

February 5, 2001

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: BRAIDWOOD - NRC INSPECTION REPORT 50-456/01-04(DRS);  
50-457/01-04(DRS)

Dear Mr. Kingsley:

On January 16, 2001, the NRC completed an inspection at your Braidwood Nuclear Generating Station. The enclosed report documents the inspection findings which were discussed on January 16, 2001, with Mr. Guthrie and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, this inspection focused on occupational and public 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. 50-456; 50-457  
License Nos. NPF-72; NPF-77

Enclosure: Inspection Report 50-456/01-04(DRS);  
50-457/01-04(DRS)

See Attached Distribution

O. Kingsley

-2-

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  
T. Tulon, Site Vice President  
K. Schwartz, Station Manager  
T. Simpkin, Regulatory Assurance Supervisor  
M. Aguilar, Assistant Attorney General  
State Liaison Officer  
Chairman, Illinois Commerce Commission

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cc w/encl: D. Helwig, Senior Vice President, Nuclear Services  
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-456; 50-457  
License Nos: NPF-72; NPF-77

Report No: 50-456/01-04(DRS); 50-457/01-04(DRS)

Licensee: Commonwealth Edison Company

Facility: Braidwood Nuclear Plant, Units 1 and 2

Location: 35100 South Route 53  
Suite 84  
Braceville, IL 60407-9617

Inspection Dates: January 8-11 and 16, 2001

Inspector: John House, Senior Radiation Specialist

Observer: Ryan Alexander, 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 05000456-01-04(DRS), IR 05000457-01-04(DRS), on 01/08-01/11 and 01/16/2001, Commonwealth Edison Company, Braidwood Nuclear Power Station, Units 1 and 2. Radiation safety specialist report.

The inspection was conducted by a senior radiation specialist.

A. Inspector Identified Findings

No findings of significance were identified.

B. Licensee Identified Findings

No findings of significance were identified.

## Report Details

Summary of Plant Status: Both Units 1 and 2 were at 100 percent power throughout the inspection period.

### **2. RADIATION SAFETY**

Cornerstone: Occupational Radiation Safety

#### 2OS1 Access Control to Radiologically Significant Areas

##### .1 Radiation Worker Performance

###### a. Inspection Scope

The inspectors evaluated radiation worker performance during the current inspection and during the recent refueling outage, A2R08. Observations included the use of low dose waiting areas, and proper use of protective clothing based on radiation work permit requirements. Radiological conditions were discussed with radiation workers to determine the workers' awareness of significant radiological conditions and dosimetry set points. Radiological problem condition reports were reviewed to determine if weaknesses in radiation worker performance existed, and if so, was there a common cause.

###### b. Findings

No findings of significance were identified.

##### .2 Radiation Protection Technician Proficiency

###### a. Inspection Scope

The inspectors evaluated radiation protection technician performance during the current inspection and during the recent refueling outage, A2R08. Observations included job coverage, control of contamination exit boundaries during job evolutions, and control of radiation workers. Radiological problem condition reports were reviewed to determine if technician errors had been identified, and if so, was there a common cause.

###### b. Findings

No findings of significance were identified.

##### .3 High Risk Significant and High Dose Rate Controls

###### a. Inspection Scope

The inspectors reviewed the licensee's controls for elevated dose rate areas and confirmed that locked high radiation areas were secured.



The inspectors also evaluated the licensee's radiological controls for a resin transfer job that occurred during the inspection. Work areas were surveyed to verify that radiation levels were consistent with the licensee's survey data and pre-job brief. The inspectors observed selected locations along the transfer path to verify that the controls were consistent with those specified in the job plan, and discussed the evolution with workers along the resin transfer path in order to determine that they had adequate knowledge of radiological work conditions and exposure controls.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

.1 Outage Review

a. Inspection Scope

The inspectors reviewed the following job activities to evaluate the effectiveness of the licensee's As Low As Is Reasonably Achievable (ALARA) controls for the recently completed A2R08 outage:

- CECO/Contractor RY Gallery Work;
- Steam Generator Eddy Current Testing and Robotic Steam Generator Repair;
- Steam Generator Secondary Side Work;
- Remove and Replace Insulation in Unit 2 Containment & Auxiliary Building; and
- Radiation Protection Surveys, Surveillances, and Miscellaneous Work.

The inspectors reviewed the methodology and assumptions used for A2R08 exposure estimates and exposure goals, compared those estimates to the final dose evaluations for each of the above jobs, and confirmed that none of the outage jobs that were greater than 5 person-rem exceeded the dose estimates by more than 50 percent. Engineering controls, use of low dose waiting areas, minimizing crew size, pre-job training including mock-ups, and equipment staging were evaluated in order to verify that these controls were effectively implemented in order to maintain worker radiation exposure ALARA.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS3 Radiological Environmental Monitoring and Radioactive Material Control Programs

.1 Review of Environmental Monitoring Reports and Data

a. Inspection Scope

The inspectors reviewed the most current Annual Environmental Monitoring Report (1999), along with the monthly progress reports for the first, second, third, and part of the fourth quarters of 2000. Sampling location commitments, monitoring and measurement frequencies, land use census, the vendor laboratory's interlaboratory comparison program, and data analysis were assessed. The review of the Radiological Environmental Monitoring Program (REMP) was conducted to verify that the REMP was implemented as required by Technical Specifications and the Offsite Dose Calculation Manual (ODCM), and that changes, if any, did not affect the licensee's ability to monitor the impacts of radioactive effluent releases on the environment. The inspectors also verified that the environmental monitoring stations were located consistent with the ODCM. The most recent utility performed audit of the licensee's REMP sampling/analysis vendor laboratory for environmental monitoring was reviewed to verify that the vendor laboratory performance was consistent with NRC requirements.

b. Findings

No findings of significance were identified.

.2 Walkdowns Of Radiological Environmental Monitoring Stations and Meteorological Tower

a. Inspection Scope

The inspectors conducted a walkdown of the eight environmental air sampling stations and 16 of the 80 thermoluminescent dosimeters to determine whether they were located as described in the ODCM, and to evaluate the equipment material condition. The inspectors reviewed a sample of monthly reports submitted to the licensee by its meteorological services vendor regarding the onsite meteorological monitoring program's data recovery rates, routine calibration and maintenance activities, and non-scheduled maintenance activities. The inspectors verified that readouts of wind speed, wind direction, and atmospheric stability measurements were available in the Control Room and were operable. The inspectors visited the meteorological monitoring site and determined that its sensors were adequately positioned and that the wind sensors were operable. The inspectors also reviewed a relevant condition report and a procedure related to reviews of the vendor's periodic reports.

b. Findings

No findings of significance were identified.

.3 Review of REMP Sample Collection and Analysis

a. Inspection Scope

The inspectors accompanied a REMP vendor technician to observe the collection and preparation of a variety of environmental samples, including surface water, air filters (particulate), and charcoal cartridges (iodine) to verify that representative samples were being collected in accordance with procedures and the ODCM. The inspectors observed the technician perform air sampler field check maintenance to verify that the air samplers were functioning in accordance with procedures. Selected air sampler calibration and maintenance records for 2000 were reviewed to verify that the equipment was being maintained as required. Additionally, the inspectors reviewed results of the vendor laboratory's inter-laboratory comparison program and quality assurance program to verify that the vendor was capable of making adequate radio-chemical measurements.

b. Findings

No findings of significance were identified.

.4 Unrestricted Release of Material From the Radiologically Controlled Area

a. Inspection Scope

The inspectors evaluated the licensee's controls, procedure, and practices for the unrestricted release of material from radiologically controlled areas. Specifically, the inspectors verified that: (1) radiation monitoring instrumentation used to perform surveys for unrestricted release of materials was appropriate; (2) instrument sensitivities were consistent with NRC guidance contained in Inspection and Enforcement (IE) Circular 81-07 and Health Physics Positions in NUREG/CR-5569 for both surface contaminated and volumetrically contaminated materials; (3) criteria for survey and release conformed to NRC requirements; (4) licensee procedures were technically sound and provided clear guidance for survey methodologies; and (5) radiation protection staff adequately implemented station procedures.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed condition reports and the results of the licensee's REMP self-assessment performed during the first quarter of 2000 to determine if problems were being identified and entered into the corrective action program for timely resolution. The inspectors also reviewed the licensee's overall management of the REMP, including attention to details of the sampling program and the vendor laboratory, in order to

evaluate the effectiveness of the REMP in collection and analysis of samples for the detection of offsite contamination.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES (OA)**

4OA1 Performance Indicator Verification

.1 Radiological Effluent Occurrences

a. Inspection Scope

The inspectors reviewed licensee effluent release data for the previous four quarters. The accuracy and completeness of the data was assessed against the criteria specified in Nuclear Energy Institute 99-02, Revision 0, "Regulatory Assessment Performance Indicator Guideline." In addition, the inspector interviewed members of the licensee's staff who were responsible for data acquisition, and performance indicator verification and reporting.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. Guthrie and other members of licensee management at the conclusion of the inspection on January 16, 2001. The licensee acknowledged the findings presented. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

K. Aleshire, Radiation Protection REMP Coordinator  
J. Bailey, Regulatory Assurance-NRC Coordinator  
J. Coughlin, Radiation Protection Supervisor  
J. Eggert, Radiation Protection Source Term Reduction Coordinator  
M. Finney, Radiation Protection Operations Supervisor  
D. Goldsmith, Radiation Protection Manager  
P. Griggs, Radiation Protection ALARA Analyst  
L. Guthrie, Acting Station Manager  
E. Hendrix, Operations  
A. Lewis, REMP Contractor  
T. Saksefski, Nuclear Oversight  
B. Schramer, Chemistry Manager  
T. Simpkin, Regulatory Assurance Manager  
R. Thacker, Radiation Protection Technical Support Supervisor  
T. Tulon, Site Vice-President  
G. Vickers, Radiation Protection Dose Assessor

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

## LIST OF ACRONYMS USED

ADAMS	Agencywide Documents and Management System
A2RO8	Unit 2 Refueling Outage
ALARA	As-Low-As-Reasonably-Achievable
CECO	Commonwealth Edison Company
CFR	Code of Federal Regulation
DRS	Division of Reactor Safety
IE	Inspection and Enforcement
NRC	Nuclear Regulatory Commission
OA	Other Activities
ODCM	Offsite Dose Calculation Manual
PARS	Publically Available Records
SDP	Significance Determination Process

## PARTIAL LIST OF DOCUMENTS REVIEWED

The following is a list of licensee documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspector reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort.

### Condition Reports

A2000-03679, A2000-00813, A2000-02226, A2000-04705, A2000-04715, A2000-00235, A2000-04389, A2000-02377, A2000-04589, A2000-02036

### Miscellaneous

Meteorological services vendor's monthly reports of monitoring program activities and data recovery amounts for the period January through October 2000, except August  
Annual Radiological Environmental Operating Report for 1999  
Annual Effluent Report for 2000, Gas Releases Units 1 & 2  
Annual Effluent Report for 2000, Liquid Releases Units 1 & 2  
Airborne Effluents, 10 CFR Part 50 Listing, December 14, 2000, Units 1 & 2  
Aquatic Effluents, 10 CFR Part 50 Listing, December 14, 2000, Units 1 & 2

### ALARA Packages & Post-job Reviews

ALARA Package for RWP No. 6031, "CECO/Contractor RY Gallery Work"  
ALARA Package for RWP No. 6076, "S/G Eddy Current Testing & Robotic S/G Repair"  
ALARA Package for RWP No. 6077, "Remove/Replace Secondary Hand Hole and Inspect Port Covers [S/G Secondary Side]"  
ALARA Package for RWP No. 6042, "Remove/Replace Insulation During Outage In All RPA's Except U-1 Containment"  
ALARA Package for RWP No. 6002, "RP Surveys, Surveillances, and Miscellaneous Work During Outage"  
"Westinghouse Final ALARA Report, Braidwood Nuclear Plant" - A2R08, Fall 2000

### Procedures

RP-AA-651, "Station Responsibilities for ComEd's Meteorological and REMP Programs," Revision 0  
BwOP WX-234, Revision 5, "Resin Removal From Boron Recycle Evaporator Feed Demineralizer"  
RP-AA-304, Revision 3, "Unconditional Release Surveys"  
TML-SPM-1-13, "Sampling Procedures Manual, Revision 4, August 11, 1999, Teledyne Midwest Laboratories"  
TML-SPM-1-13 "Surveillance and Calibration Attachments for Air Samplers and TLDs"  
BwCP 240-1T8, Revision 1, "Unconditional Release LLD Determination, Gamma Emitters in Liquids," March 16, 2000

### Quality Assurance

VA 1999-02, "Illinois Power Quality Assurance Audit of Teledyne Brown Engineering Environmental," May 6, 1999

Braidwood Station Assessment Report: "Nuclear Oversight Assessment NOA-20-00-PS04, Process Control Program, Effluent and Environmental Monitoring," March 23, 2000

Root Cause: AT # 38237/CR # 2000-04281, December 5, 2000: "Circ Water Blowdown Line Vacuum Breaker failure due to low stress, high cycle fatigue, resulting in flooding of Owner Controlled property and discharge outside of NPDES approved path"

### Radiation Work Permits

RWP No. 013003, Revision 0, "Transfer Spent Resins to Hi/Lo Tanks or Liner, Change Vendor Filters, Transfer Vendor Demin Resins, Dewater Shipping Liner"