

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 50-440/98017(DRS)

Licensee: Centerior Service Company

Facility: Perry Nuclear Power Plant

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

Dates: August 31 - September 14, 1998

Inspector: Steven K. Orth, Senior Radiation Specialist

Approved by: Gary L. Shear, Chief, Plant Support Branch 2
Division of Reactor Safety

EXECUTIVE SUMMARY

Perry Nuclear Power Plant, Unit 1
NRC Inspection Report 50-440/98017

This announced inspection included an evaluation of the effectiveness of aspects of the radiation protection (RP) program. Specifically, the inspection consisted of a review of the implementation of the solid radioactive waste management and shipping programs. The inspection also reviewed the conduct of the radiological environmental monitoring program (REMP) and reviewed previous inspection findings. One violation was identified concerning the adequacy of scaling factors used to determine the classification of solid radioactive waste shipments (Section R1.2).

Plant Support

- The REMP was properly implemented in accordance with the requirements of the Offsite Dose Calculation Manual. Air sampling equipment was calibrated at the required frequency, and the REMP technician demonstrated good analytical techniques. The 1997 and 1998 REMP sample results were consistent with normal fluctuations in background radioactivity. (Section R1.1)
- One violation was identified concerning the failure of the licensee to ensure that scaling factors used to determine the activity of hard to detect radionuclides in radioactive waste shipments could be correlated with actual plant samples. In April of 1998, the licensee did not adequately evaluate a poor correlation between isotopic data reported by its chemistry laboratory and a vendor. Consequently, the licensee implemented inaccurate radionuclide scaling factors which significantly underestimated the non-gamma radionuclides in radioactive waste shipments. (Section R1.2)
- In general, the Radiological, Environmental, and Chemistry Section (RECS) staff properly packaged and classified radioactive material and waste shipments in accordance with regulatory requirements. Although some inaccuracies were identified, the shipping documentation and low level waste manifests contained the information required by 49 CFR Part 172 and 10 CFR Part 20. (Section R1.3)
- The inspector noted slow progress in the RECS staff's revision of radioactive waste and material shipping procedures, which was started in early 1997. In addition, the inspector observed some weaknesses in the procedures used for 10 CFR Part 61 scaling factor analyses. The RECS staff had developed an action plan to ensure timely completion of the procedure revisions and planned to review the instructions contained in the process control program and additional procedures. (Section R3.1)
- The inspector noted that personnel involved in the radioactive material shipping program were properly trained. In addition, training lesson plans were comprehensive and presented a broad review of the radioactive shipping program. (Section R5.1)

- The licensee performed a thorough audit of the REMP, including REMP technician performance and Offsite Dose Calculation Manual implementation. The inspector found that audit findings were evaluated, and the RECS staff took appropriate corrective action. (Section R7.1)
- The inspector found that the most recent audit of the radioactive waste management and radioactive waste and material shipping programs did not provide a comprehensive review. The audit focused on the conduct of radioactive waste control room operations and system material condition but did not fully assess the shipping program or process control program implementation. (Section R7.1)
- One Non-Cited Violation was identified concerning the inadequate testing of the high alarm function isolation for the containment ventilation exhaust radiation monitor. The licensee identified this problem and performed corrective actions to ensure that the issue was corrected. (Section R8.5)

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope (IP 84750)

The inspector reviewed the implementation of the radiological environmental monitoring program (REMP). Specifically, the inspector reviewed the 1997 Annual Environmental and Effluent Release Report, observed sample collection activities, and reviewed the calibration and operability of instrumentation. The inspector also reviewed the following procedures and their implementation:

REMP-0003 (Revision 5), "Completing the Sample Collection Field Form and Label;"
REMP-0009 (Revision 4), "Surface and Drinking Water Sampling;"
REMP-0018 (Revision 4), "Reporting Requirements;"
REMP-0023 (Revision 1), "Air Sample Collection;" and
REMP-0024 (Revision 1), "Air Sampler Maintenance and Calibration."

b. Observations and Findings

The inspector reviewed the 1997 annual report and found the report to be well written and to contain the information required by the Offsite Dose Calculation Manual (ODCM). Within the report, the licensee documented sampling anomalies and corrective actions for those anomalies. The inspector noted that no measurable radioactivity above background (i.e., natural background and fallout) was detected in the environmental samples. The inspector reviewed the licensee's records of monthly data reviews for January through June of 1998 and observed a minor problem concerning the trending of sample data, which the licensee acknowledged and planned to address. However, no data anomalies were identified.

The inspector observed the collection of environmental air filters (air particulate and charcoal cartridges). The environmental sampling instrumentation was operable and was acceptably maintained. However, the inspector and the sample collector noted that one air sampler (location 5) was not operating and determined that the sampler had not been restarted the previous week. Since the particulate and charcoal filter samples collected at location 5 were not required by the ODCM, a violation of NRC requirements was not identified. However, the licensee acknowledged the personnel error associated with the missed sample, attributed the error to a lack of attention to detail, and documented the issue in a condition report (CR) to ensure acceptable corrective actions were implemented.

During the field observations, the inspector noted that the technician demonstrated an acceptable level of knowledge concerning the air sampling instrumentation and the

procedure requirements. The technician also demonstrated good analytical techniques in removing and replacing sample media. However, the inspector noted that the technician did not routinely perform an inleakage (filter bypass) test to ensure that the sample train was properly sealed and noted that the applicable procedure did not provide instructions to perform an inleakage test. Although no problems were identified concerning equipment performance, the radiological effluents and chemistry section (RECS) staff acknowledged the purpose of an inleakage test (e.g., to ensure that changing environmental conditions did not effect the integrity of the filter train) and planned to evaluate the conduct of the testing in the future. The inspector also reviewed instrument calibration records and verified that the licensee calibrated the air pumps and regulators used in the collection of environmental samples at the frequency required in procedure REMP-0024.

c. Conclusions

The REMP was properly implemented in accordance with the requirements of the ODCM. Air sampling equipment was calibrated at the required frequency, and the REMP technician demonstrated good analytical techniques. The 1997 and 1998 REMP sample results were consistent with normal fluctuations in background radioactivity.

R1.2 Characterization of Radioactive Waste Shipments

a. Inspection Scope (IP 86750)

The inspector reviewed the licensee's method for determining the activity of radioactive waste shipments. The inspector reviewed the most recent annual waste stream analyses and the verifications which were performed to ensure the validity of radionuclide scaling factors used to determine the activity of hard to detect radionuclides. The inspector also reviewed the implementation of procedures PCP (Revision 1), "Process Control Program," and RPI-1102 (Revision 1), "10 CFR 61 Compliance Sampling Program."

b. Observations and Findings

In accordance with 10 CFR 61.55(a)(8), the RECS staff used scaling factors as an indirect method to determine radionuclide activity in radioactive waste shipments. This is done by inferring a concentration of hard to detect radionuclides (i.e., non-gamma emitting radionuclides) by applying scaling factors to a known concentration of an easier to detect radionuclide, provided that there is a reasonable assurance that the indirect method can be correlated with actual measurements. Of the 8 waste types listed in the licensee's process control program (PCP), the licensee obtained samples from its active waste stream (i.e., spent resin tank (SRT)) resins, reactor water cleanup system (RWCU) resins, condensate system and floor drain resins (CB/FBST), and dry active waste (DAW)), sent the samples to a vendor laboratory for isotopic analysis, and calculated a scaling factor for each hard to determine radionuclide in each sample. In accordance with NRC guidance, procedure RPI-1102 required that each waste stream determined to produce Class B and C wastes be sampled every year and that each

waste stream determined to produce Class A wastes be sampled every two years. In practice, the licensee performed all of the sampling and analysis on an annual frequency.

As documented in NRC Inspection Report No. 50-440/97010(DRS), the licensee obtained representative samples of resin shipments conducted throughout the year and composited the samples for the annual analyses. For each spent resin shipment, the RECS staff determined the total activity by obtaining the product of the radionuclide concentrations (determined by direct gamma spectroscopy measurements and scaling factors) and the mass of the material. In the case of the DAW stream, the RECS staff collected surface contamination surveys from the waste sorting tables and forwarded those surveys to a vendor for analysis. For each shipment of DAW, the RECS staff determined the total activity through a dose-to-curie calculation, applying the radiation levels measured at 1 meter and the radionuclide scaling factors.

The inspector reviewed the most recent scaling factor evaluations (i.e., sample analyses and comparisons) of the waste streams, which had been completed on April 15, 1998. In accordance with procedure RPI-1102, the RECS staff performed comparisons of the following data:

- o the gamma isotopic results obtained by the vendor laboratory and by the licensee's chemistry staff;
- o the fractional abundances of cobalt-60, cesium-137, and cerium-144 determined in 1998 and in the previous analysis; and
- o the scaling factors determined in 1998 and in the previous analysis.

During the review of the 1998 vendor laboratory data, the RECS staff noted that the vendor's gamma isotopic concentrations for the resin samples were significantly lower than the concentrations measured by the licensee's chemistry laboratory. However, the relative abundances of the isotopes were in good agreement. In accordance with procedure RPI-1102, the RECS staff initiated an investigation to evaluate the poor correlation and subsequently concluded that the poor correlation resulted from the difference in the physical form of the samples that the two laboratories analyzed. The vendor laboratory analyzed the samples in the physical form that they were received (i.e., a slurry of resin and water) and based each sample mass on the total weight of the water and resin slurry. However, the licensee's chemistry laboratory dried the resin slurry before performing any analysis and before obtaining the mass of each sample. Based on this difference, the RECS staff concluded that the vendor's gamma isotopic results were affected by the attenuation of the water within the sample. Consequently, the RECS staff adjusted the vendor's gamma isotopic result by a factor necessary to achieve good agreement with the licensee's chemistry laboratory data (i.e., multiplied the vendor's RWCU and CB/FBST resin results by 10 and multiplied the SRT resin results by 50). However, the staff did not apply any correction factor to the non-gamma emitting radionuclides because the nature of the analyses would have eliminated any attenuation affect. Based on this information, the inspector identified that the plant staff failed to

recognize that the drying affected the concentration of all of the isotopic results due to the differences in the mass of the samples (activity per unit mass) and that the attenuation effects were relatively insignificant and should have been taken into account via the vendor's calibration geometry. Consequently, the inspector concluded that the calculated scaling factors for non-gamma emitting radionuclides were not representative of the sample data and were not conservative.

The inspector also reviewed the comparison between the 1998 scaling factors and the licensee's scaling factor data base (previously calculated scaling factors). As a result of the above error, the comparison between the newly calculated scaling factors and the data base indicated differences which correlated to the applicable correction factor used by the licensee. The RECS staff had noted the unacceptable comparison; however, the staff failed to recognize that the difference was caused by the above error and, instead, attributed the poor comparison (i.e., decrease in non-gamma emitting radionuclides) to a reduction of activity in the waste streams. Consequently, the licensee applied these incorrect factors in determining the radionuclide concentrations for waste resin shipped to burial sites (Section R1.3). Although the error did not result in incorrect waste classifications or packaging errors, the inaccurate scaling factors did result in a significant underestimation of the non-gamma emitting radionuclides in each shipment.

10 CFR 20.1501 requires that each licensee make, or cause to be made, surveys that may be necessary for the licensee to comply with the regulations in Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present. 10 CFR 20.2006(b)(2) requires that any licensee shipping radioactive waste intended for ultimate disposal at a licensed land disposal facility must document the information required on NRC's Uniform Low-Level Radioactive Waste Manifest and transfer this recorded manifest information to the intended consignee in accordance with Appendix G to 10 CFR Part 20. Appendix G to 10 CFR Part 20 requires, in part, that the shipping manifest contain the total activity of each container and the identities and activities of individual radionuclides contained in each container of radioactive waste. As described above, the failure of the licensee to perform an adequate evaluation to determine the activities of the non-gamma emitting radionuclides contained in four waste shipments (shipment nos. 98-0002, 98-1000, 98-1005, and 98-1006), which were required to be documented on the NRC's Uniform Low-Level Waste Manifest, is a violation of 10 CFR 20.1501 (VIO 50-440/98017-01).

Following discussions with the inspector, the RECS staff implemented the following immediate corrective actions:

- o the staff immediately suspended all shipping activities;
- o the staff recalculated the applicable scaling factors and the radionuclide activities in the affected shipments that had been transported to burial sites; and
- o the staff initiated a CR to document the incident and to ensure that the problem was fully evaluated and corrected.

Based on the results of the CR investigation, the licensee planned to implement long-term corrective actions, which will be reviewed in future NRC inspections. For example, the RECS staff indicated that the corrective actions would include a comprehensive audit/review of the shipping program.

c. Conclusions

One violation was identified concerning the failure of the licensee to ensure that scaling factors used to determine the activity of hard to detect radionuclides in radioactive waste shipments could be correlated with actual plant samples. In April of 1998, the licensee did not adequately evaluate a poor correlation between isotopic data reported by its chemistry laboratory and a vendor. Consequently, the licensee implemented inaccurate radionuclide scaling factors which significantly underestimated the non-gamma radionuclides in radioactive waste shipments.

R1.3 Conduct of Radioactive Material and Waste Shipments

a. Inspection Scope (IP 86750)

The inspector reviewed the shipping documents for the following radioactive shipments, including the package classifications and labeling and shipping papers:

- o 97-2020 Laundry (December 3, 1997);
- o 97-3004 Contaminated Safety Relief Valves (January 30, 1997);
- o 97-3006 Contaminated Safety Relief Valves (January 31, 1997);
- o 98-0001 Contaminated Shroud Bolts (May 7, 1998);
- o 98-1005 Spent Resin (August 8, 1998); and
- o 98-1006 Spent Resin (August 20, 1998).

The inspector reviewed the shipping documents to determine their compliance with 10 CFR Part 71 and 49 CFR Parts 172 and 173.

b. Observations and Findings

The inspector observed that the RECS staff prepared shipments in accordance with the licensee's procedures. As allowed by these procedures, the staff used a vendor-supplied computer program to classify the shipments and prepare the required shipping documents. Prior to each shipment, the staff sampled and analyzed the materials and compared the gamma spectroscopy results to the specific waste stream's scaling factor database. For DAW and resin shipments, the RECS staff determined the activity of the shipments using the methodology described in Section R1.2. In the case of contaminated equipment, the inspector also verified that the licensee properly determined the activity of the shipment.

The inspector reviewed the classification of radioactive materials and wastes shipped as Low Specific Activity-II (LSA-II) and Surface Contaminated Object-II (SCO-II) packages and noted that shipping documents were properly prepared. In the case of shipment number 98-1005, the licensee shipped the material in a NRC Type B package. The inspector verified that the licensee was included in the registered users list.

The inspector observed that the shipping documents and waste manifests contained the information required by 49 CFR Part 172 and 10 CFR Part 20, respectively. As described in Section R1.2, the inspector identified an error in the licensee's 1998 scaling factor evaluations. Although this error did not result in an inaccurate waste classification or 49 CFR Part 173 packaging determination, the error resulted in inaccurate activity calculations for four shipments completed after April 15, 1998 (Nos. 98-0002, 98-1000, 98-1005, and 98-1006). Following the identification of this error, the licensee recalculated the radionuclide activities and planned to contact the burial site to correct the original waste manifests. The inspector also noted that the RECS staff recorded the activity of shipments using the International System of Units and that the shipping documentation included required emergency response information.

c. Conclusions

In general, the RECS staff properly packaged and classified radioactive material and waste shipments in accordance with regulatory requirements. Although some inaccuracies were identified, the shipping documentation and low level waste manifests contained the information required by 49 CFR Part 172 and 10 CFR Part 20.

R3 RP&C Procedures and Documentation

R3.1 Radioactive Waste Management and Shipping Procedures

a. Inspection Scope (IP 86750)

The inspector reviewed the RECS staff's progress in reviewing and revising procedures applicable to the radioactive waste and material shipping program.

b. Observations and Findings

In early 1997, the RECS staff began a procedure revision program to enhance the procedures used in shipping radioactive materials and wastes. Although the procedures were adequate, the shipper had identified that certain procedures lacked instruction and provided outdated shipping forms and manifest forms. In addition, the shipper intended to consolidate procedures to be more logical for use in the field.

At the time of this inspection, the RECS staff was completing the reviews and approvals of the procedures that were created to replace the existing shipping procedures. The staff acknowledged that the project had taken an excessive amount of time. As a result of the delay, the staff had prepared an action plan to ensure that the proper reviews and approvals were completed and that the procedures were implemented by the end of

1998. The inspector reviewed this plan and observed that actions were well documented and that responsibilities were assigned to named individuals.

Based on the inspector's findings concerning the RECS staff's 1998 scaling factor calculations (Section R1.2), the staff planned to extend the procedure revision program to the procedures applicable to scaling factor evaluations and the PCP. The staff indicated that these procedures also were in need of enhancements to ensure that adequate instructions were provided to the user. For example, the inspector observed that the scaling factor reviews did not include any objective criteria to judge correlations and did not provide actions to take if correlations were unacceptable. The staff acknowledged the inspector's observations and planned to review these areas.

c. Conclusions

The inspector noted slow progress in the RECS staff's revision of radioactive waste and material shipping procedures, which was started in early 1997. In addition, the inspector observed some weaknesses in the procedures used for 10 CFR Part 61 scaling factor analyses. The RECS staff had developed an action plan to ensure timely completion of the procedure revisions and planned to review the instructions contained in the PCP and additional procedures.

R5 Staff Training and Qualification in RP&C

R5.1 Training of Individuals Involved in Shipping Radioactive Materials

a. Inspection Scope (IP 86750)

The inspector reviewed the training of personnel involved in the shipping of radioactive materials, as required by Subpart H of 49 CFR Part 172. Specifically, the inspector reviewed the licensee's designation of authorized shipping personnel and the training records of those personnel involved in the shipping program.

b. Observations and Findings

As required by procedure PAP-1304 (Revision 3), "Radioactive Material Shipment Criteria," the licensee designated, in writing, the personnel qualified to sign the radioactive material manifest, or record, prior to shipment. Per memorandum dated July 7, 1997, the RECS manager designated the shipping specialist as the only individual qualified to ship radioactive material from the site and to sign all the appropriate shipping documentation. As several individuals were also involved in various aspects of the shipping process, the RECS manager indicated that he was planning to qualify additional personnel to provide alternates for the shipping specialist. In addition, the training staff was developing a qualification guide for the shipping specialist.

The inspector reviewed the training records for the above personnel and verified that all personnel had been trained within the last 3 years, as required by 49 CFR 172.704. In

addition, the inspector reviewed the course outlines and examinations for the applicable training courses. Based on this review, the inspector noted that the training was comprehensive and provided personnel with instructions for the scope of their shipping activities, as well as a broad understanding of other NRC and Department of Transportation requirements.

c. Conclusions

The inspector noted that personnel involved in the radioactive material shipping program were properly trained. In addition, training lesson plans were comprehensive and presented a broad review of the radioactive shipping program.

R7 Quality Assurance in RP&C

R7.1 Quality Assurance Audits

a. Inspection Scope (IPs 84750 and 86750)

The inspector reviewed the licensee's self assessments of the REMP and the radioactive waste management and shipping program. The inspector reviewed the scope of the licensee's assessments and the results of the reviews, including any corrective actions taken to assess and to correct audit findings.

b. Observations and Findings

In accordance with the licensee's Quality Assurance Plan, the licensee performed reviews of the REMP on a 12-month frequency. The inspector reviewed the licensee's most recent review of the REMP (Audit PA 97-17, "Radiation Monitoring," dated February 25, 1998) and found the assessment to be both compliance and performance based. The inspector noted that the licensee conducted a comprehensive review of the program, including the performance of the REMP technician, the adequacy of ODCM implementation, the content of the annual report, and the adequacy of program documentation. Overall, the assessment concluded that the REMP implementation was effective. The inspector also noted that audit findings were properly evaluated, and the RECS staff took appropriate corrective actions.

On a 24-month frequency, the licensee also performed reviews of the radioactive waste management (e.g., PCP) and radioactive waste and material shipping programs, as required by the licensee's Quality Assurance Plan. The inspector noted a marked difference between the scope of the last two assessments. In 1996, the licensee performed a comprehensive review of these programs (Audit PA 96-12, "Packaging and Transportation of Radioactive Material/ Process Control Program Audit," dated July 11, 1996). For example, this assessment reviewed the conduct of numerous radioactive shipments (including surveys, shipping documents, and packaging) and reviewed the implementation of the PCP (including dewatering activities and the control of gas generation). However, the 1998 audit of these areas was narrowly focused and only addressed radioactive waste control room conduct of operations and the material

condition of radioactive waste systems (Audit PA 98-07, "Radwaste Processing Audit," dated September 1, 1998). Although the review of these areas was thorough, the assessment provided only a cursory review of shipping activities and the PCP implementation. In addition, neither assessment provided a review of waste classification, i.e., scaling factor evaluations. A member of the quality assurance organization acknowledged the inspector's observations and indicated that the next planned review would be similar in scope to the 1996 review.

c. Conclusions

The licensee performed a thorough audit of the REMP, including REMP technician performance and ODCM implementation. The inspector found that audit findings were evaluated, and the RECS staff took appropriate corrective actions.

However, the inspector found that the most recent audit of the radioactive waste management and radioactive waste and material shipping programs did not provide a comprehensive review. The audit focused on the conduct of radioactive waste control room operations and material condition of radioactive waste systems but did not fully assess the shipping program or PCP implementation.

R8 Miscellaneous RP&C Issues (IP 92904)

R8.1 (Closed) Inspection Follow-up Item (IFI) No. 50-440/96003-14: The licensee identified a discrepancy in the testing of the charcoal filtration system in the safety-related annulus exhaust gas treatment and fuel handling area ventilation systems. The licensee's vendor tested the charcoal filtration system to the current revision of the applicable testing method (i.e., American Society for Testing and Materials (ASTM) D3803 (1986)), as specified in the licensee's purchase order. However, Table 1.8-1 of the Updated Safety Analysis Report (USAR) stated that the testing would be performed to conform with Regulatory Guide 1.52, Revision 2, with the exception that the licensee would implement the 1975 revision of American National Standards Institute (ANSI) N510-1975, which recommended ASTM Standard No. D3803(1979). Based on its evaluation of the discrepancy, the licensee determined that the applicable criteria contained in the 1986 and in the 1979 ASTM D3803 test method were identical and that there was no impact on system performance. The licensee planned to perform a revision to the USAR to reflect the updated version of the test method, including a safety evaluation.

On December 17, 1997, the licensee completed USAR Change Request No. 97-119, which addressed the above issue. The change revised Tables 1.8-1, 6.5-1, 6.5-2, 6.5-3, and 12.3-3 of the USAR to allow the use of the 1986 revision and future revisions of ASTM D3803 or other industry approved standards, with appropriate engineering evaluations and approvals. The inspector reviewed the safety evaluation performed for this change and found it to be acceptable. The evaluation documented that the 1979 and 1986 revisions to ASTM D3803 provided equivalent testing criteria and did not result in an unreviewed safety question. Although not clearly documented in the safety evaluation, the inspector verified that the use of future revisions of the standard or a different standard would result in a change to the Technical Specifications and,

therefore, would also require additional 50.59 evaluations to ensure that the change did not result in an unreviewed safety question. This item is closed.

- R8.2 (Closed) IFI No. 50-440/96003-15: The licensee identified a discrepancy in the testing of the charcoal filtration system in the control room emergency recirculation system as compared to USAR Table 6.5-1. As described in Section R8.1, the licensee evaluated this discrepancy, determined that the methodology was equivalent, and performed a change to the USAR to address this issue. This item is closed.
- R8.3 (Closed) IFI No. 50-440/96003-16: The licensee identified a discrepancy in the testing of the charcoal filtration system in the fuel handling area exhaust subsystem as compared to USAR Table 6.5-2. As described in Section R8.1, the licensee evaluated this discrepancy, determined that the methodology was equivalent, and performed a change to the USAR to address this issue. This item is closed.
- R8.4 (Closed) IFI No. 50-440/96003-17: The licensee identified a discrepancy in the testing of the charcoal filtration system in the annulus exhaust gas treatment system as compared to USAR Table 6.5-3. As described in Section R8.1, the licensee evaluated this discrepancy, determined that the methodology was equivalent, and performed a change to the USAR to address this issue. This item is closed.
- R8.5 (Closed) Licensee Event Report (LER) No. 50-440/98001-00: On May 6, 1998, the licensee's staff identified that the relay contacts for the containment ventilation exhaust radiation monitor's high alarm isolation function had not been tested since February of 1994. In accordance with its design, the alarm function results in an isolation of the containment vessel and drywell purge system. During an operator licensing class, a member of the class challenged a test question, which led to this discovery. A subsequent licensee investigation determined that the change to the surveillance testing (re. License Amendment 77 to the Technical Specification (TS) to remove response time testing) resulted in new surveillance instructions that did not adequately test the isolation function associated with each of the radiation monitor channels. Therefore, the licensee concluded that TS surveillance requirement 3.3.6.1.5 had been missed. Technical Specification 3.3.6.1.5 requires that the licensee perform an 18-month logic system functional test for the radiation monitor's high alarm function, which results in a primary containment and drywell isolation function.

The licensee completed a thorough investigation of the incident and attributed the incident to human error and inadequacies in plant system diagrams. As immediate corrective actions, the licensee tested the high alarm relay contacts associated with the radiation monitor (May 6, 1998), which properly functioned. In addition, the licensee revised applicable test surveillances and reviewed other radiation monitor logic diagrams and surveillances, which verified that a similar issue did not exist. Finally, the licensee planned to revise plant drawings to properly reflect the alarm logic.

The failure to adequately test the alarm isolation function of the containment ventilation exhaust radiation monitor on an 18 month frequency (i.e., between February 1994 and May 6, 1998) is a violation of TS 3.3.6.1.5. However, this non-repetitive, licensee-

identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-440/98017-02). This LER is closed.

R8.6 (Closed) Violation (VIO) No. 50-440/98012-01: The licensee failed to post all access points to a radiation area on the 623' elevation of the Radwaste Building with the appropriate caution signs. During this inspection, the inspector verified that the licensee had completed the following corrective actions:

- RP management discussed the event as part of ongoing continuing training and
- RP management had developed an expectation document describing peer checking of RP activities.

The inspector attended a session of the RP staff's continuing training and observed that the posting issue was thoroughly discussed. In particular, the training was interactive, and the staff provided numerous questions to the management representative (i.e., the radiation protection manager (RPM)) to ensure that expectations were well known. In addition, the inspector reviewed the document, "Peer Checking Expectations," dated September 3, 1998, which communicated management expectations to the staff, and no problems were identified. Based on inspections within the radiologically controlled area, the inspector observed proper posting of contaminated, radiation, and high radiation areas. This violation is closed.

R8.7 (Closed) VIO No. 50-440/98012-03: An individual failed to wear the proper dosimetry (i.e, a thermoluminescence dosimeter) for 12 entries into the radiologically controlled area. In addition to the immediate corrective actions documented in NRC Inspection Report No. 50-440/98012(DRS), the licensee completed the following:

- the individual performed a self-review of his error and documented his lessons learned in a memorandum to the RPM, which included corrective actions;
- RP management provided RP technician briefing expectations via a September 1, 1998, memorandum to RP personnel; and
- RP management discussed the event as part of ongoing continuing training.

As described in Section R8.6, the inspector attended a session of RP continuing training and found the training to be well conducted. The RPM adequately described the above violation and the licensee's corrective actions. The inspector observed personnel in the plant adequately wearing dosimetry, and the licensee had not identified any additional violations. This violation is closed.

V. Management Meeting

X1 Exit Meeting Summary

On September 3, 1998, the inspector presented the inspection results to licensee management. The licensee acknowledged the findings presented. Between September 4, 1998, and September 9, 1998, the RECS staff provided additional information concerning the radionuclide scaling factor calculations to the inspector (Section R1.2), which was reviewed in the Region III office. On September 17, 1998, the inspector discussed the findings of that review with Mr. J. Sipp, RECS Manager. 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

R. Collings, Perry Nuclear Services Department - Acting Director
W. Kanda, Plant Manager
M. Medakovich, Shipping Specialist
S. Sanford, Compliance Engineer
J. Sears, Radiation Protection Section Manager
J. Sipp, Radiological Environmental and Chemistry Section Manager
L. VanDerhorst, Radiation Protection Supervisor

INSPECTION PROCEDURES USED

IP 84750 Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 86750 Solid Radioactive Waste Management and Transportation of Radioactive
Materials
IP 92904 Follow-up -- Plant Support

ITEMS OPENED, CLOSED, AND DISCUSSED

OPENED

50-440/98017-01 VIC Inadequate radionuclide scaling factors used in radioactive
waste characterization (Section R1.2).
50-440/98017-02 NCV Failure to test the high alarm function of containment
ventilation exhaust radiation monitor (Section R8.5).

CLOSED

50-440/96003-14 IFI Inconsistencies in the version of charcoal testing methods
used by the licensee and documented in the USAR
(Section R8.1).
50-440/96003-15 IFI Inconsistencies in the version of charcoal testing methods
used by the licensee and documented in the USAR
(Section R8.2).
50-440/96003-16 IFI Inconsistencies in the version of charcoal testing methods
used by the licensee and documented in the USAR
(Section R8.3).
50-440/96003-17 IFI Inconsistencies in the version of charcoal testing methods
used by the licensee and documented in the USAR
(Section R8.4).

50-440/98001-00	LER	Failure to test the high alarm function of containment ventilation exhaust radiation monitor (Section R8.5).
50-440/98012-01	VIO	Inadequate posting of a radiation area (Section R8.6).
50-440/98012-03	VIO	Individual failed to wear required dosimetry (Section R8.7).
50-440/98017-02	NCV	Failure to test the high alarm function of containment ventilation exhaust radiation monitor (Section R8.5).

DISCUSSED

None.

LIST OF ACRONYMS USED

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
CR	Condition Report
DAW	Dry Active Waste
DRS	Division of Reactor Safety
IFI	Inspection Follow-up Item
IP	Inspection Procedure
IR	Inspection Report
LER	Licensee Event Report
LSA	Low Specific Activity
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
PCP	Process Control Program
PDR	Public Document Room
RCT	Radiological Controls Training
REMP	Radiological Environmental Monitoring Program
RECS	Radiological, Environmental, and Chemistry Section
RP	Radiation Protection
RPM	Radiation Protection Manager
RP&C	Radiological Protection and Chemistry
RWCU	Reactor Water Clean-up System
SCO	Surface Contaminated Object
SRT	Spent Resin Tank
TS	Technical Specification
USAR	Updated Safety Analysis Report
VIO	Violation

PARTIAL LIST OF DOCUMENTS REVIEWED

"Action Plan for Radwaste Shipping Instructions," approved by J. R. Sipp (9/2/98).

Audit Reports Nos. PA 96-12, PA 97-17, and PA 98-07.

Condition Reports (CRs) Nos. 98-1052, 98-1169, and 98-1248.

Memorandum from M. Medakovich to J. T. Sears, "10CFR61 Results," dated November 18, 1996.

Memorandum from M. Medakovich to 10CFR61 Sample File, "Analysis of the Results of the 199710CFR61 Waste Stream Samples," dated April 15, 1998.

Memorandum from J. R. Sipp to R. D. Brandt, "Qualified Shippers," dated July 7, 1997.

Potential Issues Form (PIF) No. 96-1835.

Procedures:

HPI-H0001 (Revision 5), "Radioactive Material Shipment and Receipt Surveys;"
PAP-1304 (Revision 3), "Radioactive Material Shipment Criteria;"
PCP (Revision 6), "Process Control Program;"
REMP (Revision 4), "Surface and Drinking Water Sampling;"
REMP-0018 (Revision 4), "Reporting Requirements;"
REMP-0023 (Revision 1), "Air Sample Collection;"
REMP-0024 (Revision 1), "Air Sampler Maintenance and Calibration;"
RPI-1102 (Revision 1), "10 CFR 61 Compliance Sampling Program;"
RPI-1305 (Revision 0), "Shipment of UN2910 Classified Radioactive Material;"
RPI-1306 (Revision 0), "Shipment of Low Specific Activity Radioactive Material and
Surface Contaminated Objects;"
RPI-1307 (Revision 0), "Shipment of Radioactive Material, n.o.s. and Radioactive
Material, Special Form, n.o.s.;"
RPI-1308 (Revision 0), "Packaging Radioactive Material for Shipment;" and
RPI-1309 (Revision 0), "Shipment of Radioactive Waste for Disposal."

PTS Course Description/History, Number RW 9101-000-00, "Radwaste Shipping for Surveyors/Assistants, dated July 30, 1997.