

Commonwealth Edison Company
Byron Generating Station
4450 North German Church Road
Byron, IL 61010-9794
Tel 815-234-5441



November 14, 1996

LTR: BYRON 96-0288
FILE: 3.03.0800 (1.10.0101)

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

Dear Sir:

The Enclosed Licensee Event Report from Byron Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(ii).

This report is number 96-019; Docket No. 50-454.

Sincerely,

A handwritten signature in dark ink, appearing to read "K. L. Kofron", is written above the printed name.

K. L. Kofron
Station Manager
Byron Nuclear Power Station

KLK/WD/js

Enclosure: Licensee Event Report No. 96-019

cc: A. B. Beach, NRC Region III Administrator
NRC Senior Resident Inspector
INPO Record Center
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NRC FORM 366 <small>(4-95)</small>			U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 <small>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.</small>					
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)											
FACILITY NAME (1) BYRON NUCLEAR POWER STATION						DOCKET NUMBER (2) 05000454		PAGE (3) 1 OF 4			
TITLE (4) SX COOLING TOWER BASIN INSPECTION REVEALED SILT BUILD-UP EXCEEDING SURVEILLANCE ACCEPTANCE											
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	
10	15	96	96	-- 019	-- 00	11	14	96	Byron U-2	05000455	
									FACILITY NAME	DOCKET NUMBER	
										05000	
OPERATING MODE (9)		1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10)		97%		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 M. Robinson, System Engineer								TELEPHONE NUMBER (Include Area Code) 815-234-5441 X2107			
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	
D											
SUPPLEMENTAL REPORT EXPECTED (14)						EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR	
X	YES (If yes, complete EXPECTED SUBMISSION DATE).				NO			06	30	97	

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

On 10/15/96 while performing the annual surveillance on the Essential Service Water [BI] (SX) Ultimate Heat Sink [BSI] (UHS) cooling tower basins, the diver inspection revealed that silt accumulations exceeded the acceptance criteria. An operability assessment identified a problem with available water volume in the UHS and recommended that the UHS should be considered inoperable for past occurrences when Technical Specification 3.7.5, 82 percent action statements c, e, f, g, or h were relied upon.

The cause of these events is inadequate acceptance criteria in the inspection/surveillance procedure.

Immediate action was taken to administratively increase the minimum level in the UHS under certain conditions. Corrective actions are to: remove the silt from the UHS, provide additional margin to plant operation, and to evaluate the need to perform inspections on low velocity regions of SX piping following UHS cleaning.

Additional issues have been identified and are being investigated by a multi-disciplined team. A supplement to this LER will be issued.

The safety of the plant and the public was not affected by the discovery of these conditions. This issue is reportable per 10CFR50.73(a)(2)(ii)(B) - any condition that was outside the design basis of the plant.

NRC FORM 366A (4-95)		U.S. NUCLEAR REGULATORY COMMISSION							
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION									
FACILITY NAME (1)	DOCKET	LER NUMBER (6)	PAGE (3)						
BYRON NUCLEAR POWER STATION	05000454	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; padding: 2px;">YEAR</td> <td style="width: 50%; padding: 2px;">SEQUENTIAL NUMBER</td> <td style="width: 25%; padding: 2px;">REVISION NUMBER</td> </tr> <tr> <td style="text-align: center; padding: 2px;">96 --</td> <td style="text-align: center; padding: 2px;">019 --</td> <td style="text-align: center; padding: 2px;">00</td> </tr> </table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	96 --	019 --	00	2 OF 4
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER					
96 --	019 --	00							

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

A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 10-15-96 / 1500

Unit 1 Mode 1 - Pwr Op Rx Power - 97% RCS [AB] Temperature/Pressure NOT/NOP

Unit 2 Mode 1 - Pwr Op Rx Power - 95% RCS [AB] Temperature/Pressure NOT/NOP

B. DESCRIPTION OF EVENT:

The Ultimate Heat Sink [BS](UHS) basins provide the suction source for the Essential Service Water [BI] (SX) pumps. The UHS basins are maintained at or above required levels to provide long term cooling for essential plant equipment and emergency water supplies for the Auxiliary Feedwater [BA](AF) system. Makeup to the basins consists of the SX makeup pumps, with the capability of 1500 gpm each, or the deep well pumps with the capability of 550 gpm each. Due to the difference in makeup capability, the required basin level is greater (82% vs 50%) when relying on the deep well pumps.

NRC Generic Letter (GL) 89-13, issued on July 18, 1989, presented an industry issue dealing with Service Water system problems affecting safety-related equipment. In a 1/29/90 response to GL 89-13, Byron Station committed to annual visual inspections of the Essential Service Water System [BI] (SX) Ultimate Heat Sink [BS] (UHS) cooling tower basins. As a result of this commitment, surveillance OBVS SX-5 was developed and executed annually, following the initial inspection completed in October of 1990.

On 10/15/96 while performing the annual OBVS SX-5 on the UHS, the diver inspection revealed a large increase in silt accumulation that exceeded the surveillance acceptance criteria. Previous annual executions of OBVS SX-5 showed slight increases in silt accumulation. The silt was redistributed and the surveillance was left within acceptance criteria. The large increase in silt accumulation in the UHS in 1996 may be attributed to a higher than normal Total Suspended Solids (TSS) condition seen on the Rock River this year.

A Problem Identification Form (PIF) documenting the silt buildup in the UHS was issued and an operability assessment of the UHS was initiated by Byron Site Engineering. The preliminary operability assessment completed on 10/18/96, established that increasing the level of water in the UHS from 82% to 97% would compensate for the silt and assure that the UHS meets its design functions. This applies only when the UHS is relying on deep wells for makeup water. The final operability assessment substantiated this recommendation and concluded that the UHS should have been considered inoperable in the past when Technical Specification 3.7.5 action statements c, e, f, g or h were relied upon.

A review of plant history (Limiting Condition for Operation Action Requirement (LCOAR) entries) indicates, based on the operability assessment recommendation, that the UHS should have been considered inoperable on numerous occasions. These events are reportable per 10CFR50.73(a)(2)(ii)(B) - any condition that was outside the design basis for the plant.

C. CAUSE OF EVENT:

The cause of this issue is inadequate acceptance criteria in the inspection/surveillance procedure. The acceptance criteria development did not probe thoroughly into the design basis of the UHS with regards to volumetric requirements.

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		96	-- 019	-- 00	

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

D. SAFETY ANALYSIS:

The safety of the plant and the public was not affected by these conditions. The UHS level was never challenged during any of the times reliance was on the deep well pumps.

All of the Byron Emergency Procedures (e.g. 1/2BEP-0 Series, Reactor Trip or Safety Injection and 1/2BEP-1 Series, Loss of Reactor or Secondary Coolant) include an Operator Action Summary which provides guidance on maintaining UHS level if river flow is low or SX makeup pumps are inoperable. This guidance includes aligning UHS makeup from the deep wells.

Design basis calculations setting the 82 percent limit for the UHS level (based on the lower capacity deep well pumps' ability to supply makeup sufficient to offset the evaporation rate of the water in the cooling tower basin) conservatively includes a two hour time delay for manually aligning the deep well pumps. The two hour assumption for deep well pump alignment is excessive. This assumption is based on the absence of hand wheels on the deep well pump isolation valves, in which case nitrogen bottles would have to be used to open these Air Operated Valves (AOVs). Hand wheels have been installed on these valves which allows a much faster valve opening time.

Additionally, design basis calculations assume one basin stays full to the divider wall and overflows to the affected basin. The affected basin will decrease over 16 hours until the deep well pumps can overcome evaporative losses. During this time period, it is possible for alternative operator actions to be taken that would compensate for the decreasing basin level.

E. CORRECTIVE ACTIONS:

- a) Immediate compensatory actions have been instituted whereby an administrative basin level of 97 percent will be maintained whenever Technical Specification 3.7.5 action statements c, e, f, g, or h are entered. This action was accomplished through the issuance of an operating Daily Order on 10/18/96, and associated procedure revisions.
- b) Remove silt from the UHS. (NTS: 454-201-96-1758-01)
- c) Provide additional margin to plant operation by performing one or more of the following (NTS: 454-201-96-1758-02):
 - i) Add an administrative limit to the 82 percent value to account for some level of silt buildup.
 - ii) Modify the design basis of the plant to reduce the time frame for deep well alignment to less than two hours.
 - iii) Adjust the inspection frequency and acceptance criteria to avoid accumulating more silt than is accounted for.
- d) Evaluate the need to perform inspections on SX supplied heat exchangers and other low velocity regions of SX piping, following the UHS cleaning, to assure that silt has not accumulated in these lines. (NTS: 454-201-96-1758-03)
- e) A multi-disciplined team investigation into UHS issues is ongoing. Issues related to the scope of this investigation will be reported in a supplement to this LER. (NTS: 454-180-96-0019-01)

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TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

F. RECURRING EVENTS SEARCH AND ANALYSIS:

Data base searches were performed for industry events. The keywords used were: sediment, heat exchanger, ultimate heat sink, UHS, basin, SX, ESW, reduce, and volume. One similar industry event was found. In this event, UHS silt inspection criteria was inadequately specified and resulted in the UHS not meeting design criteria. This event, in 1993, was transmitted as an operating experience (OE) and was an opportunity to identify this concern at Byron.

Another opportunity came in 1992 when engineering performed an Ultimate Heat Sink (UHS) design basis reconstitution in preparation for a Technical Specification change submittal. During the reconstitution effort, UHS volume was evaluated. Consideration for volume displacement due to silt build up was not included.

G. COMPONENT FAILURE DATA:

No Components Failed.