

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No: 50-440/97003(DRS)

Licensee: Cleveland Electric Illuminating Company

Facility: Perry Nuclear Power Plant

Location: P. O. Box 97, A200
Perry, OH 44081

Dates: March 3 through April 10, 1997

Inspector: Kara N. Selburg, Radiation Specialist

Approved by: Thomas J. Kozak, Chief, Plant Support Branch 2
Division of Reactor Safety

EXECUTIVE SUMMARY

Perry Nuclear Power Plant NRC Inspection Report 50-440/97003

This was a routine, independent inspection of the liquid and gaseous effluents and radiation monitoring programs.

- The licensee effectively implemented the radiological effluent control program with off-site exposure due to effluent releases calculated to be a small fraction of regulatory requirements (Section R1.1).
- The licensee's liquid effluent reduction plan was effective to date. The licensee successfully recycled water resulting in no liquid effluent releases since August of 1996 (Section R1.1).
- Several problems were identified with the licensee's oversight of radiation monitors, including: material condition degradation was not identified during routine walk downs; responsible personnel were unaware of the appropriate response to a radiation monitor identified to be out of calibration; and a discrepancy between the Off-site Dose Calculation Manual and station procedures was not identified through routine assessment activities (Section R2.1).

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Liquid and Gaseous Radioactive Effluents

a. Inspection Scope (84750)

The inspector assessed the licensee's liquid and gaseous effluent monitoring program. The inspector reviewed the 1996 liquid and gaseous effluent releases and the associated dose calculations. The inspector also reviewed the licensee's effluent minimization plans through discussions with knowledgeable personnel and a review of the applicable records.

b. Observations and Findings

The off-site dose from radioactive effluents emanating from the Perry Nuclear Power Plant was less than one percent of regulatory limits and no abnormal releases occurred in 1996. The licensee used a vendor supplied computer program to calculate the off-site doses which was consistent with methods described in the Off-site Dose Calculation Manual (ODCM). Quality assurance was performed annually on the computer program by manually calculating off-site doses and comparing those values to the computer generated numbers. The inspector observed personnel using the program, and noted that training in this area was effective. The inspector independently verified selected dose calculations, and noted no problems.

Initiatives were implemented to minimize both liquid and gaseous effluents. As part of the liquid discharge minimization plan, which was implemented in August of 1996, the licensee began recycling plant water in lieu of discharging it to the environment. The licensee's primary focus in this area was to reduce the level of organics in the water and to control water leakage into the radioactive waste system. As a result of this program, the licensee had not performed a radioactive liquid effluent release since the implementation of the plan. To reduce gaseous effluent levels, the licensee developed a work plan to fix a number of small steam leaks in the turbine building/heater bay (TB/HB) area. A majority of the leaks were scheduled to be repaired during the next refueling outage (fall 1997). These improvements should be successful in reducing off-site dose.

c. Conclusions

The radiological effluent control program was effectively implemented. The implementation of the liquid discharge minimization plan resulted in no liquid discharges since August 1996 thus eliminating off-site dose from liquid effluents. Efforts to reduce gaseous effluent levels by repairing the TB/HB steam leaks should be effective in reducing off-site dose from gaseous effluents.

R2 Status of RP&C Facilities and Equipment

R2.1 Radiation Monitors

a. Inspection Scope (84750)

The inspector assessed the licensee's radiation monitor (radmonitor) program. This included inspecting effluent, area, and process radmonitors with the system engineer (SE), observing chemistry personnel obtaining effluent noble gas samples, observing chemistry and radiation protection personnel perform setpoint calculations, and reviewing various records.

b. Observations and Findings

The inspector noted that the chemistry and radiation protection technicians responsible for calculating the radmonitor alarm setpoints demonstrated good procedural compliance and had a good understanding of the methodologies. The inspector also observed that the chemistry technician obtaining grab samples from numerous effluent monitors demonstrated good procedural compliance and conservative sample acquisition techniques.

The inspector reviewed the licensee's process to improve the readability of radmonitor setpoints. In the past, setpoints calculated by chemistry or radiation protection did not meet the minimum readability requirements for instrument and control technicians (50% of hash marks). The inspector verified that the procedures had been updated to ensure that minimum readability was met. The chemistry department was recalculating the setpoints for the radmonitors as calibrations were due or during routinely scheduled setpoint changes. The radiation protection department had changed approximately half of their radmonitors to ensure they met the minimum readability requirements, and scheduled to have all area radmonitor setpoints changed by January 1998.

The inspector noted an inconsistency between the default flow rate through the unit two vent listed in the ODCM, and the normal flow rate observed (47,000 cfm in the ODCM compared to 54,000 cfm normal). While the flow rate in the ODCM was less conservative than the normal flow rate, the licensee's procedure for calculating setpoints using the default flow rate stated a value of 60,000 cfm. A review of selected documents indicated that the default flow rate of 60,000 cfm was used in actual calculations. Responsible personnel were unaware of this inconsistency. The licensee submitted an ODCM change request in the end of March to change the ODCM value to 60,000 cfm. While this discrepancy was not radiologically significant, it was indicative of a lack of attention to detail in this area.

The inspector walked down numerous process, effluent, and area (D17 and D21) radmonitors with the SE. The inspector observed several oil leaks on the D17 radmonitors, however, not all of these were identified with deficiency tags. In particular, the inspector identified oil leaking from the off-gas radmonitor pump onto the floor. This was discussed with the SE, a deficiency tag was subsequently written, and the leaking oil was cleaned. There were 31 open work orders and

requests on the D17 and D21 systems at the time of the inspection. The number of work orders had recently been reduced by the licensee's FIN (fix it now) team which has been effective in repairing uncomplicated problems. Based on a Maintenance Rule historical review for the period June 1, 1992 through June 1, 1995, the radiation monitoring system (D17) failed to meet the reliability performance criteria and was classified as A(1). The system had exhibited an unacceptable number of functional failures. The licensee established goals for these monitors to improve system reliability and to meet established performance criteria. The inspector reviewed these goals, and noted that the licensee had effectively implemented several changes to improve system reliability.

During the radmonitor inspection, the inspector observed a broken sticker reading "calibration void if broken" on the isokinetic high flow alarm for the off-gas vent monitor. This discrepancy was not identified by the licensee during routine walkdowns. Subsequently, system engineering and chemistry personnel attached a deficiency tag, declared the monitor inoperable, and entered ODCM action statement no. 122 (Table 3.3.7.10-1). The licensee then verified that the monitor was in calibration thus exiting the action statement. However, the following problems were identified during the inspector's review:

- Station procedure SVI-D17-T8053 stated that a new calibration sticker was to be placed on the OVER ISOKINETIC FLOW setpoint adjust knob following system calibration. The sticker itself stated "Calibration Void if Broken." Neither chemistry personnel nor the SE initially understood actions necessary to take if the sticker was found broken;
- Based on further discussions with the SE and chemistry personnel, the inspector discovered that the broken sticker meant that the isokinetic high flow alarm portion of the monitor was inoperable. However, neither the SE nor chemistry personnel understood the system operation sufficiently to conclude if this affected the overall operability of the monitor; and
- The chemistry department could not readily identify the applicable ODCM action statement.

Based on discussions with licensee personnel and a review of the calibration results, no problems had been identified with monitor operability or the condition of the sticker during the last routine calibration.

c. Conclusions

The licensee's oversight of radmonitors was in need of improvement. Some material condition degradation had not been identified on routine walk downs by station personnel. In addition, responsible personnel were unaware of the appropriate response to a radmonitor identified out of calibration.

R2.2 Radioactive Waste Building (86750)

The inspector performed inspections of the licensee's radioactive waste (radwaste) building. The inspector verified that radiation postings were accurate. The

inspector also inspected numerous radwaste tank rooms. No major problems were identified with the material condition of the rooms and the equipment inspected. However, a number of housekeeping problems were identified by the inspector, and were subsequently addressed by the licensee.

R4 Staff Knowledge and Performance in RP&C

R4.1 Transportation of Radioactive Material (86750)

The inspector reviewed licensee performance during the shipment of radioactive material on March 4, 1997. Radiation protection coverage during the evolution assured that personnel exposure was kept as low as reasonably achievable (ALARA). All personnel involved were knowledgeable of their responsibilities. The inspector reviewed the posting and labeling of the vehicle and found no problems.

R7 Quality Assurance in RP&C Activities

R7.1 Review of Licensee Audits

The inspector reviewed the licensee's audits of the Radiological Environmental and Effluent Monitoring Program and the Off-site Dose Calculation Manual for 1995 and 1996. The lead auditor was very knowledgeable of these programs. The audit was thorough and most identified issues were appropriately addressed by the responsible personnel. One exception to the timely response was an audit finding regarding incorrect skin dose correction factors being used in the chemistry effluent radmonitor setpoint procedure. No immediate actions were taken on this item, and several setpoints were calculated using the incorrect values. While the associated dose changes would be less than one percent using the incorrect factors, this was not a conservative action by the effluents staff. These factors were to be changed in the next procedure revision.

V. Management Meetings

X1 Exit Meeting Summary

On April 10, 1997, the inspector presented the inspection results to licensee management. The licensee acknowledged the findings presented. The inspector 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

R. Brandt, General Manager, Nuclear Power Plant Department
T. Henderson, Regulatory Affairs, Compliance Supervisor
J. Miller, Plant Engineer
J. Ratchen, RECS, Environmental Unit Superintendent
C. Reiter, Radiation Protection Manager
J. Sipp, Radwaste, Environmental, Chemistry Manager
R. Tadych, Plant Engineering, Manager
L. Zerr, Regulatory Affairs, Server Licensing Engineer

NRC

D. Kosloff, Senior Resident Inspector, Perry Nuclear Power Plant Site
R. Twigg, Resident Inspector, Perry Nuclear Power Plant Site

INSPECTION PROCEDURES USED

IP 34750: Radioactive Waste Treatment and Effluent and Environmental Monitoring
IP 86750: Solid Radioactive Waste Management and Transportation of Radioactive Materials

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFM	Cubic feet per minute (ft ³ /min)
CFR	Code of Federal Regulations
DRS	Division of Reactor Safety
FIN	Fix It Now
IP	Inspection Procedure
IR	Inspection Report
NRC	Nuclear Regulatory Commission
ODCM	Off-site Dose Calculation Manual
PIF	Problem Identification Form
PNPP	Perry Nuclear Power Plant
RP&C	Radiological Protection and Chemistry
SE	System Engineer
TB/HB	Turbine Building/Heater Bay

PARTIAL LIST OF DOCUMENTS REVIEWED

The Cleveland Electric Illuminating Company Perry Nuclear Assurance Department Audit Reports:

"Radiological Environmental and Effluent Monitoring Programs and the Offsite Dose Calculation Manual," dated 1/21/97;

"Radiological Environmental and Effluent Monitoring Programs," dated 1/16/96.

The Cleveland Electric Illuminating Company Perry Nuclear Power Plant Memorandum:

"Prioritizing ODCM Controls Instrumentation," (RECS-CTU-96-00016), dated 6/21/96.

The Cleveland Electric Illuminating Company Perry Operations Manuals:

Chemistry Instruction:

CHI-0006, Revision 0, effective 6/15/96, "Radiation Monitoring Alarm Setpoint Determination."

Health Physics Instruction:

HPI-A0003, Revision 1, effective 4/21/95, "Radiation Monitor Alarm Setpoint Determination."

Plant Administrative Procedure:

PAP-1403, Revision 5, effective 6/30/95, "Control of Setpoints."

Surveillance Instruction:

SVI-D17-T8053, Revision 4, effective 3/13/91, "Offgas Vent Effluent System and Sampler Flow Rate Monitor Functional Calibration for 1H51-P146 and Functional for 1H51-P169."

Daily Chemistry Reports (selected from July 1996 to present).

Perry Discharge Minimization Plan, July 15, 1996, Revision 2.

PNPP Chemistry Unit Log, March 5, 1997.

"PNPP Gaseous Effluent Controls," by J.T. Ratchen, May 17, 1995.

PNPP Off-site Dose Calculation Manual, Revision 5.