

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

**ComEd**

DATE April 23, 1996

LTR: BYRON 96-0091  
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)(iv)(A).

This report is number 96-001; Docket No. 50-455.

Sincerely,



K. L. Kofron  
Station Manager  
Byron Nuclear Power Station

KLK/WD/js

Enclosure: Licensee Event Report No. 96-001

cc: H. J. Miller, NRC Region III Administrator  
NRC Senior Resident Inspector  
INPO Record Center  
CECo Distribution List

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| <b>NRC FORM 366</b><br><small>(4-95)</small>  |                   |                 | <b>U.S. NUCLEAR REGULATORY COMMISSION</b>   |                     |                   | <b>APPROVED BY OMB NO. 3150-0104</b><br><b>EXPIRES 04/30/98</b><br><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 (IT-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><br>(See reverse for required number of digits/characters for each block)   |                   |                 |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| FACILITY NAME (1)<br><div style="text-align: center; font-weight: bold;">BYRON NUCLEAR POWER STATION</div>  |                   |                 |   |                     |                   | DOCKET NUMBER (2)<br><div style="text-align: center; font-weight: bold;">05000455</div>  |   | PAGE (3)<br><div style="text-align: center; font-weight: bold;">1 OF 4</div> |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| TITLE (4)<br><div style="text-align: center;">Inadvertent Letdown Isolation During Slave Relay Surveillance Due to Electrical Jumper Falling Off</div>  |                   |                 |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| EVENT DATE (5)<br><table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>MONTH</th> <th>DAY</th> <th>YEAR</th> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">26</td> <td style="text-align: center;">96</td> </tr> </table> |                   |                 | MONTH   | DAY                 | YEAR              | 3  | 26  | 96   | LER NUMBER (6)<br><table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>YEAR</th> <th>SEQUENTIAL NUMBER</th> <th>REVISION NUMBER</th> </tr> <tr> <td style="text-align: center;">96</td> <td style="text-align: center;">-- 001 --</td> <td style="text-align: center;">00</td> </tr> </table> |  |  | YEAR  | SEQUENTIAL NUMBER | REVISION NUMBER | 96 | -- 001 -- | 00 | REPORT DATE (7)<br><table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>MONTH</th> <th>DAY</th> <th>YEAR</th> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">23</td> <td style="text-align: center;">96</td> </tr> </table> |  |  | MONTH | DAY | YEAR | 4 | 23 | 96 | OTHER FACILITIES INVOLVED (8)<br><table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>FACILITY NAME</th> <th>DOCKET NUMBER</th> </tr> <tr> <td></td> <td style="text-align: center;">05000</td> </tr> <tr> <th>FACILITY NAME</th> <th>DOCKET NUMBER</th> </tr> <tr> <td></td> <td style="text-align: center;">05000</td> </tr> </table> |  | FACILITY NAME | DOCKET NUMBER |  | 05000 | FACILITY NAME | DOCKET NUMBER |  | 05000 |
| MONTH   | DAY               | YEAR            |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| 3   | 26                | 96              |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| YEAR  | SEQUENTIAL NUMBER | REVISION NUMBER |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| 96  | -- 001 --         | 00              |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| MONTH   | DAY               | YEAR            |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| 4   | 23                | 96              |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
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|   | 05000             |                 |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
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|   | 05000             |                 |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| OPERATING MODE (9)<br><div style="text-align: center; font-weight: bold;">1</div>   |                   |                 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11) |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| POWER LEVEL (10)<br><div style="text-align: center; font-weight: bold;">100</div>   |                   |                 | 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)  |  | 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)     |  | <input checked="" type="checkbox"/> 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)                                    |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| <b>LICENSEE CONTACT FOR THIS LER (12)</b>   |                   |                 |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| NAME<br><div style="text-align: center;">Raymond F. Choinard, extension 2041</div>  |                   |                 |   |                     |                   | TELEPHONE NUMBER (include Area Code)<br><div style="text-align: center;">815-234-5441</div>  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| <b>COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)</b>   |                   |                 |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| CAUSE   | SYSTEM            | COMPONENT       | MANUFACTURER  | REPORTABLE TO NPRDS |                   | CAUSE  | SYSTEM  | COMPONENT  | MANUFACTURER  | REPORTABLE TO NPRDS  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| N/A   |                   |                 |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
|   |                   |                 |   |                     |                   |  |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| <b>SUPPLEMENTAL REPORT EXPECTED (14)</b>  |                   |                 |   |                     |                   | <b>EXPECTED SUBMISSION DATE (15)</b>   |   |  |   |  |  |   |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |
| YES<br><small>(If yes, complete EXPECTED SUBMISSION DATE).</small>  |                   |                 |   |                     | X                 | NO   |   |  |   | MONTH<br><div style="border: 1px solid black; width: 30px; height: 20px;"></div> | DAY<br><div style="border: 1px solid black; width: 30px; height: 20px;"></div> | YEAR<br><div style="border: 1px solid black; width: 30px; height: 20px;"></div> |                   |                 |    |           |    |  |  |  |       |     |      |   |    |    |   |  |               |               |  |       |               |               |  |       |

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

During the performance of surveillance 2BOS 3.2.1-850, "Unit Two ESFAS Instrumentation Slave Relay Surveillance (Train B, Containment Isolation Phase A - K605)," an unplanned ESF actuation occurred. Slave relay K605, "ESFAS Instrumentation Slave Relay for CNMT Isolation Phase A," actuated and caused valve 2CV8160, "AOV U-2 Letdown Orifices Outlet Header Isolation Valve" to close. This valve provides letdown isolation for the Reactor Coolant System (AB).

During the event, relief valve 2CV8117, "U-2 Letdown Orifices Outlet Header Relief Valve," lifted. This was due to the letdown line being isolated. The Nuclear Station Operator (NSO) (Licensed) manually isolated letdown and reduced charging flow to stabilize the plant.

Relief valve 2CV8117 reseated and the NSO re-established letdown and charging flows. The surveillance was successfully completed.

A jumper that was installed during the surveillance fell off and caused the valve to close.

To prevent recurrence, this event was discussed with Electrical Maintenance personnel. A review will be done to determine if a more secure method of installing the jumper is needed.

This event is reportable in accordance with 10CFR 50.73(a)(2)(iv)(A) as an unplanned ESF actuation during testing.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

|                             |          |       |            |          |        |
|-----------------------------|----------|-------|------------|----------|--------|
| BYRON NUCLEAR POWER STATION | 05000455 | YEAR  | SEQUENTIAL | REVISION | 2 OF 4 |
|                             |          | 96 -- | 001 --     | 00       |        |

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

A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 03-26-96 / 13:04

Unit 1 Mode 1 - Power Operations Rx Power 98% RCS [AB] Temperature/Pressure NOT/NOP

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

B. DESCRIPTION OF EVENT:

At 1249, a Nuclear Station Operator (NSO#1) began surveillance 2BOS 3.2.1-850, "Unit Two ESFAS Instrumentation Slave Relay Surveillance (Train B, Containment Isolation Phase A - K605)." Operations performs this surveillance quarterly.

At 1258, the Unit 2 NSO (NSO #2) entered Limiting Condition for Operation Action Requirement (LCOAR) 6.3-1a for valve 2CV8160 as directed by the surveillance. Step F.1.5.a of surveillance 2BOS 3.2.1-850 requires a jumper between contacts 1 and 2 of relay K605. This jumper prevents valve 2CV8160 from closing when slave relay K605 actuates during the surveillance and makes it inoperable. Electrical Maintenance (EM) personnel installed the jumper.

At 1304, the Control Room received a "Low Pressure Letdown Relief Temperature High Alarm." Upon investigation, NSO #2 found 2CV8160 closed. This occurred when NSO #2 depressed a test switch as directed by the surveillance. NSO#2 performed an emergency exit from 2BOS 3.2.1-850 due to the unanticipated closure of 2CV8160. NSO#2 isolated letdown and reduced charging to minimum. Then he reestablished letdown to 75 gpm. CV letdown flow indicated approximately 125 gpm with one 75 gpm orifice on-line. This indicated that CV Orifice Relief Valve had lifted. NSO#2 isolated CV Letdown again as it did not appear that the CV Orifice Relief Valve had reset. CV letdown was completely isolated. He reduced charging flow to a minimum for RCP seal flow and isolated the normal CV charging path by closing 2CV8105 and 2CV8106 for thermal transient considerations to the CV Charging nozzle. He exited LCOAR 6.3-1a on the 2CV8160. The EMs removed the jumper and the emergency exit for 2BOS 3.2.1-850 was completed.

At 1324, NSO#2 restored CV letdown flow. The CV Orifice Relief Valve had reseated.

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

|                             |          |       |            |          |        |
|-----------------------------|----------|-------|------------|----------|--------|
| BYRON NUCLEAR POWER STATION | 05000455 | YEAR  | SEQUENTIAL | REVISION | 3 OF 4 |
|                             |          | 96 -- | 001 --     | 00       |        |

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

**B. DESCRIPTION OF EVENT:** (cont.)

At 1334, after verifying CV letdown restoration appeared proper, NSO#2 increased CV letdown flow to 120 gpm. NSO#2 observed no problems and restored all controllers to Automatic Control. The jumper was reinstalled and test conditions were verified. NSO#1 completed 2BOS 3.2.1-850 ESFAS Instrumentation Slave Relay (Train B Cmnt Isol Phase A - K605) without further incident.

This event is reportable in accordance with 10CFR 50.73(a)(2)(iv)(A) as an unplanned ESF actuation during testing.

**C. CAUSE OF EVENT:**

The lead had fallen off terminal connection 1 on relay K605. EM personnel found this after the event when they opened cabinet 2PA10.J. The lead most likely fell off when the relay actuated. The force of the relay actuating and the fact the jumper was not installed securely caused it to fall off.

The Electrical Maintenance (EM) (Non Licensed) worker that installed the jumper used an "alligator clip." This type of clip grabs the top of the field wire termination screws on the relay. Placement of this type of clip can be affected by the amount of space around the screw and accessibility of the relay. To verify the jumper was secure, the worker gave it a small tug.

NSO#1 independently verified that the EM worker had installed the jumper on the correct terminal points on the relay. He did not verify it was installed securely. But he was not required to do this. There is no positive method for verifying an alligator clip is installed securely without physically pulling on it. This action could in fact cause the clip to become loose.

The root cause of this event was an inadequately installed jumper. Alligator clips do not always attach securely, so a more secure method of installing the jumper for the BOS may be needed.

**D. SAFETY ANALYSIS:**

This event resulted in no safety consequences. The closure of valve 2CV8160 normally occurs on a Phase A Containment Isolation signal.

The surveillance prevents the valve from closing because it causes thermal transients not accounted for in the design of the letdown and charging systems. Excessive occurrences of these transients may result in exceeding the fatigue usage design limits. The thermal transients for this system are being tracked by the Plant Life Extension (PLEX) program. No fatigue usage design limits have been exceeded. ComEd was informed of this potential issue by Westinghouse on September 25, 1990. The jumper is being used until a Tech Spec change is approved. The change will allow testing every eighteen months while shut down. This will eliminate the thermal transients experienced when testing is done at power.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

|                             |          |     |            |        |        |
|-----------------------------|----------|-----|------------|--------|--------|
| BYRON NUCLEAR POWER STATION | 05000455 | YEA | SEQUENTIAL | REVISI | 4 OF 4 |
|                             |          | 96  | -- 001     | -- 00  |        |

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

E. CORRECTIVE ACTIONS:

Operations personnel immediately stabilized the plant and re-established letdown flow.

The surveillance was successfully completed without further incident.

The station will review the use of a more secure method of attaching the jumper used during surveillance 2BOS 3.2.1-850, "Unit Two ESFAS Instrumentation Slave Relay Surveillance (Train B, Containment Isolation Phase A-K605)." NTS Item 455-180-96-0001-01 will track the evaluation.

After the event, Electrical Maintenance Department evaluated their work practices for installing jumpers. At a department meeting, the electricians were instructed to confirm the jumper is securely attached, prior to using it, by pulling on it. They were also instructed about the importance of using self-checking. An interview of the electricians who installed the jumper that fell off indicated they followed these practices. Additionally, all EM department jumpers were inspected for integrity.

F. RECURRING EVENTS SEARCH AND ANALYSIS:

CDE 455201950473, "Jumper Fell Off Terminal Causing Actuation."

During calibration of OPR18J, "easy hooks" jumper fell off of interlock terminal causing OWX058C to open. This was not an ESF actuation.

G. COMPONENT FAILURE DATA:

|                     |                     |                     |                        |
|---------------------|---------------------|---------------------|------------------------|
| <u>MANUFACTURER</u> | <u>NOMENCLATURE</u> | <u>MODEL NUMBER</u> | <u>MFG PART NUMBER</u> |
|---------------------|---------------------|---------------------|------------------------|

Not Applicable