

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No: 50-454/97015(DRP); 50-455/97015(DRP)

Licensee: Commonwealth Edison Company

Facility: Byron Generating Station, Units 1 & 2

Location: 4450 N. German Church Road  
Byron, IL 61010

Dates: July 25 through September 8, 1997

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EXECUTIVE SUMMARY  
Byron Generating Station, Units 1 & 2  
NRC Inspection Report 50-454/97015(DRP), 50-455/97015(DRP)

This inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection. Additionally, this inspection included aspects of licensee operations, maintenance, engineering, and plant support pertaining to the Unit 1 auxiliary feedwater (AF) system. The AF portion of the report covers a 1-week period of inspection.

Operations

- The inspectors noted a decline in the operations department log keeping practices as evidenced by the lack of safety injection accumulator level log entries, poor daily order requirements, and missing log entries from the official control room log (Section O1.2).
- The licensee identified that the limiting condition for operation action requirement was not entered while the pressurizer heater feeder breaker was open while a small contact coil fire was extinguished (Section O1.3).
- Poor communications between operating crews resulted in confusion as to whether the pressurizer heater contact cabinet was or should have been quarantined after a small contact coil fire (Section O1.3).

Maintenance/Surveillance

- Routine maintenance and surveillance activities were well performed (Section M1.1 and M1.2).
- The inspectors considered the licensee's continued silt inspection efforts to be effective in identifying potential contributors to the increased silting found in the essential service water (SX) cooling towers and the river screen house (Section M1.2).
- The inadvertent auto-start of the 0B essential service water make-up pump was an example of poor documentation of precautions for potential system response in work packages and was a violation of 10 CFR Part 50, Appendix B, Criterion XVI (Section M1.3).
- A breakdown in foreign material exclusion (FME) controls occurred during activities associated with maintenance in the spent fuel pool area. However, appropriate immediate action and planned additional corrective actions were taken. The ComEd corporate FME procedure continued to be a concern in that it did not require stringent FME controls. The failure to follow Byron fuel handling procedure FH-31 was a violation of Technical Specification 6.8.1 (Section M1.4).
- Material condition items found by the inspectors on the Unit 1 AF system were not safety significant; however, the inspectors questioned why licensee system walkdowns failed to identify the same issues (Section M2.1).

- The inspectors concluded that the licensee failed to take timely corrective actions to revise Technical Specification Table 3.3-4 and procedure 1BIS 3.2.1-021 when the setpoint for AF pump suction transfer from the condensate storage tank to SX changes was made in December 1994. A violation was issued with two examples of inappropriate corrective actions. (Section M3.1).

#### Engineering

- The procedure to reduce the pressure between the ECCS check valves was well prepared and executed. However, a missing safety evaluation, identified by the inspectors, demonstrated a need for continued emphasis on safety evaluations (Section E1.1).
- The inspectors identified that engineering personnel failed to address the effects of reactor coolant system check valve leakage on potential residual heat removal system overpressurization (Section E1.2).
- Byron's design basis initiative program, implemented in response to the NRC's 10 CFR 50.54(f) letter, was clearly defined and well staffed (Section E2.1).

## REPORT DETAILS

### Summary of Plant Status

Unit 1 and Unit 2 operated at or near full power during this inspection period.

### I. Operations

#### 01 Conduct of Operations

##### 01.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious. Observations indicated that the operations staff was knowledgeable of plant conditions and responded promptly and appropriately to alarms; however, the inspectors noted a decline in log taking practices during the period. Specific events and noteworthy observations are detailed in the sections below.

##### 01.2 Incomplete Log Entries With Safety Injection Accumulator Level Changes

###### a. Inspection Scope (71707)

During a routine log review, the inspectors noted that the run time for a safety injection (SI) pump was not documented. The inspectors also reviewed the Unit 2 log for SI accumulator level changes.

###### b. Observations and Findings

The 2D SI accumulator check valve has been periodically leaking a small amount (approximately 0.015 gpm) during the current cycle. The Technical Specification (TS) allowed leakage was 1 gpm. The check valve leakage resulted in a slow increase in the 2D accumulator level and a corresponding reduction in accumulator boron concentration. The licensee periodically borated the accumulator with refueling water storage tank (RWST) water using a drain and fill procedure. An SI pump was used to refill the accumulator.

The inspectors noted that TS 4.5.1.1.b required an accumulator to be demonstrated operable within 6 hours, after each solution volume increase of greater than or equal to 70 gallons, by verifying the boron concentration of the accumulator solution. The sample requirement was not applicable if the RWST was used to increase the volume and the RWST boron concentration was greater than the accumulator boron concentration. The licensee determined that, based on the accumulator check valve leak rate, sampling every Monday, Wednesday, and Friday would meet the TS requirement.

The inspectors noted that periodically, usually on weekends, operators lowered accumulator level to maintain level within the TS required values. However, the inspectors identified that the amount drained from the accumulator was not logged.

Additionally, accumulator level was not included in point history on the process computer. The inspectors questioned compliance with the TS sample requirement and system engineer's awareness of the level reductions to ensure accurate leak rate calculations. The licensee indicated that, given the existing leak rate, the sample frequency was sufficient, including a periodic drain, to ensure TS compliance. The inspectors agreed but determined that accumulator level changes should be logged.

The licensee agreed that additional logging detail was necessary and issued a daily order with a supplemental log sheet for accumulator level. However, the inspectors identified that the daily order only required the operators to log level once per shift and did not require a log entry for changing accumulator level as discussed by the inspectors. The licensee subsequently changed the daily order to require the logging of any accumulator level changes.

During a routine log review, the inspectors noted that the SI pump start and stop times had not been logged during the accumulator boration the previous evening. After an investigation, the operators determined the start and stop times were included in the unofficial log existing in a computer. The correct log was reprinted from the computer and reviewed, signed, and incorporated into the official unit logs. At the end of the inspection period, the licensee had not determined the cause of the missing entries; however, the licensee believed that a late entry was made after the shift logs were printed and not identified as a late entry. The inspectors were concerned that although immediately retrieved, the pump run times were not part of the official log.

c. Conclusions

The inspectors concluded that the lack of accumulator level log entries, poor daily order requirements, and missing log entries from the official log indicated a decline in the operations department log keeping practices.

O1.3 Unit 1 Pressurizer Heater Contact Coil Fire

a. Inspection Scope (71707)

The inspectors reviewed the licensee's actions after a small fire in the Group B pressurizer heater breaker contact cabinet on July 27, 1997. The inspectors reviewed TS applicability, actions taken by the operators, and the investigation initiated by the licensee.

b. Observations and Findings

On July 27, 1997, the Unit 1 Group B pressurizer heater group contact coil overheated and ignited. A fire watch initially reported the smoke. When operators opened the door, a small flame was noted on a contact coil which self-extinguished when the door was opened. Control room operators de-energized the contact cabinet by opening the feeder breaker to the B and C heater groups.

NRC Inspection Report 97012 documented that TS 3.4.3 did not require redundant pressurizer heater capability. The inspectors determined, and the licensee agreed, that the intent of TS 3.4.3 was to require redundant heater capability. Until a TS amendment

was approved, the licensee's short-term corrective actions included the issuance of a daily order that provided operators direction for operation action requirement (LCOAR) when redundant pressurizer heater capability was not available. When the operators opened the feeder breaker to both groups of breakers to extinguish the fire, the redundant heater groups were removed. The operators did not enter the LCOAR while the feeder breaker was open as required by the daily order. The inspectors reviewed the daily order and noted that the administrative requirement to enter the LCOAR was not clear. The licensee subsequently prepared a new daily order that provided additional guidance on the LCOAR entry requirements.

The inspectors asked the operators if the contact cabinet had been quarantined. A unit supervisor was not sure whether the cabinet had been quarantined, but thought that it should be. A shift manager did not believe it was quarantined and did not believe that the magnitude of the event required that the equipment be quarantined. The inspectors were subsequently informed that the contact cabinet had been quarantined.

The inspectors reviewed Nuclear Station Work Procedure (NSWP) - A-11, "Quarantine of Areas, Equipment and Records," Revision 1, and noted that a form was required to be completed to identify all the equipment that was quarantined after an event. The operators had not completed the form; however, the damaged contact was isolated with an out-of-service. Implementation of NSWP-A-11 was at the shift manager's discretion.

The inspectors were concerned that the operators were not fully aware of the requirements of NSWP-A-11. The NSWP series was a new corporate wide series for all Commonwealth Edison stations. Several new NSWPs had been issued and generally were similar to previous Byron procedures. However, the inspectors were concerned that subtle differences between the Byron and corporate procedures had not been effectively communicated. The licensee stated that training had been completed on the NSWPs.

c. Conclusions

The inspectors concluded that the LCOAR should have been entered while the feeder breaker was open as directed in the operations department daily order. Poor communications between operating crews resulted in confusion as to whether the pressurizer heater contact cabinet was or should have been quarantined after a small contact coil fire.

**O8 Miscellaneous Operations Issues (92700, 92901)**

- O8.1 (Closed) URI 50-454/94022-03: Diesel generator (DG) inoperability in Mode 5 due to misinterpretation of TS requirements. This item is a duplicate of LER 50-454/94014, which was closed and a violation was issued in NRC Inspection Report 97008. This item is closed.
- O8.2 (Closed) LER 50-455/95002, LER 50-455/95002-01: Extraction steam valve maintenance without LCOAR entry due to personnel error. Shift operating personnel failed to realize that the TS LCOAR was not entered for maintenance work on extraction steam non-return check valve 2ES002. Technical Specification 3.3.4 required that if a valve associated with the turbine protection system was considered inoperable, then the steam supply affected by the inoperable valve must be isolated from the main turbine within

6 hours. Valve ES002 was one of several valves required to be operable for turbine overspeed protection. The valve was inoperable for approximately 12 hours. The inspectors reviewed the licensee's corrective action for this LER and found them appropriate and acceptable to prevent similar occurrences. Failure to meet the requirements of a LCOAR as well as the necessary actions within the 6-hour completion time is a violation of TS 3.3.4.b; however, this licensee identified and corrected violation is being treated as a non-cited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (50-455/97015-01(DRP)). This item is closed.

- O8.3 (Closed) URI 50-455/95004-01: Review of licensee's corrective actions and root cause of failure to enter LCOAR for extraction steam valve maintenance. This item is a duplicate of LER 50-455/95002, which has been closed as a non-cited violation in Section O8.2 in this report. No further concerns were noted. This item is closed.
- O8.4 (Closed) IFI 50-454/455-94027-01: Review of root cause evaluation regarding five missed or late TS surveillances in a 4-month period due to poor test coordination and management oversight. The inspectors reviewed the licensee's root cause evaluation and also reviewed the number of late or missed TS surveillances during the 1995 through 1997 time period. The inspectors noted fewer missed surveillances; specifically, three during 1995 and one in 1996. Thus far in 1997, the licensee had missed four TS surveillances; however, the root cause for these instances has been misinterpretation of TS surveillance requirements since initial plant operation and not poor test coordination. The inspectors considered the corrective actions to preclude missed or late TS surveillances acceptable and had no further concerns. This item is closed.
- O8.5 (Closed) URI 50-454/455-95013-01: Review of the licensee's root investigation for why valve 2FW027B position did not match the out-of-service (OOS) position. On February 8, 1996, while removing the OOS tag, the licensee discovered that the valve was already in the open position with the OOS card indicating a closed position. The inspectors reviewed the licensee's root cause determination, which could not identify when or whom changed the valve position. The inspectors determined that the licensee's efforts to identify a root cause were thorough. The inspectors reviewed other instances during the past 2 years where OOS tag positions were different than those found in the plant using the licensee's trending program and identified only one instance similar to this item. Based on the licensee's thorough efforts to identify the root cause and the lack of pervasive OOS tag/equipment discrepancies during the last 2 years, this item is closed.
- O8.6 (Closed) LER 50-454/96012: The TS action statement was not entered for a tornado watch. The weather radio, located in the shift manager's office, alarmed when no personnel were in the shift manager's office. There were no safety consequences impacting plant safety as a result of this event. The missed actions required by TS were to verify both deep well pumps were operable and to verify both essential service water (SX) cooling tower basin levels were greater than or equal to 82%. However, plant records indicated that both deep well pumps were operable and the SX basin levels were greater than or equal to 82%, throughout the tornado watch. The inspectors verified that the licensee installed a weather radio in the control room and a weekly operational check was performed. This item is closed.
- O8.7 (Closed) IFI 50-454/455-94020-03: Review of the licensee's response to a Westinghouse analysis regarding emergency core cooling system actuation during transients while at

power. Initial actions performed by the licensee were characterized as a strength in NRC Report 94020. The inspectors verified that the licensee revised procedures 1/2BEP-0, "Reactor Trip or Safety Injection," to verify at least one flowpath was available through the pressurizer power operated relief valves (PORVs). All licensed operators were trained on the revision and its basis. Also, the licensee revised the LCOAR procedure to address the concern of two pressurizer PORV block valves being closed simultaneously for excessive seat damage. The inspectors considered the licensee's actions for this issue thorough. This item is closed.

- 08.8 (Closed) VIO 50-454/455-96003-01b; VIO 50-454/455-96006-01; VIO 50-454/455-96012-03b: Failure to follow flood door impairment procedure for the SX pump room doors and the auxiliary building floor drain sump room doors. The inspectors reviewed revisions to Byron Administrative Procedure (BAP) 1100-3, "Fire Protection Systems, Fire Rated Assemblies, Ventilation Seals, Flood Seals, and Watertight Doors Impairments," Revision 1 i, that the licensee had implemented to address this issue. Procedure changes included a requirement that water tight doors be closed and secured except during passage or for short stays within the room for less than 15 minutes. A barrier/fire protection system impairment permit was required if the water tight door needed to be open for more than 15 minutes. Because violation 50-454/455-96012-03b was identified by the inspectors after this procedure revision, the licensee installed video cameras in April 1997, at each of the water tight doors to monitor and identify an open door before the allowed 15 minute criteria was exceeded. The licensee also planned to install an alarm at the door that would sound when the door was opened for periods longer than 15 minutes without a impairment tag issued. The inspectors determined that corrective actions to address open or unattended water tight doors were acceptable. There have been no instances of procedural violation since the video cameras were installed. This item is closed.

## II. Maintenance

### M1 Conduct of Maintenance

#### M1.1 Maintenance Observations (62707)

##### a. Inspection Scope

The inspectors observed the performance of all of, or portions of, the following work requests (WR). When applicable, the inspectors also reviewed TS and the UFSAR for potential issues.

- WR 970086244 Troubleshoot 1B Auxiliary Feedwater (AF) diesel tachometer switch
- WR 97008651 Check freon charge for new DG 2A air dryer
- WR 960021245-01 Preventative maintenance for Unit 0 Component Cooling water 4 kV breaker
- WR 960021247 Inspect Unit 0 CC switchgear cubicles
- WR 970081058 Repair Unit 1 group B pressurizer heater supply breaker
- WR 970028824 Open and clean 1A residual heat removal pump cubicle cooler



- WR 970020438      Repair Unit 2 boric acid transfer pump
- WR 970009123-01      Replace bushings and diaphragm - Unit 1 diesel oil storage tank fire protection foam tank

b. Observations and Findings

The inspectors observed that the maintenance activities were conducted in accordance with approved procedures and were in conformance with TS. The inspectors observed maintenance supervisors and system engineers monitoring job progress. Quality control personnel were also present when required. When applicable, appropriate radiation protection measures were in place.

c. Conclusions

The inspectors determined that routine maintenance activities were well performed.

M1.2 Surveillance Observations (61726)

a. Inspection Scope

The inspectors observed the performance of all of, or parts of, the following surveillance test procedures. The inspectors also reviewed plant equipment and surveillance testing activities against the UFSAR descriptions.

- 2BOS 8.1.1.2.a-2      2B DG monthly surveillance test
- BIP 2500-099      Calibration of Tachometer and Engine Speed Switch
- BVP 500-32      Testing Operational Procedure for the Movable Incore Detector System
- SPP 97-020      DG Starting System Air Dryer Replacement Modification Test
- 2BOS 8.1.1.2.a-1      2A DG Semi-Annual Surveillance Test
- 1BOS 7.1.2.1.b-2      1A Motor Driven AF Pump Monthly Surveillance Test
- 0BVS SX-5      Inspection of River Screen House (RSH) and SX Cooling Tower Basins
- 1BVS 6.2.1.b.2      1B Containment Spray Pump ASME Quarterly Surveillance Test
- 2BIS 3.2.1-022      Functional Test of Auxiliary Feedwater Pump Suction Pressure Loop
- 2BVS 5.2.f.3-1      2B Residual Heat Removal Pump ASME Surveillance Test

b. Observations and Findings

The inspectors noted that proper authorization was routinely obtained from the control room senior reactor operator (SRO) before the start of each surveillance test. Components removed from service as part of the surveillance test were identified prior to commencing the surveillance test and the proper TS LCOAR was entered. At the completion of the surveillance test and after independent verification of system restoration, the TS LCOAR was cleared. Test instruments used were verified to be calibrated as applicable. The inspectors reviewed completed surveillance tests and verified the surveillance tests met the acceptance criteria. Specific noteworthy observations are detailed in the following section.

### SX System Silting Inspections

The inspectors noted that the licensee continued to perform quarterly RSH and SX cooling tower basin inspections for accumulated silt that could impact SX system performance and operability. During a July RSH inspection, the licensee performed an inspection of water vanes installed in the Rock River. The vanes were installed in 1993 to help direct the flow of debris and silt away from the RSH intake. The licensee's sonar inspection revealed that a sandbar had formed on a number of the vanes. In some instances, the vanes were almost completely buried in the sand. The licensee was working with the Army Corp of Engineers to remove the sandbar within the next few months. The inspectors considered the licensee's continued silting inspection efforts to be effective in identifying potential contributors to the increased silting found in the SX cooling towers and the RSH.

#### M1.3 0B SX Make-up Pump Inadvertent Start (62707)

##### a. Inspection Scope

During a routine control room inspection, the inspectors were notified of an inadvertent start of the 0B SX make-up pump. The inspectors observed the initial fact finding interviews and reviewed the work package, WR 960107829 02, which removed/installed an SX level switch.

##### b. Observations and Findings

On September 2, 1997, the licensee was replacing the 0B SX cooling tower basin level switch as part of a modification. When the instrument mechanics (IMs) lifted the leads for the switch, the 0B SX make-up pump started because operators had not placed the make-up pump in pull-to-lock. The work package had been reviewed by the unit supervisor and approved before starting work. The IMs did not discuss with the unit supervisor that the pump could auto-start and the work package did not contain a step that ensured the make-up pump was in pull-to-lock before removing the level switch.

During the fact finding interviews, the licensee identified that the potential to auto-start the make-up pump had been discussed by the IMs during the previous planning meetings. At the end of the inspection period, the licensee was conducting an investigation of the event and determining the required corrective actions.

NRC Inspection Report 97002 discussed a violation that was issued for an event where a PORV was briefly opened due to an inadequate work procedure. In this instance, the PORV work package did not contain any precautions concerning PORV actuations. The licensee's corrective actions to the violation included appropriate measures to address the specific event; however, because the licensee considered the event unique to the specific instrument loop, no broad-based corrective actions were implemented. The inspectors concluded that the auto-start of the SX make-up pump, due to an inadequate work procedure, was an event that could have been prevented by corrective actions to the PORV actuation. Therefore, the inspectors concluded that the auto-start of the 0B SX make-up pump was a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," (50-45497015-02(DRP); 455-97015-02(DRP)).

c. Conclusions

The inspectors concluded that the auto-start of the SX make-up pump was due to poor documentation in work packages of precautions for potential system response. The lack of broad-based corrective actions to address a similar issue raised in a previous NRC inspection report was considered a violation.

M1.4 Foreign Material Exclusion Program

a. Inspection Scope

During a routine auxiliary and fuel handling building inspection, the inspectors reviewed foreign material exclusion (FME) practices. The inspectors also reviewed NSWP-A-03, "Foreign Material Exclusion," Revision 0, procedure BFP FH-31, "Fuel Handling Cleanliness Zones and Requirements," Revision 4, and ANSI 45.2.3 - 1973, "Housekeeping During the Construction Phase of Nuclear Power Plants."

b. Observations and Findings

On July 28, 1997, while observing contract personnel performing modifications in the fuel transfer canal, the inspectors identified several discrepancies in the FME zone (cleanliness zone II) around the spent fuel pool (SFP). Untethered tools, including needlenose pliers, a hammer, and several other hand tools were on a floor cover approximately 4 feet from the SFP edge. The inspectors noted that procedure BFP FH-31, Paragraph F.5.e, required tools to be tethered and logged. The inspectors considered the untethered tools an example of a failure to follow procedure BFP FH-31 and a violation of TS 6.8.1, which required procedures be implemented for the control of maintenance and modifications (50-454/97015-03a(DRP); 455-97015-03a(DRP)).

The inspectors also identified that a person logged into the area on June 23, 1997, and had not logged out. The inspectors noted that BFP FH-31, Paragraph F.5.f, required personnel accountability to be accomplished by logging in and out each individual at the control point. The inspectors considered the person's failure to log out of the cleanliness zone an example of failure to follow procedure BFP FH-31 and a violation of TS 6.8.1 (50-454/97015-03b(DRP); 455-97015-03b(DRP)).

The licensee reviewed the area and agreed with the inspector that a breakdown in FME control existed. The fuel handling supervisor became involved along with maintenance department management. Immediate corrective action included a work stoppage, the removal of equipment not required to be in the FME area, a complete inventory of all equipment in the FME area, additional briefings for the contract personnel by the fuel handling supervisor, and the posting of fuel handling personnel as an FME entrance monitor. The inspector considered the licensee's corrective actions appropriate.

The licensee indicated that fuel handling personnel had manned the entrance to the cleanliness zone at the start of the modification work; however, contractor personnel eventually relieved the fuel handlers. Additionally, the contractors were using ComEd corporate FME procedure NSWP-A-03 for FME controls. These FME controls were less restrictive than the requirements contained in procedure BFP FH-31.

Long term actions taken by the licensee included a procedure revision to BFP FH-31 which would allow modification to the SFP FME area with solid barriers, and a procedure revision to NSW-P-A-03 which would reference BFP FH-31. The licensee also stated that an electronic log-in system was planned and special tethered hand tools were ordered.

The inspectors also identified that procedure BFP FH-31 did not contain any controls for transparent material. The licensee agreed that controls should exist and planned to include appropriate controls in the procedure revision pending at the end of the inspection period.

The inspectors noted that previous NRC Inspection Reports 96004, 96012, and 97002 discussed FME issues, including one cited violation in 97002. Each report described areas other than the SFP and reactor cavity; however, the inspectors noted that each report identified problems associated with procedure NSW-P-A-03 (previously SMP-M-04). The licensee identified that the breakdown of FME controls near the SFP was partially due to the less stringent controls required in NSW-P-A-03. The inspectors continued to be concerned that NSW-P-A-03 did not require stringent FME controls.

c. Conclusions

The inspectors concluded that a breakdown in FME controls occurred; however, the licensee took appropriate immediate action and planned additional corrective actions. The inspectors continued to be concerned that corporate ComEd procedure NSW-P-A-03 did not require stringent FME controls.

**M2 Maintenance and Material Condition of Facilities and Equipment**

**M2.1 Unit 1 AF System Walkdown**

a. Inspection Scope (71707)

The inspectors performed a walkdown of the Unit 1 AF system from the condensate storage tank (CST) to the AF containment penetrations to assess material condition and verify proper system lineup.

b. Observations and Findings

During the walkdown, the inspectors noted the following material condition discrepancies:

- A local emergency lighting battery (0LL148E) in the 1B diesel driven AF pump room did not have an Appendix R label. The 0LL148E emergency light illuminates the local diesel control panel if normal lighting is lost.
- The inspectors noted instrument air blowing from the exhaust ports of the solenoids for valves 1/2AF004A. The valves fail open on loss of the air supply to the valves so the safety impact was minimal. The system engineer explained that Byron SED/SEC were investigating the issue.

- The inspectors noted that although instrument air had been isolated to AF flow control valve 1AF005D, the local air gauge to the flow control valve actuator diaphragm read 7 psig.
- The inspectors noticed that two lock chains for rad waste processing valves (OAB8557A and OAB8557B) were secured around instrument air lines leading to the Unit 1 AF system flow control valves. The system engineer had the valves relocked in a way that did not use the instrument air lines.
- The inspectors noted that the diesel oil return line back to the diesel oil day tank had a flow arrow on isolation valve 1DO059 which was opposite to the labeled pipe flow direction. Subsequent investigation by the system engineer revealed an additional labeling problem where 1DO059 and 1DO096 were labeled incorrectly.

The above items and other minor housekeeping concerns were brought to the attention of the system engineer, who initiated maintenance action requests. None of the items identified impacted safety or AF system operability.

c. Conclusions

None of the material condition items identified by the inspectors impacted safety or AF system operability. However, the inspectors were concerned that licensee walkdowns and system lineups performed on the AF system failed to identify the above issues.

M3 Maintenance/Surveillance Procedures and Documentation

M3.1 AF Low Suction Pressure Transfer Setpoint (61726)

a. Inspection Scope

The inspectors reviewed the TS and UFSAR associated with the AF system. The inspectors also reviewed the following surveillance packages for adequacy of procedures, appropriate AF flow paths, and correct calibrations:

- BIS 3.2.1-205 Calibration of 1P AF051 Auxiliary Feedwater Pump Suction Pressure Low, Revision 1
- 1BIS 3.2.1-021 Functional Test of Auxiliary Feedwater Pump Suction Pressure, Revision 8
- BIS 3.3.5-201 Auxiliary Feedwater to Steam Generator 1A Flow Control Loop, Revision 2
- 1BOS 7.1.2.1.B-1 1A Motor Driven Auxiliary Feedwater Pump Monthly Surveillance, Revision 3

b. Observations and Findings

1BIS3.2.1-021, Functional Test of AF Pump Suction Pressure

During an AF design review in December 1994, the licensee identified that two sections of piping attached to the CST supply lines to the AF system were non-seismic. AF pump suction would be normally supplied from the CST, a non-seismic tank. The safety-related

backup water supply for the AF suction was the SX system. If the AF pump suction pressure dropped to less than 14.1 psia, the isolation valves from the CST would shut and the SX supply valves would open, providing water for AF suction. The two sections of pipe identified as non-seismic were located at an elevation lower than the bottom of a loop seal. If either of the two pipes ruptured, the loop seal could be siphoned and the AF suction header would then be exposed to atmospheric pressure (14.7 psia). This would have prevented the system from performing the switchover to SX since pressure would never reach the switchover pressure of 14.1 psia.

To address this design issue and ensure that the AF system performed as described in the UFSAR, the licensee changed the suction transfer setpoint to 18.1 psia (above atmospheric pressure) in December 1994. The setpoint change was controlled during instrumentation calibration using procedure 1BIS 3.2.1-021. The setpoint for AF pump transfer to the SX system and allowable value setpoint values were listed in TS Table 3.3-4, Functional Unit 6.g.

An operability assessment, documented in CHRON #0306210, was performed on February 10, 1995. The assessment did not identify the need to revise the TS; therefore, the licensee failed to revise the setpoint and allowable values in the TS Table. The table identified an AF pump low suction pressure transfer to SX setpoint of 1.22 inches mercury (Hg) (14.1 psia) and an allowable limit of 2 inches Hg (13.7 psia). Failure to take timely corrective action to revise TS Table 3.3-4, Functional Unit 6.g. to show the revised setpoint and allowable setpoint values for the AF pump low suction pressure transfer to SX water is considered a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," (50-45497015-04a(DRP); 455-97015-04a(DRP)).

The licensee also failed to revise procedure 1BIS 3.2.1-021 to reflect the allowable transfer setpoint change. Though the setpoint had been set correctly following identification of the design issue, if the suction transfer setpoint had been left at 2 inches Hg as stated in the unchanged procedure, there would be no automatic transfer to SX water. Failure to take timely corrective action to revise procedure 1BIS 3.2.1-021 to show the revised allowable value for the AF pump low suction pressure transfer to SX water is considered a violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," (50-45497015-04b(DRP); 455-97015-04b(DRP)).

BIS 3.3.5-201, "Auxiliary Feedwater to Steam Generator 1A Flow Indication Control Loop"

The inspectors reviewed completed calibration sheets of AF to steam generator 1A flow control loop, and identified that the as-left value for the loop calibration had one point that was left out of tolerance. Although the calibration error had no effect on instrument loop operation and appeared to be an isolated incident, the inspectors noted that supervisory reviews of the package failed to detect the error.

The licensee documented the calibration error in problem identification form (PIF) B1997-01655. The instrument loop was scheduled to be calibrated during B1R08.

c. Conclusions

The inspectors concluded that the licensee failed to take timely corrective actions to revise TS Table 3.3-4 and procedure 1BIS 3.2.1-021 when the setpoint for AF pump

suction transfer from CST to SX changed in December 1994. A violation was issued with two examples of inappropriate corrective actions. The inspectors also identified a calibration error for the AF to steam generator 1A flow control loop. The inspectors considered this error to be isolated and to have no effect on instrument loop performance.

**M8 Miscellaneous Maintenance/Surveillance Issues (92902)**

- M8.1 (Closed) VIO 50-454/455-96009-01: Procedure 0BVS SX-5, "Inspection of River Screen House and SX Cooling Tower Basins," failed to have sufficient quantitative acceptance criteria to determine SX system operability. The inspectors reviewed the licensee's corrective actions as documented in Byron letter 97-0132, dated June 13, 1997. The inspectors verified that procedure 0BVS SX-5 was revised on April 1, 1997, and that it included quantitative acceptance criteria on the acceptable level of silt accumulation, concrete degradation, and trash rack degradation that ensured SX system operability. The inspectors reviewed the calculations that supported the acceptance criteria and agreed that they ensured SX system operability. The inspector noted no further concerns. This item is closed.
- M8.2 (Closed) VIO 50-454/455-96009-02: Failure to use adequate test instrumentation to measure the amount of silt in the SX cooling tower basins during the performance of procedure 0BVS SX-5. The licensee's past practice was to measure the depth of silt using the diver's arm or boot. The inspectors reviewed the licensee's corrective actions as documented in Byron letter 97-0132, dated June 13, 1997. The inspectors verified that procedure 0BVS SX-5 was revised on April 1, 1997, to require the use of a commercial-grade ruler and observed the use of the ruler during the performance of this surveillance on numerous occasions. This item is closed.
- M8.3 (Closed) VIO 50-454/455-96009-03a: Failure to take appropriate corrective action to silt accumulation in the SX cooling tower basins since July 26, 1993. The inspectors reviewed the licensee's corrective actions as documented in Byron letter 97-0132, dated June 13, 1997. The licensee took immediate corrective actions and removed accumulated silt from the SX cooling tower basins and RSH. The inspectors verified that procedure 0BVS SX-5 was revised to include quantitative acceptance criteria on the acceptable level of silt accumulation. Also, the licensee increased the inspection frequency of the cooling tower basins and RSH to quarterly until sufficient data could be collected on an acceptable inspection interval. The inspectors observed several SX cooling tower surveillance inspections and the licensee's silt removal process when unacceptable silt accumulation was found and determined that the licensee's corrective actions had been prompt and appropriate. No further concerns have been noted. This item is closed.
- M8.4 (Closed) VIO 50-454/455-96009-03b: Failure to take prompt corrective action to repair degraded SX cooling tower basin trash racks since 1993. The inspectors reviewed the licensee's corrective actions as documented in Byron letter 97-0132, dated June 13, 1997. The licensee took immediate corrective actions and repaired/modified the trash racks. The inspectors verified that the repairs/modifications were consistent with the UFSAR and also verified that procedure 0BVS SX-5 was revised to include quantitative acceptance criteria on trash rack degradation. The inspectors observed several SX cooling tower surveillance inspections and noted prompt and appropriate corrective

actions to any unacceptable conditions. No further concerns have been noted. This item is closed.

- M8.5 (Closed) IFI 50-454/455-97012-01: Review of 10 CFR 50.59 performed for TS failing to meet regulatory requirements for the pressurizer heaters. The inspectors identified that TS 3.4.3 did not meet the requirements for two redundant groups of pressurizer heaters to be operable as specified in the UFSAR. The inspectors reviewed the licensee's 10 CFR 50.59 screening evaluation and considered it thorough in addressing the administrative actions to be taken until the TS were permanently changed. The inspectors also verified that the licensee submitted an amendment to the improved Technical Specifications and revised the appropriate procedures. This item is closed.

### III. Engineering

#### E1 Conduct of Engineering

##### E1.1 Unit 2 Emergency Core Cooling System (ECCS) Piping Depressurization Safety Evaluation

###### a. Inspection Scope (37551)

The inspectors reviewed Special Plant Procedure (SPP) 97-093, "2D ECCS Loop Piping Depressurization," Revision 0, the UFSAR, and TS. The inspectors also attended a plant operating review committee (PORC) meeting that discussed SPP 97-093.

###### b. Observations and Findings

The licensee prepared an SPP designed to reduce leakage through the reactor coolant system (RCS) ECCS check valve as described in Section O1.2 of this report. The intent of the procedure was to reduce the pressure between the RCS check valve and the individual ECCS component check valves, thus raising the differential pressure across the RCS check valve and potentially reducing the leak rate. The inspectors reviewed the procedure and did not have any significant concerns. The inspectors noted that the procedure did not have all initial calculation assumptions documented and also noted two editorial observations. The inspectors attended a PORC meeting that discussed the SPP and the PORC addressed each observation without the inspectors' input.

The inspectors requested the safety evaluation for SPP 97-093; however, the licensee's safety evaluation screening determined that a safety evaluation was not required. The inspectors considered the SPP a test not described in the UFSAR that should have a safety evaluation completed. After the inspectors' questions, the licensee agreed that the procedure was a test and completed a safety evaluation. The inspectors concluded that a violation of 10 CFR 50.59, "Changes, tests, and experiments," did not occur because the licensee completed the safety evaluation before the SPP was approved and implemented. The inspectors reviewed the completed safety evaluation and did not have any additional concerns.

The inspectors reviewed the SPPs prepared during 1997 to verify all test packages contained a safety evaluation. No discrepancies were noted.



The inspectors observed the test on September 5, 1997, with no deficiencies noted by the inspectors.

c. Conclusions

The inspectors concluded that the procedure to reduce the pressure between the ECCS check valves was well prepared and executed. However, the missing safety evaluation, identified by the inspectors, demonstrated a need for continued emphasis on safety evaluations by the licensee.

E1.2 Engineering Evaluation of ECCS Check Valve Leakage

a. Inspection Scope (37551)

The inspectors reviewed PIF B1997-02401 regarding Unit 2 RCS check valve leakage into the residual heat removal (RH) system. The inspectors also discussed the issue with engineering personnel.

b. Observations and Findings

During the performance of the ASME 2B RH surveillance test, the system engineer experienced difficulties in obtaining accurate pump suction and discharge pressure readings due to RCS check valve leakage. The leakage caused the pump suction and discharge pressure to slowly increase during the test performance. As discussed in Section O1.2, this leakage also caused an increase in the 2D SI accumulator level. Since the test could possibly last longer than the expected approximate 15 minutes length, the inspectors were concerned that pressure would continue to increase until the RH relief valve setpoint was reached. PIF B1997-02401 documented the issue with the ASME surveillance; however, the response to the problem was narrowly focused on obtaining and evaluating ASME data and did not discuss the effect that the leaking check valves could have on the RH system pressure.

The inspectors discussed the PIF's lack of RH system evaluation with system engineering personnel and the engineers agreed that the issue should have been addressed. Once performed, the inspectors reviewed the licensee's evaluation to the potential RH system overpressurization and agreed that the RH system would not reach the relief valve setpoint. The inspectors considered the lack of an engineering evaluation during the initial PIF documentation and evaluation to be a missed opportunity to evaluate the change in RH system performance based on the check valve leakage.

c. Conclusions

The inspectors concluded that engineering personnel missed an opportunity to address the effects of RCS check valve leakage on potential RH system overpressurization during the PIF process. Once an evaluation was performed, the inspectors agreed that RH system overpressurization would not occur due to the check valve leakage.

## E2 Engineering Support of Facilities and Equipment

### E2.1 Design Basis Initiative Program

#### a. Inspection Scope (37551)

The inspectors discussed the licensee's design basis initiative (DBI) program with engineering personnel. The program was implemented in response to an NRC issued 10 CFR 50.54(f) letter regarding adequacy and availability of design basis information.

#### b. Observations and Findings

The inspectors determined that the program coupled "line-by-line" UFSAR verification, regulatory and design documents, calculations, and plant procedures to ensure that Eyrion Station was configured and operated in a manner consistent with the design bases. Although the DBI program was in the initial stages of implementation, the inspectors noted that the program was clearly defined and well staffed. The inspectors also noted that several PIFs had identified a number of discrepancies during the initial UFSAR reviews. The number of PIFs were expected to increase as the program developed.

#### c. Conclusions

The DBI program was clearly defined and well staffed.

## E8 Miscellaneous Engineering Issues (92903)

E8.1 (Closed) VIO 50-454/455-95011-05: Calculation BYR95-086 did not adequately determine the maximum differential pressure (dP) across the containment sump isolation valves. The inspectors reviewed the licensee's response to the violation documented in a letter to the NRC dated February 28, 1996. The inspectors verified that calculation BYR95-086 was voided and new dP calculations for the containment isolation valves were re-performed. The dP calculations were verified to be correct during an NRC motor operated valve inspection documented in Inspection Report 96003. The inspectors also reviewed an assessment of engineering calculations performed by the licensee that compared calculational errors made during 1995 against those made in 1996. The assessment noted that training given to engineers and increased management attention during the calculation review process were effective in decreasing calculational errors. The inspectors had no further concerns. This item is closed.

E8.2 (Closed) IFI 50-454/455-94022-04: Review operability assessment regarding potential increase in containment pressure. On August 30, 1994, Byron engineering personnel received information from Nuclear Fuels Services (NFS) that a containment integrity computer analysis revealed a higher containment peak pressure than that specified in the TS. The inspectors reviewed the licensee's evaluation completed on September 23, 1994, and discussed the issue with site engineering personnel. The UFSAR analysis for the containment pressure that was originally considered to be incorrect and nonconservative, was proven to be correct through detailed calculations that were re-reviewed. The licensee identified that NFS utilized a computer analysis that was not approved for use and some of the input assumptions for reactor containment fan cooler (RCFC) and containment spray (CS) actuation times were incorrect. The licensee

demonstrated that the current UFSAR RCFC and CS actuation times, and the overall loss of coolant accident containment response, were correct. The inspectors had no further concerns. This item is closed.

- E8.3 (Closed) IFI 50-454/455-95009-02: The DG jacket water standpipe volume was less than described in the UFSAR. The inspectors reviewed the licensee's operability assessment, which determined that the lower volume was adequate for supplying water without makeup under design-basis conditions. The inspectors also determined that appropriate procedures were revised to reflect the volume change and that the UFSAR changes were also made. The inspectors concluded that the issue was thoroughly addressed and had no further concerns. This item is closed.

#### IV. Plant Support

##### **F8 Miscellaneous Fire Protection Issues (71750 and 92504)**

- F8.1 (Closed) VIO 50-455/96009-06: Failure to follow fire door impairment procedure for containment spray fire door. The inspectors reviewed the licensee's response to the violation in a letter to the NRC dated February 10, 1997. In this particular case, a maintenance supervisor of one job, cleared the impairment tag without considering the other work in progress and assumed the other maintenance supervisor would initiate another impairment tag. When the first work task was completed, the impairment tag was removed. This programmatic deficiency was corrected by requiring all jobs to have individual impairment tags assigned. The inspectors also verified that the containment spray door was labeled as a fire door. The inspectors had no further concerns. This item is closed.

#### V. Management Meetings

##### **X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on September 8, 1997. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

K. Kofron, Byron Station Manager  
J. Bauer, Health Physics Supervisor  
D. Brindle, Regulatory Assurance Supervisor  
E. Campbell, Maintenance Superintendent  
J. Fiemster, Mechanical Lead Engineering Supervisor  
R. Freidel, Primary Group System Engineering Lead  
T. Gierich, Operations Manager  
B. Israel, Site Quality Verification Supervisor  
B. Moravec, SGRP Lead  
T. Schuster, Manager of Quality & Safety Assessment  
M. Snow, Work Control Superintendent  
D. Wozniak, Engineering Manager

## INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering  
IP 61726: Surveillance Observations  
IP 62707: Maintenance Observations  
IP 71707: Plant Operations  
IP 71750: Plant Support  
IP 92700: Onsite Follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities  
IP 92901: Followup - Plant Operations  
IP 92902: Followup - Maintenance  
IP 92903: Followup - Engineering  
IP 92904: Followup - Plant Support

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-455/97015-01	NCV	Failure to meet LCOAR requirements of TS 3.3.4.b.
50-454/455-97015-02	VIO	Ineffective corrective actions to prevent auto-start of SX make-up pump
50-454/455-97015-03a	VIO	Failure to follow BFP FH-31 for FME controls
50-454/455-97015-03b	VIO	Failure to follow BFP FH-31 for personnel accountability
50-454/455-97015-04a	VIO	Failure to update AF TS setpoint.
50-454/455-97015-04b	VIO	Failure to revise procedure 1BIS 3.2.1-021.

### Closed

50-455/95002	LER	Extraction steam valve maintenance without LCOAR entry.
50-455/95002-01	LER	Extraction steam valve maintenance without LCOAR entry.
50-454/96012	LER	TS action statement not entered for tornado watch.
50-455/97015-02	NCV	Failure to meet LCOAR requirements of TS 3.3.4.b.
50-454/94022-03	URI	DG inoperability in Mode 5 due to misinterpretation of TS requirements.
50-455/95004-01	URI	Review of licensee's corrective actions and root cause of failure to enter LCOAR for extraction steam valve maintenance.
50-454/455-95013-01	URI	Review of the licensee's root investigation regarding OOS discrepancy.
50-454/455-94020-03	IFI	Review of the licensee's response to a Westinghouse analysis regarding ECCS actuation at power transients.
50-454/455-94022-04	IFI	Review operability assessment regarding potential increase in containment pressure.
50-454/455-94027-01	IFI	Review of root cause evaluation regarding five missed or late TS surveillances in a four month period.
50-454/455-95009-02	IFI	The DG jacket water standpipe volume was less than described in the UFSAR.
50-454/455-97012-01	IFI	Review of 10 CFR 50.59 regarding incorrect TS for pressurizer heaters.
50-454/455-95011-05	VIO	Calculation BYR95-086 did not adequately determine the maximum dP across the containment sump isolation valves.
50-454/455-96003-01b	VIO	Failure to follow flood seal impairment procedure for SX auxiliary building floor drain sump watertight door.
50-454/455-96006-U1	VIO	Failure to follow flood seal impairment procedure for watertight door.
50-454/455-96009-01	VIO	Inadequate acceptance criteria in procedure 0BVS SX-5.
50-454/455-96009-02	VIO	Failure to use adequate test instrumentation during the performance of procedure 0BVS SX-5.
50-454/455-96009-C3a	VIO	Failure to take appropriate corrective action to silt accumulation in the SX cooling tower basins since July 26, 1993.
50-454/455-96009-03b	VIO	Failure to take prompt corrective action to repair degraded SX cooling tower basin trash racks since 1993.

50-455-96009-06

VIO Failure to follow fire door impairment procedure for CS fire door.

50-454/455-96012-03b

VIO Failure to follow flood seal impairment procedure for SX watertight door.

## LIST OF ACRONYMS USED

AF	Auxiliary Feedwater System
BAP	Byron Administrative Procedure
BFP	Byron Fuel Handling Procedure
CS	Containment Spray
CST	Condensate Storage Tank
D3I	Design Basis Initiative
DG	Diesel Generator
dP	Differential Pressure
ECCS	Emergency Core Cooling System
FME	Foreign Material Exclusion
IM	Instrument Mechanic
LCOAR	Limiting Condition for Operation Action Requirement
LER	Licensee Event Report
NFS	Nuclear Fuels Services
NSWP	Nuclear Station Work Procedure
OOS	Out of Service
PDR	Public Document Room
PIF	Problem Identification Form
PORC	Plant Operating Review Committee
PORV	Power Operated Relief Valve
RCFC	Reactor Containment Fan Coolers
RCS	Reactor Coolant System
RH	Residual Heat Removal System
RSH	River Screen House
RWST	Refueling Water Storage Tank
SFP	Spent Fuel Pool
SI	Safety Injection
SPP	Special Plant Procedure
SRO	Senior Reactor Operator
SX	Essential Service Water System
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
WR	Work Request

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

October 6, 1997

LTR: BYRON 97-0227

Mr. John A. Grobe  
Acting Director, Division of Reactor Safety  
U.S. Nuclear Regulatory Commission  
Region III  
801 Warrenville Road  
Lisle, IL 60532-4251

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- Reference: 1) Letter from John Grobe, U.S. N.R.C., to K. Graesser, Byron Station, Commonwealth Edison Company, dated June 11, 1997.
- 2) Letter from K. Graesser, Byron Station, Commonwealth Edison Company, to John Grobe, U.S. N.R.C. dated July 25, 1997.

Dear Mr. Grobe,

In Reference 1 you requested information on a matter raised with the NRC by an anonymous individual. ComEd responded to your request for information in Reference 2. Reference 2 stated that the information in its attachment included sensitive, confidential information that should not be publicly disclosed.

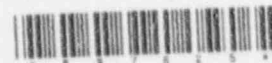
Subsequently, in a telephone request by Mr. Roger Lanksbury of your office to Don Brindle, Byron Station Regulatory Assurance Supervisor, on October 2, 1997 you requested that ComEd remove the restriction on public disclosure in order to provide the information to a member of the public who desired to review it.

Byron Station will accommodate the request. Typically Employee Concerns Program investigations are kept confidential by ComEd. We have reviewed the information in Reference 2 again and have determined that the information would be acceptable to provide to the requesting individual. We would request that the NRC provide a copy of the document only to the individual and will not make the document available for inspection and copying in the NRC Public Document Room.

If you have any questions related to this matter, please contact me at 815-234-3600.

Sincerely,

*K. L. Graesser*  
for K. L. Graesser  
Site Vice President  
Byron Nuclear Power Station



*JEOL*

OCT 09 1997