

Commonwealth Edison Company  
Byron Generating Station  
4450 North German Church Road  
Byron, IL 61010-9700  
Tel 815-234-5441

**ComEd**

June 23, 1997

LTR: BYRON 97-0146  
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)(i).

This report is number 97-009; Docket No. 50-454/455.

Sincerely,

*M Snow*  
K. L. Koiron  
Station Manager  
Byron Nuclear Power Station

KLK/MS/js

Enclosure: Licensee Event Report No. 97-009

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. 3150-0104 EXPIRES 04/30/98			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.		
<b>LICENSEE EVENT REPORT (LER)</b>											
(See reverse for required number of											
BYRON NUCLEAR POWER STATION, UNIT 1						05000454			1 OF 6		
MISSED TECHNICAL SPECIFICATION SURVEILLANCE											
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME		DOCKET NUMBER
05	22	97	97	009	00	06	23	97	Byron, Unit 2		05000455
									FACILITY NAME		DOCKET NUMBER
									Braidwood, Unit 1, Unit 2		05000456/457
OPERATING MODE (9)		1	20.2201(b)			20.2203(a)(2)(v)		X	50.73(a)(2)(i)		50.73(a)(2)(viii)
POWER LEVEL (10)		097	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)		
NAME						TELEPHONE NUMBER (Include Area Code)					
Jerry Horn, Systems Engineering						815-234-5441 X2045					
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
YES (If yes, complete EXPECTED SUBMISSION DATE)					NO	EXPECTED SUBMISSION DATE (15)					

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

Pursuant to Technical Specification (TS) 4.5.2, ECCS Subsystems, venting the Chemical and Volume Control System (CB) (CV) pump casings and discharge piping high points outside of containment is required to be performed every 31 days.

However, the monthly surveillance procedure used to meet this TS criterion does not require the applicable high head injection (CV) system components to be vented.

This deficiency was attributed to managerial methods allowing the approval of a document, surveillance 1 BOS 5.2.b-1 / 2 BOS 5.2.b-1, without adequate critique or technical review. The procedure was approved without the requirement of venting the CV high head injection components, primarily because the CV pumps are designed to be self venting (i.e. the pumps do not have vents on the pump casings).

Corrective actions included weekly Ultrasonic examinations (UT) of piping, issuance of a Daily Order to Operators, discussion of gas accumulation in stagnant lines, an exigent Technical Specification change and, a procedure revision to include the monthly UT examinations and the 1RH027 valve into the Unit 1 Monthly ECCS Venting Surveillance.

10 CFR 50.73 (a)(2)(i) requires Licensee to report operations or conditions prohibited by the plant's Technical Specifications. The surveillance requirements for 4.5.2.b-1 had not been completed and the equipment was inoperable for more than the LCO allowable time.

(4.95)

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

BYRON NUCLEAR POWER STATION, UNIT 1	05000454	YEAR	SEQUENTIAL	REVISION	2 OF 6
		97 --	009 --	00	

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

**A. PLANT CONDITIONS PRIOR TO EVENT:**

Event Date/Time 05-22-97 / 1900

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

Unit 2 Mode 1 - Pwr Op Rx Power - 100% RCS [AB] Temperature/Pressure NOT/NOP

**B. DESCRIPTION OF EVENT:**

On May 22, 1997, during the discussion of a clogged 2A Safety Injection (SI) pump vent, the Byron NRC Resident Inspectors raised a concern that the ECCS venting procedure does not include venting the Chemical and Volume Control System {CB} (CV) pumps and CV discharge line high point. The same procedure is used at Braidwood.

During the discussion, the NRC residents stated their position that a running pump is considered to flush a system, not vent it. The discharge piping downstream of the standby CV pump is not subject to system flow and is therefore not vented.

The CV system high point vent is in a section of piping that is pressurized to CV pump discharge pressure (~2500 pounds per square inch gauge) and it is not appropriate to routinely vent this section of piping for personnel safety reasons, or from an equipment reliability standpoint.

A Braidwood Engineer had raised this issue concerning CV pump venting, in February 1996. In response, a Byron Operability Assessment was performed to address the 1996 concern. It was concluded that the pumps are self-venting due to their design. At that time, the TS surveillance requirement was considered to be met.

During this 1996 timeframe, ComEd believed that system venting was not necessary because there are no vents installed on the pumps and, the design of the pumps did not require them to be vented.

However, on May 22, 1997, Byron's NRC Resident Inspectors were concerned that the ECCS venting procedure did not include venting the CV pumps and CV pump discharge lines. After further discussion with NRC personnel, Byron determined that it did not literally meet the Technical Specification requirement.

On May 22, 1997, ComEd agreed this condition constituted a non-compliance with the surveillance requirements of TS 4.5.2.b.1. Both trains of CV were declared inoperable and TS 3.0.3 was entered on May 22, 1997 at 1900 hrs. In accordance with TS 4.0.3, the actions of TS 3.0.3 were delayed for 24 hours for performance of a missed surveillance.

As a result, ComEd requested that the NRC grant a Notice Of Enforcement Discretion (NOED) from the surveillance requirement for venting the CV pump casings and CV discharge piping high point until an exigent Technical Specification change could be submitted and approved, to change the ECCS venting requirements.

The draft request was discussed with the NRC Staff and comments were included in the final package. The NOED request, as presented to the NRC, met the requirements documented in Administrative Letter 95-05, and was approved on 5/23/97.

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LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

BYRON NUCLEAR POWER STATION, UNIT 1	05000454	YEAR	SEQUENTIAL	REVISION	3 OF 6
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

B. DESCRIPTION OF EVENT (cont.)

ComEd is performing periodic ultrasonic test (UT) inspections of the identified areas in the CV system piping. This inspection activity will continue until the NRC approves the amendments to revise the ECCS venting requirements in Technical Specifications.

On May 31, 1997, Unit 1 was shutdown to repair a Main Steam Isolation Valve. In order to re-start the Unit, an Emergency Technical Specification change was requested. The Emergency Technical Specification change was approved on June 1, 1997.

On May 27, 1997, the Resident Inspector asked why 1RH027, indicated on P & ID M-62 as a High Point Vent valve, was not included in the Monthly Venting Surveillance. Upon investigation, it was discovered that this valve was on the discharge piping of the 1B RH Heat Exchanger, located approximately 40 feet above the floor of the 1B RH Heat Exchanger room. The remote valve operator was discovered to be disconnected. Additionally, the vent valve had no piping attached to it to provide for venting. Unit 2 does not have a corresponding valve.

ComEd immediately initiated action to vent the RH system through the 1RH027 valve. The valve was opened to vent the system and then re-closed. No evidence of gas or air was noted. An Engineering Request (ER) was submitted to provide a design change to route the vent piping of valve 1RH027 to the floor of the 1B RH Heat Exchanger room to allow access for monthly venting. A procedure change was submitted to incorporate this valve into the Unit 1 Monthly Venting Surveillance.

Investigation revealed that although a remote valve operator was installed for this valve, it had been disconnected some years ago because the vent valve was not piped to a floor drain. Venting with this configuration results in spilling water into the 1B RH Heat Exchanger room. Because of the water spillage, and the fact that it is difficult to physically access the valve, the valve was not included in the monthly venting procedure. The valve is included in the Fill & Vent procedure for the 1B RH train for filling the system after draining for maintenance.

In addition to the emergency and exigent TS amendment requests, ComEd has provided written information concerning gas accumulation in stagnant lines to licensed operators via a Daily Order. This information was communicated during shift briefings.

This event is reportable per 10CFR50.73(a)(2)(ii), Operations or Conditions Prohibited by the Plant's Technical Specifications.

**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

BYRON NUCLEAR POWER STATION, UNIT 1	05000454	YEAR	SEQUENTIAL	REVISION	4 OF 6
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**C. CAUSE OF EVENT:**

This issue did not involve equipment failures with multiple component functions. This issue was considered a management error and involved a Technical Specification violation.

The management involved at the time of the original procedure review on 12/28/84, considered meeting the intent of the Technical Specifications to be adequate. Therefore, no changes to the Technical Specifications were thought to be required.

Taken collectively, these events which occurred in 1984, are classified as management deficiencies or weaknesses in managerial methods. The methods allowed approval of a proposed document surveillance (1 BOS 5.2.b-1 / 2 BOS 5.2.b-1) without adequate critique or technical review. No additional corrective actions are assigned for Byron Management.

**D. SAFETY ANALYSIS:**

Byron and Braidwood have performed UT inspections of potentially susceptible areas of the CV piping system. Specifically, the piping on the discharge side of the standby CV pump up to the downstream check valves for both units is being UT inspected along with the stagnant piping around the 1/2 SI045 valves. No gas voids were identified in either section of piping. One additional intermediate high point location is being routinely inspected via UT. This location is on the discharge piping of the 1B/2B CV pumps. When the 1B/2B pump is idle, this location is under pressure, but has stagnant flow. UT inspections are performed at this location when the 1B/2B pump is idle.

The above provides technical justification that the safety significance for this event is minimal. From a risk perspective, the surveillance issue did not increase the probability of an initiating accident that would require the CV system to mitigate the consequences of the accident.

In addition, ComEd has determined that there was minimal impact on the functional capability of the CV system to perform its intended function of cooling the reactor core and providing shutdown capability following initiation of certain accidents.

ComEd has evaluated the piping configuration for the ECCS discharge piping of the ECCS subsystems. A specific engineering evaluation of both a voided 2-inch and 8-inch RH line was performed. This evaluation concluded that the piping can withstand the dynamic loads caused by the maximum credible air void. Due to the higher-pressure rating and smaller size of the SI and CV discharge piping, this evaluation is considered bounding for the ECCS subsystems. The results of the evaluation were submitted for NRC staff review in a letter dated March 12, 1990, in support of Amendments 47 and 36 to the Operating Licenses for Byron and Braidwood, respectively.

ComEd has determined that the CV system was fully capable of performing its intended design function, including mitigation of design basis accidents.

Although it has been determined that Byron and Braidwood are not in compliance with the surveillance requirements in TS 4.5.2.b.1, the functional intent of the surveillance for the CV Pumps was met by the inherent design of the pumps. This is further supported by the compensatory action, which was completed on May 23, 1997 to perform UT inspections of the vulnerable sections of CV system piping for gas voids. No gas voids were identified. Therefore, since the CV system is expected to function as designed, there would be no increase in consequences from that previously evaluated.



**LICENSEE EVENT REPORT (LER)**  
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BYRON NUCLEAR POWER STATION, UNIT 1	05000454	YEAR	SEQUENTIAL	REVISION	5 OF 6
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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**E. CORRECTIVE ACTIONS:**

Weekly ultrasonic testing inspection of vulnerable areas in the CV discharge pump is being performed and will continue until the Technical Specification change is approved. (NTS 454-240-97-074-01)

A Daily Order was issued to licensed operators to heighten awareness. (NTS 454-240-97-074-02)

Discussion of concern for gas accumulation in stagnant lines is being included in shift briefings. (NTS 454-240-97-074-03)

An exigent Technical Specification change was submitted on 5/23/97. On May 31, 1997 the exigent request was supplemented to request an emergency Technical Specification change for Unit 1. This was to allow restart of Unit 1 following a Technical Specification required shutdown for inoperability of a main steam safety valve. The NRC approved that request on June 1, 1997.

ECCS Venting and Valve Alignment Monthly Surveillance (1/2 BOS 5.2.b-1) is being revised to include UT inspections on a 31 day basis, including acceptance criteria and actions to satisfy the surveillance requirements. (NTS 454-180-97-SCAQ00009-01)

The feasibility of a design change to route the vent piping of valve 1RH027 to the floor of the 1B RH Heat Exchanger Room will be investigated. (NTS 454-180-97-SCAQ00009-02A, -02B, -02C, -02D)

A procedure change was submitted to incorporate the 1RH027 valve into the Unit 1 Monthly Venting Surveillance. (NTS 454-180-97-SCAQ00009-03)

A review of selected Technical Specification surveillances will be performed to verify literal compliance with Technical Specification requirements. Results will determine further actions. This will be tracked by NTS item 454-180-97-SCAQ00009-04)

**F. RECURRING EVENTS SEARCH AND ANALYSIS:**

The following keywords were used for the Data Base search:

Vent\$, charging, SI, Pump and ECCS

IEN 88-23 "Potential for Gas binding of High Pressure SI Pumps during a LOCA."

This item addresses the potential for common-mode failure caused by hydrogen gas binding of the high-head safety injection pumps (Charging Pump) during a Loss-Of-Coolant Accident (LOCA). In response to this IEN ComEd had Westinghouse perform an analysis which concluded that the centrifugal charging pump (CV) suction piping network at Byron allows elevation head from the Volume Control Tank (VCT) to maintain hydrogen in solution. Based on the Westinghouse analysis and past operating history of the CV pump in which no problems were noted Byron felt that no further actions were needed.

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**LICENSEE EVENT REPORT (LER)**  
**TEXT CONTINUATION**

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**F. RECURRING EVENTS SEARCH AND ANALYSIS (cont.)**

455-201-96-0118 "Significant Air Vented from Vent Valve 2SI047."

While performing the ECCS fill and vent surveillance, 2BOS 5.2.b-1, a significant amount of air/gas was vented from vent valve 2SI047. Previously, multiple valve strokes in the Safety Injection (SI) system took place, which may have allowed gas bubbles to migrate to a high point in the system. Air was removed from the Residual Heat Removal system (RH) hot leg injection, the Systems Engineering Department was consulted, and the problem identification form information was put in the data base for trending.

454-100-96-00303 "Inspection follow-up item, Safety Injection Pump Venting Surveillance."

On 2/14/96, the licensee was initially unable to vent the 1B Safety Injection (SI) Pump Casing during the performance of a monthly venting surveillance. The pump casing was eventually vented through the VF line. Venting through the VF line caused the NRC to question the detrimental affects of borated water on the carbon steel VF system piping. Systems Engineering evaluated the NRC concern and determined that the introduction of boric acid into the carbon steel piping of the VF system would have an extremely minimal effect on the system. It was determined that corrosion rates would be less than two thousandths of an inch per year with a boron concentration of 2500 parts per million. The plugged 1B SI vent line was replaced.

IEN 90-064 "Potential for common-mode failure of High Pressure Safety Injection Pumps or release of Reactor Coolant outside containment during a LOCA."

IEN 90-064 describes an industry event where the manner in which the vent line isolation valves were installed allowed the Volume Control Tank (VCT) to drain through these high-point vent isolation valves. The installed configuration of the ASCO valves at Haddam Neck was such that failure of these valves to isolate during a LOCA (i.e., during ECCS injection phase) could drain down the VCT and allow hydrogen gas in the VCT (and any gas that had accumulated in the vent line) to be transported to the suction of the charging pumps by way of the high-point vent charging pump suction line. Westinghouse reviewed the document and concurred with the Byron/Braidwood System Engineering evaluations, which state that the Byron Station Chemical Volume Control System (CV) configuration is such that the event described in the NRC Information Notice is not applicable to Byron Station.

**G. COMPONENT FAILURE DATA:**

No components failed.