



NRC-00-005

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

January 19, 2000

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

10 CFR 50.73

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Reportable Occurrence 1999-006-00

In accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System," the attached Licensee Event Report (LER) for reportable occurrence 1999-006-00 is being submitted.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark L. Marchi".

for
Mark L. Marchi
Vice President-Nuclear

DJM

Attach.

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

JE 22/1

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.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)

Kewaunee Nuclear Power Plant

DOCKET NUMBER (2)

05000305

PAGE (3)

1 OF 6

TITLE (4)

Both Trains of Control Room Post-Accident Recirculation Inadvertently Removed From Service

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
12	20	1999	1999	006	00	01	19	2000		05000
									FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000
<p>OPERATING MODE (9) N</p> <p>POWER LEVEL (10) 096</p> <p>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</p>										
			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)			X 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

David J. Molzahn

TELEPHONE NUMBER (Include Area Code)

(920) 433-1308

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

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

At 0710 CST on December 20, 1999, with the plant at 96.5% power both trains of Control Room Post Accident Recirculation (CRPAR) were rendered inoperable. This event occurred while attempting to rotate running equipment. The Control Room Air Conditioning (CRAC) train B control switch was placed in ON. The CRAC train A was placed in OFF. Train A was placed in OFF in order to allow CRAC train B to start. Train B failed to start because the train A control switch was not placed in OFF within 20 seconds. The CRAC system start logic requires the unit selected to ON to start within 20 seconds after the control switch is placed in the ON position. With train A in OFF and the failure of train B to start, both trains of CRAC were incapable of automatically starting. Since one train of CRAC ventilation must be operating to support CRPAR, both trains of CRPAR were rendered inoperable. Once the operator recognized that train B did not start, the train A control switch was returned to the auto position and the unit returned to service. At 1025 during a review of this event it was determined that both CRAC trains were inoperable for a total of 12 seconds and therefore, both trains of CRPAR were also inoperable for 12 seconds. Having both trains of CRPAR inoperable is a violation of KNPP Technical Specifications that require at least one train of CRPAR to be operable with the reactor critical.

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

DESCRIPTION OF EVENT

The Control Room Air Conditioning (CRAC) system has two air conditioning units [ACU]. Each includes a fan [FAN], filter [FLT] unit, chilled water pump [PMP], and compressor [CMP]. During normal operation one unit operates continuously and the other is in standby. If the operating unit trips off, the unit in standby will automatically start. The logic does not allow both trains of CRAC to be operating at the same time during normal control room ventilation operation and once the control room switch is positioned to ON, a timer relay locks the signal in for 20 seconds. If the CRAC unit selected to ON does not start in 20 seconds, its start signal is then locked out. Normal control room ventilation automatically aligns to post-accident recirculation mode upon receipt of a steam exclusion signal, safety injection/blackout signal, or high radiation in the control room as detected by the ventilation duct monitor. There are two trains of Control Room Post Accident Recirculation (CRPAR) and each train consists of a filter unit and a fan. Each train of CRPAR is dependent on the operability of its associated CRAC fan. A CRAC fan is necessary to ensure compliance with the assumptions for adequate airflow. With no CRAC fan operable, the ability of the CRPAR to remove contaminants is reduced.

At 0710 CST on December 20, 1999, with the plant at 96.5% power, the control room operators were attempting to rotate running equipment. Prior to the event, CRAC train A was operating. A control room operator trainee, under the supervision of a licensed control room operator was performing the task. The sequence of events is as follows:

- 1) The trainee placed the stand-by CRAC train B control switch [HS] to ON, per procedure N-ACC-25.
- 2) Shortly thereafter, the CRAC train A control switch was positioned to OFF.
- 3) After 2 seconds and subsequent to recognizing that CRAC train B did not start, the train A control switch was positioned to AUTO.

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- 4) Upon returning the control switch to AUTO, the CRAC train A unit restarted. After a moment of self-checking, and discussion with the licensed operator, both the control room operator and trainee assumed the CRAC train A control switch was not held in the OFF position long enough and therefore had never stopped.
- 5) The trainee then placed the CRAC train A control switch in the OFF position again. The control switch was maintained in the OFF position for 10 seconds after which the switch was again returned to the AUTO position.
- 6) Upon returning the control switch to AUTO the CRAC train A unit again restarted.

The CRAC train A unit restarted because the CRAC train B unit failed to start. Since the CRAC train B unit did not start, the control room operators left the CRAC train A in the AUTO position (running) and the CRAC train B unit in the ON position pending an investigation. At 1025, during a review of this event, it was determined that both CRAC trains were inoperable for a total of 12 seconds and therefore, both trains of CRPAR were also inoperable for 12 seconds.

CAUSE OF EVENT

Prior to the event, CRAC train A was operating. When the control room operator trainee positioned the CRAC train B control switch to ON, the unit did not start since the system logic does not allow both units to be operating at the same time. However, placing the CRAC train B control switch to ON latched in a timer relay [2] with a 20-second timer. This timer relay enables the start signal for 20-seconds. If after 20 seconds the unit does not start, the start signal is disabled and a unit trip annunciator is actuated. In order to reset the relay, the control room switch must be positioned to AUTO or OFF. Furthermore, in order to start the CRAC train B, the CRAC train A control switch must be placed in the OFF position within the 20-second period. Since the CRAC train A switch was not placed in the OFF position within 20 seconds of placing the CRAC train B control room switch to the ON position, the train B fan did not start. Both

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times the control room operator trainee positioned the CRAC train A control room switch to OFF, without the CRAC train B operating, both CRAC trains were inoperable and therefore both trains of CRPAR were also inoperable. Both trains of CRPAR were inoperable for 12 seconds, prior to CRAC Unit A being restarted.

This event was caused by the procedure used to shift the CRAC units, N-ACC-25; it did not contain any guidance warning of the time constraints. Additional factors contributing to the event were the involvement of a trainee, the coincidence of the CRAC train B not starting and the logic requiring the operating CRAC unit control switch to be positioned to OFF to allow the standby unit to start.

Involvement of the trainee delayed the normally routine equipment shift that usually occurs quickly. Although the activity was slowed by the trainee's involvement, had the trainee not been involved, this previously unrecognized vulnerability would not have been found.

Coincident with the B unit not starting and the A unit switch selection, virtually simultaneous alarms were actuated. According to the control room sequence of events recorder (SER) alarm printouts, the B unit trip actuated an alarm at 07:10:23.210 am. This was at the same time the trainee was moving the control switch of the A unit to OFF. The SER shows the switch in OFF alarm actuated at 07:10:24.442 am. Selecting the switch to OFF alarm was an expected alarm and the unit trip alarm was not immediately recognized.

At 1025 CDT, during an investigation of this event, it was determined that both CRAC trains were inoperable for a total of 12 seconds and therefore, both trains of CRPAR were also inoperable for 12 seconds. At 1104 CDT, this event was reported to the NRC.

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ANALYSIS OF EVENT

This event is reportable in accordance with 10CFR50.73(a)(2)(ii)(B) as a condition outside the design basis of the plant. This event was reported in accordance with 10CFR50.72 (b)(1)(ii)(B) at 1104 CDT on December 20, 1999.

The CRPAR system is designed to maintain an acceptable control room radiological environment in response to plant casualties that could adversely impact the control room atmosphere. Normal control room ventilation automatically aligns to post-accident recirculation mode upon receipt of a steam exclusion signal, safety injection/blackout sequence, or high radiation in the control room as detected by the ventilation duct monitor.

CRPAR operability is dependent on at least one CRAC fan being operable and able to automatically start. One CRAC fan is necessary to ensure compliance with the assumptions for adequate airflow. With no CRAC fan operable, the ability of the CRPAR to remove contaminants is reduced. However, for this event there were no radiological concerns, including no radiological releases in progress. In addition, the control room operator trainee returned the CRAC train A fan to service in 12 seconds. For these reasons, the safety significance of this event was minimal. Furthermore, both fans were capable of being started from the control room.

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CORRECTIVE ACTIONS

- 1) The operations procedure N-ACC-25 is being revised to inform the control room operator that the operating CRAC fan control room switch must be positioned to the OFF position within 20 seconds of placing the non running CRAC control switch to ON. This additional procedure guidance will be completed by the end of January 2000.

- 2) Calibration and/or verification of the CRAC 20 second timer relay will be verified.

- 3) The CRAC units are scheduled for replacement during the spring 2000 refueling outage. The design of the new units will include new control logic to preclude similar failures of the system.

ADDITIONAL INFORMATION

The Control Room Air Conditioning Units are manufactured by Trane Co., Model 25CC.
 The Control Room Post Accident Recirculation Fans are manufactured by Joy Manufacturing Co., Model 18-14-3450.

Similar Events: None