

February 3, 2000

Mr. Michael T. Coyle  
Site Vice President  
Clinton Power Station  
AmerGen Energy Company  
Mail Code V-275  
P. O. Box 678  
Clinton, IL 61727

SUBJECT: NRC RADIATION SAFETY INSPECTION REPORT 50-461/2000005(DRS)

Dear Mr. Coyle:

On January 7, 2000, the NRC completed an inspection at your Clinton Nuclear Power Station. The purpose of the inspection was to review the radiological effluent and radiological environmental monitoring programs. The enclosed report presents the results of that inspection. No violations of NRC requirements were identified.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of work in progress, and interviews with personnel.

We concluded that your radiological effluent and radiological environmental monitoring programs were well-implemented. We noted, however, that discussions among members of your staff delayed the initiation of a condition report to address on-going problems scheduling and performing timely calibrations of process monitors. While this may be an isolated incident, it raised questions about the staff's understanding of management's expectations regarding the timely reporting of deficiencies in condition reports.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and its enclosure will be placed in the NRC Public Document Room (PDR).

M. Coyle

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

Sincerely,

***/RA/***

John A. Grobe, Director  
Division of Reactor Safety

Docket No. 50-461  
License No. NPF-62

Enclosure: Inspection Report 50-461/2000005(DRS)

cc w/encl: P. Hinnenkamp, Plant Manager  
M. Reandeu, Director - Licensing  
M. Aguilar, Assistant Attorney General  
G. Stramback, Regulatory Licensing  
Services Project Manager  
General Electric Company  
Chairman, DeWitt County Board  
State Liaison Officer  
Chairman, Illinois Commerce Commission

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-461  
License No: NPF-62

Report No: 50-461/2000005(DRS)

Licensee: Illinois Power Company

Facility: Clinton Nuclear Power Station

Location: Route 54 West  
Clinton, IL 61727

Dates: January 3-7, 2000

Inspector: D. W. Nelson, Radiation Specialist

Approved by: Steven K. Orth, Acting Chief, Plant Support Branch  
Division of Reactor Safety

## EXECUTIVE SUMMARY

Clinton Nuclear Power Station, Unit 1  
NRC Inspection Report 50-461/2000005(DRS)

This announced inspection included various aspects of the licensee's radiation protection (RP) program. Specifically, the following areas were reviewed:

- Radiological Effluent Monitoring Program
- Radiological Environmental Monitoring Program (REMP)

This inspection covered a 5-day period concluding on January 7, 2000.

The following conclusions were reached in these areas:

- The REMP program was well implemented, and no discernable environmental impact from plant operations was observed (Section R1.1).
- Effluent monitors were operational, calibrated, and had set points in compliance with the Offsite Dose Calculation Manual (ODCM) (Section R2.1).
- A significant percentage of process monitors had been calibrated while in their 25 percent grace period. Corrective actions taken in 1998 to ensure that process monitors were calibrated before entering their 25 percent grace period were ineffective. Discussions among the staff delayed the issuance of a condition report to address this issue (Section R2.1).
- The 1998 Quality Assurance (QA) audit of the REMP program was comprehensive and effective in identifying areas in need of improvement (Section R7.1).
- The QA assessments of the area radiation/process radiation monitoring program were limited in scope and range. For example, auditors did not review records to determine if surveillances of process monitors were timely (Section R7.1).
- Condition Reports related to the REMP and effluent monitoring programs documented issues that were minor in nature and were the result of equipment problems or personnel error. The corrective actions taken were appropriate (Section R7.2).

## Report Details

### **R1 Radiological Protection and Chemistry Controls**

#### **R1.1 Implementation of the Radiological Environmental Monitoring Program (REMP)**

##### **a. Inspection Scope (84750)**

The inspector reviewed the 1998 Annual Radiological Environmental Operating Report, the 1998 Annual Radioactive Effluent Release Report, and the Offsite Dose Calculation Manual (ODCM). The inspector also reviewed a 1999 focus area self-assessment of the radiological effluents program. The inspector also observed the collection of air particulate/iodine air samples and the testing of the operability of surface water compositors and interviewed various plant staff regarding the operability and materiel condition of the sampling equipment and the implementation of the REMP.

##### **b. Observations and Findings**

Prior to the inspection, the licensee performed a self-assessment of the radiological effluents monitoring program and several aspects of the radiological environmental monitoring program (REMP). The auditors focused the assessment on radiological effluents, changes to the ODCM, and reviews of condition reports related to the radiological effluent program. The auditors identified problems with the performance of the ND6685 computer used to process radiological and meteorological data and the operability of two ODCM-required process monitors in 1997 and 1998. The auditors indicated in the assessment report that the computer problem had been addressed and that the corrective actions taken would permanently solve the problem. For ODCM-required process monitor operability problems, the auditors indicated that the timeliness for repair/restoration of the monitors needed to be monitored. However, the auditors made no mention in the assessment of the on-going problems with the timely calibration of process monitors (Section R2.1). At the exit meeting, management indicated that an expansion of the scope of the focus area self-assessment in this area would be considered.

The inspector noted that the REMP sample collector used procedure CPS No. 9911.70 "Radiological Environmental Surveillance Airborne Radioiodine and Particulate Monitoring", Revision 34, December 19, 1999, to collect air particulate/iodine samples. The inspector noted that the collector appeared to be well trained and was very knowledgeable of appropriate sampling principles. The inspector frequently referenced procedure No. 9911.70 during the collection of the samples and noted that the sample collector complied fully with the procedure's requirements. In addition to collecting the samples, the collector properly tested the air sampling train for leakage and appropriately labeled and packaged the samples for shipment to the vendor analytic laboratory. During interviews, the collector indicated that the air sampler motors had been replaced during 1999 and that since then the availability of the samplers had been excellent. The inspector determined that the REMP sample collector was sufficiently knowledgeable of sampling requirements, equipment, and transport; and no operability or materiel condition issues regarding the sampling equipment were identified.

The inspector noted that the 1998 Annual Radiological Environmental Operating Report was submitted by the required date and that the report contained the required information as described by the ODCM. The report noted that although the plant had been in an extended outage for the entire year of 1998, almost all of the required samples had been collected. On those few occasions when air samples had not been collected, air sample pumps had been inoperable due to power outages. There were no modifications to the program in 1998, and the procedures used remained unchanged. Data recovery for meteorological measurements, however, was erratic during 1998 due to problems with the ND6685 computer. Although all of the meteorological data was stored in a Westronics Recorder, realtime data via the ND6685 computer was unavailable for as much as 59 percent of the time during the last quarter of 1998. In 1999, this problem was corrected with the implementation of modification PRO40, which was designed to enhance equipment reliability and improve the meteorology data flow path.

The REMP program included the collection and analysis of air, water, vegetation, fish, and bottom and shoreline river sediments. Thermoluminescence dosimeters (TLD) were used to measure direct radiation and were exchanged quarterly. The results from the REMP sampling and analyses, including the analyses of supplemental onsite and offsite groundwater wells, indicated that plant operations did not have a discernable radiological impact on the environment.

The 1998 Annual Radioactive Effluent Release Report indicated that there were no radioactive liquid discharges during 1998 and that gaseous and particulate releases never came close to approaching the limits specified in the ODCM.

The inspector reviewed the REMP program interlaboratory cross check program data for the licensee's environmental sample analysis vendor laboratory. The inspector reviewed the 1998 results, as described in the 1998 Annual Radiological Environmental Monitoring Report, and the reported results for the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> quarters of 1999. The reviews indicated that the vendor laboratory results were within the acceptance criteria for the known values. On the few occasions when results were outside the accepted limits, an evaluation was conducted to determine the reason for the difference, and corrective actions were implemented when needed.

During 1999, the licensee made two revisions (Revision 17 and Revision 18) to the ODCM. The changes in Revision 18 were administrative in nature and editorial in content. Revision 17 implemented the new off-site dose calculation software and the new meteorological data processing software. Revision 17 also corrected a number of typographical errors, clarified the intent of certain portions of the document, and removed un-needed verbiage. Revision 17 included a technical review of the new dose and meteorology software and an overview of verification and validation activities to confirm that the final results from the use of the new software were equivalent to that of the old software. The inspector reviewed the 10 CFR 50.59 safety reviews performed on both revisions and determined that the reviews met regulatory requirements as well as the licensee's procedural requirements.

c. Conclusions

The REMP program was well implemented, and the 1998 data demonstrated that there was no discernable environmental impact from plant operations.

**R2 Status of Radiation Protection and Chemistry Facilities and Equipment**

R2.1 Process and Effluent Radiation Monitors (84750)

a. Inspection Scope (84750)

The inspector reviewed the 1998 and 1999 records to determine if process radiation monitors were operational with their alarm/trip set points properly set and had been calibrated per the requirements of the ODCM.

b. Observations and Findings

The inspector determined that process radiation monitor (PRM) (0RIX-PR040), Plant Service Water PRM (1RIX-PR036), FC Heat Exchanger 1A & 1B Service Water PRMs (1RIX-PR005 and PR004), Plant Service Water PRM (1RIX-PR036), Component Water PRM (1RIX-PR037), the Shutdown Service A & B PRM (1RIX-PR038 and 1RIX-PR039), Station Heating, Ventilation, and Air Conditioning (HVAC) Stack PRMs #1 and #2 (0RIX-PR002 and 0RIX-PR001), and SGTS Exhaust Stack PRMs #1 and #2 (0RIX-PR003 and 0RIX-PR004) been operational per the requirements of the ODCM during 1998 and 1999. The inspector also noted that the effluent monitors had been calibrated within the time constraints of the ODCM and that the set points were properly set.

However, the inspector noted that since April 1998, 86 percent of the monitors had entered their 25 percent grace period before being calibrated. The system engineer responsible for the process monitors indicated that although the ODCM allowed a 25 percent grace period, management's expectation was that the monitors be calibrated within the 18 month calibration cycle. The engineer indicated, however, that due to limited resources and scheduling conflicts the monitor calibrations had been frequently postponed and rescheduled. The inspector asked the system engineer if a condition report (CR) had been written to address these on-going problems. The system engineer indicated that although he had not written a condition report, he would discuss the need for writing a CR with his management. During reviews of previous inspection reports, the inspector noted that prior to 1998, the licensee had been having difficulties scheduling and performing routine calibrations of the process monitors (Inspection Report No. 50-461/98002(DRS)). The system engineer indicated that during the 1998 inspection he had written a condition report (CR No. 1-97-10-474) to address this issue. During a subsequent inspection (Inspection Report No. 50-461/98007(DRS)) the inspector noted that corrective actions had been taken to correct the difficulties described in the previous NRC inspection and that the number of lapsed calibrations had been significantly reduced. Two days after raising this issue with the licensee, the inspector was provided with a copy of a condition report (CR No. 2-00-01-023) that had been written that day to address the inappropriate use of surveillance test grace periods.

The licensee indicated that discussions among the staff and management regarding the need for writing a CR to address this issue and the content of the CR if one was issued had delayed its issuance.

The inspector reviewed CR No. 2-00-01-023 and found it to be deficient. Although the CR identified that the calibration of the HVAC System PRM (OPR001) had not been performed as scheduled and was 76 percent into its grace period, the CR made no reference to CR No. 1-97-10-474 nor was there a discussion regarding the ineffectiveness of previous corrective actions to correct the problem. During an interview, the Plant Manager indicated that he had read the CR and had also found it to be deficient. The Plant Manager indicated that failing to issue a CR to address ongoing problems with the timely calibration of the process monitors when they were first identified and the delays in issuing CR No. 2-00-01-023 had not met management's expectations.

Following the exit meeting, the inspector was provided copies of CR No. 2-00-01-030 and CR No. 2-00-01-031. Condition report No. 2-00-01-030 identified weaknesses in the work control program and used the delays in calibrating the HVAC System PRM as an example of those weaknesses. Condition report No. 2-00-01-031 identified ongoing problems with the timely surveillances of process monitors. The CR specifically referenced CR 1-97-10-474 and noted that the issue of performing required surveillances of the process monitors after the due date had not been resolved by the corrective actions associated with CR 1-97-10-474. Even though the untimely calibration of process monitors was not a safety issue nor did it not constitute a condition adverse to quality, the Plant Manager addressed this issue at the exit meeting and discussed his and senior management's expectations for the timely identification of deficiencies in CRs.

a. Conclusions

Effluent monitors were operational, calibrated, and had set points in compliance with the ODCM. However, the inspector identified that process monitors had not be calibrated in accordance with due dates (i.e., calibrations routinely occurred during grace periods) and that the corrective actions taken to correct this problem in 1998 had not been effective. Delays in issuing a CR to address on-going problems in scheduling and performing timely calibrations of process monitors raised questions about the staff's understanding of management's expectations regarding the timely reporting of deficiencies in condition reports.

**R5 Staff Training and Qualification in Radiation Protection and Chemistry**

**R5.1 REMP Staff Training and Qualifications (84750)**

The inspector reviewed the REMP RP technician task certification matrix and the technicians' training records. The inspector found that the REMP technicians were properly trained and had sufficient experience to properly execute the program. Comprehensive training and retraining of personnel was provided to the staff, and the

course content was kept up-to-date. The training program was adequate to assure compliance with the licensee procedures and regulatory requirements.

## **R7 Quality Assurance in Radiation Protection and Chemistry Activities**

### **R7.1 QA Audits and Assessments (84750)**

#### **a. Inspection Scope (84750)**

The inspector reviewed the results of the 1998 QA audit of the REMP program to assess implementation of the TS, station procedures, and regulatory requirements. The inspector also reviewed two QA assessments of the area and process radiation monitoring system.

#### **b. Observations and Findings**

The 1998 QA audit of the REMP program was broad in scope and substantive. Although the auditors found minor deficiencies in the implementation of several REMP administrative requirements and a deficiency in the REMP training program, they concluded that the program had been effectively implemented. The inspector noted that CRs had been initiated to address each deficiency.

The QA assessments of the area and process radiation monitoring system tended to be limited in scope and range. For example, the auditors reviewed the procedures associated with process monitor operations to verify that surveillance requirements had been implemented but failed to review the records to determine if the surveillances had been timely. While the auditors were not required to review the surveillance records during the assessments, management indicated at the exit meeting that expanding the scope of the QA assessments of the REMP and effluent monitoring programs would be considered.

#### **c. Conclusions**

The 1998 QA audit of the REMP program was comprehensive and effective in identifying areas in need of improvement. However, the QA assessments of the area radiation/process radiation monitoring program were limited in scope and range.

### **R7.2 Condition Report (CR) Corrective Actions and Resolution**

#### **a. Inspection Scope (84750)**

The inspector reviewed the REMP and effluent monitoring program condition reports initiated during 1999, which addressed deficiencies in the programs.

#### **b. Observations and Findings**

With the exception of the condition reports discussed in Section R 2.1, the inspector noted no significant adverse trends in the CRs reviewed. Most issues were minor in

nature and addressed equipment problems or personnel errors. Corrective actions appeared timely and adequate.

c. Conclusions

Condition reports identified issues related to the REMP and effluent monitoring programs that were minor in nature and were equipment related or attributable to personnel error. The corrective actions taken were timely and appropriate.

R7.3 Meteorology Program

a. Inspection Scope (84750)

The inspector reviewed the 1999 surveillance records for the meteorology system loops. The inspector also reviewed the 1999 problem logs for the meteorology system.

b. Observations and Findings

The inspector noted that all surveillances on the meteorology system loops had been performed per procedural requirements. The inspector also noted that meteorology system problems had been addressed in a timely manner.

At the exit meeting, the inspector questioned management about the need for enhanced QA oversight of the meteorology system. The inspector noted that although a QA assessment had been performed on the implementation of the PR040 modification to address the problems with the ND6685 computer system, there were no assessments of the operability of the meteorology system loops, nor were there field observations of personnel providing quality assurance and maintenance services for the collection of meteorological data. While the auditors were not required to assess the operability of the meteorological system loops or perform field observations during the assessments, management indicated that enhanced QA oversight of the meteorology data collection program would be considered.

c. Conclusions

Surveillances of the meteorological data collection equipment met the requirements of the ODCM and station procedures. The QA assessments of the meteorology program were limited.

## **V. Management Meetings**

### **XI Exit Meeting Summary**

The inspector presented the preliminary inspection findings to members of licensee management on January 7, 2000. The licensee acknowledged the findings presented and did not identify any of the documents reviewed as proprietary.

## **PARTIAL LIST OF PERSONS CONTACTED**

P. Berry, Director, Instrument and Controls  
R. Campbell, Supervisor - Radiation Protection  
M. Coyle, Vice President  
J. Goldman, Manager - Work Management  
P. Hinnenkamp, Manager - Clinton Power Station  
G. Kephart, Supervisor - Radiological Programs  
K. Moore, Supervisor - Engineering  
J. Niswander, Supervisor, Radiation Protection  
A. Plater, Director - Radiation Protection  
M. Reandeau, Director - Licensing  
R. Schenck, Manager - Maintenance  
M. Stickney, Supervisor - Licensing  
G. Tierney, Director, Work Coordination  
E. Wrigley, Supervisor - QA Maintenance

## **INSPECTION PROCEDURES USED**

IP 84750: Radioactive Waste Treatment, and Effluent and Environmental Monitoring.

## **ITEMS OPENED, CLOSED OR DISCUSSED**

Opened

None

Closed

None

Discussed

None

## LIST OF ACRONYMS USED

CR	Condition Report
HVAC	Heating, Ventilation, and Air Conditioning
IFI	Inspection Followup Item
IP	Inspection Procedure
ODCM	Offsite Dose Calculation Manual
PCP	Process Control Program
PRM	Process Radiation Monitor
QA	Quality Assurance
RP	Radiation Protection
RP&C	Radiation Protection and Chemistry
REMP	Radiological Environmental Monitoring Program
TS	Technical Specifications

## LIST OF DOCUMENTS REVIEWED

### Condition Reports (CRs) Nos.

1-97-10-474, 2-00-01-023, 2-00-01-30, 2-00-01-31

### Clinton Power Station Procedures Nos.

9911.70 (Revision 34), "Radiological Environmental Surveillance Airborne Radioiodine and Particulate Monitoring"

### Miscellaneous Documents and Records

Clinton Power Station 1998 Annual Radiological Environmental Operating Report

Annual Radioactive Effluent Release Report for the Clinton Power Station, January 1, 1998 through December 31, 1998

Safety Evaluation CPS No. 1005.06F002, "Revision of ODCM", Rev. 17

Safety Evaluation CPS No. 1005.06F001, "Revision of ODCM", Rev. 18

Results of Radiochemistry Cross Check Program, 1<sup>st</sup> and 2<sup>nd</sup> quarters of 1999

Calibration Records of Process Monitors for period from 1987 to 1<sup>st</sup> quarter 2000

Surveillance Test Packages for Meteorology Tower for June 28, 1999 and August 23, 1999

Illinois Power Company Nuclear Program, Task Certification Matrix, CPS Radiation Protection Program, December 20, 1999

1999 LCO Actions from the Operator Logs for the Plant Service Water PRM (1RIX-PR036)

### Quality Assurance Audits

Quality Assurance Audit Report No. Q38-98-12, "Radiological Environmental Monitoring Program", approved July 9, 1998.

Quality Assurance Assessment Report, "Area Process Radiation Monitoring System", approved September 10, 1999.

Quality Assurance Assessment Report, "Radiological Environmental Monitoring Program", approved January 3, 1999.

Quality Assurance Assessment Report, "Chemical Control Program", approved November 30, 1998.

Quality Assurance Assessment Report, "Area Radiation/Process Radiation Monitoring Overview", approved April 24, 1998.

Illinois Power Quality Assurance Audit Report No. VA1999-02, "Teledyne Brown Engineering Environmental", approved May 6, 1999.

Radiation Protection Department Self-Assessments

CPS Self Assessment Report No. 1999-083 on Radiological Effluents.