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Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
LER 2000-002-01

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

In accordance with Appendix A, Beaver Valley Technical Specifications, the following Licensee Event Report is submitted:

LER 2000-002-01, 10 CFR 50.73(a)(2)(ii), "Condition Outside Design Basis for One Train of River Water System Inoperable."

Lew W. Myers

Attachment

IE22

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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

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TITLE (4)

Condition Outside Design Basis for One Train of River Water System Inoperable

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL	REVISION	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									None	
02	08	2000	2000	002	01	04	27	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
POWER LEVEL (10)	94 %	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)	X	OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)		10 CFR 21
		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)
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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	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)

During a routine surveillance on the BVPS Unit No. 1 Reactor Plant River Water (RPRW) System B Train pump at 1209 on 2/8/2000, the pump unexpectedly tripped approximately three seconds after a start signal due to an overcurrent condition. Technical Specification 3.7.4.1 was entered due to having only one River Water System pump operable. RPRW pump WR-P-1C (swing pump) was then aligned to the B train and started at 1716 on 2/8/2000. This pump also tripped approximately three seconds after a start signal due to an overcurrent condition. A subsequent evaluation determined that the two overcurrent trip conditions on the RPRW pumps were a result of physical contact between the rotating element (impeller) and the lower casing liner of the pumps. The cause of this condition was due to differential thermal expansion between the pump shaft and the pump casing as a result of an elevated seal injection water temperature. This delta temperature elongated the pump shaft to the point of physical binding. Normally the RPRW Pumps' seal water is supplied by the Filtered Water System at approximately the same temperature as the Ohio River. At the time of the condition, the seal water was being supplied by the Filtered Water System, which was in an abnormal configuration that created the elevated water temperature. This condition is reportable pursuant to 10CFR50.73(a)(2)(ii)(B) as a condition that is outside the design basis of the plant because one train of a two train safety related system (required to be operable per Technical Specification 3/4.7.4.1) was incapable of performing its design safety function for an extended period of time during operation. This seal water supply design defect had the potential to render non-operating RPRW pump(s) inoperable. Therefore this design defect could create a safety hazard, and is also reportable pursuant to 10 CFR 21 requirements. This report satisfies the notification and reporting requirements of 10 CFR Part 21 per the provisions of 10 CFR 21.2(c). An additional material condition that occurred on 3/3/2000 provided further basis that the BVPS Unit 1 seal water design for the RPRW Pumps may not have been sufficient to meet the design basis of the plant.

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PLANT AND SYSTEM IDENTIFICATION

Westinghouse-Pressurized Water Reactor System
River Water System and Auxiliary River Water System {BI}
Service Water System and Standby Service Water System {BI}
Filtered Water System {KH}
Water Treatment System {KH}

CONDITIONS PRIOR TO OCCURRENCE

Unit 1: Mode 1 at 94 % power

There were no systems, structures, or components that were inoperable that contributed to the event.

DESCRIPTION OF EVENT

During a routine surveillance on the BVPS Unit No. 1 Reactor Plant River Water (RPRW) System {BI} 'B' pump (1WR-P-1B) at 1209 on 2/8/2000, the pump unexpectedly tripped approximately three seconds after a start signal due to an overcurrent condition. Technical Specification 3.7.4.1 was entered due to having only one River Water System pump operable. RPRW pump WR-P-1C (swing pump) was then aligned to the 'B' train and started at 1716 on 2/8/2000. This pump also tripped approximately three seconds after a start signal due to an overcurrent condition.

The following actions were taken as an immediate response to the tripping of the second RPRW System pump: controls were established to maintain the integrity of the 'A' train of the RPRW System, 'B' and 'C' RPRW pumps and associated power supplies were administratively controlled to preserve equipment status until all relevant indications were recorded, the Auxiliary River Water System pumps (BVPS Unit 1) in the Alternate Intake Structure were rotated by hand with no anomalies noted, the Emergency Standby Service Water System pumps (BVPS Unit 2) in the Alternate Intake Structure were verified to be aligned with their self supplied seal water source from the Ohio River, and the Main Intake Structure forebays were verified to be free of obvious ice and debris. A multi-disciplined Event Response Team was formed to investigate this condition.

The subsequent Event Response Team evaluation determined that the two overcurrent trip conditions on the RPRW pumps were a result of physical contact between the rotating element (impeller) and the lower casing liner of the pumps. The cause of this condition was due to differential thermal expansion between the pump shaft and the pump casing. This condition was precipitated by an elevated seal water temperature (approximately 70 F) that elongated the pump shaft to the point of

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DESCRIPTION OF EVENT (Continued)

physical binding. At the time of the condition, the seal injection water was being supplied by the Filtered Water System {KH}. This system was modified in 1976 to be used as a seal water supply source for the RPRW pumps. This elevated seal water temperature condition was caused by use of a temporary operating procedure that changed the configuration of the Filter Water System to allow maintenance on the water treatment clarifier. The elevated seal water temperature existed for approximately 3 days prior to the condition. Normally the RPRW pumps' seal water is supplied by the Filtered Water System at approximately the same temperature as the Ohio River because an appreciable amount of heat is not normally added to the seal water by the water treating system. The Ohio River water temperature was approximately 35 F during the condition.

Following the Event Response Team evaluation and immediate corrective actions to ensure that the BVPS Unit 1 RPRW pump operating clearances would be maintained, RPRW System train B pump WR-P-1B was declared operable at 0858 on 02/11/00.

Operating Event 10671 was issued by BVPS on 2/10/2000 providing preliminary notification to the industry via the INPO Nuclear Network about this condition. Operating Event 10760 issued on 3/6/2000 provided updated information.

Related Recent Condition:

On 3/3/2000, River Water Pump WR-P-1C at Beaver Valley Power Station (BVPS) Unit 1 was placed into service with bearing and motor cooling water supplied by its own discharge via the safety related 'Y' strainer RW-YS-42. Within 10-15 seconds of pump startup, the seal water pressure dropped to approximately 5 psig from its normal operating pressure of approximately 30 psig. The operator then blew down the strainer and normal seal water operation ensued.

A review of the adequacy of the BVPS Unit 1 seal water design for the River Water System was initiated as a result of the condition that occurred with the non-safety related seal water source on 2/8/2000. The recent partial fouling of the 'Y' strainer on 3/3/2000 identifies that starting a River Water Pump which has been idle for a period of time may initially ingest a slug of silt from the Intake Structure bay large enough to restrict the flow of seal water through this strainer. The inlets of the RPRW pumps are located approximately seven inches above the concrete floor of the bay. The combination of the idle Unit 1 RPRW pump and the continuous operation of the Unit 2 Service Water pump in this bay is believed to have caused silt to fill in near the Unit 1 idle pump.

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DESCRIPTION OF EVENT (Continued)

Since by design, the WR-P-1C pump's motor operated discharge valve is normally closed when the pump is shutdown, the valve must automatically stroke open when the pump starts. Although the discharge valve has a relatively long stroke time (approximately 60 seconds), it is a butterfly valve and achieves relatively high flow in a short period of time. While the discharge valve is closed, and the pump is running, whatever fluid mixture was located at the pump suction during start would be transported to the section of piping between the pump discharge and the discharge valve. This is the section where the self-supplied strainer supply piping taps into the pump discharge piping. Thus, until the discharge valve opens sufficiently to allow the water with higher than normal concentration of silt to move on down the header, the seal water piping will receive flow from this higher silt concentration source. The period that the seal water piping is exposed to the higher silt concentration is estimated to be approximately 10 seconds. The self-supplied strainer fouling situation did not occur during past pump starts because an independent source of filtered water was aligned to the pump seals. Even though the self-supplied strainer was aligned, it did not supply seal water due to the intentionally designed pressure-auctioneering scheme of the seal water system. As long as the filtered water supply maintained adequate pressure in the seal water supply header, it prevented flow from the self-supplied strainer flowpath which is connected to the seal water supply header through a check valve.

It has been determined that design deficiencies existed in the safety related BVPS Unit 1 seal water design for the River Water System pumps that has been credited since initial operation of the Unit. The strainer fouling occurrence on 3/3/2000 required operator intervention in a brief period of time to restore desired seal flow. In this case, an operator was stationed at the pump as an expected practice for routine pump starts. During an emergency start of a RPRW pump, an operator may not be in the area, and the pump must be able to continue to operate without unreasonable operator response required. This seal water design concern involves the operability of a non-operating pump during startup.

Seal water strainer fouling during pump operation is more gradual and allows time for reasonable operator action. This was demonstrated on February 19, 2000 when the low seal water pressure alarm occurred on the 1B RPRW pump (alarm set point is 27.5 psig). During muddy river water conditions following recent rain, an operator cleared a partially fouled strainer. The seal water pressure had decreased to about 25 psig from the normal operating value of 30 psig.

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REPORTABILITY

One train of the River Water System was inoperable following the reconfiguration of the Filtered Water System on 2/5/2000 leading to higher than normal seal water temperature. The higher seal water temperature caused the non-operating RPRW System pump to be inoperable due to thermal pump shaft elongation. This condition is reportable pursuant to 10CFR50.73(a)(2)(ii)(B) as a condition that is outside the design basis of the plant because one train of a two train safety related system (required to be operable per Technical Specification 3/4.7.4.1) was not fully capable of performing its design safety function for an extended period of time during operation. NUREG-1022 defines 'extended period of time' where the LCO allowed outage time is exceeded by more than a modest amount (e.g., 25 percent). The allowed outage time for one train of River Water System pursuant to Technical Specification 3.7.4.1 is 72 hours. The time frame between when the temporary operating procedure was initiated (which resulted in higher than normal seal water temperature) until the second train of River Water System was restored to operable status exceeded 90 hours. This condition was initially reported via the ENS System for information at 1650 on 2/9/2000 and subsequently reported pursuant to 10CFR50.72 (b)(1)(ii)(B) at 1827 on 2/10/2000.

This condition is also reportable pursuant to 10 CFR 21. The installation and use of the Filtered Water System in 1976 by Stone & Webster Engineering Corp (SWEC) to supply seal water to the BVPS Unit 1 RPRW pumps did not provide adequate consideration or control of the water temperature being supplied as seal water to the RPRW pumps. This design defect had the potential to render non-operating RPRW pump(s) inoperable if warmer water happened to flow into the filtered water supply header from the filtered water storage tank or other warmer water sources in cold weather. This would result in the loss of safety function necessary to mitigate the consequences of a design basis accident following a postulated single failure. Therefore this condition involves a basic component with a defect that could create a safety hazard and is reportable pursuant to 10 CFR 21 requirements. This report satisfies the notification and reporting requirements of 10 CFR Part 21 per the provisions of 10 CFR 21.2(c).

A material condition problem was identified on 3/3/2000 involving the seal water filter design which provided further basis that the BVPS Unit 1 seal water design for the RPRW Pumps may not have been sufficient to meet the design basis of the plant. This condition was reported as an update at 1816 on 3/7/2000 to the information previously reported at 1827 on 2/10/2000 pursuant to 10CFR50.72 (b)(1)(ii)(B).

CAUSE OF THE EVENT

The root cause of the condition involving the temperature of the Filtered Water System was inadequate design analyses and inadequate specification of technical information in site documents regarding critical characteristics related to the temperature effect of seal water on the vertical, thermal expansion of a non-operating pump shaft. This lack of published information resulted in a lack of consideration for critical characteristics related to seal water temperature. This is evident by the installation and use of the Filtered Water System as a seal supply in 1976 by SWEC without understanding, or not considering the pump shaft temperature growth concerns. The design change that installed the filtered water connection from the Unit 1 water treating system to the intake structure in 1976 failed to consider the overall effects of seal water temperature on the river water pumps. The seal water temperature was not identified as a critical parameter in site documents. The water treating system temperatures were not designed to be controlled for safety related purposes. The main temperature control designed in the water treatment system is to prevent freezing from occurring. These water treatment system temperatures can and do vary.

The root cause analysis also identified the following causal factors:

1) The pump vendor technical information of the Byron Jackson (28KXH, Single Stage) River Water pump does not identify the limitations of seal water temperature for pump operability. The vendor technical manual detailing the installation, operation and maintenance requirements of the Unit 1 River Water System pumps lacked sufficient information with regard to the temperature effects that seal water would have on shaft length. Additionally, the plant staff was not knowledgeable of this concern.

2) The following were missed opportunities to recognize the adverse effects of warmer seal water. However, the design documents and technical manuals did not identify seal water temperature as a critical parameter.

   - When the temporary operating procedure was first used in July 1990.
   - When determining the reasons for frequent pump lift adjustments during a Service Water Operational Performance Inspection (SWOPI) in 1994. Further investigation and understanding of the bases for pump lift changes may have identified the adverse effects of warmer seal water temperature during pump non-operating conditions.
   - During a design change in 1999 for upgrading an alternate seal water supply system at the main intake structure.

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CAUSE OF THE EVENT (Continued)

The direct cause of the degradation of seal water pressure during start of RPRW pump WR-P-1C on 3/3/2000 is fouling of the seal water strainer (RW-YS-42) caused by ingestion of silt from the bottom level of the intake bay during the pump start. A combination of several factors contributed to the seal water strainer RW-YS-42 situation. RPRW pump WR-P-1C had been idle for a few weeks with the Unit 2 Service Water pump 2SWS-P21B operating in the same bay. The active flow in the bay facilitated silt filling in the void that normally forms beneath the pump suction opening during pump operation, while also bringing in new silt material from the river. When WR-P-1C was started, the silt under and around its suction was drawn into the pump and a portion of this material was routed to the seal supply strainer by virtue of the self-supplied seal water piping arrangement. The same result could occur whenever a pump is started if it has been idle for some time (days), and another pump is active in the bay. This result has not occurred on prior pump starts because filtered water was the normal supply to the pump seals, and by design, the RW-YS-42 strainer was not demanded to provide flow.

The root cause of the strainer fouling event is design analysis. The RPRW pump self-supplied seal water strainers RW-YS-40, 41, and 42 are only 3/4 inch devices and do not appear sufficient to reliably filter river water during poor river water quality conditions and/or restarting of a pump that has been idle in a bay with active flow from an adjacent pump.

A contributing cause for both events is ineffective corrective action. Review of the seal water system modification history, and examination of differences applied to subsequent designs used for Unit 2 and the Auxiliary Intake structure seal water systems, indicates that prior modifications to the Unit 1 RPRW seal water system were intended to remedy seal water quality and maintenance problems associated with the original as-built design. These attempts, however, were ineffective in solving the overall problem, did not recognize the thermal binding critical characteristic of the RPRW/SWS pumps, and failed to properly address the need for greater reliability in the safety related portion of the system. Until the thermal binding problem occurred on February 8, 2000, use of the filtered water system appeared successful, and apparently masked the reliability problems with the self-supplied strainers (RW-YS-40, 41, &42).

A second contributing cause to the strainer fouling event is inadequate testing. Pre-operational testing was focused primarily on pump performance testing and utilized the self-cleaning strainer WR-S-2 as the primary seal water source. Routine testing of the Unit 1 RPRW Pumps did

CAUSE OF THE EVENT (Continued)

not require starting the pumps with only their safety related seal water supplies in service to simulate the conditions that could exist during a Design Basis Accident (DBA) start. During quarterly testing, the safety related seal flow is established to verify flow and pressure capability, and also to test seal water supply check valves. However, the test procedure established this alignment after the pump had already been started using the non-safety related filtered water source.

ANALYSIS AND SAFETY IMPLICATIONS

Normally at BVPS Unit 1, one RPRW pump is in service with the second pump in standby. In addition, a third (swing) pump is available to support the RPRW System. The seal water supply for the BVPS Unit 1 RPRW pumps was provided by the non-safety related Filtered Water System. Seal water flow was normally provided to idle pumps as well as the running pumps to keep an alarm from actuating on low seal water pressure. Each pump also has a safety grade seal water supply which uses water from the pump discharge through a strainer. This safety grade seal water supply was designed to be continuously aligned to the seal water supply header via a pressure control valve which would provide seal water flow whenever the non-safety related seal water flow became inadequate.

If warm water is provided to an idle RPRW pump during cold river water conditions, the warmer seal water travels down along the pump shaft, which is approximately 69 feet long, and increases the shaft temperature. The pump casing temperature is not substantially affected by the seal water temperature because much of it is submersed in the river and is at thermal equilibrium with the river water temperature. This creates a differential thermal growth between the pump shaft and the pump casing. This differential thermal growth can potentially lead to impeller binding as described in this LER.

Filtered water is normally at or near river water temperature because an appreciable amount of heat is not normally added to the process by the water treating system. Therefore, under normal conditions, the temperature concerns of the Filtered Water System had not caused a problem. Past effects are difficult to ascertain due to the multiple variables and availability of limited historical data. In the abnormal occasions when there may have been an appreciable amount of heat added to the water treating system or by the Filtered Water Storage Tank, river water pump susceptibility with this elevated temperature concern is limited to the colder months when river temperature is low. This is because in the other months when the river water temperature is higher, the river water pump casing is also at a higher temperature, thereby

ANALYSIS AND SAFETY IMPLICATIONS (Continued)

limiting the differential temperature between the river water pump shaft and casing. A review of past river water pump starts reveals that these pumps have started successfully multiple times over a wide range of possible thermal conditions. From 1/4/99 to 2/8/00 alone, there have been collectively over 70 successful starts of the RPRW pumps (WR-P-1 A, B and C). With the exception of this recent condition, it cannot be conclusively determined if in the past, that a RPRW pump would have failed to start due to the differential temperature of the filtered water temperature and the actual river water temperature. However, favorable historical pump start performance indicates that the effects on past pump operability would have been limited.

The effect of having warmer than normal filtered water being supplied to an operating RPRW pump at either BVPS unit is negligible due to the extremely large volume of pumped water transferring heat from the small volume of seal water as it passes through the pump. This maintains a relatively isothermal temperature condition between the pump shaft and the pump casing of a running pump. Thus this condition would not completely remove all river water cooling capability via the Unit 1 River Water System since at least one pump always remains in operation.

Contrary to the BVPS Unit 1 River Water System design, the BVPS Unit 2 Service Water System utilizes both Train A and B pumps operating to provide cooling to both safety related and non-safety related plant components. [BVPS Unit 1 has a separate river water system to provide cooling for non-safety related equipment.] Since BVPS Unit 2 operates with both trains of Service Water pumps in service, this condition would not prevent operability of the Unit 2 Service Water System since the condition can only adversely affect a non-operating pump.

The BVPS Unit 1 Auxiliary River Water (ARW) System pumps and BVPS Unit 2 Standby Service Water (SWE) System pumps, located in the Alternate Intake Structure, are not normally in operation. However, the ARW pumps were able to be rotated by hand and the SWE pumps were not receiving seal water from the Filtered Water System. Therefore these pumps were not adversely affected by this condition and were available to be used for safety related equipment cooling in place of the BVPS Unit 1 River Water pumps or the BVPS Unit 2 Service Water pumps, respectively, if needed. These Alternate Intake Structure pumps rely mainly on self supplied seal water. Although filtered water could have been used for the pumps in the Alternate Intake Structure in the past, the long run of underground piping and low flow to the Alternate Intake Structure would have tended to remove potential abnormal heat from filtered water enroute to the Alternate Intake Structure.

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ANALYSIS AND SAFETY IMPLICATIONS (Continued)

A probabilistic risk assessment was performed for the condition involving warmer seal water at Unit 1. This assessment assumed 1) that operators are given credit to start the 'A' and 'B' Auxiliary River Water pumps and 2) this condition began at 2210 on 2/5/2000 when the temporary operating procedure redirected the filtered water configuration. With the 'B' train declared functional (but not yet operable due to the need to complete assessments) at 2116 on 2/9/2000, it was determined that the maximum change in Core Damage Frequency (CDF) for this condition correlates to a 'White' condition (i.e., 1.0E-06 < delta CDF < 1.0E-05) in the NRC Significance Determination Process (SDP). Thus this condition would be categorized as low to medium SDP risk.

The longer-term effects of the river water pump seals and filtered water system design deficiencies were also evaluated based on the NRC SDP using the Updated PRA model of record. An annual delta CDF was calculated, given that these deficiencies existed since 1976.

This evaluation was based on modeling a combination of seal water issues, including strainer fouling and temperature effects on the river water pump shafts. Some of the variables that were used in this evaluation include combinations of silting in idle pump bays, the difference between river water and filtered water temperatures, and high river water levels. The frequency during a year that the plant was vulnerable to each of these combinations was also estimated, using actual plant data as the basis. Investigations determined that both auxiliary river water pumps were unaffected by river water conditions during the period analyzed. However, the PRA assumed unavailabilities for these pumps were included in the analysis.

Based on this evaluation, the annual delta CDF was calculated to be between 1E-06 and 1E-05, or 'WHITE' per the NRC SDP guidelines. Therefore, the safety significance of this condition, as measured by the annual delta CDF, is characterized to be low to medium.

CORRECTIVE ACTIONS

1. Administrative controls were implemented to place and maintain the seal water supply source for BVPS Unit 1 RPRW pumps as being self supplied from the respective pumps discharge strainer or the pumped fluid common strainer (WR-S-2). The use of the Filtered Water System or the original non-safety related Cyclone Separator have been precluded as seal water/lubricating fluid for the BVPS Unit 1 RPRW pumps, the BVPS Unit 1 Auxiliary River Water System pumps, and the BVPS Unit 2 Service Water System pumps, and the BVPS Unit 2 Standby Service Water System pumps, pending further evaluation. The use of the non-safety related Cyclone Separator is being evaluated for potential return to service on the BVPS Unit 2 Service Water pumps due to their design and operating differences.

2. The design of the safety-related portion of the seal water supply to the BVPS Unit 1 RPRW pumps has been modified to improve reliability and support an unattended automatic start of the non-operating RPRW pump. Individual cyclone separators were installed and tested satisfactorily on each BVPS Unit 1 RPRW pump. This was completed before BVPS Unit 1 entered Mode 4 during its 1R13 refueling outage.

3. Applicable site design documents (vendor technical information) were revised for the River and Service Water pumps to reflect the seal water temperature effects on the pump.

4. Periodic testing procedures for both BVPS Units have been revised to ensure that the safety-related portions of the seal water supply system are periodically tested at pump start. The intent of this action was to utilize a seal supply alignment that simulates the available seal water sources during a DBA emergency automatic start of an idle pump.

5. Station procedures have been revised to inspect intake bay silt levels following high river conditions and clean bays if acceptance criteria is exceeded.

PREVIOUS SIMILAR EVENTS

A review of LERs for Beaver Valley Power Station Unit 1 and Unit 2 identified two occurrences involving design or operational issues on the BVPS Unit 1 River Water System or BVPS Unit 2 Service Water System within the last three years.

BVPS Unit 2 LER 99-007, 'Forced Shutdown Due to Inoperable Emergency Diesel Generator'

BVPS Unit 2 LER 99-011, 'Inoperability of Service Water System Train B Due to Deformed Discharge Expansion Joint on In-Service Pump 2SWS*P21C'