June 8, 2000

Mr. Oliver D. Kingsley
President, Nuclear Generation Group
Commonwealth Edison Company
ATTN: Regulatory Services
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: BYRON INSPECTION REPORT 50-454/2000007(DRP); 50-455/2000007(DRP)

Dear Mr. Kingsley:

On May 15, 2000, the NRC completed an inspection at the Byron 1 and 2 reactor facilities. The enclosed report presents the results of that inspection. The results of this inspection were discussed on May 12, 2000, with Mr. W. Levis and other members of your staff.

The inspection was an examination of activities conducted under your license as they relate to reactor safety and to compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel. No findings were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and the enclosure will be placed in the NRC Public Electronic Reading Room link at the NRC homepage, namely http://www.nrc.gov/NRC/ADAMS/index.html.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

***/RA/***

Michael J. Jordan, Chief
Reactor Projects Branch 3

Docket Nos. 50-454; 50-455
License Nos. NPF-37; NPF-66

Enclosure: Inspection Report 50-454/2000007(DRP);
50-455/2000007(DRP)

cc w/encl: D. Helwig, Senior Vice President, Nuclear Services
C. Crane, Senior Vice President, Nuclear Operations
H. Stanley, Vice President, Nuclear Operations
R. Krich, Vice President, Regulatory Services
DCD - Licensing
W. Levis, Site Vice President
R. Lopriore, Station Manager
B. Adams, Regulatory Assurance Manager
M. Aguilar, Assistant Attorney General
State Liaison Officer
State Liaison Officer, State of Wisconsin
Chairman, Illinois Commerce Commission

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| NAME | Tongue | | Jordan | | | | | | |
| DATE | 06/ /2000 | | 06/ /2000 | | | | | | |

**OFFICIAL RECORD COPY**

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

| | |
|---|---|
| Docket Nos: | 50-454; 50-455 |
| License Nos: | NPF-37; NPF-66 |
| Report No: | 50-454/2000007(DRP); 50-455/2000007(DRP) |
| Licensee: | Commonwealth Edison Company |
| Facility: | Byron Generating Station, Units 1 and 2 |
| Location: | 4450 N. German Church Road<br>Byron, IL 61010 |
| Dates: | April 2 through May 15, 2000 |
| Inspectors: | E. Cobey, Senior Resident Inspector<br>B. Kemker, Resident Inspector<br>C. Thompson, Illinois Department of Nuclear Safety |
| Approved by: | Michael J. Jordan, Chief<br>Reactor Projects Branch 3<br>Division of Reactor Projects |

## SUMMARY OF FINDINGS

Byron Generating Station Units 1 and 2
NRC Inspection Report 50-454/2000007(DRP); 50-455/2000007(DRP)

The report covers a 6-week period of inspection activities by the resident staff.

No findings were identified in any of the cornerstones.

# NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

| Reactor Safety | Radiation Safety | Safeguards |
|---|---|---|
| ● Initiating Events | ● Occupational | ● Physical Protection |
| ● Mitigating Systems | ● Public | |
| ● Barrier Integrity | | |
| ● Emergency Preparedness | | |

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

## Report Details

Summary of Plant Status

The licensee operated Units 1 and 2 at or near full power for the duration of this inspection period.

### 1. REACTOR SAFETY
**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness**

1R01 Adverse Weather

a. Inspection Scope

The inspectors evaluated the licensee's preparation for high wind conditions during a tornado watch, which was declared by the National Weather Service for the area immediately surrounding the facility on May 8, 2000. The inspectors observed the licensee's preparations for high wind conditions, interviewed operators, and reviewed the following procedures.

- Byron Abnormal Operating Procedure (BOA) ENV-1, "Adverse Weather Conditions Unit 0," Revision 1A
- 1BOA ENV-1, "Adverse Weather Conditions Unit 1," Revision 3
- 2BOA ENV-1, "Adverse Weather Conditions Unit 2," Revision 3
- Byron Operating Limiting Condition for Operation Action Requirement Procedure 7.9, "Ultimate Heat Sink (UHS) Tech Spec LCO [Technical Specification Limiting Condition for Operation] #3.7.9," Revision 3

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R04 Equipment Alignment

a. Inspection Scope

The inspectors verified the system alignment of the 1B residual heat removal (RH) and the 1B essential service water (SX) trains while the 1A RH and 1A SX trains, respectively, were out-of-service for maintenance. The inspectors selected these systems because they were risk significant in the licensee's risk analysis. The inspectors reviewed the system drawings and the current valve lineup procedures to determine the correct system alignment. The inspectors performed walkdowns of the accessible portions of these systems and verified the system lineup and each of the system operating parameters (i.e., temperature, pressure, flow, etc.).

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R05 Fire Protection

a. Inspection Scope

The inspectors toured the plant areas listed below to observe conditions related to fire protection.

- Unit 1 Cable Tunnel (Zone 3.1-1)
- Unit 2 Cable Tunnel (Zone 3.1-2)
- Laundry Room (Zone 11.6C-0)
- Division 11, 4 Kilo-Volt Switchgear Room (Zone 5.2-1)
- Division 12, 4 Kilo-Volt Switchgear Room (Zone 5.1-1)
- Division 21, 4 Kilo-Volt Switchgear Room (Zone 5.2-2)
- Division 22, 4 Kilo-Volt Switchgear Room (Zone 5.1-2)

These areas were selected for inspection because they were identified as risk significant in the Byron Station Individual Plant Examination of External Events. The inspectors assessed the licensee's control of transient combustibles and ignition sources, material condition, and operational status of fire barriers and fire protection equipment.

b. Issues and Findings

During this inspection activity, the inspectors selected four fire seals which were located in fire zone 5.2-2 in order to verify that the fire seals were the appropriate fire resistance rating and were installed in accordance with the applicable design requirements (i.e., dimensions and material composition). The licensee was able to provide documentation that one of the four fire seals was correctly installed in a configuration that had a 3-hour fire rating. However, the licensee was unable to locate the installation records for the three remaining fire seals.

Each of these fire seals were external fire seals for electrical conduit which penetrated a 3-hour fire rated block wall. The licensee determined that all of the fire seals installed in the facility of this type were originally installed to one of three general details and these fire seals were not uniquely identified. Consequently, the licensee was having difficulty locating the installation records which would demonstrate that these fire seals were correctly installed in a configuration that had a 3-hour fire rating.

As a result, the licensee initiated problem identification form (PIF) B2000-01350 and performed an operability assessment, which concluded that all of the fire seals of this type were operable. At the end of the inspection period, the licensee's investigation of this issue was in progress. This issue is considered an Unresolved Item (50-454/455-2000007-01(DRP)) pending NRC review of the results of the licensee's investigation and resolution of this issue.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors assessed licensed operator performance and the training evaluators' critique during a licensed operator evaluated training session in the Byron Station operations training simulator on April 17, 2000. The inspectors focused on alarm response, command and control of crew activities, communication practices, procedural adherence, and implementation of emergency plan requirements.

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R12 Maintenance Rule Implementation

a. Inspection Scope

The inspectors evaluated the licensee's implementation of the maintenance rule, 10 CFR Part 50.65, as it pertained to identified performance problems with direct current (DC) breakers and emergency lighting units which had been documented in the following problem identification forms.

- PIF B1999-03725 DC Bus 211 Battery Breaker Failed to Close
- PIF B1999-03946 DC Bus 212 AF-2 Breaker Failed to Close During Surveillance
- PIF B1999-03991 4 Breaker Failures in 4 Days
- PIF B1999-04706 Batteries Failed While Performing Teledyne Light Inspection

During this inspection, the inspectors evaluated the licensee's monitoring and trending of performance data, verified that performance criteria were established commensurate with safety, and verified that the equipment failures were appropriately evaluated in accordance with the maintenance rule. The inspectors also interviewed the station's Maintenance Rule Coordinator and reviewed Nuclear Station Procedure ER-3010, "Maintenance Rule," Revision 0.

In addition, the inspectors evaluated the licensee's corrective actions for maintenance rule program issues documented in the following problem identification forms.

- PIF B1998-04584 Core Damage Frequency Trending Not Performed Per Site Policy Memo 600.13
- PIF B1999-03501 Continuing Lack of PSA [Probabilistic Safety Assessment] Support to the Byron Maintenance Rule Program

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the licensee's evaluation of plant risk for planned maintenance activities on the 1A residual heat removal heat exchanger, the 1B auxiliary feedwater train, and the 1A essential service water train. The inspectors selected these maintenance activities because they involved systems which were risk significant in the licensee's risk analysis. During this inspection, the inspectors evaluated the licensee's implementation of planned contingency actions, which had been developed to minimize plant risk, where appropriate. The inspectors also interviewed operations and work control department personnel and reviewed Nuclear Station Procedure WC-3006, "On-Line Maintenance," Revision 2.

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors evaluated the licensee's basis that the issues identified in the following operability evaluations did not render the involved equipment inoperable or result in an unrecognized increase in plant risk.

- 2000-005 Incorrect Bolts Installed on the 0A and 0D Essential Service Water Cooling Tower Fan Motor Shaft Couplings
- 2000-006 Elevated Grounds on 125 Volt Direct Current Bus 212
- 2000-007 Unit 2 Feedwater Check Valves 2FW079B, C and D Show Evidence of Graphite Seal Material Extrusion From the Upper Bonnet

The inspectors interviewed engineering department personnel and reviewed Nuclear Station Procedure CC-3001, "Operability Determination Process," Revision 0, Commonwealth Edison Company Report, "DC System Grounds Task Force Report," Revision A, dated May 25, 1989, and the applicable portions of the Updated Final Safety Analysis Report and the Technical Specifications.

In addition, the inspectors evaluated the licensee's corrective actions for operability evaluation issues documented in the following problem identification forms.

- PIF B1998-05247 Unit 2 Containment Floor Sump Level Indication Operability Questionable
- PIF B1998-05298 Operability Assessment in Error

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R16 Operator Work-Arounds

a. Inspection Scope

The inspectors reviewed operator work-around (OWA) 201, Erratic Control of the Motor Driven Feedwater Pump Discharge Flow Control Valves, and OWA 223, Instrument Inverter Alternating Current Input Breaker Trips During Diesel Generator Sequence Testing. The inspectors selected these OWAs because they involved systems that were risk significant in the licensee's risk analysis. The inspectors evaluated these OWAs to identify any potential affect on the functionality of mitigating systems or on the operators' response to initiating events. The inspectors interviewed operating and engineering department personnel and reviewed Nuclear Station Procedure OP-AA-101-303, "Operator Work-Around Program," Revision 0.

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors evaluated the licensee's post maintenance testing activities for the maintenance conducted on the 1A residual heat removal (RH) heat exchanger, the 1B auxiliary feedwater (AF) train, and the 1A essential service water (SX) train, which included the following action request (AR) and work requests (WRs).

- AR 990082022 Install Blocking Device on Valve 1RH606 (Closed Position) to Form OOS [Out-of-Service] Boundary
- WR 980077599-01 Replace Speed Indicator on Panel 1AF01J -- 1B AF Pump Tachometer
- WR 980105087-01 1B Diesel Driven AF Pump Diesel Engine -- Repair Small Exhaust Manifold Leak
- WR 980119466-01 Perform Breaker Swap-Out at Bus 141 Cubicle 2
- WR 990020435-01 1B AF Pump Cubicle Cooler 1VA08S SX Outlet Valve 1SX168 -- Re-Pack Valve
- WR 990020435-02 Install Valve Block on 1SX178 to Support 1SX168 Work
- WR 990029529-01 1A RH Heat Exchanger 1RH02AA Tube Side Vent Valve -- Repair Valve Leak Coming From Under Insulation
- WR 990029529-02 1A RH Heat Exchanger 1RH02AA Tube Side Vent Valve -- Install Freeze Seal to Support Task 01
- WR 990091612-01 Open Strainer for SED [System Engineering Department] Inspection/Repair
- WR 990091612-02 Remove/Reinstall Blank Flange

- WR 990091612-03 Remove/Reinstall Flood Seal
- WR 990091613-01 Clean SX Oil Cooler
- WR 990124761-01 Support 1SX116A Check Valve Isolation
- WR 990124765-01 Support 1SX116A Check Valve Isolation
- WR 990124768-01 Support 1SX116A Check Valve Isolation
- WR 990124771-01 Support 1SX116A Check Valve Isolation
- WR 990126532-01 Oil Leak at Flange
- WR 990126532-02 Re-Align Flanges By Welding If Needed
- WR 990238645-01 1B AF Pump Engine Driven Cooling Water Pump -- High Vibrations on Outboard Pump Bearing in Horizontal Direction

The inspectors selected these post maintenance testing activities because they involved systems which were risk significant in the licensee's risk analysis. The inspectors interviewed operations, maintenance and engineering department personnel. The inspectors also reviewed the completed post-maintenance testing documentation and the applicable portions of the Updated Final Safety Analysis Report and the Technical Specifications.

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors evaluated the surveillance testing activities listed below to verify that the testing demonstrated that the equipment was capable of performing its intended function.

- Byron Operating Surveillance Requirement (BOSR) 3.1.5-1, "Unit Two Train A Solid State Protection System Bi-Monthly Surveillance (Staggered)," Revision 4
- 2BOSR TS-M1, "Turbine Oil Trips Monthly Surveillance," Revision 7
- Byron Technical Surveillance Requirement (BVSR) 5.5.8.SX.1-2, "Unit 0 Test of the 0B Essential Service Water Makeup Pump," Revision 2

The inspectors selected 2BOSR 3.1.5-1 and 2BOSR TS-M1 because the licensee considered these surveillance tests high risk activities. The inspectors selected 0BVSR 5.5.8.SX.1-2 because the essential service water system was risk significant in the licensee's risk analysis and the 0B essential service water makeup pump was in double test frequency due to elevated vibration. The inspectors interviewed operations and engineering department personnel; reviewed the completed test documentation and applicable portions of the Updated Final Safety Analysis Report and the Technical Specifications; and observed the performance of these surveillance testing activities.

In addition, the inspectors evaluated the licensee's corrective actions for surveillance testing issues documented in the following problem identification forms.

- PIF B1999-03993 Execution of Superceded Revision of Surveillance
- PIF B1999-04207 Outdated BOSR/BVSR Performed

b. Issues and Findings

There were no findings identified and documented during this inspection.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors evaluated Temporary Modification 1999-1-028, Install Camera System to Monitor Reactor Coolant Pump 1B Seal Leak-off Flow Indication, and verified that the installed temporary modification did not degrade or render the containment barrier inoperable. The inspectors interviewed engineering and maintenance department personnel. The inspectors also reviewed Nuclear Station Procedure CC-AA-112, "Temporary Modifications," Revision 0, and the applicable portions of the Updated Final Safety Analysis Report.

In addition, the inspectors evaluated the licensee's corrective actions for temporary plant modification issues documented in the following problem identification forms.

- PIF B1999-00938 Nuclear Oversight Identified Procedure Adherence Problem for Temporary Modification Procedure
- PIF B1999-00944 Nuclear Oversight Observation of Temporary Alteration/Modification Process Procedure Adequacy Concerns

b. Issues and Findings

There were no findings identified and documented during this inspection.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed the licensee's annual emergency preparedness drill which was conducted on April 26, 2000. The inspection effort was focused on evaluation of the licensee's classifications, notifications, and protective action recommendations during the drill.

b. Issues and Findings

There were no findings identified and documented during this inspection.

## 4. OTHER ACTIVITIES (OA)

### 4OA1 Performance Indicator Verification

a. Inspection Scope

The inspectors verified the Unplanned Scrams per 7000 Critical Hours and the Scrams with Loss of Normal Heat Removal performance indicators for both units. The inspectors reviewed each of the licensee event reports since April 1997, determined the number of scrams that occurred, evaluated each of the scrams against the performance indicator definitions, and verified the licensee's calculation of critical hours for both units.

b. Issues and Findings

There were no findings identified and documented during this inspection.

### 4OA6 Meetings, including Exit

Exit Meeting Summary

The inspectors presented the inspection results to Mr. W. Levis and other members of licensee management at the conclusion of the inspection on May 12, 2000. The licensee acknowledged the findings presented. 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

B. Adams, Regulatory Assurance Manager
R. Deppi, Nuclear Oversight Manager
P. Donnelly, Maintenance Programs Supervisor
W. Grundmann, System Engineering Manager
D. Hoots, Operations Manager
J. Kramer, Work Control Manager
S. Kuczynski, Maintenance Manager
W. Levis, Site Vice President
R. Lopriore, Station Manager
W. McNeill, Radiation Protection Manager
D. Spitzer, Site Business Operations Manager
D. Spoerry, Training Manager
D. Starke, Chemistry
G. Stauffer, Regulatory Assurance
D. Wozniak , Engineering Manager

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

| | | |
|---|---|---|
| 50-454/455-2000007-01 | URI | Review the results of the licensee's investigation and resolution of the missing installation records for 3-hour rated fire seals |

Closed

None

Discussed

None

## LIST OF BASELINE INSPECTIONS PERFORMED

The following inspectable-area procedures were used to perform inspections during the report period. Documented findings are contained in the body of the report.

| Inspection Procedure | | Report |
|---|---|---|
| Number | Title | Section |
| 71111-01 | Adverse Weather Protection | 1R01 |
| 71111-04 | Equipment Alignment | 1R04 |
| 71111-05 | Fire Protection | 1R05 |
| 71111-11 | Licensed Operator Requalification Program | 1R11 |
| 71111-12 | Maintenance Rule Implementation | 1R12 |
| 71111-13 | Maintenance Risk Assessments and Emergent Work Control | 1R13 |
| 71111-15 | Operability Evaluations | 1R15 |
| 71111-16 | Operator Work-arounds | 1R16 |
| 71111-19 | Post Maintenance Testing | 1R19 |
| 71111-22 | Surveillance Testing | 1R22 |
| 71111-23 | Temporary Plant Modifications | 1R23 |
| 71114-06 | Drill Evaluation | 1EP6 |
| 71151 | Performance Indicator Verification | 4OA1 |

LIST OF ACRONYMS USED

| | |
|---|---|
| AF | Auxiliary Feedwater |
| AR | Action Request |
| BOA | Byron Abnormal Operating Procedure |
| BOSR | Byron Operating Surveillance Requirement Procedure |
| BVSR | Byron Technical Surveillance Requirement Procedure |
| CFR | Code of Federal Regulations |
| DC | Direct Current |
| DRP | Division of Reactor Projects |
| DRS | Division of Reactor Safety |
| LCO | Limiting Condition for Operation |
| NRC | Nuclear Regulatory Commission |
| OOS | Out-of-Service |
| OWA | Operator Work-around |
| PIF | Problem Identification Report |
| PSA | Probabilistic Safety Assessment |
| RH | Residual Heat Removal |
| SED | System Engineering Department |
| SX | Essential Service Water |
| UHS | Ultimate Heat Sink |
| URI | Unresolved Item |
| WR | Work Request |