump was operable, he also felt that a retest of the pump was necessary to demonstrate operability. The SS also noted that shifting pumps for testing following seal repairs has been done in the past in the identical manner. The SS's understanding was that the practice of shifting pumps for post maintenance testing was considered acceptable following seal repairs.

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ANALYSIS OF THE EVENT

This event is being reported under 10CFR50.73(a)(2)(i)(B), "an event or condition prohibited by the plant's Technical Specifications." Kewaunee TS require that two CCW trains be operable when the plant is above criticality. The limiting condition for operation (LCO) for the CCW system is one train may be inoperable for 72 hours. For approximately one minute, the only available pump required to satisfy the TS requirement was not officially declared operable. Although a declaration of operability had not been made on the "A" pump, when the "B" pump's discharge valve was closed, the "A" pump's condition was acceptable for satisfying its required functions. Therefore, the plant operating condition remained within analysis assumptions. The safety significance of this event was minimal.

After identifying the conditions found on the "A" pump, management staff met to discuss the status of the "A" CCW pump. One purpose of the meeting was to determine if leaving the "A" pump in service was acceptable considering the seal leak, oil leak and bearing temperature. This meeting was held after the pump shift had occurred and confirmed the SS's informal assessment of operability. The conclusion was that the pump was operable and could continue to be relied upon to satisfy its intended functions indefinitely with the degraded conditions noted. The seal leak was assessed as acceptable and primarily a house-keeping concern, the oil leak had been corrected, and the bearing temperature was found to be within acceptance limits.

The Probabilistic Risk Assessment (PRA) group was contacted following this event. They were requested to determine the increased core damage potential (CDP) and frequency (CDF) for the short duration (one minute) of having both CCW pumps out of service. The PRA group determined that the CDP was 1.572×10^{-8} and yearly CDF increase was 4×10^{-4} or 0.04%. This is well below the EPRI PSA Applications Guide recommended limits.

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CORRECTIVE ACTIONS

Additional guidance has been provided to the Operations staff. This guidance clarifies that prior to shifting CCW pumps, an operability determination is required for the pump to be left in service. This guidance stipulates that if the pump that remains running is not operable, then a pump shift without closing the off-going pump's discharge valve shall be performed.

ADDITIONAL INFORMATION

Based upon this event, a work history review of the CCW pumps was performed for similar occurrences back through 1992. This review found that since 1992 there have been at least ten times where SP 31-189 has been performed to demonstrate pump operability following maintenance on a CCW pump and/or motor. This would indicate that a formal operability assessment had not been completed before the pumps were shifted. As such, the condition noted by this event may have happened before. In each of the examples there was no indication that the pump being tested failed its surveillance test. Therefore, the consequences of earlier events are not significant.

SIMILAR EVENTS

None