

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

**ComEd**

December 4, 1996

LTR: BYRON 96-0306  
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 a supplement to report number 96-019.

This report is number 96-019, Supplement 1; Docket No. 50-454.

Sincerely,



K. L. Koffron  
Station Manager  
Byron Nuclear Power Station

KLK/WD/js

Enclosure: Licensee Event Report No. 96-019, Supplement 1

cc: A. B. Beach, NRC Region III Administrator  
NRC Senior Resident Inspector  
INPO Record Center  
ComEd Distribution List

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NRC FORM 366 (4-95)			U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3160-0104 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>					
<b>LICENSEE EVENT REPORT (LER)</b>  (See reverse for required number of digits/characters for each block)											
FACILITY NAME (1)					DOCKET NUMBER (2)		PAGE (3)				
BYRON NUCLEAR POWER STATION					05000454		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	01	12	04	96	Byron U-2		05000455
									FACILITY NAME		DOCKET NUMBER
											05000
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)									
1		20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)			50.73(a)(2)(viii)
POWER LEVEL (10)		97%			20.2203(a)(1)			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								TELEPHONE NUMBER (Include Area Code)			
M. Robinson, System Engineer								815-234-5441 X2107			
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
A											
SUPPLEMENTAL REPORT EXPECTED (14)											
X	YES (If yes, complete EXPECTED SUBMISSION DATE).				NO	EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR	
								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 [BS] (UHS) cooling tower basins, the diver inspection revealed that silt accumulations exceeded the acceptance criteria. The LER issued in November of 1996 reported immediate and long term actions taken and also identified a corrective action to report results of an ongoing investigation into UHS issues. As a result of this ongoing investigation, a number of UHS issues have been identified. Among these UHS issues, errors were identified on 11/12/96 where design basis calculations did not consider the acceptance criteria for silt buildup nor take into account an anti-vortex box in the basin design. Other identified UHS issues such as, fallen trash racks, harmonic vibrations, concrete expansion anchor corrosion, and UHS intake bay intake channel silting, are under consideration for reportability and if appropriate will be reported in an additional supplement to this LER.

The cause of these events is cognitive personnel error on the part of engineering personnel.

These design basis calculational errors are bounded, with respect to operability, by the operability assessment performed, and compensatory measures taken following the 10/15/96 diver inspection. These compensatory measures included raising the UHS basin level from 82% to 97%.

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.

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BYRON NUCLEAR POWER STATION	05000454	96	-- 019	-- 01	2 OF 4

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 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. 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.

The LER issued in November of 1996, on this concern, reported immediate and long term actions taken, and also identified a corrective action to report results of an ongoing investigation into UHS issues. As a result of this ongoing investigation, a number of UHS issues have been identified. Among these UHS issues, errors were identified on 11/12/96 where design basis calculations did not consider the acceptance criteria for silt buildup nor take into account an anti-vortex box in the basin design. Other identified UHS issues such as, fallen trash racks, harmonic vibrations, concrete expansion anchor corrosion, and UHS intake bay intake channel silting, are under consideration for reportability and if appropriate will be reported in an additional supplement to this LER.

These design basis calculational errors are bounded, with respect to operability, by the operability assessment performed, and the compensatory measures taken, following the 10/15/96 diver inspection.

C. CAUSE OF EVENT:

The cause of these issues is cognitive personnel error on the part of engineering personnel. The design basis calculations did not consider the acceptance criteria for silt buildup nor take into account an anti-vortex box in the basin design. Engineers did not probe thoroughly into the design basis of the UHS with regards to volumetric requirements.

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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.

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.

The 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 were 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) An investigation into UHS issues continues. Long term corrective actions based on these calculational errors and the results of the continuing UHS investigation will be reported in a supplement to this LER. (NTS: 454-180-96-0019-01)

LICENSEE EVENT REPORT (LER)  
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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 previous events in the Byron Regulatory Assurance data base (RABY). The keywords used were "design AND basis AND calculation". Sixty-three documents were found dating back to 1986. The majority of these documents were applicable to design basis calculations in error, design basis document deviation control, or pertained to design basis knowledge. One of the documents pertained specifically to the UHS.

G. COMPONENT FAILURE DATA:

No Components Failed.