NRC-00-030

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

April 10, 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 2000-002-00

In accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System," the attached Licensee Event Report (LER) for reportable occurrence 2000-002-00 is being submitted.

Sincerely,

FOR

Mark L. Marchi
Vice President-Nuclear

DLR

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)
Failure to Perform Second Level Review Results in Train B of the Shield Building Ventilation System Being Incorrectly Returned to 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
03	10	2000	2000	-- 002 --	00	04	10	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)	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)
Dennis L. Rozell - E&TS-Engineer	(920) 388-8766

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)			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)

On March 10, 2000, while the plant was operating at full power, a second level review of surveillance data determined that train B of the shield building ventilation (SBV) system had incorrectly been returned to service. Train B could not be verified operable using the surveillance procedure test data last performed on July 27, 1999. Using the recorded data, train B of the SBV system was outside the test acceptance criteria (+/- 10 percent) for fan flow by 2.5 percent. SBV train B was declared out of service at 1620 hours Central Standard Time (CST) and the 7-day Limiting Conditions for Operation (LCO) of Technical Specification 3.6.b.1 was entered. On March 11, 2000, SBV train B was retested and determined operable.

Two problems were identified concerning this event: 1) failure to identify unacceptable test results on July 27, 1999, and 2) a delay in performing a required technical review of the test results. Causes include: procedure design problems, administrative directive problems, attention to details issues, testing methodology changes, and communication challenges.

Corrective actions taken or in progress include: retesting SBV train B to verify it is operable and procedure reviews and revisions.

DESCRIPTION OF EVENT

On March 10, 2000, while the plant was operating at full power, a second level review of surveillance data determined that train B of the shield building ventilation (SBV) system [VC] had incorrectly been returned to service.

Surveillance procedure, (SP) 24-122, "Shield Building Vent Filter Testing," had been last performed on July 27, 1999. Immediately following the test, train A was correctly determined to be operable while train B was erroneously determined to be operable. After SP 24-122 was performed on July 27, 1999, the surveillance testing package was misplaced and not located until March 10, 2000. This package included SP 24-122 and other completed filter testing surveillances. Once found, a technical review was performed on all the SPs, and the error associated with declaring SBV train B operable was identified. Kewaunee Assessment Process (KAP) # 00-000609 was initiated to document and evaluate this event. No problems were found with the other SPs.

During the technical review on March 10, 2000, it appeared that both train A and B test data did not meet the acceptance criteria of the test. After further evaluation, the technical reviewer and the test engineer determined that there had been a data entry error for train A data and therefore train A was operable. There were no similar data entry problems for the train B data. Using the recorded data, train B of the SBV system was outside the acceptance criteria for fan flow by 2.5 percent.

SBV train B was declared out of service on March 10, 2000 at 1620 hours Central Standard Time (CST) and the 7 day Limiting Conditions for Operation (LCO) action statement of Technical Specification 3.6.b.1 was entered.

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Train B was retested and found operable on March 11, 2000 and returned to service at 1627 at which time the action statement was exited.

CAUSE OF THE EVENT

The following discussion is split into two parts:

1) Problems encountered during the July 27, 1999 testing of the SBV filters [FLT] which resulted in failing to identify that train B did not meet the test acceptance criteria, and
2) Causes of the delay in performing the technical review.

Failure to Identify Unacceptable Test Results

On July 27, 1999, a team consisting of two Kewaunee Nuclear Power Plant (KNPP) personnel (the qualified, responsible engineer (RE) and another engineer being trained) and two vendor personnel performed SP 24-122, "Shield Building Vent Filter Testing."

The purpose of the SP is to verify that the SBV filters are capable of meeting bypass leakage design requirements and the SBV fans [FAN] operate within +/- 10 percent of design flow. As part of this SP, charcoal filter samples are taken (and sent off-site for analysis), bypass leakage tests are performed, and fan flows are measured and compared to design values. Approved vendor procedures are primarily used to collect test data while SP 24-122 is used to manage the overall testing.

This event was caused by problems associated with the collection and evaluation of the fan flow data portion of the SP. The test requires that the "fan static pressure" (FSP) be measured using test ports, in the ventilation ductwork, at the inlet and outlet of the fan. The FSP value is used to determine the "required flow" from a system fan curve. The "actual flow" is then measured

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and compared to the required flow. The actual flow must be within +/- 10 percent of the required flow.

Train A was tested in the morning and train B in the afternoon. Each train was determined to have met the SP system performance acceptance criteria, including the fan flow, and returned to service the same day.

Several causes have been identified which contributed to failing to identify unacceptable test results on July 27, 1999. These are discussed separately below.

Poor Human Factors in SP 24-122 data sheet design (Primary Cause)

Several deficiencies have been identified with the design of the SP 24-122 data sheet, which is used to record filter data and fan flow data for each train.

The SP 24-122 data sheet requires only a subset of the total test data to be recorded. The vendor procedure and data sheets are used to collect the complete set of test data. The data sheet of SP 24-122 requires the FSP, required flow and actual flow to be recorded. The data sheet does not require the actual "percent of design" flow value to be recorded on the data sheet (it is recorded on the vendor sheet). The percent of design value is used to determine if the fan flow is within the acceptance criteria of +/- 10 percent of design.

The actual data recorded on the data sheet for train B on July 27, 1999 shows a FSP value of 8.5 which, by using the fan curve, shows a required flow value of 6200 SCFM. The actual flow was measured at 5427 SCFM. The "percent of design", which is not documented on the data sheet, is -12.5 percent, which is outside the acceptance criteria by 2.5 percent.

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The RE relied on the value recorded on the vendor's procedure to determine if the fan flow met the acceptance criteria. As described in the next section, the wrong test data was entered in the "percent of design" space on the vendor's data sheet. The value recorded was the FSP value of 8.37 percent, which is reasonable for a "percent of design" value and within the acceptance criteria. It could not be determined due to the elapsed time why a FSP value of 8.37 percent was recorded in the vendor's procedure while a value of 8.5 percent was recorded on the KNPP SP data sheet.

The data sheet for SP 24-122 does not require a sign-off by the RE to verify that acceptance criteria for specific portions of the test have been met. The procedure has one sign-off for the RE at the end of the procedure and none on the data sheet.

One other deficiency noted is that the data entry areas on the data sheet are in a different order than the procedure steps. While not directly leading to this event, it could account for the RE entering a train B filter differential pressure value in the wrong place and requiring a correction to the data sheet.

Data entry error on vendor data sheets (Primary Cause)

During the testing of train B, the vendor test personnel wrote the FSP value (8.37 percent) in the "percent of design" space. The 8.37 percent value is one that would be expected and acceptable as an actual calculated result, therefore, it is reasonable to conclude the RE would not have questioned the value. The value is within the test acceptance criteria, and therefore, would show that train B test results were acceptable.

Another opportunity to catch the data entry error was missed during the closeout of the package after the testing was complete. The vendor test personnel identified the data entry error of 8.37 percent the next day (July 28, 1999). At that time the 8.37 percent was crossed out of the

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"percent of design" space and recorded in the proper place. Unfortunately, a new "percent of design" value was not calculated at that time. The reason for this could not be determined due to the elapsed time between discovering this error and its occurrence.

Testing measurement method changes (Secondary Cause)

Two issues led to the problems in collecting test data on July 27,1999. One was the use of a new style test probe at KNPP. The other was lack of knowledge by the test team of specific test methods used in the past at KNPP.

During the performance of SP 24-122 on July 27, 1999, a different (than in the past) style of test probe was used for measuring fan static pressure. This new probe was a short metal L-shaped static probe. The design was an improvement over the 6 foot pitot tube line used in the past.

The test equipment can use several ports in the SBV ductwork to collect data. One port exists immediately downstream of the fan discharge, at fan centerline level. Another port exists approximately 10 feet downstream of the first, past an elbow, and approximately 12 feet above the floor on a vertical run of ductwork. In the past the port immediately downstream of the fan was used in conjunction with the 6 foot pitot tube line. The tubing was inserted into the port and then maneuvered inside the ductwork (using the system airflow to carry it downstream) to a location past the elbow. This was done to place the pitot tube line end past the turbulent airflow area, at the fan discharge, to get better data. On the morning of July 27 while performing the train A test, the static probe was used in the first port, immediately downstream of the fan discharge, to collect data. The test results did not meet the acceptance criteria so the team performed troubleshooting to determine why. A call was made to a test expert at the vendor's home office who explained that the pressure data needed to be collected at the second port

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location (past the elbow) to get out of turbulent airflow. Train A was retested using the second port and the acceptance criteria was met.

There was a minor problem of documenting the retest data for train A. The SP data sheet was updated with the new FSP value but the "required flow" field was not updated. The correct value was recorded on the vendor procedure data sheet. Due to this error, on March 10, 2000, the technical reviewer determined that train A was potentially inoperable until the RE reconciled the data. Using the correct data, train A was determined to have met the acceptance criteria. The SP data sheet was corrected during the technical review on March 10, 2000. The cause of this error was inattention to detail while recording test data in the field.

Train B testing was performed in the afternoon. It is unclear which port was used to collect data on train B. The data recorded on the data sheet did not meet the acceptance criteria. Unlike what happened on train A, the unacceptability of the test data was not identified and train B was signed off as having met the acceptance criteria. The previous discussion on the design of the SP data sheet details how train B was determined to be acceptable at that time.

Several other factors contributed to the lack of test methodology knowledge by the team.

- No method, process or expectations exists to aid in the turnover of knowledge and responsibilities between REs.
- This test is performed once every 18 months, therefore, the impact of knowledge gained during the turnover, could easily have been reduced in the intervening 18-month period.
- There was a lack of experience by the testing team. This was the second time the RE was involved in performing this SP and the second time at KNPP for the most senior vendor team member.

- There was no documentation of specific testing methods, either in the SP itself or in other documents.

These factors contributed to the problems encountered during the performance of the SP and the need to rerun some portions of the test.

Delay in Performing Technical Review

SP 24-122 includes a field testing portion, as described above, and a charcoal filter sample analysis portion, where filter samples are sent offsite to a lab for analysis. The SP is not complete until the lab results are returned to KNPP and reviewed. It usually takes more than a month for the lab results to be returned to KNPP.

The field testing was completed on July 27, 1999 and the remaining portion of the SP was completed on September 20, 1999. The package was then given to a technical reviewer for review. For reasons explained below, the SP package was misplaced for 6 months and not located until a request for SBV test data was received from the NRC. On March 3, 2000, it was identified that the package was missing and KAP # 00-000599 was written to document the problem. The package was found on March 10, 2000 in the technical reviewer's office in a box of miscellaneous documents. Several causes have been identified which contributed to misplacing the SP package and the resulting failure to perform the technical review. These are discussed separately.

<u>Weaknesses in the administration of the surveillance process (Primary Cause)</u>

There is a separate scheduling system that is used for the performance of various tests with a defined frequency, including surveillance procedures. The system sends a "scheduling card" to the procedure owner a few weeks before a test is due to be performed. This card shows the due

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date and has a place to document the completion date. The owner is then responsible to insure the procedure is performed within the required time frame. This scheduling card is returned to the scheduling group after the procedure is complete. Once the card is returned, a new due date is calculated and the schedule is updated.

The purpose of the card is to link the scheduling process with the procedure performance process. Returning the scheduling card signifies that the procedure is complete, including all required reviews. A backlog report is generated to show which procedures are past due, as determined by a non-returned scheduling card. This does not necessarily mean a procedure has not been performed by its due date as it may be in the review process.

Nuclear Administrative Directive (NAD) 12.2, "Surveillance Procedures," defines the responsibilities and requirements for the preparation and use of Surveillance Procedures. NAD 12.2, Step 5.5.2.6 implies that the scheduling card remains with the SP until the technical review is completed.

After the performance of SP 24-122 on July 27, the RE returned the scheduling card while the SP was then on hold, pending the lab analysis of the charcoal samples. This was contrary to NAD 12.2, step 5.5.2.6. Once the scheduling card was returned the SP was considered complete and therefore never showed up on a backlog report. If the scheduling card had remained with the RE or technical reviewer as required, the SP would have reflected on a backlog report as incomplete. This would have been a flag to investigate the status of the SP. The RE and technical reviewer were unaware of the scheduling card requirement found in NAD 12.2.

As part of the root cause analysis into this event, it was determined that if NAD 12.2, step 5.5.2.6 were to be performed as required for SP 24-122, it would not have prevented an untimely delay in the performance of the technical review. Because of the design of the SP, the

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technical review would have happened a month after the filter testing was complete. Although this would have provided an opportunity to identify that train B did not meet the acceptance criteria a month after the testing, it still would have be unacceptable.

Communication failure between RE and Technical Reviewer (Primary Cause)

After SP 24-122 was complete on July 27, 1999, the RE determined that only one qualified person was available to perform the technical review of the test results. Neither the RE nor the technical reviewer can remember how the package was transferred between them. The RE did not follow-up to ensure the technical review was completed. The technical reviewer was unaware that he was in possession of the package. The SP package was found in the technical reviewer's office on March 10, 2000. These are examples of a lack of communication between the involved parties.

Office moves by Technical Reviewer (Secondary Cause)

A contributing factor to the above was multiple office moves by the technical reviewer. Since it was known at the time that each move was temporary, the technical reviewer did not unpack until the final move. The SP package was found in a box that had not been unpacked during the intervening moves.

ANALYSIS OF THE EVENT

This event is being reported under 10CFR50.73(a)(2)(i)(B), "any event or condition prohibited by the plant's Technical Specifications." Kewaunee TS Section 3.6.b.1 requires that whenever containment system integrity is required: "both trains of the Shield Building Ventilation System, including filters and heaters shall be operable or the reactor shall be shut down within 12 hours, except that when one of the two trains of the shield building ventilation system is made or found to be inoperable for any reason, reactor operation is permissible only during the succeeding 7 days."

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Since it could not be determined on March 10, 2000 if train B of the SBV system was operable, based upon the existing documentation of the last performance of SP 24-122, the 7 day LCO action statement was entered as required by TS 3.6.b.1. The retest performed on March 11, 2000 verified that train B was operable in the as found condition and met the acceptance criteria of the procedure.

Additional performance data was collected during the retest on March 11, 2000 and again during a scheduled test on March 29, 2000. This additional data, which compared previous testing methods with current testing methods, showed that similar train B test data, as recorded on July 27, 1999 could be obtained by taking data at the first port, immediately downstream of the fan discharge. The system configuration and conditions were similar for all three tests. Therefore, it is highly probable that the train B data recorded on July 27, 1999 was collected at the immediate downstream port location. Testing in March 2000 showed that train B was operable when data was collected at the proper port (downstream of the elbow). There is no reason to suspect that, if the proper port were used on July 27, 1999, train B data would have been collected consistent with an operable system.

This event was previously reported via the emergency notification system (ENS) on March 10, 2000 at 1713 CST. It was previously reported as a condition of the plant being seriously degraded. Based on the subsequent satisfactory testing it was identified that SBV train B operated within acceptable limits and was not seriously degraded. Although subsequent testing demonstrated the systems operability, the ENS notification was not retracted since the condition was prohibited by TS and remained reportable as defined above.

A safety assessment of a change in shield building fan flow on the LOCA dose calculation of record was performed on March 10, 2000. The assessment postulated both higher and lower fan flows than the design assumption used in the Updated Safety Analysis Report (USAR) accident

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analysis. The assessment looked at all time periods where the SBV system is required to be operable. The results of the assessment determined that, with all other parameters being the same, a reduction or increase in fan flow, on the order of magnitude documented as part of the July 27, 1999 performance of SP 24-122 (i.e. 2.5 percent outside of acceptance criteria of +/- 10 percent), would not increase the consequences of the LOCA Dose calculation. Therefore, the significance of this event is minimal.

CORRECTIVE ACTIONS

Corrective actions immediately taken were:

- Management was immediately notified and plans were developed to test the system.
- SP 24-122 was performed to determine the actual condition of train B.
- Root Cause team was assembled to investigate the event.

Corrective actions planned or in progress include:

- SP 24-122 and the other filter testing SP's will be revised to include:
  1. Better human factors design,
  2. Requirement to record calculated test data,
  3. Sign-off for meeting acceptance criteria,
  4. Timely performance of technical reviews,
  5. Less reliance on vendor procedures to document important data and calculations,
  6. Correction of other weaknesses not related to this event but identified during the root cause analysis.
- Identify other surveillance procedures that may include actions involving time delays between completion of system/equipment testing and other tasks, such as off-site analysis work. Review and revise these procedures as necessary to prevent the possibility of an unacceptable time delay between returning equipment to service and any technical review.

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- Further investigation will be performed to determine the adequacy of NAD 12.2 and the associated expectations and training requirements.

ADDITIONAL INFORMATION

None

SIMILAR EVENTS

KNPP Incident Report 87-16

Flow results of filter testing done the week of 2/2/87 were miscalculated. Causes included incorrect use of flow instrument, incorrect calculation, and error in testing methods.

Notice of Violation, Inspection Report 50-305/97002

Violation was cited due to a failure to maintain acceptance criteria for both the residual heat removal and auxiliary feedwater flow tests consistent with plant accident analyses assumptions and a failure to use and adequate methodology to calculate instrument accuracy. Similar causes were found including procedure acceptance criteria deficiencies and staff training and experience issues.