

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-440/94002(DRSS)

Docket No. 50-440

License No. NPF-58

Licensee: Cleveland Electric Illuminating Company  
10 Center Road  
Perry, OH 44081

Inspection At: Perry Site, Perry, Ohio

Inspection Conducted: January 3 - 7, 1994

Inspectors: *M. A. Kunowski*  
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2/16/94  
Date

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2/16/94  
Date

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Radiological Programs Section 1

2/16/94  
Date

Inspection Summary

Inspection on January 3 - 7, 1994 (Inspection Report No. 50-440/94002(DRSS))

Areas Reviewed: Routine announced inspection of the radiation protection program (Inspection Procedure (IP) 83750), the liquid radioactive waste (radwaste) program (IP 84750), and the radioactive materials shipping program (IP 86750). The inspectors also reviewed licensee action on previously identified items, Licensee Event Report (LER) No. 93018, the interim radwaste storage facility (IRSF), and the radwaste classification and characterization program established to implement 10 CFR 61 (IP 84850).

Results: No violations were identified; however, a recent instance where three workers were locked in the drywell (Section 5) represents another of an ongoing problem regarding control of high and potentially high radiation areas. Additionally an unresolved item was identified concerning a late charcoal sample for the annulus exhaust gas treatment system for which a required Technical Specification 3.0.3 entry was not performed (Section 5). Both issues will be reviewed during subsequent inspections. On the positive side, a recently formalized program for periodic plant tours by radiation protection and chemistry managers and specialists appeared to be a good means to increase staff awareness of current plant conditions and identify those requiring corrective actions (Section 4).

The station's dose total for 1993, a year with several extended unscheduled outages, was approximately 278 person-rem (2.78 person-Sievert). For 1994, with the fourth refueling outage scheduled, the licensee established a goal of 580 person-rem (5.8 person-Sievert). No major problems were identified in the radwaste programs reviewed (Sections 7-10). In the IRSF, the failure of the fourth set of shredding blades delayed full use of the radwaste shredder-compactor (Section 8). The licensee stated that an agreement was made with the vendor to ensure that the replacement blades, unlike the previous blades, met the original specifications.

## DETAILS

### 1. Persons Contacted

T. Barton, Corporate Health Physicist  
M. Bezilla, Operations Manager  
T. Collins, Health Physicist  
D. Conran, Compliance Engineer  
J. Detchemendy, Quality Assurance Evaluator  
J. Grimm, Plant Chemist  
H. Hegrat, Acting Manager, Regulatory Affairs  
V. Higaki, Manager, Quality Assurance Section  
K. Pech, Director, Perry Nuclear Assurance Department  
J. Polyak, Corporate Health Physicist  
D. Poole, Assistant to Plant Manager  
J. Ratchen, Radiation Protection Analyst  
C. Reiter, Plant Health Physicist and Radiation Protection Manager  
R. Schrauder, Director, Perry Nuclear Services Department  
J. Traverso, General Supervisor, Radiation Protection  
P. Volza, Manager, Radiation Protection Section

D. Kosloff, NRC Senior Resident Inspector

The individuals listed above attended the exit meeting on January 7, 1994.

The inspectors also contacted other licensee personnel during the inspection.

### 2. Licensee Action on Previous Inspection Findings (IP 83750)

(Closed) Inspection Followup Item (IFI) No. 50-440/92025-02(DRSS): This item was opened to review the licensee's revision to its recordkeeping system for radiological surveys of potentially hazardous wastes. During the current inspection, the inspectors interviewed cognizant personnel, reviewed survey records and transfer logs, and reviewed a revised procedure for controlling the use and disposal of potentially hazardous waste at the site. As part of the revised procedure, the responsibility for shipping hazardous waste was shifted to the RP section, which has responsibility for shipping radioactive material. The revised system appeared adequate to demonstrate that containers of hazardous material shipped from the site had been surveyed to show the absence of licensed radioactive material.

(Closed) IFI No. 440/92015-01(DRSS): The licensee was to analyze a spiked sample of reactor coolant for chloride, fluoride, and sulfate and report the results to the Region III office for comparison. The licensee completed the analyses; however, the NRC reference laboratory was not prepared to analyze the sample until about one year after the sample was collected and split. At this date, the stability of the sample would be questionable. This item is administratively closed.

(Closed) Licensee Event Report (LER) No. 50-440/93016-00: Fuel Handling Building (FHB) Integrity Not Properly Established. Through review of

records and discussions with personnel this LER was reviewed to determine if reportability requirements were fulfilled, immediate corrective actions were accomplished in accordance with technical specifications (TS), and corrective actions to prevent recurrence had been established. This review and discussions with licensee personnel identified no problems related to the specific event.

On August 25, 1993, the licensee determined that FHB integrity was improperly established (on August 7) to support fuel handling activities (on August 9). This determination was made after NRC inspectors identified a failure to properly test FHB ventilation system charcoal (Inspection Report No. 50-440/93017(DRSS)). Subsequent tests demonstrated the charcoal was within TS requirements, and thus the safety significance of the improperly established building integrity was low. In addition, since this event, two other minor problems related to TS charcoal samples occurred and were promptly corrected by the licensee.

As part of the corrective actions for the charcoal testing violation, the licensee reviewed previous surveillances on the FHB and other TS-related ventilation systems. Additional examples of late charcoal sampling were identified, which the licensee tentatively planned to describe in a supplement to LER 93016. However, as most of these examples involved the control room emergency recirculation and annulus exhaust gas treatment systems, a separate LER may be appropriate. In one example from November 1989, identified by the licensee, a late charcoal sample on one train of the annulus exhaust gas treatment system required entry in TS 3.0.3, which apparently did not occur. This matter is considered unresolved and will be reviewed during a future inspection (URI No. 50-440/94002-01 (DRSS)).

No violations of NRC requirements were identified.

3. Organization, Management Controls and Training (IPs 83750 and 84850)

As discussed in several previous inspection reports, personnel re-assignments had taken place with the corporate health physicist and plant health physicist positions. The performance of the individuals in these positions has been good, and they, along with the individuals currently assigned as plant chemist, manager of the radiation protection (RP) section (this section includes radiation protection and chemistry), and several other RP managers, represent a strong cadre of technical and managerial skill.

The inspectors reviewed the licensee's training, organization, and procedures for radwaste processing, transportation, and disposal programs to ensure that the responsible individuals were clearly designated, that there was clear delineation of the authorities and responsibilities of those individuals, that sufficient training was provided, and that management-approved instructions were established to carry out the various radwaste processing and packaging activities.

Training on applicable regulations was provided onsite to the staff by a contractor every other year. Responsibility for the radwaste processing, transportation, and disposal programs was assigned to the

Radiation Protection Section Technical Support Group. Within which the day-to-day implementation was assigned to the Radioactive Shipment Coordinator (RSC). The inspectors observed that while preparing paperwork for a shipment, the RSC was routinely interrupted to address questions and direct radwaste processing activities. Considering that the licensee processes over 1000 cubic meters of radwaste and makes well over 100 radioactive material/waste shipments each year, it is at best very difficult for the RSC to pay attention to the details of his responsibilities. Additional staffing support may be beneficial to preclude future problems caused by the heavy work load.

The inspectors also reviewed several documents related to radwaste processing. The licensee indicated that the Updated Safety Analysis Report would be revised to include radwaste processing at the IRSF during the next yearly revision. The inspectors noted that the Process Control Program was also in need of revision to include processing information regarding the IRSF. The licensee's administrative procedures contained accurate descriptions of waste processing activities at the site. The inspectors indicated that revisions to the above documents would be reviewed during future inspections.

No violations of NRC requirements were identified.

4. Audits and Appraisals (IPs 83750, 84750, and 86750)

The inspectors reviewed the recently proceduralized program (termed "Management By Walking Around") for regular inplant area observations by RP managers. With some necessary flexibility built-in, RP managers are assigned to visit certain areas in the plant each week to observe RP practices, housekeeping, industrial safety, and other items. The tours are expected to be approximately two hours in duration and the observations, both positive and negative, are documented for followup and trending. A program was also recently begun where RP technicians periodically conduct a checklist-based audit of work activities to determine compliance with the applicable radiation work permit. A review of records for the two programs and discussions with cognizant individuals indicated that, overall, a good self-assessment mechanism had been developed and implemented.

There have been no audits performed of the radioactive waste program since the last radiation protection inspection, so the inspectors reviewed surveillances, performed by the Perry Nuclear Assessment Division (PNAD) since the last inspection. These surveillances were standardized and comprehensive. No significant findings were identified. Specific surveillances are discussed in other sections of this report.

The quality control organization was involved with all exclusive use shipments. The exclusive use shipment checklist required a quality control inspector to initial inspection items to ensure the shipment complies with pertinent regulations. It appeared that the quality control organization was effectively utilized in the radwaste shipping and disposal programs to ensure that appropriate regulations were met.

No violations of NRC requirements were identified.

5. External Exposure Control (IP 83750)

In 1993, the station's dose total was approximately 278 person-rem (2.78 person-Sievert), compared to a goal of 190. The higher than expected dose was attributed to unplanned outages to remove leaky fuel, to repair a ruptured service water pipe, and to repair numerous leaky valves. Although the licensee exceeded their dose goal, given the amount of emergent work the accrued dose was reasonable. The inspectors noted good radiological controls and planning for this emergent work. For 1994, the licensee established a goal of 580 person-rem (5.8 person-Sievert), of which 510 person-rem (5.1 person-Sievert) was expected from the 4th cycle refueling outage scheduled for 85 days. High exposure jobs planned for the outage include replacement of the reactor recirculation pump shafts, replacement of cap screws on 177 control rod drives, replacement of the jet-pump hold down beams, and balance-of-plant valve repairs. A chemical decontamination of the recirculation system was planned to reduce drywell dose rates. Recent unplanned outages to repair numerous valves and to perform work on the reactor water cleanup system had somewhat hampered the RP section's preparation for the refueling outage.

Other noteworthy items reviewed by the inspectors are discussed below. On the positive side, since May 1993, the ALARA (as-low-as-reasonably-achievable) group tracked dose from rework, an important datum. On the negative side, in 1993 there were several problems related to areas controlled as high radiation areas:

- A floor plug had not been installed in a timely manner in the elevation above the Offgas Prefilter Room A,
- Operation of condenser in-leakage testing equipment resulted in higher than expected dose rates (because of fuel leaks),
- Although not effecting maintenance department dose, malfunctions of mechanical components of alarms, doors, and locks in several areas had higher than expected malfunctions
- Miscommunications between an RP technician and an upper-level manager resulted in an unauthorized entry into the drywell
- Key inventory was not timely,
- Higher than expected dose rates resulted in an evacuation of the Offgas Building occurred after maintenance began on four valves associated with the B train of the Off-Gas regeneration skid, and
- Miscommunications resulted in three workers being inadvertently locked inside the drywell.

Although no significant exposures of workers resulted, these examples indicated a weakness in the control of high radiation areas or potentially high radiation areas. Of particular concern, was the locking of the workers in the drywell, on December 3, 1993. This

concern was expressed at the exit meeting (Section 12). As of the current inspection, corrective actions were completed for most of the examples. These actions included a day-long "effective listening" training class for RP personnel. The licensee's root cause of the offgas release during the valve maintenance was not reviewed by the inspectors and will be reviewed during a future inspection (IFI No. 50-440/94002-02(DRSS)).

In 1994, during the current inspection, an inspector observed a problem with work in a high radiation area. Contract riggers were attempting to move a barrel of lead shielding out of a High Radiation Area in the resin transfer area. When an attempt was made to lift the barrel, the riggers noticed that the steel plate that the barrel was welded to was stuck under a HIC (High Integrity Container). During the attempt to move the HIC, one of the riggers' electronic dosimetry alarmed due to reaching a dose limit. The riggers immediately stopped work and left the High Radiation Area. Work was stopped for the day and the barrel was successfully moved the next day. This evolution demonstrated that even seemingly easy evolutions would benefit from some pre-planning for ALARA considerations. Approximately 180 millirem were received by the personnel involved in the barrel evolution during the first attempt. A pre-work survey, either by the available crane camera or by the radiation protection technician on the scene, may have detected the steel plate being under the HIC and allowed for dose savings by not requiring repeat attempts to move the barrel.

No violations of NRC requirements were identified; however, a weakness was identified with the control of high radiation and potentially high radiation areas.

6. Exposure Records (IP 83750)

The inspectors reviewed the licensee's program for obtaining previous exposure records for prospective employees, maintaining exposure records for current employees, and for fulfilling request from previous employees for their exposure records. The licensee was a member of INDEX which is a service that maintains a database of security, training, and dosimetry records for individuals who have worked at a site that subscribes to INDEX. The concept behind maintaining current records for individuals in INDEX is that when an individual reports for work at a site subscribing to INDEX, that site is responsible for obtaining all records from previous employers and entering them into the system. Once an individual is entered into INDEX, their records are available to any other site that subscribes to INDEX.

Perry's practice for a prospective employee was to verify all exposure records with the previous site(s) at which the individual had worked whether the records were received directly from the individual or from INDEX. Once records were received from another site, the information was added to INDEX by dosimetry personnel and each entry was verified as being input correctly by another individual. Each INDEX site was required to conduct internal audits to verify the information was entered into the system correctly. INDEX was also required to conduct independent audits every other year to verify the information was entered into the system correctly. At Perry, an internal audit was

conducted in alternate years with the INDEX audit. Both the licensee's internal audits and INDEX audits have found errors in the information provided through INDEX, including some related to the total dose reported (e.g., math or transposition problems), but none have resulted in an exposure in excess of regulatory limits. The next internal audit was scheduled for November 1994.

No violations of NRC requirements were identified.

7. Liquid Radwaste (IP 84750)

The inspectors reviewed effluent release data and instrumentation calibration records with no significant problems identified. Liquid releases in 1993 contained approximately 9.5 Ci (351.5 GigaBecquerels (GBq)) of tritium and 0.15 Ci (5.55 GBq) of other nuclides compared with 9.3 (344.1 GBq) and 0.13 Ci (4.87 GBq), respectively, in 1992. Doses via the liquid pathway were well within TS limits.

An inspector observed activities in the Radwaste Control Room during the inspection. Radwaste operators interviewed were well qualified and knowledgeable regarding the systems they operated and how plant conditions would affect their operations. During the observation period, the Radwaste Shift Supervisor (RSS) quickly noted an increasing Chemical Waste Tank level. The RSS immediately ascertained that the increase was due to a planned maintenance evolution on a Chemical Waste Transfer Pump and paged the auxiliary operator (AO) that was to do the evolution that day. When the AO did not respond, the RSS directed another AO to have the AO running the Chemical Waste Transfer Pump to stop. By the time the increase was stopped, approximately 4000 gallons of relatively high quality water was transferred to the Chemical Waste Tank. While the RSS was aware that the maintenance was scheduled for the day, the AO was expected to contact the RSS before running the transfer pump so that the RSS could line-up the high quality water to a Floor Drain Collection Tank. By discharging to the Chemical Waste Tank, the quality of the water was lessened and would require more processing. The licensee's evaluation of the apparent miscommunications between the AO and the RSS will be reviewed in a future inspection (IFI No. 50-440/94002-03(DRSS)).

No violations of NRC requirements were identified.

8. Interim Radioactive Waste Storage Facility (IP 86750)

An inspector toured the interim radioactive waste storage facility (IRSF) and noted that housekeeping in the facility was excellent. Since the last inspection, the shredder/compactor was put into service to process radioactive waste (radwaste). The failure of the fourth set of the shredder's blades forced a stop to the radwaste processing after six boxes were filled. These boxes were to remain in storage until enough radwaste was processed to make a complete shipment to the disposal site. The licensee indicated that the four sets of failed blades were not made to the original specification, but that the vendor had recently agreed to supply blades made to that specification. The licensee also indicated that a quality assurance check would be made of the blades upon receipt.



Along with the boxes, approximately fifty drums were also stored in the facility. Surface dose rates listed on the radwaste containers were verified to be accurate. However, several different types of labels were used to identify the containers' contents and dose rates. In many instances, it was not readily apparent what was actually in the containers due to crossing out or writing over information on the labels. While this in itself did not appear to violate any regulations, inconsistent and unclear labeling is not a good radiation protection practice. Subsequent to the tour, a discussion with quality assurance personnel indicated that Surveillance Report 93-150 described problems with labeling at the plant and that in response to the report, a new label was ordered and planned to be implemented as soon as it was received. Progress in improving labeling practices will be reviewed during a future inspection.

The inspectors also noted that the settling pools for silt removed from the emergency service water forebay had been removed (this silt is contaminated from leakage from the liquid radwaste discharge line). According to the licensee, most of the contamination in the pools had been removed and packaged for eventual disposal, but that some contamination remained in the ground and would be removed after the winter. In addition, at the exit meeting (Section 12), the licensee indicated that a decision on how to fix the leakage had not yet been made.

No violations of NRC requirements were identified.

9. Solid Radwaste Shipping (IPs 84850 and 86750)

The inspectors reviewed licensee records for the 27 radwaste shipments in 1993. Typically, the licensee shipped dry active waste (DAW) to a vendor for processing prior to burial and resin directly to the disposal site. The total DAW volume sent to the vendor was 1,068 cubic meters for these shipments. To date, the vendor sent approximately 25 cubic meters of the licensee's processed waste to the disposal site for burial. The total volume of resin sent to the burial site by the licensee was 65.7 cubic meters. Once the problems with the shredder/compactor were fixed, the licensee planned to process all DAW onsite and then ship it directly to the disposal site or, if unavailable, store it in the IRSF.

A review of selected radwaste shipment records verified the licensee's compliance with the manifest requirements of 10 CFR 20.2006 and the shipping paper requirements of 49 CFR 172.200-204. Procedure and record reviews indicated that shipments of radwaste were marked and labeled in accordance with applicable regulations. Vehicle placarding requirements also appeared to have been properly met. Licensee procedures and records indicated that the system for tracking shipments and notifying the NRC of missing shipments was adequate. A checklist documenting shipment departure and arrival dates was maintained by the RSC. The licensee stated that there have been no problems with missing shipments, late arrival of shipments, or delayed acknowledgement of receipt of shipments. In addition, adequate procedures to ensure that the applicable disposal site and waste processor license conditions were met. Finally, the licensee had current copies of the disposal site

licenses readily available.

No violations of NRC requirements were identified.

10. Waste Classification and Characterization (IP 84850)

The inspectors verified that the licensee was appropriately classifying and characterizing their radioactive waste. The licensee had identified five different waste streams; dry active waste (DAW), cartridge filters, powdered resin used for reactor water, powdered resin used for the condensate/fuel pool water, and bead resin used for the suppression pool and liquid radwaste processing system. Once a year, the licensee sends samples from these waste streams to a vendor for analysis to identify those isotopes which are not readily quantifiable using gamma spectroscopy and to develop specific scaling factors relating the difficult-to-measure isotopes to common gamma-emitters such as Cs-137 and Co-60. The computer program RADMAN, which has an approved topical report with the NRC, was used in classifying waste shipments. The licensee typically inputs an average of all previous scaling factors for the respective waste streams for use in classifying the waste. The inspectors verified that the licensee's scaling factors were properly applied and that the appropriate limits corresponding to those in the tables for waste classification in 10 CFR 61.55 were accurate.

The licensee's Failed Fuel Action Plan required that a new 10 CFR 61 sample be obtained if Action Level 2 was exceeded. This occurred on October 1, 1992, and sample results indicated a change in spent resin isotopic concentration due to the failed fuel. The licensee decided to input to RADMAN the actual scaling factors from this sample rather than an average with the previous samples to classify the resin. On April 6, 1993, PNAD conducted Surveillance Number 93-072 to review the adequacy of 10 CFR 61 sampling considering the fuel problems the plant was experiencing. The surveillance raised the concern that additional isotopic concentration changes could have occurred in the six months since the last sample and suggested that another sample be obtained and analyzed. In response, a sample was drawn and forwarded to a vendor for analysis. The sample indicated that isotopic ratios remained consistent and no change to the scaling factors was warranted. Even though the sample results indicated that there was no problem with the scaling factors, this type of review by PNAD is encouraged by the NRC.

A review of procedures and discussions with licensee personnel indicated that the waste form and characterization requirements of 10 CFR 61.56 were met. The licensee recently purchased resin dewatering equipment from a vendor. The inspectors verified that the system had an approved NRC Topical Report. Files of disposal liners and shipping casks were maintained by the RSC. The licensee did not use high integrity containers that were approved by the NRC to provide waste stabilization. However, the 10 CFR Part 61 waste stabilization requirements for dewatered resin were met through variances and Certificates of Compliance granted by the burial site host state which allow the liners which were used to be placed in a concrete overpack container to provide waste stabilization.

No violations of NRC requirements were identified.

11. Tours (IP 83750)

Tours were conducted of the various buildings and the outdoor areas to review postings and radiation worker practices. Except for some posting inconsistencies near the condensate storage tank and the carbon dioxide tank for the turbine lube oil storage purifier room, no problems were noted. On the positive side, the inspectors noted the licensee was using step-off pads imprinted with instructions for removing protective clothing, instead of using a separate posting.

No violations of NRC requirements were identified.

12. Exit Meeting

The scope and findings of the inspection were reviewed with the licensee (Section 1) on January 7, 1994, at the conclusion of the inspection. Topics discussed included the RP program for plant tours (Section 4), the high radiation area problems, particularly the concern over locking workers in the drywell (Section 5), the inadvertent addition of liquid radwaste to a tank (Section 7), and the progress related to the contaminated silt (Section 8). The licensee acknowledged the inspector's comments and did not identify any material reviewed during the inspection as proprietary.