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April 3, 2003
BW0300026

U. S. Nuclear Regulatory Commission
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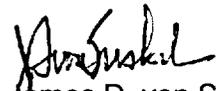
Braidwood Station, Unit 1
Facility Operating License No. NPF-72
NRC Docket No. STN 50-456

Subject: Submittal of Licensee Event Report Number 2003-002-00, "Residual Heat Removal Pump Technical Specification Completion Time Exceeded Requiring Notice of Enforcement Discretion Due to Poor Planning and Execution of Planned Maintenance "

The enclosed Licensee Event Report (LER) is being submitted in accordance with 10 CFR 50.73, "Licensee event report system", paragraph (a)(2)(i)(B). 10 CFR 50.73(a) requires an LER to be submitted within 60 days after discovery of the event; therefore, this report is being submitted by April 3, 2003.

Should you have any questions concerning this submittal, please contact Kelly Root, Regulatory Assurance Manager, at (815) 417-2800.

Respectfully,



James D. von Suskil
Site Vice President
Braidwood Station

Enclosure: LER Number 2003-002-00

cc: Regional Administrator - Region III
NRC Braidwood Senior Resident Inspector

IE22

Estimated burden per response to comply with this information collection request 500 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NOEB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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)

1. FACILITY NAME
Braidwood, Unit 1

2. DOCKET NUMBER
STN 05000456

3. PAGE
1 of 5

4. TITLE
Residual Heat Removal Pump Technical Specification Completion Time Exceeded Requiring Notice of Enforcement Discretion Due to Poor Planning and Execution of Planned Maintenance

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED		
MO	DAY	YEAR	YEA	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
02	02	2003		2003-002-00		04	03	2003	N/A	N/A	
									FACILITY NAME	DOCKET NUMBER	
									N/A	N/A	
9. OPERATING MODE		1		11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)							
10. POWER LEVEL		100		<input type="checkbox"/> 20 2201(b)	<input type="checkbox"/> 20 2203(a)(3)(i)	<input type="checkbox"/> 50 73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)				
				<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50 73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)				
				<input type="checkbox"/> 20 2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 73.73(a)(2)(viii)(B)				
				<input type="checkbox"/> 20 2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50 73(a)(2)(iii)	<input type="checkbox"/> 73 73(a)(2)(ix)(A)				
				<input type="checkbox"/> 20 2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)				
				<input type="checkbox"/> 20 2203(a)(2)(iii)	<input type="checkbox"/> 50 36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)				
				<input type="checkbox"/> 20 2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)				
				<input type="checkbox"/> 20 2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	Specify in Abstract below or in NRC Form 366A			
				<input type="checkbox"/> 20 2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)					
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					

12. LICENSEE CONTACT FOR THIS LER

NAME
Craig Chovan, Work Management Director

TELEPHONE NUMBER (Include Area Code)
(815) 417-3100

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO epix	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED

Yes (If yes, complete EXPECTED SUBMISSION DATE). X NO

15. EXPECTED SUBMISSION DATE

MONTH DAY YEAR

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

On January 26, 2003 at 2200 hours, Braidwood Station Unit 1 entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.5.2 Condition A for planned maintenance on the Unit 1B Residual Heat Removal (RHR) pump. The planned work window for the 1B RHR pump included numerous routine surveillance and preventive maintenance activities. However, the primary activity in the work window was to inspect the 1B RHR pump internals and replace the stuffing box extension as follow-up actions from a station operability determination and lessons learned from a previous 2B RHR pump repair. It was determined, based on unexpected work delays, that the pump maintenance and testing would not support restoration to operability of the 1B RHR pump within the TS Completion Time and a Notice of Enforcement Discretion (NOED) was requested and subsequently granted by the NRC on February 2, 2003 at 1250 to extend the Completion Time by 20 hours. The pump was restored to an operable status and the LCO exited on February 3 at 0337.

The root cause for exceeding the TS Completion Time was the lack of management oversight and the failure to recognize challenges related to planning, safety, dose and troubleshooting during work execution.

This event is being reported pursuant to 10CFR50.73(a)(2)(i)(B).

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A. Plant Operating Conditions Before The Event:

Unit: 1 Event Date: 2/02/2003 Event Time: 1250
MODE: 1 Reactor Power: 100 percent

Reactor Coolant System (RCS) [AB] Temperature: 580 degrees F, Pressure: 2235 psig

B. Description of Event:

There were no systems or components with the exception of the 1B RHR pump that were inoperable at the beginning of this event that contributed to the severity of the event.

On January 26, 2003 at 2200 hours, Braidwood Station Unit 1 entered TS LCO 3.5.2 Condition A for an inoperable Emergency Core Cooling System (ECCS) train to support planned maintenance on the Unit 1B Residual Heat Removal (RHR) [BP] pump. The seven-day Completion Time to restore the 1B ECCS train to operable status expired at 2200 hours on February 2, 2003.

On February 2, 2003 at 2200, the 1B RHR Pump planned work window was extended past the TS Completion Time. A NOED to extend the Completion Time was requested and subsequently granted by the NRC on February 2, 2003 at 1250 to extend the Completion Time by 20 hours. The LCO was exited at the completion of the maintenance activities on February 3, 2003 at 0337.

The planned work window for the 1B RHR pump included numerous routine surveillance and preventive maintenance (PM) activities. The activities included maintenance activities associated with the 1B RHR pump, as well as performing an actuator overhaul of the 1B RHR pump minimum flow valve (i.e., 1RH611). However, the primary activity in the work window was to inspect the 1B RHR pump internals and replace the stuffing box extension as follow-up actions from a station operability determination and lessons learned from a previous 2B RHR pump repair. There were no performance issues with the 1B RHR pump prior to the work window and it had been satisfactorily meeting all surveillance requirements. The Original Equipment Manufacturer (OEM) was contracted to provide onsite support for the repair to provide technical assistance and facilitate resolution of emergent issues.

TS LCO 3.5.2 for an inoperable Emergency Core Cooling System (ECCS) train was entered at 2200 hours on January 26, 2003 to support the 1B RHR pump maintenance activities. The LCO was expected to be exited on January 31, 2003 at 1500 hours. However, unforeseen difficulties encountered during the pump reassembly process delayed returning the 1B RHR pump and thus the 1B train of ECCS to operable status. Failure to complete the work as scheduled was entered into the Corrective Action Program.

Inspection of the 1B RHR pump internals was required for the following two reasons:

1. Verify the diffuser anti-rotation pin was installed, and
2. Measure the stuffing box extension (SBE) clearances.

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In order to perform the above inspections, the 1B RHR pump was disassembled. Numerous minor issues and delays, including emergent radiation protection issues of personnel dose and contamination control that could have been avoided were encountered during the pump disassembly. The emergent radiation protection issues were entered into the Corrective Action Program. The work window was approximately eight hours behind schedule at the time pump reassembly was scheduled to commence.

During inspection of the 1B RHR pump internals, it was discovered that the as-found SBE measurements were not within specification. A new SBE and reconditioned motor support plate were planned replacements. The inner diameter (ID) of the pump casing at the location where the SBE mounts to the pump was found to be out-of-round to the extent that the replacement SBE could not be installed. This out-of-round condition had been seen on a previous occasion, but not to this extent. The pump casing required dressing to restore the pump casing ID dimensions to within specification tolerances. Discovery of the out-of-round condition on the 1B RHR pump casing was entered into the Corrective Action Program. The work to restore the pump casing ID to within specification resulted in an unforeseen delay of 11.5 hours.

Shortly after the pump casing tolerance work was started, an eight-hour delay was encountered to satisfactorily resolve a safety concern associated with performing work under a suspended load. Due to space constraints the motor was suspended during assembly/disassembly. A safety concern was identified in the post-job critique from previous maintenance performed on the 2B RHR pump. To address the concern previously identified and improve the safety factor for workers performing work under the load, two methods of securing the load were implemented during maintenance activities associated with the 1B RHR pump. However, a safety concern was identified with the second method employed for securing the load. Further enhancements to the second method of securing the suspended load were made to satisfactorily resolve the safety concern. It took approximately eight hours to resolve the safety concern. The safety issue was entered into the Corrective Action Program.

During the assembly process, it was determined that the overall replacement motor support assembly concentricity did not meet procedural requirements. Resolving this issue resulted in an additional delay of six hours.

During the initial assembly of the 1B RHR pump internals, the impeller was installed and found to exceed required impeller total indicated runout values. The manufacturer's representative was consulted and recommended machining the lower skirt diameter to remove the runout condition. The machining was performed with the field representative in attendance. After the lower skirt area was machined, the runout was measured and found to be acceptable ensuring that the inner bore was concentric with the lower skirt. During this time the motor shaft was also measured for runout and found to be within tolerance. Subsequently, the 1B RHR impeller was installed on the motor shaft and found to have a runout value greater than the original readings taken. The 1B RHR pump impeller was removed, cleaned, reinstalled and checked again with no change. The manufacturer's representative reviewed the data and suggested that a rebuilt impeller be installed on a mandrel to check it for concentricity. It was decided to use a rebuilt impeller due to the fact that any further machining of the original impeller would place it outside of the required clearance

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specification. The rebuilt impeller was found to be within required runout values and accepted for installation. The rebuilt impeller was installed on the motor shaft and found to initially exceed required runout values. Further inspection of the motor shaft led to a replacement of the shaft spacer. The combination of the rebuilt impeller and the new shaft spacer reduced the total indicated runout to within the required specification. The problems with the pump impeller runout resulted in an additional delay of approximately 34 hours. The issues associated with the pump assembly difficulties were entered into the Corrective Action Program.

The time used to address the issues of pump casing out-of-round, motor support concentricity, and impeller runout problems, coupled with the time to complete the remaining operability testing, caused the seven-day Completion Time for restoring an inoperable ECCS train to be exceeded. The NOED was requested to enable the work to be completed without requiring Unit 1 to be shutdown.

Enforcement discretion was requested from the Completion Time of TS 3.5.2 Condition A to allow an additional 20 hours to complete the required repairs, post maintenance testing and evaluation required to declare the 1B RHR pump and thus the 1B ECCS train operable.

This condition is reportable to the NRC in accordance with 10CFR 50.73(a)(2)(i)(b) as a condition prohibited by Technical Specifications. TS 3.5.2 allows six hours to complete a shutdown to Mode 3 after exceeding the seven-day Completion Time for an inoperable train of ECCS. The 1B RHR pump work was completed and the ECCS train declared operable before exceeding the six-hour shutdown requirement (i.e. 5 hours and 37 minutes). There was not sufficient time without the issuance of the NOED, to perform an orderly shutdown of the unit within the six-hour shutdown requirement.

C. Cause of Event

The root cause for exceeding the Completion Time was the lack of management oversight and the failure to recognize challenges related to planning, safety, dose and troubleshooting during work execution.

D. Safety Consequences:

Granting of enforcement discretion was of minimal safety consequence. The 1A ECCS train was fully operable. In addition, the four safety injection accumulators were operable. These components were in the 10 CFR 50.65 "Requirements for monitoring the effectiveness of maintenance at nuclear power plants" a(2) category and have had no functional failures in the last two years. This indicates they are meeting very stringent reliability and availability criteria. Additionally, Technical Specification Surveillances Requirements were completed to ensure that the 1A ECCS train was properly aligned and full of water. Further, the 1B Centrifugal Charging (CV) [BQ] and 1B Safety Injection (SI) [BQ] pumps were operable and capable of performing their functions, thus providing additional assurance that the ECCS function was preserved.

A risk assessment was performed, and it concluded that there was no net radiological risk increase as a result of extending the Completion Time by 20 hours. This was based on the quantitative risk assessment which concluded that

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the impact on risk associated with continued operation beyond the current Completion Time of seven days for an additional 20 hours is small and is not risk significant in comparison with the acceptance criteria stated in the Electric Power Research Institute "PSA Applications Guide." In addition, this risk was less than the risk associated with shutting the unit down when the 1B RHR pump is unavailable. In determining the risk associated with a plant shutdown, the conditional core damage probability (CCDP) associated with a reactor trip was used.

Based on a comparison of the risk associated with continued operation with the 1B RHR pump unavailable and the risk associated with a unit shutdown, continued operation for an additional 48 hours was justified because the calculated risk of a plant shutdown exceeds the risk of operating with the 1B RHR pump unavailable. This included a factor of five margin to account for other factors, that were not included in the quantification of shutdown risk.

This condition did not constitute a Safety System Functional Failure.

E. Corrective Actions:

There were two Corrective Actions identified to prevent recurrence. The first is to examine the process used for outage preparation for applicability to on-line work windows. Based on this examination, methods of planning and execution of on-line work will be changed as required. The second is to establish a process that requires a peer review for all work windows that require entry into a short-term TS LCO.

Other Corrective Actions are being developed to address the individual weaknesses identified. Those weaknesses have been entered into the Corrective Action Process.

F. Previous Occurrences:

A review of previous occurrences identified an issue in which poor planning and execution of work involving the four Emergency Diesel Generators [EK] took place at Braidwood in 2002. Similar issues that adversely affected timely completion of the 1B RHR work were present in the Emergency Diesel Generator maintenance activities.

G. Component Failure Data:

<u>Manufacturer</u>	<u>Nomenclature</u>	<u>Model</u>	<u>Mfg. Part Number</u>
N/A	N/A	N/A	N/A