

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-440  
License No: NPF-58

Report No: 50-440/96013(DRS)

Licensee: Cleveland Electric Illuminating Company

Facility: Perry Nuclear Power Plant

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

Dates: October 7 through 11, 1996

Inspectors: Patrick L. Loudon, Senior Radiation Specialist  
Kara N. Selburg, Radiation Specialist

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

## Report Details

### IV. Plant Support

#### **R1 Radiological Protection and Chemistry (RP&C) Controls**

##### **R1.1 Post-Outage ALARA Review**

###### **a. Inspection Scope (83750)**

The inspectors reviewed the licensee's post-outage As Low As is Reasonably Achievable (ALARA) review of several work activities performed during Refueling Outage 5 (RFO 5). This included a review of the licensee's ALARA/Health Physics Post Outage Report, RFO 5 Chemical Decontamination Report, and interviews with numerous radiation protection (RP) Department personnel.

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

Several good ALARA initiatives were used during RFO 5, which contributed to a low outage dose of 278 person-rem, and created an estimated dose savings of 291 person-rem. ALARA techniques which successfully reduced general area dose rates included the extensive use of temporary lead shielding and the flushing of numerous contaminated systems and components. The use of remote teledosimetry, a dedicated health physics communications network, and audiovisual equipment helped to reduce overall personnel dose. The licensee completed chemical decontaminations of the Reactor Recirculation System (B33), the Reactor Water Clean-up System (G33), and the Fuel Pool Cooling and Clean-up System (G41) piping. While these decontaminations did not all achieve the expected decontamination factors, they did contribute to an estimated dose savings of 61 person-rem.

Outage work planning incorporated ALARA lessons learned and industry experience and was effective in keeping final dose within initial dose estimates for total drywell, containment, refuel floor and steam tunnel/turbine building activities. However, some weaknesses were noted in ALARA contingency planning following outage schedule changes which caused conflicts between work activities. One example of this was noted during the B33 chemical decontamination. Snubber work initially was scheduled to be conducted in the B33 area following the chemical decontamination. However, the chemical decontamination was delayed several days due to problems encountered early in the evolution, while the snubber work schedule remained constant. General area radiation levels were not reduced until the completion of the decontamination and installation of temporary shielding in the B33 area. This conflict in schedule was not thoroughly evaluated for the new ALARA challenges, and the work on the snubbers was completed in the B33 area in the higher radiation fields. As a result of the higher dose fields, the actual dose for snubber work exceeded the original estimate by a factor of 1.25.

c. Conclusions

The inspectors noted several good ALARA initiatives during the refueling outage, including the use of temporary shielding, system and component flushing, and chemical decontaminations which contributed to a dose avoidance of 291 person-rem. The initial outage planning incorporated the ALARA principle, and was effective in planning dose estimates which accurately represented actual work. However, when conflicts in the outage schedule were recognized, contingency planning was weak in reevaluating new ALARA challenges, as observed during the delay in the B33 chemical decontamination.

R1.2 Poor Radworker Practices

a. Inspection Scope (83750)

The inspectors reviewed the circumstances surrounding an event documented through the station's potential issue form (PIF) system involving two individuals who received dose rate alarms while searching for a work area in the radiologically restricted area.

b. Observations and Findings

On September 3, 1996, two maintenance personnel involved in repairs to the condenser entered the radiologically restricted area (RRA) and proceeded to the condenser area. Upon arriving in the area, the workers became uncertain as to where exactly within the area they were to perform their condenser tests. The workers proceeded to search the area to locate the exact test location. While searching the area, the workers received dose rate alarms on their electronic dosimetry.

The workers left the immediate area upon hearing the alarms; however, they did not immediately report the alarms to the health physics (HP) office. Upon exiting the RRA, one worker was prompted by the exit dosimeter reader to contact the HP desk. Further investigation revealed that the two individuals had entered radiation fields of 278 mrem/hr and 210 mrem/hr respectively. The dose rate alarm set point for the RWP was 130 mrem/hr. The HP office initiated a PIF to review the event. The PIF review and final corrective actions were still being developed for approval by the Corrective Action Review Board (CARB) at the conclusion of the inspection. Initial results of the licensee's investigation indicated that while the correct response to alarms appears to be understood, inconsistencies in the Nuclear General Employee Training may have contributed to the workers uncertainty during this event.

c. Conclusions

The inspectors concluded that poor planning and pre-job briefing for this event contributed to workers spending more time in a high radiation area (HRA). They

also concluded that workers did not have a clear understanding of the expected response to electronic dosimeter alarms.

### R1.3 Radioactive Effluent Releases

#### a. Inspection Scope (84750)

The inspectors reviewed gaseous effluent release data for September and October 1996.

#### b. Observations and Findings

A review of the gaseous effluent release data indicated a slight increase in the iodine release rate through the off-gas vent during the week of September 30, 1996. A leak on the A Steam Jet Air Ejector (SJAE) train had been identified, and the licensee shifted the off-gas system from the A to B train on September 30, 1996, to repair this leak. However, air in-leakage on the A train continued, thus increasing the off-gas flow rate from the typical 17 standard cubic feet per minute (scfm) to approximately 35 scfm. (This flow rate remained within the charcoal bed rating of 140 scfm). The increase in the off-gas flow decreased the amount of time the off-gas passed through the charcoal filters. This directly resulted in less iodine removal in the charcoal filters, thus an increase in the off-gas iodine release rate from approximately  $2.6 \times 10^{-6}$  microcuries per second ( $\mu\text{Ci/sec}$ ) to approximately  $3.6 \times 10^{-6}$   $\mu\text{Ci/sec}$ . The annual accumulative iodine dose was approximately  $5.8 \times 10^{-2}$  millirem, which was less than one percent of the Off-site Dose Calculation Manual (ODCM) limit of 15 millirem. The air inleakage was repaired on October 6, 1996, and the off-gas flow rate returned to the typical range of around 17 scfm. After the flow rate stabilized, iodine off-gas vent release rate decreased to approximately  $1 \times 10^{-6}$   $\mu\text{Ci/sec}$ .

#### c. Conclusions

The inspectors noted an increase in iodine gaseous effluent release rates and weekly iodine dose in the off-gas system. However, the iodine released was within ODCM parameters, was thoroughly investigated by the chemistry and engineering staffs, and was within the design criteria of the system.

### R5 Staff Training and Qualifications in RP&C

#### R5.1 Radiation Protection Manager Qualifications

The inspectors reviewed the qualifications of three licensee personnel temporarily filling the position of Radiation Protection Manager. The qualifications of these personnel were in accordance with licensee technical specifications which require the radiation protection manager to meet or exceed the qualifications of Regulatory Guide 1.8, September 1975.

## **R8 Miscellaneous RP&C Issues**

- R8.1 (Open) Follow-Up Item 50-440/96005-10: Implementation of the radioactive material (RAM) control program. During the previous radiation protection inspection, it appeared the plant's RAM control program was being adequately implemented; however, a lack of understanding of the program requirements existed among the general work force and planned program improvements had not yet been implemented. The inspectors revisited this area to determine what actions the licensee had implemented to date. The inspectors noted that an increased emphasis was being applied on the issue; however, recent PIFs continue to illustrate that station wide worker understanding of the flow path for the use and return of tools within the RRA is still weak. The ALARA engineering and maintenance groups have completed the planning of a three phase implementation plan to improve the program. This item remains open pending evaluation of the implementation of the program.

## **V. Management Meetings**

### **X1 Exit Meeting Summary**

On October 11, 1996, the inspectors presented the inspection results to licensee management. The licensee acknowledged the findings presented.

The inspectors 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. D. Brandt, General Manager Operations  
N. L. Bonner, Engineering Director  
L. W. Worley, Nuclear Assurance Director  
J. Messina, Operations Manager  
C. Reiter, Plant Health Physicist  
E. Gordon, Supervisor, Health Physics Technical

## **INSPECTION PROCEDURES USED**

IP 83750: Occupational Radiation Exposure  
IP 84750: Radioactive Waste Treatment and Effluent and Environmental Monitoring

## **ITEMS OPENED, CLOSED, AND DISCUSSED**

### Discussed

50-440/96005-10 IFI Radioactive Material Control Program.

## **DOCUMENTS REVIEWED**

RFO 5 Chemical Decontamination Report.

Fifth Refueling Outage ALARA/Health Physics Post Outage Report, January 27 to April 10, 1996.

Weekly Effluent and Release Rate Data Report, for the weeks ending October 7, 1996, and October 14, 1996.