U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-440
License No:	NPF-58
Report No:	50-440/98022(DRS)
Licensee:	Centerior Service Company
Facility:	Perry Nuclear Power Plant
Location:	P. O. Box 97, A200 Perry, OH 44081
Dates:	November 2 - 6, 1998
Inspector:	Steven K. Orth, Senior Radiation Specialist Mark Mitchell, 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 50-440/98022

This announced inspection included an evaluation of the effectiveness of aspects of the chemistry and radiation protection (RP) programs. Specifically, the inspection consisted of a review of the implementation of the chemistry program, which included a review of plant water quality, instrument quality control, training, and the post accident sampling system (PASS). In addition, the inspectors reviewed the implementation of the meteorological monitoring program and the licensee's control and monitoring of personnel radiation dose. The report covers a one-week inspection concluded on November 6, 1998, performed by two radiation specialists. No violations of regulatory requirements were identified.

Plant Support

- The licensee maintained a strong commitment to reducing corrosive impurities in the reactor coolant system. Reactor coolant sulphate and chloride concentrations were maintained at levels which were well below the industry averages. In addition, the chemistry staff performed thorough evaluations of chemistry trends and of the levels of zinc in the reactor coolant system to reduce radiological source term. The inspectors also noted effective teamwork in the licensee's detection and evaluation of fuel integrity indications. (Section R1.1)

- The licensee maintained aggressive control and monitoring of accumulated personnel dose. For example, the RP staff prepared monthly ALARA reports which documented each plant department's dose performance and compared that performance to established goals. For 1998, the licensee's annual dose performance was projected to be one of the lowest in the industry for boiling water reactors. (Section R1.2)

- The chemistry staff implemented a sound quality control (QC) program for laboratory instruments. The inspectors found that instrument performance tests were properly performed and that control chart data generally demonstrated only statistical variations in instrument performance. As a result of recent audit and assessment findings, the chemistry staff had also taken actions to improve QC practices concerning certain instrument calibrations and overview of long-term instrument performance trends. (Section R2.1)

- The licensee maintained the PASS as required by station procedures. Quality control results for 1997 demonstrated that the system was obtaining representative liquid samples. Although the testing results were not acceptable for 1998, the licensee was taking actions to resolve testing problems and system operability issues. In addition, the licensee provided PASS training to chemistry technicians which was comprehensive and included an evaluation of technician performance. (Section R2.2)

- The Radiological, Environmental, and Chemistry Section staff performed effective monitoring of system operability for the meteorological tower instrumentation. The calibrations and surveillances for the meteorological tower were properly performed, and

the licensee properly maintained the monitoring instrumentation. The licensee thoroughly reviewed an issue related to the vendor's instrument calibration practices. (Section R2.3)

- Chemistry technicians demonstrated effective analytical techniques and procedure adherence. For example, the technicians took steps to ensure that samples were not cross-contaminated. With some minor exceptions, the inspectors observed proper contamination control practices and surveys of radioactive samples. (Section R4.1)

- The inspectors observed some problems concerning the content of chemistry procedures. For example, a note in the routine chemistry sampling procedure contained directions which the staff was not fully implementing. Although the chemistry staff was attempting to correct these issues and had performed a complete review of the department's procedures, the staff had not identified the above problem, which indicated a lack of rigor in the initial reviews. (Section R4.1)

- During chemistry training, the inspectors observed good interaction between the participants and effective communication of training materials. The instructor was technically knowledgeable of the procedure, presented the material in an orderly fashion, and encouraged participation by the trainee. (Section R5.1)

- Audits of the chemistry program were performed in good depth, and the staff was taking aggressive actions to correct problems identified. For example, chemistry management was increasing the line organization's involvement in the self assessment program and the supervisory staff's review of QC data results. Generally, the inspectors found that the chemistry staff had taken appropriate actions to correct issues identified in condition reports. (Section R7.1)

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Plant Water Chemistry Control

a. Inspection Scope (IP 84750)

The inspectors reviewed the licensee's control and mitigation of chemical contaminants in plant cooling systems, which contribute to corrosion of reactor vessel and plant piping systems. Specifically, the inspectors reviewed the levels of impurities in the reactor coolant, feedwater, and condensate during 1998. The inspectors also verified the licensee's implementation of procedure RPI-1103 (Revision 2), "Chemistry Analysis and Rounds Log."

b. Observations and Findings

The licensee maintained a strong commitment to minimizing corrosive impurities in the reactor coolant system (RCS). Procedure RPI-1103 contained administrative action levels at concentrations of impurities that were consistent with current industry guidance. The inspectors also reviewed the licensee's chemistry trends for January through October of 1998 and noted that the levels of impurities in the RCS were maintained at a minimum. For example, the concentration of chloride and sulfate in the RCS were maintained within ranges of 0.2 - 0.4 parts per billion (ppb) and 0.5 - 1.5 ppb, respectively, and were often near or below the licensee's lower limits of detection. Feedwater iron concentrations ranged from 0.2 to 0.8 ppb, which was consistent with top industry performance. The chemistry staff maintained monthly reports of system parameters, which contained clear documentation of adverse trends in chemistry parameters and actions taken to correct any problems.

The licensee also trended radiochemical parameters in the RCS. Based on these trends, the licensee noted that the concentrations of activation products in the coolant system (e.g., cobalt-60 (soluble and insoluble)), appeared higher than the levels found in other U.S. boiling water reactors. Consequently, the chemistry staff performed a zinc addition optimization study to address this trend and, consequently, increased the level of zinc in the reactor coolant system to 10 ppb. The inspectors reviewed the licensee's study, found the licensee's method to be well thought-out, and determined that the data supported the licensee's increased concentration range. Based on this increase, the chemistry staff anticipated a notable decrease in the RCS activation product inventory.

On October 28, 1998, the licensee also identified a potential fuel integrity issue. Specifically, the operations staff identified a slight increase in the offgas radiation monitor response level. The chemistry staff performed grab samples of the offgas system which confirmed the rise in offgas activity. Based on the increases in the offgas levels, RCS radiochemistry, and offgas radiochemistry, the licensee predicted the presence of a small leak in a fuel element. The inspectors reviewed the data and

confirmed that the licensee was operating within its Technical Specifications (TS) limits and that no discernable increase was observed in its radioactive effluents. The inspectors also attended team meetings, which the licensee had conducted to prepare for fuel testing, and observed strong teamwork and coordination between the licensee's chemistry, operations, engineering, and work planning staffs.

c. Conclusions

The licensee maintained a strong commitment to reducing corrosive impurities in the RCS. Reactor coolant sulphate and chloride concentrations were maintained at levels which were well below the industry averages. In addition, the chemistry staff performed thorough evaluations of chemistry trends and of the levels of zinc in the reactor coolant system to reduce radiological source term. The inspectors also noted effective teamwork in the licensee's detection and evaluation of fuel integrity indications.

R1.2 Control of Cumulative Personnel Dose (IP 83750)

The inspectors reviewed the radiation protection (RP) staff's monitoring of department doses and the current personnel dose for 1998. The licensee established monthly dose goals for each department and documented the department's performance in monthly ALARA [as-low-as-is-reasonably-achievable] reports. The inspectors reviewed the May 1998 through October 1998 monthly reports and observed good documentation of dose performance. Generally, the monthly doses were within the licensee's original estimates. In cases when departments exceeded their monthly goals, the RP staff documented the reason(s) for exceeding the dose goal and any actions taken to improve performance, as applicable. At the time of this inspection, the licensee had accrued about 34 person-rem of dose for the year and projected that the annual dose total would be less than the original goal of 67 person-rem (50 person-rem (operational) + 17 person-rem (outage)). Based on the current performance, the RP staff projected that the 1998 personnel dose would be the lowest in its history and one of the lowest in the industry for boiling water reactors.

R2 Status of RP&C Facilities and Equipment

R2.1 Quality Control of Chemistry Instruments

a. Inspection Scope (IP 84750)

The inspectors reviewed the licensee's quality control (QC) program for laboratory and in-line chemistry instrumentation including instrument control charts and calibrations, interlaboratory and intralaboratory sample analyses, and control of chemistry standards and reagents. The inspectors also discussed laboratory practices with the chemistry staff and verified the licensee's implementation of procedure REC-0103 (Revision 0), "Chemistry Unit Quality Control Program."

b. Observations and Findings

The chemistry staff implemented a QC program that was consistent with industry guidance and NRC Regulatory Guides 1.21 and 4.15. The staff performed instrument calibrations, efficiency tests, and performance tests at the frequency described in the above procedure. As a result of recent audits and assessments (Section R7.1), the chemistry staff was in the process of revising certain instrument calibration practices and improving the oversight and review of QC data. For example, the staff planned to increase the calibration frequency for the high purity germanium and ultraviolet-visible spectrophotometers. In addition, the staff had increased its focus on reviewing long-term trends in instrument performance. Based on the planned changes and the licensee's current instrument calibration methods, the inspectors observed that the licensee's methods were consistent with acceptable analytical practices.

The inspectors observed chemistry technicians performing QC tests and entering the test results into a computerized data analysis system. The system provided automatic detection of results which exceeded the licensee's acceptance criteria, the ability to graphically represent the results, and the ability to identify any long-term biases in instrument performance (i.e., non-statistical performance). Routinely, the performance tests were performed twice during each shift or each day, as applicable. As provided by procedure REC-0103, the chemistry technicians were directed to take corrective actions when performance test results exceeded action levels (i.e., ± 2 and 3 standard deviations from a mean/prepared concentration). The inspectors reviewed performance test data which exceeded these action levels and verified that appropriate actions were taken prior to the analysis of plant samples. In addition, the licensee reviewed previous sample results to ensure their validity. With some minor exceptions, the inspectors found the instrument performance test data to demonstrate expected variations about the mean value.

The chemistry staff implemented interlaboratory and intralaboratory analysis programs to ensure the accuracy of instruments and technicians, respectively. In these programs, the chemistry staff analyzed samples prepared by a vendor laboratory. The chemistry staff performed the analysis required by procedure REC-0103 and performed corrective actions for results which were not in agreement. The staff's performance in these programs was very good, as evidenced by the level of agreement between the laboratory results and the known concentrations/ activities. The chemistry staff maintained a database of the relative standard deviation for each analysis, which indicated that the staff's precision had increased over the years. However, the inspectors identified some notable data errors within the database, which indicated some lack of thoroughness in the staff's review of the data. The RECS manager acknowledged the inspectors' observations and indicated that the errors would be corrected and that improvements were continuing in the staff's review of QC data and trends.

c. Conclusions

The chemistry staff implemented a sound QC program for laboratory instruments. The inspectors found that instrument performance tests were properly performed and that

control chart data generally demonstrated only statistical variations in instrument performance. As a result of recent audit and assessment findings, the chemistry staff had also taken actions to improve QC practices concerning certain instrument calibrations and overview of long-term instrument performance trends.

R2.2 Post Accident Sampling System (PASS) Quality Control and Operability

a. Inspection Scope (IP 84750)

The inspectors reviewed the operability and testing of the PASS. As part of this review, the inspectors reviewed the material condition of the sampling panels and reviewed QC test results. The inspectors also reviewed chemistry technician training records, concerning PASS instructions, and verified the licensee's implementation of procedure PAP-1118 (Revision 0), "Post Accident Sampling System."

b. Observations and Findings

The licensee performed semi-annual QC testing of the PASS, as required by procedure PAP-1118. During these tests, the licensee obtained liquid samples at routine sample points and at the PASS panel and compared the gamma spectroscopy analyses of the samples. If the results differed by more than a factor of two, the procedure required the chemistry staff to investigate the disagreement. For gaseous samples, the licensee demonstrated that a sample was able to be obtained from each of the sample points. However, the lack of radioactivity within these samples precluded the ability to compare the PASS samples to grab samples.

During the last half of 1997 (September and October of 1997), the chemistry staff performed the above QC tests, as required, and observed good comparisons between the PASS and routine grab samples. However, in the first half of 1998, the PASS and grab sample results did not compare within a factor of two for the suppression pool sample (i.e., the comparisons ranged from a factor of 2 to 10). Since the licensee attributed the unacceptable results to the grab sampling method and to the adequacy of the isotopes compared, the licensee initiated a condition report (CR) (No. 98-1475) to investigate these issues. In addition, the reactor water cleanup (RWCU) inlet and reactor recirculation system PASS sample results were not valid due to a dilution problem. Specifically, leakage of a solenoid valve (associated with the RWCU outlet sample) was diluting PASS samples from these sample points. Although the solenoid valve had been replaced in December of 1997, the licensee detected leakage during the post maintenance testing. Due to scheduling problems, the repair of the valve had been delayed but was scheduled for November of 1998. However, the licensee indicated that the leakage only affected testing of the system. In an accident condition, the RWCU outlet sample point would be fully isolated from the PASS panel. Consequently, the solenoid valve leakage would not be an issue, and the other sample points would be valid (i.e., not diluted). Although the licensee indicated that the potential for additional problems was very low, the inability to test the RWCU inlet and reactor recirculation sample points reduced the licensee ability to ensure the integrity of these sample points.

The licensee's actions to resolve the problems associated with the suppression pool sample comparison and with the testing of the RWCU inlet and reactor recirculation sample points will be reviewed in future RP&C inspections (IFI No. 50-440/98022-01).

The inspectors also reviewed the training of chemistry technicians on the PASS system. As required by procedure PAP-1118, the licensee performed training on the PASS twice during each calendar year. During this training, the chemistry staff evaluated each chemistry technician as he/she performed the sampling procedures (i.e., in two-person teams). In addition, the chemistry technicians were instructed on the principles of the PASS, NUREG-0737 commitments, and other related topics. The inspectors noted that the training was comprehensive and provided a good review of the system. In addition, the licensee's training records for the previous two training sessions were also complete.

c. Conclusions

The licensee maintained the PASS as required by station procedures. Quality control results for 1997 demonstrated that the system was obtaining representative liquid samples. Although the testing results were not acceptable for 1998, the licensee was taking actions to resolve testing problems and system operability issues. In addition, the licensee provided PASS training to chemistry technicians which was comprehensive and included an evaluation of technician performance.

R2.3 Maintenance and Quality Control of Meteorological Monitoring Instrumentation

a. Inspection Scope (IP 84750)

The inspectors reviewed the operability of the meteorological instrumentation located on the meteorology tower. Specifically, the inspectors reviewed trends of instrument performance, instrument calibration records, and preventive maintenance surveillances; discussed instrument performance with members of the staff; and performed a walk-down of the meteorological tower and related instrumentation.

b. Observations and Findings

The licensee maintained a meteorological tower to provide weather information for the purpose of offsite dose projections and emergency response actions. The meteorological tower consisted of instrumentation to measure the wind speed, wind direction, temperature, dew point, and precipitation. Dual instrumentation was available at each level (10 meters (m) and 60 m) on the tower. In addition, the licensee had a third set of wind direction, speed and temperature instruments at the 10 m level.

The inspectors observed the condition of the meteorological tower and did not identify any discernable material condition issues. Although replacement parts for the electronic and computer equipment were difficult to obtain (as a result of the age of the components), the staff maintained an excellent level of availability. On a monthly basis, a member of the RECS department performed validation tests to determine the operability of the meteorological instrumentation and generated a summary report. Based on the results of these monthly tests, the availability (i.e., recoverable data hours)

for meteorological tower instrumentation (i.e., for wind speed, wind direction, and temperature indication) was generally greater than 90 percent. In cases when the availability was less than 90 percent, the environmental technician ensured that corrective actions were taken. For 1997, the inspectors noted that the annual data recovery was greater than 90 percent for all instruments. For the first three quarters of 1998, the monthly data recovery was greater than 95 percent for 8 months and 90 percent for the remaining month. In 1998, the precipitation instrument was not operational for the summer months. Consequently, the licensee relied on manual precipitation collectors.

System engineering representatives indicated that a design modification was in progress to upgrade the data recorders and tower instruments and to provide a new housing for the data collection systems . The purpose of the project was to improve the reliability of the system and to ensure that replacement parts and equipment were available in the future. In addition, the current system was incapable of functioning in the year 2000. Due to a contractual problem, the project was delayed; however, the system engineering staff anticipated the upgrade to be completed in April of 1999.

The licensee properly calibrated and tested the meteorological tower instrumentation, as required. At a 6-month frequency, the licensee performed a calibration of each of the instruments or returned the instruments to a vendor for calibration. The inspectors reviewed the quarterly surveillance data (performed from October of 1996 to September of 1998) and did not identify any problems. The inspectors noted that equipment response variations were properly corrected and that the equipment was returned to operation. For example, on multiple occasions, the equipment was found outside the "leave as is" limit but within the acceptable range, and the staff pursued the cause and successfully corrected the matter.

During the most recent audit of the vendor, the licensee initiated CR No. 98-2136 to identify problems with an aspect of the vendor's quality assurance program. Specifically, the vendor's quality assurance manual stated that wind speed standards would be calibrated by NIST (National Institute of Standards and Technology) every 48 months. However, the vendor was not meeting this internal commitment. The inspectors reviewed the CR and found the licensee's actions to be appropriate. For example, the licensee limited further calibrations by the vendor pending the vendor's demonstration of compliance with its quality assurance procedures. In addition, the licensee reviewed previous calibration data to ensure that the instruments were properly calibrated.

c. Conclusions

The RECS staff performed effective monitoring of system operability for the meteorological tower instrumentation. The calibrations and surveillances for the meteorological tower were properly performed, and the licensee properly maintained the monitoring instrumentation. The licensee thoroughly reviewed an issue related to the vendor's instrument calibration practices.

R4 Staff Knowledge and Performance in RP&C

R4.1 Chemistry Sampling Observations

a. Inspection Scope (IP 84750)

The inspectors observed chemistry technicians obtaining offgas and reactor coolant samples and performing associated chemical analyses. The inspectors verified that the technicians properly implemented the following procedures:

a. CHI-0005 (Revision 0), "Miscellaneous Sampling Rounds;"
b. SOI-D17A (Revision 3), "Process Radiation Monitor System (Unit 1);" and
c. SOI-P35 (Revision 2), "Reactor Plant Sampling."

b. Observations and Findings

The inspectors observed two chemistry technicians obtaining samples from the offgas system and RCS. The technicians demonstrated effective analytical techniques and procedure adherence. The inspectors noted that the technician performing the offgas sample performed the evolutions with the applicable procedure in-hand and properly implemented the procedure requirements. Consistent with the above procedures, the technicians purged the sample lines to ensure a representative sample was obtained and were aware of the purge times and their basis. In the case of the reactor coolant sample, the technician pre-rinsed the sample container to reduce the potential for cross contamination.

The technicians also demonstrated good radiological practices, with some minor exceptions. The inspectors noted that both technicians used a survey instrument to monitor radiation levels in the area and of the samples. Generally, the technicians properly donned applicable protective clothing to reduce the potential for the spread of contamination. However, the technician obtaining the offgas sample was not always consistent in his use of protective clothing (i.e., gloves) and in his handling of the potentially contaminated sample vial. For example, the technician wore gloves when handling the sample vial but did not remove his gloves before touching the clean surface of the sampling tool. As the technician self-identified this, he performed a complete contamination survey of the tool. In addition, the technician placed the potentially contaminated sample on clean surfaces of the laboratory, before performing a contamination survey of the vial, which later indicated that no external contamination was present. Although the sample vial represented only a very slight potential for contamination, the inspectors' observations indicated a lack of consistency in the treatment of the sample. The RECS manager acknowledged the inspectors' observations and indicated that the sample area was later decontaminated and that the contaminated area posting was removed. In addition, the RECS manager planned to provide additional instructions to the technicians.

However, the inspectors observed some problems concerning the content of the above procedures. For example, step 5.1.3 of procedure SOI-P35 referred the user to an incorrect procedure. In addition, procedure CHI-0005, which was the intended

reference, contained a note that the technicians were not fully implementing. Specifically, a note to step 5.3.2 instructed the user to overflow the container by approximately five volumes, when obtaining a liquid grab sample for conductivity or pH measurements. During the RCS sampling, the inspectors did not observe this action. The technician indicated that the staff determined that the potential for the spread of contamination outweighed the insignificant analytical variances from not overflowing the container. Although the note did not constitute a procedure requirement, the staff acknowledged that the note should be consistent with the desired practice. In addition, the chemistry supervisor indicated that the licensee's procedure format guide prohibited the direction of actions via notes. As noted in Section R7.2, the licensee had issued a CR concerning inconsistencies in procedures. Although the licensee had performed reviews of these procedures as corrective actions for the CR, the inspectors noted that the licensee had not identified the specific problems described above. In the case of procedure SOI-P35, the licensee had identified another issue which resulted in a complete review/revision to the procedure (in progress). Within the scope of the revision process, the chemistry staff had also identified the above problem. However, the licensee's review of procedure CHI-005 did not result in the need for any further review or revision. The inspectors discussed these observations with the RECS manager, which indicated a lack of thoroughness in the licensee's initial procedure reviews. The RECS manager acknowledged the inspectors' observations and planned to conduct an additional audit of the reviewed procedures to determine the extent of the problem.

c. Conclusions

Chemistry technicians demonstrated effective analytical techniques and procedure adherence. For example, the technicians took steps to ensure that samples were not cross-contaminated. With some minor exceptions, the inspectors observed proper contamination control practices and surveys of radioactive samples.

The inspectors observed some problems concerning the content of chemistry procedures. For example, a note in the routine chemistry sampling procedure contained directions which the staff was not fully implementing. Although the chemistry staff was attempting to correct these issues and had performed a complete review of the department's procedures, the staff had not identified the above problem, which indicated a lack of rigor in the initial reviews.

R5 Staff Training and Qualification in Radiation Protection & Chemistry

R5.1 Chemistry Technician Training Observation (IP 84750)

The inspectors observed a chemistry technician training session concerning the high purity germanium (HPGe) detectors. The inspectors verified that the trainer (a qualified chemistry technician) and the trainee properly implemented the required procedures for use of the HPGe detectors (Procedure RPI-1313, Operation of the Gamma Spectroscopy System). The instructor was technically knowledgeable of the procedure, presented the material in an orderly fashion, and encouraged participation of the technician. During the training, the inspectors noted good interaction between the

instructor and the trainee. For example, the technician asked questions that clarified his understanding of the system, quality assurance documents, and the procedure. However, the inspectors noted that the use of "flags" in the QC software was not specifically demonstrated during the training and procedure. Although the instructor indicated that "flags" alerted the user to various procedural limits, the instructor was not able to demonstrate the appearance of these "flags" to the trainee, which would have ensured the trainee's understanding. This matter was discussed with the instructor who acknowledged the inspectors' comments and planned to include a demonstration in future training sessions.

R7 Quality Assurance in RP&C

R7.1 Quality Assurance Audits and Self-Assessments

a. Inspection Scope (IP 84750)

The inspectors reviewed the licensee's self assessments of the chemistry program. The inspectors 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. In addition, the inspectors reviewed the RECS staff's actions concerning CRs initiated in the chemistry area.

b. Observations and Findings

The inspectors reviewed the 1997 audit of the chemistry area, which was performed by the quality assurance department. The audit was comprehensive and focused on several areas of the chemistry program, including plant water chemistry control, technician performance observations, the chemical control program, and laboratory QC. Overall, the auditors concluded that the chemistry program was properly implemented. However, some problems were identified concerning supervisory oversight of QC test results and the RECS staff's lack of self-assessment activities. In response to the audit, the RECS staff performed a self assessment in February of 1998 and requested an industry peer group audit (March of 1998). The assessments confirmed the findings of the 1997 audit and identified additional areas in need of improvements. During this inspection, the inspectors reviewed these areas and found that RECS staff was implementing the recommended actions (Section R2.1). In addition, the RECS staff planned to increase chemistry technician involvement in the self assessment process. Specifically, the chemistry operations lead was assigning one chemistry technician each month to perform 8 hours of self assessment activities. The chemistry supervisor indicated that additional programmatic self assessment initiatives were also under review.

The inspectors also reviewed CRs concerning the chemistry department to assess the organization's corrective actions and to identify any repetitive problems. The inspectors found the RECS investigations to be performed in a timely manner, and corrective actions appeared to address the issues. Based on the issues identified, the inspectors

did not identify any repetitive problems or inadequate corrective actions. However, the inspectors did identify a problem concerning the licensee's actions to address procedure content problems (Section R4.1), which was being reviewed by the RECS staff.

c. Conclusions

Audits of the chemistry program were performed in good depth, and the chemistry staff was taking aggressive actions to correct problems identified. For example, chemistry management was increasing the line organization's involvement in the self assessment program and the supervisory staff's review of QC data results. Generally, the inspectors found that the chemistry staff had taken appropriate actions to correct issues identified in CRs.

R8 Miscellaneous RP&C Issues (IP 92904)

R8.1 (Open) Violation No. 50-440/98017-01: The RECS staff performed an inadequate evaluation of the radionuclide scaling factors used to determine the activities of the non-gamma emitting radionuclides contained in four radioactive shipments. In addition to the corrective actions documented in NRC Inspection Report No. 50-440/98017(DRS), the licensee had completed its apparent cause investigation (CR No. 98-1890) and developed comprehensive corrective actions, which included the following:

- Revise procedure RPI-1102, "10 CFR 61 Compliance Sampling Program," to provide more quantitative tools for evaluating data;
- Review the CR for lessons learned and stress aggressive self-checking with Radwaste shipping personnel [completed];
- Develop a method for additional reviews of radioactive waste shipping data base information;
- Repair and correct the scaling factor data base and shipment data base [completed];
- Send revised waste manifests to the applicable radioactive waste burial site and processors [completed];
- Develop a method to train and qualify additional personnel in 10 CFR Part 61 and radioactive waste/radioactive material shipping;
- Establish a method for an initial and periodic industry peer reviews of the radioactive waste shipping program; and
- Review staffing levels in radioactive waste staff.

The inspectors verified that the licensee had completed the corrective actions (noted above). In addition, the RECS staff also discussed the ongoing revision to procedure RPI-1102 with the inspectors, which included added guidance in reviewing 10 CFR Part

61 sample results and in resolving data discrepancies. The licensee's progress in the above long-term corrective actions will continue to be reviewed in future NRC inspections.

R8.2 (Retracted) Non-Cited Violation No. 50-440/98017-02: Failure to test the high alarm function of containment ventilation exhaust radiation monitor (Licensee Event Report No. 50-440/98001). The NRC reviewed this issue in NRC Inspection Reports Nos. 50-440/98010(DRP) and 50-440/98017(DRS) and characterized the failure as a non-cited violation in both NRC inspection reports (i.e., NCV Nos. 50-440/98010-05 and 50-440/98017-02). As a result of this error, the above duplicate item is retracted.

V. Management Meeting

X1 Exit Meeting Summary

On November 6, 1998, 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

J. Balstad, Environmental Technician
H. Bergendahl, Director, Perry Nuclear Services Department
R. Collings, Quality Assurance Manager
M. Doty, Chemistry Supervisor
G. Fobell, Engineering Specialist
G. Garrett, Hardware Supervisor
E. Gordon, Radiation Protection Operations Supervisor
T. Henderson, Compliance Supervisor
W. Kanda, Plant Manager
M. Kehn, Chemistry Technician
P. Lashley, Engineering Specialist
S. Lee, Radiation Protection Programs Supervisor
B. Luthanen, Compliance Engineer
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R. Matthys, Supervisor of Assessments, Quality Assurance
A. McGowan, Chemistry Technician
M. Medakovich, Shipping Specialist
J. Sears, Radiation Protection Section Manager
R. Schrauder, Director, Plant Nuclear Engineering Department
A. Schwenk, Radwaste Operations Supervisor
J. Sipp, Radiological Environmental and Chemistry Section Manager

INSPECTION PROCEDURES USED

IP 83750	Occupational Radiation Exposure
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

50-440/98022-01	IFI	Licensee to evaluate PASS QC acceptance criteria and resolve dilution problem concerning the RWCU inlet and reactor recirculation system sample points (Section R2.2).

CLOSED

None.

DISCUSSED

50-440/98017-01	VIO	Inadequate radionuclide scaling factors used in radioactive waste characterization (Section R8.1).
50-440/98017-02	NCV	Failure to test the high alarm function of containment ventilation exhaust radiation monitor (Section R8.2).

LIST OF ACRONYMS USED

ALARA	As-Low-As-Is-Reasonably-Achievable
CFR	Code of Federal Regulations
CR	Condition Report
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
HPGE	High Purity Germanium Detector
IFI	Inspection Follow-up Item
IP	Inspection Procedure
IR	Inspection Report
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
PASS	Post Accident Sampling System
PDR	Public Document Room
PPB	Parts Per Billion
QC	Quality Control
RCS	Reactor Coolant System
RECS	Radiological, Environmental, and Chemistry Section
RP	Radiation Protection
RPM	Radiation Protection Manager
RP&C	Radiological Protection and Chemistry
RWCU	Reactor Water Cleanup System
TS	Technical Specification
VIO	Violation

PARTIAL LIST OF DOCUMENTS REVIEWED

Audit Report No. PA-97-07, "Chemistry," dated June 2, 1997.

Chemistry Unit Self-Assessment No. 063-REC-98, dated March 23, 1998.

Condition Reports (CRs) Nos. 98-0233, 98-1085, 98-1113, 98-1475, 98-1883, 98-1889, 98-1890,

In-Depth Review Checklist for procedure CHI-005 (Revision 0), dated October 19, 1998.

In-Depth Review Checklist for procedure SOI-P35 (Revision 3), dated April 27, 1998.

Perry Nuclear Power Plant Monthly ALARA Reports for May 1998 through October 1998.

Procedures:

CHI-0005 (Revision 0), "Miscellaneous Sampling Rounds;"
PAP-1118 (Revision 0), "Post Accident Sampling Program;"
REC-0103 (Revision 0), "Chemistry Unit Analytical Quality Control Program;"
RPI-1103 (Revision 2), "Chemistry Analysis and Round Logs;"
RPI-1313 (Revision 2), "Operation of the Gamma Spectroscopy System"
SOI-D17A (Revision 3), "Process Radiation Monitor System (Unit 1);" and
SOI-P35 (Revision 2), "Reactor Plant Sampling."

PTS Lesson Plan No. CHC 4200-1998-11, "Chemistry Continuing Training, dated August 6, 1998.

Surveillances:

SVI-D51-T0309-A (Revision 4), "Meteorological Monitoring 10 Meter Primary Wind Speed Channel Calibration for D51-N700", performed between October 1996 and September 1998.

SVI-D51-T0309-B (Revision 4), "Meteorological Monitoring 10 Meter Validity Wind Speed Channel Calibration for D51-N701", performed between October 1996 and September 1998.

SVI-D51-T0309-C (Revision 4), "Meteorological Monitoring 60 Meter Primary Wind Speed Channel Calibration for D51-N702", performed between October 1996 and September 1998.

SVI-D51-T0309-D (Revision 4), "Meteorological Monitoring 60 Meter Validity Wind Speed Channel Calibration for D51-N761", performed between October 1996 and September 1998.

SVI-D51-T0309-E (Revision 4), "Meteorological Monitoring 10 Meter Backup Wind Speed Channel Calibration for D51-N721", performed between October 1996 and September 1998.

SVI-D51-T0309-F (Revision 4), "Meteorological Monitoring 10 Meter Validity Backup Wind Speed channel Calibration for D51-N722", performed between October 1996 and September 1998.

SVI-D51-T0310-A (Revision 4), "Meteorological Monitoring 10 Meter Primary Wind Direction Channel Calibration for D51-N703", performed between October 1996 and September 1998.

SVI-D51-T0310-B (Revision 4), "Meteorological Monitoring 10 Meter Validity Wind Direction Meteorological Monitoring 10 Meter Primary Wind Speed channel Calibration for D51-N7 Channel Calibration for D51-N704", performed between October 1996 and September 1998.

SVI-D51-T0310-C (Revision 4), "Meteorological Monitoring 60 Meter Primary Wind Direction Channel Calibration for D51-N705", performed between October 1996 and September 1998.

SVI-D51-T0310-D (Revision 4), "Meteorological Monitoring 60 Meter Validity Wind Direction Channel Calibration for D51-N762", performed between October 1996 and September 1998.

SVI-D51-T0310-E (Revision 4), "Meteorological Monitoring 10 Meter Primary Backup Wind Direction Channel Calibration for D51-N723", performed between October 1996 and September 1998.

SVI-D51-T0310-F (Revision 4), "Meteorological Monitoring 10 Meter Validity Backup Wind Direction Calibration for D51-N760", performed between October 1996 and September 1998.

SVI-D51-T0317-A (Revision 3), "Meteorological Monitoring Primary Air Temperature and Delta Air Temperature Calibration for D51-N706 and D51-N708", performed between October 1996 and September 1998.

SVI-D51-T0317-B (Revision 3), "Meteorological Monitoring Validity Air Temperature and Delta Air Temperature Calibration for D51-N707 and D51-N709", performed between October 1996 and September 1998.