October 24, 2000

EA-00-171

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 - NRC INSPECTION REPORT 50-454/2000016(DRS);
50-455/2000016(DRS)

Dear Mr. Kingsley:

On October 6, 2000, the NRC completed a routine inspection at your Byron Generating Station, Units 1 and 2. The results were discussed on October 6, 2000, with Mr. Levis and other members of your staff. The enclosed report presents the results of that inspection.

The inspection was an examination of activities conducted under your license as they relate to radiation 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. Specifically, this inspection focused on occupational radiation safety.

No findings of significance were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the *Publicly Available Records (PARS) component of NRC's document system (ADAMS)*. *ADAMS is accessible from* the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Gary L. Shear, Chief
Plant Support Branch
Division of Reactor Safety

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

Enclosure: Inspection Report 50-454/2000016(DRS);
50-455/2000016(DRS)

See Attached Distribution

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
P. Reister, 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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See Attached Distribution
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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:	50-454/2000016(DRS); 50-455/2000016(DRS)
Licensee:	Commonwealth Edison Company (ComEd)
Facility:	Byron Generating Station, Units 1 and 2
Location:	4450 North German Church Road Byron, IL 61010
Dates:	October 2 - 6, 2000
Inspectors:	Steven K. Orth, Senior Radiation Specialist Robert D. Jickling, Emergency Preparedness Analyst
Approved by:	Gary L. Shear, Chief Plant Support Branch Division of Reactor Safety

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.

SUMMARY OF FINDINGS

IR 50-454/2000016(DRS), 50-455/2000016(DRS), on 10/2-10/6/2000; Commonwealth Edison Company, Byron Generating Station, Units 1 and 2; Radiation safety specialist report.

The inspection was conducted by a regional emergency preparedness analyst and a senior radiation specialist. There were no findings of significance identified during this inspection.

Report Details

Summary of Plant Status

During this inspection, Byron Unit 1 was in a scheduled refueling outage, and Byron Unit 2 was operating at essentially full power.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2OS1 Access Controls for Radiologically Significant Areas

.1 Plant Walkdowns and Radiological Boundary Verifications

a. Inspection Scope

The inspectors performed walkdowns of the radiologically controlled area (RCA) to verify the adequacy of radiological boundaries and postings. Specifically, the inspectors performed confirmatory radiation measurements in the Unit 1 Containment Building to verify that radiologically significant work areas (high radiation areas (HRAs), radiation areas, and airborne radioactivity areas) were properly posted and controlled in accordance with 10 CFR Part 20 and the licensee's procedures.

b. Findings

No findings of significance were identified.

.2 Reviews of Radiation Work Permits

a. Inspection Scope

The inspectors reviewed radiation work permits (RWPs) and electronic dosimeter alarm setpoints, for both a dose rate and accumulated dose, to ensure that the controls were consistent with the licensee's Technical Specifications and to verify that adequate work controls were in place to maintain worker exposures ALARA (as-low-as-is-reasonably-achievable). Specifically, the inspectors reviewed the controls contained in the following RWPs:

- RWP No. 001522 (Revision 0, Temp 1), "Stage, Set-up, and Teardown S/G [steam generator] Equipment in CNMT [containment];"
- RWP No. 001574 (Revision 0), "Remove and Reinstall Reactor Head and Upper Internals;"
- RWP No. 001580 (Revision 0), "Reactor Coolant Pumps: Inspection, Maintenance, and Repair (All Loops);"

- RWP No. 001795 (Revision 0), “Rx [Reactor] Cavity Decon: Equipment Staging and Set Up, Removal and Associated Activities;”

- RWP No. 001827 (Revision 0), “LSIVs [Loop Stop Isolation Valves]: Remove & Replace Interferences/Stage Equip./Set-up & Tear-Down Equip./LSIV Repair: (Cutting, Grinding, & Welding);” and

- RWP No. 001828 (Revision 0), “LSIV: Radiography Specifically for LSIV Work.”

b. Findings

No findings of significance were identified.

.3 High Risk Significant, High Dose Rate High Radiation Area (HRA) and Very High Radiation Area (VHRA) Controls

a. Inspection Scope

The inspectors reviewed the licensee’s controls for access to high risk significant HRAs and VHRAs to ensure that the licensee’s controls were consistent with the requirements contained in 10 CFR Part 20 and contained within its Technical Specifications. Specifically, the inspectors discussed the controls with members of the radiation protection staff and reviewed the following procedures:

- BAP 370-3 (Revision 28), “Administrative Control During Refueling;”

- BFP FH-37 (Revision 2), “Control of Non-Fuel Items in the Spent Fuel Pool;” and

- RP-AA-460 (Revision 1), “Controls for High and Very High Radiation Areas.”

The inspectors also performed walkdowns of the Unit 1 Containment Building to ensure adequate posting and locking of entrances to high dose rate (>25 rem in one hour at 30 centimeters) HRAs and VHRAs.

b. Findings

No findings of significance were identified.

.4 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed condition reports completed during the previous nine months which identified issues in radiation worker and radiation protection technician performance. In particular, the inspectors discussed with the licensee an adverse trend in radiation worker practices that was documented in a number of condition reports. The inspectors reviewed these documents to assess the licensee’s ability to identify repetitive problems, contributing causes, the extent of conditions, and corrective actions which will achieve lasting results.

b. Findings

No findings of significance were identified.

2OS2 As-Low-As-Is-Reasonably-Achievable (ALARA) Planning and Controls

.1 Radiation Dose Controls and Trending

a. Inspection Scope

The inspectors reviewed the licensee's outage and annual dose goals and dose trending for calendar year 2000.

b. Findings

Originally, the licensee established a goal of 126 person-rem for calendar year 2000 and a goal of 80 person-rem for the Fall 2000 Unit 1 refueling outage. As a result of outage performance, the licensee adjusted the outage dose goal to 124 person-rem and the annual dose goal to 143 person-rem. As of October 11, 2000 (with all radiological outage work completed), the licensee recorded an outage exposure of about 179 person-rem and an annual exposure of about 198.5 person-rem.

No findings of significance were identified.

.2 Job Site Inspections and ALARA Controls

a. Inspection Scope

The inspectors observed work activities in the RCA that were performed in radiation areas or HRAs to evaluate the use of ALARA controls. Specifically, the inspectors verified the adequacy of radiation work permits, ALARA reviews, surveys, pre-job radiological briefings, and radiation protection technician performance for the following work activities:

- Reactor coolant pump seal maintenance;
- Reactor head replacement;
- Loop stop isolation valve repair; and
- Reactor cavity decontamination.

The inspectors also reviewed the licensee's radiological planning (e.g., person-hour estimates, engineering controls, and use of mock-ups) for the loop stop isolation valve repair which resulted in a total dose of about 82.5 person-rem, as compared to the licensee's initial estimate of 8 person-rem.

b. Findings

No findings of significance were identified.

.3 Source Term Reduction

a. Inspection Scope

The inspectors reviewed the status of the licensee's source term reduction program, which included source term trending, hot spot reduction, system flushing/hydrolazing, and chemistry controls (i.e., early boration/hydrogen peroxide shutdown chemistry). The inspectors also performed surveys within the radiologically controlled area to verify the accuracy of the licensee's records/surveys and to identify any other significant, unidentified sources of radiation exposure.

b. Findings

No findings of significance were identified.

.4 Declared Pregnant Workers

a. Inspection Scope

The inspectors reviewed the controls implemented by the licensee for the two individuals who voluntarily declared their pregnancies within the last 18 months. Specifically, the inspectors reviewed the licensee's adherence to the requirements contained in 10 CFR 20.1208 and its procedures and reviewed the licensee's evaluation of the dose to the individuals' embryos/fetuses.

b. Findings

In accordance with the licensee's program, the declared pregnant workers chose to work outside of the RCA during their pregnancies. Consequently, the doses assigned to the embryos/fetuses were 0 millirem for the gestation periods.

No findings of significance were identified.

.5 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed self-assessments, audits, and condition reports completed during the previous 18 months which focused on ALARA planning and controls. The inspectors reviewed these documents to assess the licensee's ability to identify repetitive problems, contributing causes, the extent of conditions, and corrective actions which will achieve lasting results.

b. Findings

No findings of significance were identified.

2OS4 Radiation Worker Performance

a. Inspection Scope

The inspectors observed radiation workers performing the activities described in Section 2OS2.2 and evaluated their awareness of radiological conditions and their implementation of applicable radiological controls.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification

.1 Reactor Coolant System Performance Indicator

a. Inspection Scope

The inspectors verified that the licensee had accurately reported the reactor coolant system (RCS) activity performance indicator (PI) for the barrier integrity cornerstone. Specifically, the inspectors reviewed the licensee's sample analyses results for maximum dose equivalent iodine-131 (January 2000 through September 2000), performed independent calculations of dose equivalent iodine-131, and reviewed procedure BCP 300-23 (Revision 18), "Reactor Coolant or Pressurizer Liquid and/or Grab Sample." The inspectors also observed a chemistry technician obtain and analyze an RCS sample and discussed a recent quality assurance observation which documented procedural adherence problems during routine reactor coolant sampling.

b. Findings

No findings of significance were identified.

.2 Occupational Exposure Control Effectiveness Performance Indicator

a. Inspection Scope

The inspectors verified the licensee's assessment of its PI for the occupational radiation safety cornerstone that the licensee reported to the NRC. Specifically, the inspectors reviewed selected RCA transaction records (i.e., exposure reports) and condition reports for the previous 18 months. The inspectors independently reviewed the licensee's records to validate the licensee's PI data.

b. Findings

No findings of significance were identified.

4OA5 Other

.1 Temporary Instruction 2515/144

a. Inspection Scope

The inspectors reviewed the data collection and reporting process for the emergency response organization drill participation performance indicator. Specifically, the inspectors reviewed the licensee's definition of terms, procedures and instructions, and clarifying notes used by the licensee to ensure consistency with industry guidance document NEI [Nuclear Energy Institute] 99-02, Revision 0.

b. Findings

No findings of significance were identified.

.2 Deliberate Violation of Radiation Protection Procedures

On September 22, 2000, the NRC issued Enforcement Action (EA) No. 00-171, which concerned a deliberate violation of radiation protection procedures at the Byron site on November 2, 1999. The NRC concluded that the failure of an individual to obtain authorization prior to entering a radiologically posted area constituted a Severity Level IV violation. For administrative purposes, the licensee's actions to correct this violation will be tracked as VIO No. 50-454/2000016-01 and 50-455/2000016-01.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. Levis and other members of licensee management at the conclusion of the inspection on October 6, 2000. The licensee acknowledged the findings presented. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Colglazier, Regulatory Assurance
D. Drawbaugh, Emergency Preparedness Coordinator
D. Goldsmith, Radiation Protection Manager - Braidwood
S. Kerr, Chemistry Supervisor
J. Kuczynski, Health Physicist Supervisor
W. Levis, Site Vice President
R. Lopriore, Station Manager
W. McNeil, Radiation Protection Manager
K. Moser, Nuclear Oversight Assessment Manager
P. Reister, Regulatory Assurance Manager
K. Rowe, Corporate Radiation Protection
T. Schuster, Chemistry Manager
R. Tucker, Radiation Protection Supervisor

NRC

E. Cobey, Senior Resident Inspector

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

50-454/2000016-01 50-455/2000016-01	VIO	Deliberate violation of radiation protection procedures (Section 40A5.2).

Closed

None

Discussed

None

LIST OF ACRONYMS USED

ALARA	As-Low-As-Is-Reasonably-Achievable
DRS	Division of Reactor Safety
EA	Enforcement Action
HRA	High Radiation Area
NEI	Nuclear Energy Institute\
OS	Occupational Radiation Safety
PI	Performance Indicator
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RWP	Radiation Work Permit
VHRA	Very High Radiation Area

LIST OF DOCUMENTS REVIEWED

Audits and Assessments

Byron Station Assessment Report: Nuclear Oversight Assessment No. NOA-06-99-008, dated March 14, 1999

Byron Station Radiological Protection Area: Fourth Quarter 1999, First Quarter 2000, and 2nd Quarter 2000

Focus Area Self-Assessment Report: "ALARA Planning and Control/Online Exposure," approved August 31, 2000

"Focus Area Assessment of NRC PI Data for Occupational Exposure Control Effectiveness Indicator (S.27) and the RETS/ODCM Radiological Effluents Occurrence Indicator (S.28)," completed on June 12, 2000

Memorandum from Radiation Protection Department Self-Assessment Coordinator to the Plant Manager, dated February 8, 2000, "Department Monthly Self-Assessment Report for January"

Memorandum from Radiation Protection Department Self-Assessment Coordinator to the Plant Manager, dated March 2, 2000, "Department Monthly Self-Assessment Report for February"

Memorandum from Radiation Protection Department Self-Assessment Coordinator to the Plant Manager, dated May 5, 2000, "Department Monthly Self-Assessment Report for April"

"TEDE ALARA Evaluations Performed for B2R08," completed on January 14, 2000

Condition Reports Nos.:

B1999-03711, B2000-01677, B2000-01875, B2000-02363, B2000-02555, B2000-02633, B2000-02641, B2000-02644, B2000-02646, B2000-02661, B2000-02662, B2000-02668, B2000-02693, B2000-02694, B2000-02705, B2000-02735, B2000-02772, B2000-02787, B2000-02794, B2000-02795, B2000-02803, B2000-02812, B2000-02819, B2000-02857, B2000-02898, B2000-02911, B2000-02925, B2000-02930, and B2000-02960

Miscellaneous

Attachment 7 to RP-AA-401 (Revision 1), "ALARA Work In Progress Review," dated September 25, 2000; September 27, 2000; September 28, 2000; October 1, 2000; and October 2, 2000

Procedures Nos.

BAP 370-3 (Revision 28), "Administrative Control During Refueling"
BCP 300-23 (Revision 18), "Reactor Coolant or Pressurizer Liquid and/or Pressurized Grab Sample"
BFP FH-37 (Revision 2), "Control of Non-Fuel Items in the Spent Fuel Pool"

BRP 5300-3 (Revision 4), “Administration of the Radiation Protection Aspects of COMED’s Fetal Protection and Postnatal Program”
BRP 5300-5 (Revision 4), “Special Instructions Concerning Female Radiation Workers”
BRP 6210-8 (Revision 3), “Radiological Controls for Reactor Head and Upper Internals Movement”
RP-AA-400 (Revision 1), “ALARA Program”
RP-AA-401 (Revision 1), “Operational ALARA Planning and Controls”
RP-AA-460 (Revision 1), “Controls for High and Very High Radiation Areas”