

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



November 18, 1996

LTR: BYRON 96-0296
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 96-004.

This report is number 96-004, Supplement 1; Docket No. 50-455.

Sincerely,

A handwritten signature in dark ink, appearing to read "K. L. Kofron".

K. L. Kofron
Station Manager
Byron Nuclear Power Station

KLK/WD/ld

Enclosure: Licensee Event Report No. 96-004, 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 <small>(4-95)</small>			U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXP/RES 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) 05000455		PAGE (3) 1 OF 6																														
TITLE (4) SOURCE RANGE DETECTORS INOPERABLE WITH REACTOR TRIP BREAKERS CLOSED																																				
EVENT DATE (5) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>MONTH</th> <th>DAY</th> <th>YEAR</th> </tr> <tr> <td>09</td> <td>22</td> <td>96</td> </tr> </table>			MONTH	DAY	YEAR	09	22	96	LER NUMBER (6) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>YEAR</th> <th>SEQUENTIAL NUMBER</th> <th>REVISION NUMBER</th> </tr> <tr> <td>96</td> <td>004</td> <td>01</td> </tr> </table>			YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	96	004	01	REPORT DATE (7) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>MONTH</th> <th>DAY</th> <th>YEAR</th> </tr> <tr> <td>11</td> <td>18</td> <td>96</td> </tr> </table>			MONTH	DAY	YEAR	11	18	96	OTHER FACILITIES INVOLVED (8) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>FACILITY NAME</th> <th>DOCKET NUMBER</th> </tr> <tr> <td></td> <td>05000</td> </tr> <tr> <th>FACILITY NAME</th> <th>DOCKET NUMBER</th> </tr> <tr> <td></td> <td>05000</td> </tr> </table>		FACILITY NAME	DOCKET NUMBER		05000	FACILITY NAME	DOCKET NUMBER		05000
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POWER LEVEL (10) 000		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>20.2201(b)</td> <td>20.2203(a)(2)(v)</td> <td><input checked="" type="checkbox"/></td> <td>50.73(a)(2)(i)</td> <td>50.73(a)(2)(viii)</td> </tr> <tr> <td>20.2203(a)(1)</td> <td>20.2203(a)(3)(i)</td> <td></td> <td>50.73(a)(2)(ii)</td> <td>50.73(a)(2)(x)</td> </tr> <tr> <td>20.2203(a)(2)(i)</td> <td>20.2203(a)(3)(ii)</td> <td></td> <td>50.73(a)(2)(iii)</td> <td>73.71</td> </tr> <tr> <td>20.2203(a)(2)(ii)</td> <td>20.2203(a)(4)</td> <td></td> <td>50.73(a)(2)(iv)</td> <td>OTHER</td> </tr> <tr> <td>20.2203(a)(2)(iii)</td> <td>50.36(c)(1)</td> <td></td> <td>50.73(a)(2)(v)</td> <td rowspan="2">Specify in Abstract below or in NRC Form 366A</td> </tr> <tr> <td>20.2203(a)(2)(iv)</td> <td>50.36(c)(2)</td> <td></td> <td>50.73(a)(2)(vii)</td> </tr> </table>						20.2201(b)	20.2203(a)(2)(v)	<input checked="" type="checkbox"/>	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)		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)
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NAME B. Jacobsen, Operating Support				TELEPHONE NUMBER (Include Area Code) 815-234-5441 Ext. 2622																																
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																				
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

The Level Trip switch for the N32 Source Range Detector had been placed in "Bypass" as a result of spurious radio noise induced spiking. The status of the N32 Source range was turned over as Operable but on the Degraded Equipment Log. The position of the Level Trip Switch was not addressed in the turnover. With the Control Rod Drive System Out of Service, deenergized and incapable of withdrawing rods, the oncoming Station Control Room Engineer believed the Reactor Trip Breakers could be considered to be open for Technical Specification considerations, even if physically closed. Later in the new shift, this Station Control Room Engineer authorized the performance of a Solid State Protection System surveillance that resulted in both Source Range Detectors being inoperable with the Reactor Trip Breakers physically closed.

The root cause of this event was poor communications on the status of the N32 Source Range Detector at shift turnover coupled with differing opinions resulting from inadequate training concerning managements expectations for the application of Technical Specifications when both Source Range Detectors are inoperable with the Reactor Trip Breakers closed but incapable of withdrawing rods.

To prevent recurrence, Operators will receive training on Technical Specification 3.3.1 and on Technical Specification Interpretation Number 3/4.3.3.1-2. Additionally all Operators will receive training to ensure understanding of the findings of OSR 95-128 as it specifically applies to Technical Specification 3.1.3.3, Digital Rod Position Indication and how this same criteria does not apply to TS 3.3.1, Reactor Trip System Instrumentation. NTS Item 455-180-96-0004-01 will track this action to completion.

This is a condition prohibited by Byron Technical Specification 3/4.3.3.1 and is therefore, a reportable event per 10CFR 50.73(a)(2)(i)(B).

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

A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 09-22-96 / 1718

Unit 1 Mode 1 - PWR OPS	Rx Power ~96%	RCS [AB] Temperature/Pressure NOT/NOP
Unit 2 Mode 5 - Cold Shutdown	Rx Power ~00%	RCS [AB] Temperature/Pressure Shutdown

B. DESCRIPTION OF EVENT:

The N32 Source Range (SR) channel for Unit 2 has had a recent history of spiking due to electrical noise from unidentified sources. At 1940 hrs on 09/21/96 with Unit 2 in MODE 5, the Operating Crew entered the Technical Specification Limiting Condition for Operations Action Statement under Technical Specification 3/4.3.1 action 5a on the N32 Source Range channel due to spurious spiking. At 2128 hrs, noise through the N32 Source Range channel was processed through "A" Train of the Unit 2 Solid State Protection System. This caused the "A" Reactor Trip Breaker and the "B" Reactor Trip Bypass Breaker to trip open. This is a Unit 2 reactor trip. The Rod Drive Motor/Generator sets were deenergized at the time and the Rod Drive disconnects were open and Out of Service under Out of Service #960010164, so no rod movement occurred as a result of the reactor trip signal.

At 2130 hrs, the Unit Operating crew entered Byron Abnormal Operating Procedure 2BOA INST-1, Nuclear Instrumentation Malfunction. After verifying status of the instrument, this procedure directs the Operator to place the Level Trip switch at the N32 Source Range cabinet to the "Bypass" position. This prevents the trip signal from the degraded source range detector from automatically tripping open the Reactor Trip Breakers. With permission from the Duty Station Control Room Engineer (SCRE #1) (SRO Licensed), the Duty Nuclear Station Operator (NSO #1) (RO Licensed) placed the Level Trip switch at the N32 Source Range cabinet to "Bypass".

At 2226 hrs, the Operating Crew attempted to perform the Unit Two Train B Solid State Protection System Bi-Monthly Surveillance, as directed by Byron Operating Surveillance 2BOS 3.1.1-21. Electrical noise on the N32 Source Range channel prevented Operators from completing the surveillance.

At 2230 hrs, the Shift Engineer completed an evaluation for reportability of the Reactor Trip that had been generated at 2128 hrs. After discussing the event with the Regulatory Assurance Supervisor and the Station Duty Officer, the Shift Engineer had determined that the Reactor Trip was not reportable.

Because of the spiking problem, NSO #1 asked SCRE #1 if they should declare the N32 Source Range channel inoperable. SCRE #1 concluded that spiking frequency had decreased and the spikes were easily identifiable. The Source Range channel was providing reliable data for trending purposes, which was the only function required under the current plant conditions. Based on this, and on the Shift Engineer's determination about the non-reportability of the Reactor Trip, SCRE #1 felt the channel was operable and exited Technical Specification Action Statement 3/4.3.1 at 2232 hrs. Because of the sporadic electrical noise that induced spiking, he decided to place Source Range channel N32 on the Degraded Equipment Log.

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B. DESCRIPTION OF EVENT (cont.)

On 09/22/96, during the Station Control Room Engineer shift turnover that occurred at 0630 hrs, and the Nuclear Station Operator shift turnover that occurred at 0700 hrs, the offgoing shift informed the oncoming shift about the spiking of Source Range channel N32. Since the frequency of the noise induced spiking had diminished, Source Range channel N32 was being considered Operable but had been placed on the Degraded Equipment Log. When discussing the spiking problem of the N32 Source Range, NSO #1 indicated the alarms associated with the problem. The oncoming Nuclear Station Operator (NSO #2)(RO Licensed) was not specifically informed that the Level Trip switch for the N32 Source Range was in "Bypass".

At 1346 hrs, the Shift crew again attempted to perform 2BOS 3.1.1-21, Unit Two Train B Solid State Protection System Bi-Monthly Surveillance. This time the surveillance was successfully performed, logged as completed at 1546 hrs.

Technical Specification 3.3.1 was recently revised. Previously, Technical Specification 3.3.1 had one Action Statement, Action 5, which stated that with no source range channels operable, and Reactor Trip Breakers closed and capable of withdrawing rods, the Reactor Trip Breakers were required to be opened immediately. The new requirements for Technical Specification 3.3.1 was revised and became effective on 03/15/96. the new Technical Specification Action Statement, 3.3.1 for functional unit 6 requires two Source Range Detector channels Operable and now has two associated Action Statements, 5a and 5b. Action Statement 5a says "With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or within the next hour open the reactor trip breakers. With no channels OPERABLE, immediately open the reactor trip breakers.". Action Statement 5b says "With no channels OPERABLE, immediately suspend operations involving positive reactivity additions and within 1 hour verify valves CV-111B, CV-8428, CV-8439, CV-8441, and CV-8435 are closed. Also, within one hour and at least once per 12 hours thereafter, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2 as applicable."

The Technical Specification for the Source Range Detectors, Technical Specification 3.3.1, does not cover the plant condition where the Reactor Trip Breakers are closed but incapable of withdrawing rods. Because of this, Technical Specification Interpretation 3/4.3.3.1-2 was developed and approved on 09/05/96 to provide guidance for operations under this condition. This interpretation recommends that Operators follow the more conservative Technical Specification Action Statement, 3.3.1 action 5a, when under the condition where the Reactor Trip Breakers are closed but incapable of withdrawing rods. The Operators had receive no training on the Technical Specification Interpretation, and few were aware that one existed.

An On Site Review written in 1995, OSR 95-128, indicated Reactor Trip Breakers can be considered open for Technical Specification 3.1.3.3 compliance when one of the following three conditions are met:

1. The Rod Drive System Motor/Generator sets are not running.
2. The Power Cabinet overhead disconnect switches are open.
3. Control Room lift disconnect switches are open.

At the time of the event on 09/22/96, two of these three conditions were met, in that the Motor/Generator Sets were not running and the Power Cabinet overhead disconnect switches were open, leading Operators to believe that the Reactor Trip Breakers could be considered open.

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B. DESCRIPTION OF EVENT (cont.)

2BOS 3.1.1-20, Unit Two Train A Solid State Protection System Bi-Monthly Surveillance, has the Operators close the Reactor Trip Breakers and place the Solid State Protection System in Inhibit which renders the N31 Source Range Channel inoperable. SCRE #2 had previous experience in this type of configuration, where having the Motor/Generator Sets deenergized and the Rod Drive Disconnects open qualified as having the Reactor Trip Breakers open. As a result of this previous experience the Duty Station Control Room Engineer (SCRE #2)(SRO Licensed) believed that under the present configuration, he could consider the Reactor Trip Breakers functionally open for Technical Specification considerations, even if they were physically closed. Also, even if the Reactor Trip Breakers were closed, with the Control Rod Drive System physically incapable of rod movement, the Reactor Trip Breaker trip function was not necessary and therefore, as long as the Source Range Detector was able to provide for accurate trending of the neutron population, SCRE #2 believed the Source Range channel could be considered Operable. With the B Train Surveillance completed, SCRE #2 authorized the performance of 2BOS 3.1.1-20, Unit Two Train A Solid State Protection System Bi-Monthly Surveillance.

There was a heavy workload at Unit 2 at the time, so SCRE #2 assigned a specific crew of Nuclear Station Operators (NSOs)(All RO Licensed) to perform the surveillance, leaving NSO #2 to attend to the overall operation of the Unit. The crew of NSOs checked in with NSO #2, and then began preparations to perform the surveillance. This included having an Auxiliary Operator (Non Licensed) close the Unit 2 Reactor Trip Breakers. At 1656 hrs, the N31 Source Range Detector was deenergized and rendered inoperable by the surveillance, and NSO #2 logged the entry into Technical Specification 3.3.1 Limiting Condition for Operations Action Statement. With the N32 Source Range Detector Level Trip switch in "Bypass", the detector could not function to open the Reactor Trip Breakers and was, therefore, also inoperable during the time the Reactor Trip Breakers were closed.

A short time later, the Shift Engineer entered the Control Room and noticed the N32 level switch in the "Bypass" position. Because of a recently approved Technical Specification Interpretation, the SE was uncertain if they were meeting Technical Specification Requirements in the current configuration. The Shift Engineer voiced his concerns about possible Technical Specification compliance to SCRE #2. After he and SCRE #2 made sure that there was no special reason why the Level Trip switch was in bypass, the Shift Engineer requested that SCRE #2 have the Level Trip switch returned to the "Normal" position while he evaluated the situation further. The exact time repositioning of the Level Trip switch occurred is unknown. However, at 1714 hrs, Technical Specification 3.3.1 Limiting Condition for Operations Action Statement was exited when the N31 Source Range Detector was reenergized and the Reactor Trip Breakers were reopened.

The Shift Engineer continued to assess the situation and subsequently concluded it was appropriate to use the conservative interpretation of the recently approved Technical Specification Interpretation and determined that both source range channels had been inoperable for 18 minutes while the Reactor Trip Breakers had been closed.

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B. DESCRIPTION OF EVENT (cont.)

This is a condition prohibited by Byron Technical Specification 3/4.3.3.1 and is therefore, a reportable event per 10CFR 50.73(a)(2)(i)(B).

C. CAUSE OF EVENT:

The Root Cause of the 09/22/96 event was the poor communications on the status of the N32 Source Range Detector at shift turnover coupled with inadequate training resulting in differing opinions. The differing opinions resulted from past experience being in conflict with the current Technical Specification requirements and the recently issued Technical Specification Interpretation. These differing opinions concerned the application of Technical Specifications when both Source Range Detectors are inoperable with the Reactor Trip Breakers closed but incapable of withdrawing rods. Confusion over how Operability related to current plant conditions at the time resulted from the incomplete coverage for possible plant configurations in Technical Specification 3.3.1 for functional unit 6, from the guidance provided in On Site Review 95-128 concerning the status of the Reactor Trip Breakers, and the conservative interpretation of Technical Specification 3.3.1 in Technical Specification Interpretation 3/4.3.3.1-2.

D. SAFETY ANALYSIS:

There were no safety consequences impacting plant or public safety as a result of this event. During the period in which the Reactor trip breakers were closed, no core reactivity excursion occurred that would have initiated a trip signal.

Had a trip signal been initiated the Reactor Trip Breakers would not have automatically opened. However, all control rods were fully inserted at the time. Also, the Motor/Generator sets were not in service and the knife switches above the Rod Drive Power Cabinets were open and controlled under the Station Out of Service Program. Therefore rod motion would not have been possible during the time both source ranges were inoperable with the Reactor Trip Breakers closed.

E. CORRECTIVE ACTIONS:

The Immediate Corrective Action taken was to place the Source Range N32 Level Trip switch position to "Normal", restoring the Source Range detector's input into the Solid State Protection System, thus restoring its ability to trip open the Reactor Trip Breakers if necessary.

To prevent recurrence, Operators will receive training on Technical Specification 3.3.1 and on Technical Specification Interpretation Number 3/4.3.3.1-2. Additionally all Operators will receive training to ensure understanding of the findings of OSR 95-128 as it specifically applies to Technical Specification 3.1.3.3 and how this same criteria does not apply to TS 3.3.1. NTS Item 455-180-96-0004-01 will track this action to completion.

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F. RECURRING EVENTS SEARCH AND ANALYSIS:

An Industry Event search was performed to identify other events where all required compensatory actions had not been taken during a period where both source ranges were inoperable.

One event was identified. That event, 456-180-86-0020, occurred at Braidwood. In this event, the correct Action Statement was entered, but not all requirements of the Action Statement were completed. This event occurred before the current Technical Specification Amendment, for Byron and Braidwood was issued. No other occurrences were identified since the current Technical Specification Amendment was issued on 09/27/88.

G. COMPONENT FAILURE DATA:

None