

January 23, 2001

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 50-454/01-04(DRS);  
50-455/01-04(DRS)

Dear Mr. Kingsley:

On January 12, 2001, the NRC completed a routine inspection at your Byron Generating Station, Units 1 and 2. The enclosed report documents the inspection findings which were discussed on January 12, 2001, with Mr. Lopriore and other members of your staff.

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 public radiation safety.

Based on the results of this inspection, the inspector identified one issue of very low safety significance (Green). This issue was determined to involve a violation of NRC requirements. However, because of its very low safety significance and because it has been entered into your corrective action program, the NRC is treating this issue as a Non-cited Violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny this Non-cited Violation, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Byron facility.

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 50-454/01-04(DRS);  
50-455/01-04(DRS)

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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 Chairman, Illinois Commerce Commission

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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: 50-454/01-04(DRS); 50-455/01-04(DRS)

Licensee: Commonwealth Edison Company (ComEd)

Facility: Byron Generating Station, Units 1 and 2

Location: 4450 North German Church Road  
Byron, IL 61010

Dates: January 8 - 12, 2001

Inspector: Steven K. Orth, Senior Radiation Specialist

Observer: Ronald V. Schmitt, Radiation Specialist

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

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness

## Radiation Safety

- Occupational
- Public

## Safeguards

- Physical Protection

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 05000454-01-04(DRS), IR 05000455-01-04(DRS), on 01/08-01/12/2001, Commonwealth Edison Company, Byron Generating Station, Units 1 and 2. Radioactive material processing and transportation.

The inspection was conducted by a senior radiation specialist. The inspection identified one Green finding, which was a Non-cited Violation. The significance of most/all findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "no color" or by the severity level of the applicable violation.

### A. Inspector Identified Findings

Cornerstone: Public Radiation Safety

- Green. The inspector identified a Non-cited Violation for the failure to provide an adequate barricade and to conspicuously post a high radiation area within the radioactive waste truck bay in accordance with Technical Specification 5.7.1.

The finding was of very low significance because the inspector concluded that it was unlikely that an individual could have inadvertently entered the area and obtained an overexposure. (Section 2PS2.1)

### B. Licensee Identified Findings

No findings of significance were identified.

## Report Details

### Summary of Plant Status

During this inspection, Byron Units 1 and 2 were operating at essentially full power.

## **2. RADIATION SAFETY**

Cornerstone: Occupational Radiation Safety (OS)

### 2OS1 Access Control to Radiologically Significant Areas

#### .1 Problem Identification and Resolution

##### a. Inspection Scope

The inspector reviewed three condition reports completed during the previous 12 months which documented incidents taking place in high radiation areas (HRAs) (general area dose rates less than 1 Rem per hour). In addition, the inspector reviewed a condition report that the licensee had initiated to determine if these incidents (and other recent HRA incidents) had common causes. The inspector 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.

Cornerstone: Public Radiation Safety (PS)

### 2PS2 Radioactive Material Processing and Transportation

#### .1 Walk-Downs of Radioactive Waste Systems

##### a. Inspection Scope

The inspector performed walk-downs of the liquid and solid radioactive waste systems to assess their material condition and operability and to ensure that radiological hazards were adequately posted and controlled in accordance with 10 CFR Part 20 and the licensee's Technical Specifications. The inspector also discussed the current operation of the system with a member of the radioactive waste operations crew. Specifically, the inspector reviewed conditions in the following areas:

- chemical drain tank room,
- chemical/regeneration tank room,
- drumming stations,
- equipment drain tank room,
- radwaste control room,

- radwaste evaporator rooms,
- radwaste monitor tank rooms,
- radwaste tunnel
- recycle hold-up tank rooms,
- regeneration waste drain tank room, and
- solid radioactive waste handling, storage, and processing areas.

The inspector compared the operations of the liquid/solid radioactive waste systems to the descriptions in the Updated Final Safety Analysis Report and the licensee's process control program. In the case of abandoned equipment (i.e., installed solidification system and evaporators), the inspector reviewed the administrative and physical controls to verify that the equipment would not contribute to an unmonitored release path and would not inadvertently affect operating systems.

b. Findings

The licensee failed to properly post an HRA within the radioactive waste area. During walk-downs of the solid radioactive waste area (dewatering area and truck bay) on January 9, 2001, the inspector observed that a trailer was parked alongside of a posted HRA. Based on the most recent survey, the licensee measured general area dose rates of up to 200 millirem per hour in the posted area. On about December 21, 2000, the licensee had moved the trailer into the area to prepare to ship a container of miscellaneous contaminated materials generated during the Fall 2000 refueling outage. The inspector observed that the trailer obscured the licensee's HRA postings and effectively defeated the established barricade. Specifically, the trailer blocked all but one of the licensee's HRA postings on the one side. In addition, the trailer was at a height equal to or greater than that of the barricade (plexiglass wall), which eliminated the barricade's ability to prevent an inadvertent entry into the HRA from the trailer. Based on the described configuration, the inspector concluded that neither the postings nor the barricade were conspicuous from on top of the trailer to identify the area and to prevent an inadvertent entry. As an immediate corrective action, the licensee placed a rope at a height visible from the trailer (with appropriate HRA postings) to identify the hazard to personnel who may be working on the trailer. The licensee also initiated a condition report in its corrective action program.

Technical Specification 5.7.1 states, in part, that each HRA, in which the intensity of radiation is greater than 100 millirem per hour but less than or equal to 1000 millirem per hour at 30 centimeters from the radiation source or from any surface which the radiation penetrates, shall be barricaded and conspicuously posted as an HRA. The failure to provide an adequate barricade and to conspicuously post the HRA within the radioactive waste truck bay is a violation of Technical Specification 5.7.1. However, this violation is considered a Non-cited Violation (50-454/2001004-01; 50-455/2001004-01), consistent with Section VI.A of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report No. B2001-00122.

The inspector evaluated the risk significance of this issue using the Occupational Radiation Safety Significance Determination Process (Appendix C to NRC Manual Chapter 0609, "Significance Determination Process"). The failure to conspicuously display the HRA posting and to maintain the integrity of the barricade resulted in a

reduction in the barriers to prevent an unintended exposure and in a failure to alert workers of the potential radiological hazards present. However, the inspector noted that personnel entering the radiologically controlled area were required by radiation work permits to have electronic dosimetry, which would have provided an indication of an increased exposure in the area. Based on these factors and the dose rates in the area, the inspector concluded that there was not a significant potential for an inadvertent entry that could have resulted in an overexposure. Therefore, the inadequate radiological posting and barricade was determined to be of very low safety significance (Green).

## .2 Waste Characterization and Classification

### a. Inspection Scope

The inspector reviewed the licensee's methods and procedure for determining the classification of radioactive waste shipments, including the licensee's use of scaling factors to quantify difficult-to-measure radionuclides (e.g., pure alpha or beta emitting radionuclides). Specifically, the inspector reviewed the licensee's calendar year 2000 radio-chemical analysis results for the licensee's waste streams: radioactive waste resins, primary resins, filters, and dry active waste (DAW). The inspector verified that the licensee's scaling factors were accurately determined such that waste shipments were classified in accordance with the requirements contained in 10 CFR Part 61 and the licensee's process control program. The inspector also verified that the licensee had measures to ensure that changes in operating parameters, that can result in changes to the waste stream composition, are identified between the annual or biennial scaling factor updates.

### b. Findings

No findings of significance were identified.

## .3 Ongoing Shipment Preparation and Radioactive Waste Processing Activities

### a. Inspection Scope

The inspector observed an ongoing shipment of effluent release samples (Limited Quantity) to ensure that the shipping activities were performed in accordance with the requirements of 49 CFR Parts 172 and 173. Specifically, the inspector reviewed shipping calculations and paperwork, performed independent radiological surveys, and observed the packaging of the shipment and the transfer to the carrier. The inspector also observed the removal/replacement of a spent fuel pool filter and the transfer of the filter to a radioactive waste storage area. During these activities, the inspector verified the adequacy of radiological practices and evaluated the knowledge of plant personnel. Since direct observations of shipping activities were limited, the inspector also verified that the licensee's training program provided training to personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities. Specifically, the inspector reviewed lesson plans for initial and recurrent training and ensured that applicable personnel (shippers, radiation protection technicians, and station laborers) had completed the training sessions within the last three years, as required by 49 CFR Part 172.

b. Findings

No findings of significance were identified.

.4 Shipping Records

a. Inspection Scope

The inspector reviewed a selection of non-excepted package shipments (Low Specific Activity II (LSA II) and Type B packages) completed between January 1, 2000, and the date of this inspection to verify compliance with NRC and Department of Transportation requirements (i.e., 10 CFR Parts 20, 61, and 71 and 49 CFR Parts 172 and 173). Specifically, the inspector reviewed the following radioactive materials/waste shipment records:

Radioactive Materials

- RMS 00-005, Top Nozzle Equipment (LSA II), January 17, 2000
- RMS 00-012, Sludge Lance Equipment (LSA II), February 21, 2000
- RMS 00-065, Contaminated Laundry (LSA II), October 3, 2000

Radioactive Wastes

- RWS 00-005, Contaminated Metals (LSA II, Class A), March 9, 2000
- RWS 00-026, Dewatered Resins (Type B, Class B), May 19, 2000
- RWS 00-040, Miscellaneous Wastes (LSA II, Class A), December 19, 2000
- RWS 01-001, Dewatered Filters (LSA II, Class C), January 4, 2001

The inspector also interviewed individuals responsible for answering the licensee's emergency response 24-hour telephone number. Specifically, the inspector verified that those individuals could provide a caller with adequate information concerning the shipment, emergency precautions, and incident mitigation information or that the individuals had immediate access to a person who possessed such knowledge.

b. Findings

No findings of significance were identified.

.5 Problem Identification and Resolution

a. Inspection Scope

The inspector reviewed self-assessments, audits, and condition reports completed during the previous 12 months which concerned the areas of radioactive waste processing and radioactive waste/material shipping. The inspector 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.

**4. OTHER ACTIVITIES (OA)**

4OA1 Performance Indicator Verification

.1 Radiological Effluent Technical Specifications (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrence Performance Indicator

a. Inspection Scope

The inspector verified that the licensee had accurately reported the performance indicator (PI) for the public radiation safety cornerstone. Specifically, the inspector reviewed the licensee's condition reports for calendar year 2000 and quarterly offsite dose calculations to identify any occurrences that were not identified by the licensee.

b. Findings

No findings of significance were identified.

4OA5 Other

.1 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. On October 23, 2000, the licensee transmitted its corrective actions to the NRC, which appeared to be adequate. The NRC may review these corrective actions in future inspections of the licensee's problem identification and resolution program. This item is closed.

4OA6 Management Meetings

.1 Exit Meeting Summary

The inspector presented the inspection results to Mr. Lopriore and other members of licensee management at the conclusion of the inspection on January 12, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Blaine, Radiation Protection Manager  
W. Grundman, Executive Assistant  
D. Herrmann, Chemistry, Radwaste Specialist  
S. Koval, Radiation Protection, Shipping Specialist  
J. Kuczynski, Health Physicist Supervisor  
R. Lopriore, Station Manager  
K. Moser, Nuclear Oversight Assessment Manager  
P. Reister, Regulatory Assurance Manager  
S. Robinson, Radiation Protection, Senior Health Physicist  
J. Sambito, Radiation Protection, Field Supervisor  
T. Schuster, Chemistry Manager  
G. Stauffer, Regulatory Assurance  
D. Thompson, Radiation Protection, Dose Assessment Health Physicist

NRC

B. Kemker, Resident Inspector

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

50-454/2001004-01	NCV	Failure to adequately post and barricade an HRA in accordance with Technical Specification 5.7.1 (Section 2PS2.1)
50-455/2001004-01		

Closed

50-454/2000016-01	VIO	Deliberate violation of radiation protection procedures (Section 40A5.1)
50-455/2000016-01		
50-454/2001004-01	NCV	Failure to adequately post and barricade an HRA in accordance with Technical Specification 5.7.1 (Section 2PS2.1)
50-455/2001004-01		

Discussed

None

## LIST OF ACRONYMS USED

DAW	Dry Active Waste
DRS	Division of Reactor Safety
EA	Enforcement Action
HRA	High Radiation Area
LSA	Low Specific Activity
NCV	Non-cited Violation
ODCM	Offsite Dose Calculation Manual
OS	Occupational Radiation Safety
PI	Performance Indicator
PS	Public Radiation Safety
RETS	Radiological Effluent Technical Specifications
VIO	Violation

## LIST OF DOCUMENTS REVIEWED

### Audits and Assessments

Byron Chemistry Department, Focus Area Self-Assessment of the Radwaste Program Per NRC Inspection Criteria 7122.02 [sic], conducted June 1 through July 28, 2000  
Byron Station Assessment Report, Nuclear Oversight Assessment NOA-06-99-PS05, "Radwaste," dated December 16, 1999  
Focus Area Self-Assessment Report, "Radioactive Material Shipping," conducted December 27 - 29, 2000  
Focus Area Self-Assessment Report, "Review of UFSAR for Radioactive Waste Processing," December 1 - 18, 2000

### Condition Report Nos.:

B2000-00147, B2000-00672, B2000-00771, B2000-00928, B2000-00975, B2000-01048, B2000-01356, B2000-01386, B2000-01677, B2000-02855, B2000-02889, B2000-03046, B2000-03056, B2000-03744, B2000-03756, B2000-03878, B2000-03984, B2001-00122, B2001-00123, and B2001-00138

### Miscellaneous

BRP 5600-13T1 (Revision 0), "Trending for Shifts in Scaling Factors," dated January 10, 2001  
BRP 5600-13T2 (Revision 0), "Scaling Factor Determination Worksheet," dated July 20, 2000  
GSEP Training, Environs Teams, Module/L.P.I.D No. S-08, (Revision 6), dated November 29, 1999  
Memorandum from David A. Thompson to File, Designated Shipping Qualified Personnel, dated August 7, 2000  
Nuclear General Employee Training Study Guide (Revision 23), dated June 2000  
RS-AA-122-116 (Revision 1), "Performance Indicator -- RETS/ODCM Radiological Effluent Occurrence," completed for the 4<sup>th</sup> Quarter of 2000  
Survey Nos. 00-2845, 00-2847, and 00-2903  
Training Lesson Plan (Revision 2), "Radioactive Material Shipping," Fuel Handlers/Station Laborer Personnel  
Training Lesson Plan (Revision 8), "Radioactive Material Shipping," Radiation Protection Technicians (RP-60)  
Work Request No. 990206088-01

### Procedures Nos.

AD-AA-106 (Revision 3), "Corrective Action Program (CAP) Process Procedure"  
BRP 5600-13 (Revision 3), "Trending for Shifts in Scaling Factors and Waste Stream Sampling"  
OP-AA-101-902 (Revision 1), "Accidents Involving the Transportation of Radioactive Materials"  
RP-AA-600 (Revision 2), "Administrative Process for Radioactive Material/Waste Shipments"  
RP-AA-602 (Revision 2), "Packaging of Radioactive Material/Waste Shipments"  
RW-AA-10 (Revision 3), "Process Control Program for Radioactive Wastes"  
TQ-AA-115 (Revision 1), "Radiation Protection Technician Training Program"  
TQ-AA-126 (Revision 0), "Radioactive Material Shipping"