

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports Nos. 50-254/92013(DRSS); 50-265/92013(DRSS)

Docket Nos. 50-254; 50-265

License Nos. DPR-29; DPR-30

Licensee: Commonwealth Edison Company
1400 Opus Place
Downers Grove, IL 60515

Facility Name: Quad Cities Nuclear Generating Station, Units 1
and 2

Inspection At: Quad Cities Site, Cordova, Illinois

Inspection Conducted: May 4 - 7, 1992

A. G. Januska
Inspectors: A. G. Januska

5/14/92
Date

S. K. Orth
S. K. Orth

5-14-92
Date

A. G. Januska for
Approved By: M. C. Schumacher, Chief
Radiological Controls and
Chemistry Section

5/14/92
Date

Inspection Summary

Inspection on May 4 - 7, 1992 (Report Nos. 50-254/92013(DRSS);
50-265/92013(DRSS))

Areas Inspected: Routine unannounced inspection of the chemistry program including: (1) reactor systems water quality control programs (IP 84750), (2) quality assurance/quality control program in the laboratory (IP 84750), and (3) nonradiological confirmatory measurements (IP 84750); the Radiological Environmental Monitoring Program (REMP) (IP 84750); and the review of open items from a previous inspection (IP 84750).

Results: The licensee's water quality control program conforms to the EPRI BWR Owners Group Guidelines. The nonradiological confirmatory measurements results were very good. The licensee continues to maintain a very good quality control program. One noncited violation for missing a Technical Specification (TS) functional test requirement was reviewed (Section 7).

DETAILS

1. Persons Contacted

- ¹R. Bax, Station Manager
- ^{1,2}D. Kanakares, Regulatory Assurance NRC Coordinator
- ¹A. Misak, Regulatory Assurance Supervisor
- ¹T. O'Leary, Nuclear Quality Programs
 - K. Simpson, Chemistry
 - M. Hesse, Chemistry
 - ¹M. Stuhlman, Chemistry
- ¹C. Smith, Nuclear Quality Programs Superintendent
- ¹G. Tietz, Technical Superintendent
- ¹R. Wiebenga, Chemistry

¹P. Prescott, Resident Inspector, NRC

¹Present at the Exit Meeting on May 7, 1992

²Telephone conversation on May 8, 1992

2. Licensee Action on Previous Inspection Findings (IP 84750)

(Open) Open Item (50-254/91009-02; 50-265/91009-02):
Licensee to devise a standardized procedure for evaluating trend charts including such aspects as the reviewing frequency, evaluation guidance, and appropriate actions. The licensee had since added computer software to manipulate and trend the performance data for proportional counters and is testing methods for evaluating and responding to poor performance trends. The licensee had not formally adopted a system of performance trend evaluation.

(Open) Open Item (50-254/91009-03; 50-265/91009-03):
Upgrade of Post Accident Sampling System (PASS) maintenance. The licensee has prioritized PASS components to better ensure PASS reliability. The manufacturer was contracted to provide assistance in problem identification and correction. The Chemistry Supervisor had placed the PASS on a watch list to ensure prompt attention for PASS maintenance. The effectiveness of these improvements will be reviewed in a subsequent inspection.

3. Water Chemistry Control Program (IP 84750)

The inspectors reviewed the water chemistry control program. The operational chemistry limits and action levels were consistent with, and in some cases more restrictive than the EPRI BWR Owners Group Guidelines. Chemistry parameters were reviewed by laboratory personnel and trend plotted. Trend charts were available for tracking various reactor and

cleanup water parameters. The inspectors reviewed selected trend charts and supporting data which indicated that except for excursions during significant power changes, chemistry values were usually lower than the EPRI achievable values. When action level values were exceeded, the licensee made appropriate reviews and took necessary actions.

No violations or deviations were identified.

4. Confirmatory Measurements (IP 84750)

The inspectors submitted chemistry samples to the licensee for analyses as part of a program to evaluate the laboratory's capabilities to monitor nonradiological chemistry parameters in various plant systems with respect to regulatory and administrative requirements. These samples had been prepared, standardized, and verified for the NRC by the Analytical Chemistry Division of Oak Ridge National Laboratory (ORNL). The samples were analyzed by the licensee using routine methods and equipment.

Three appropriate dilutions were made on each vial by licensee personnel, and analyses were performed at concentrations within the ranges normally used by the laboratory. A single analysis was performed on each dilution in a manner similar to that of routine samples. The results are presented in Table 1 which also contains the criteria for comparison. These criteria are based on ORNL analyses of the standards and on the relative standard deviations (RSD) derived from the results of the plants participating in the 1986 interlaboratory comparisons (Table 2.1, NUREG/CR-5422). The acceptance criteria were defined as follows: the licensee's value should be within 2 Standard Deviations (SD) of the ORNL value for an agreement and between 2 and 3 SD for a qualified agreement. A qualified agreement may indicate a bias in the assay.

The licensee analyzed six analytes at three concentrations and one analyte at two concentrations. All of the licensee's analyses were in agreement. Chemistry personnel who performed the dilutions and analyses used good laboratory techniques.

A dilute reactor coolant sample was spiked with an aliquot of the low concentration anions and analyzed by the licensee. A portion of this sample will also be analyzed by Oak Ridge National Laboratory and the results compared. (Inspection Followup Item 50-254/92013-01; 50-265/92013-01)

No violations or deviations were identified.

5. Implementation of the QA/QC Program in the Laboratory (IP 84750)

The inspectors reviewed the chemistry QA/QC program as defined by "Nuclear Stations Chemistry Quality Control Program Manual", Revision 10, dated December 31, 1991. The licensee had control charts, independent controls and multiple point calibration curves. The licensee maintained both quality control trends and maintenance logs for each laboratory instrument. The licensee conducted performance tests with an independent control both at the start and completion of all analyses. Passing these tests required the instruments to respond within two standard deviations from the mean value. Chemistry staff and management reviewed these trend charts daily and about three times a week, respectively. Trend charts reviewed showed random scatter within the control limits. Any biases noted were properly detected, and control bands and/or calibrations were adjusted accordingly. All maintenance and calibrations were appropriately entered into instrument logs.

The inspectors discussed the instrument calibrations with the licensee. The licensee calibrated the atomic absorption spectrophotometer (AA), ultraviolet-visible spectrophotometer (UV-Vis), and the ion chromatograph (IC) on a prior to use, biannual, and weekly frequency, respectively. The instruments were also properly calibrated when biases were detected in performance trends.

The licensee participated in interlaboratory comparison programs administered by a vendor and by the Commonwealth Edison Company. The licensee plotted their results to indicate any trends which were present. The inspectors reviewed results of the licensee's performance. Overall, the licensee's results were good.

Overall, the quality control of the laboratory instruments was very good. Instruments were well maintained, and proper reviews were provided by chemistry management.

No violations or deviations were identified.

6. Radiological Environmental Monitoring Program (REMP) (IP 84750)

The inspectors reviewed the 1991 Annual Environmental Report. The report contained sample collection and analysis results as required by the licensee's Technical Specifications (TS) and Offsite Dose Calculation Manual (ODCM). All samples were below TS reporting limits. There were no omitted samples in this report; however, the licensee did document certain anomalies in 8 air samples.

The anomalies were defined as air volume deficiencies. Review of the data did not indicate any recurring air sampler maintenance problems.

The quarterly summary of results did appear to contain an inconsistency. TS required 40 thermoluminescence dosimeter (TLD) locations to be sampled quarterly; however, this section contained data for only 16 of the 40. The balance of the results were found in the body of the annual report. The licensee suggested that this inconsistency was an artifact of when TS required only 16 TLD locations. The licensee agreed that this would be evaluated and revised in subsequent reports.

No violations or deviations were identified.

7. Audits and Appraisals (IP 84750)

The inspectors reviewed audits, corrective action reports and Field Monitoring Reports (FMRs). Nuclear Quality Programs (NQP) Audit Report Number 04-91-03 conducted on March 4-15, 1991 verified implementation of the chemistry Quality Control program, sampling and analyses performance, procedural adherence and technical specification compliance in the area of chemistry. The FMRs reviewed included chemical sampling, instrument calibrations, sample analysis, and performance trend reviews. The audit and FMRs were performance based and in good depth. The corrective actions taken as the result of the audit findings and unresolved items were appropriate.

During the performance of a surveillance test on a Service Water Radiation Monitor (SWRM), an auditor observed that the functional tests required by TS Table 4.2-3 were not being fully met by the procedure for the SWRM. The table requires, in part, that control room alarm annunciation occurs if the monitor indicates a downscale failure. The shift engineer was notified and took appropriate immediate corrective actions. Subsequently, the Service Water Effluent Radiation Monitors, Steam Jet Air Ejector Activity Monitors, Main Chimney High Range Noble Gas Monitor and the Liquid Radwaste Effluent Gross Activity Monitor, all of which had the same functional test procedural inadequacy, were functionally tested under temporary procedures which satisfied TS Tables 4.2-3 and 4.2-4. Failure to demonstrate that control room alarm annunciation occurs if the instrument indicates a downscale failure is a violation of TS Tables 4.2-3 and 4.2-4. However because the provisions of Section VII.B of Appendix C to 10 CFR Part 2 have been satisfied, a Notice of Violation will not be issued. The licensee issued an LER detailing the events and corrective actions taken.

One noncited violation and no deviations were identified.

8. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on May, 7, 1992. The inspectors discussed the confirmatory measurements results, audits and the REMP. During the exit interview, the inspectors discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. Licensee representatives did not identify any such documents or processes as proprietary.

Attachment: Table 1, Nonradiological Confirmatory Measurements
Results, May 4-7, 1992

TABLE 1
 Nonradiological Confirmatory Measurements Results
 Quad Cities Nuclear Station
 May 4 - 7, 1992

Analyte	Method ¹	Concn ²	Ratio ³	Acceptance Ranges ⁴		Result ⁵	
				± 2RSD	± 3RSD		
<u>ppb</u>							
Iron	G	AA/F1	20	1.010	0.904-1.096	0.854-1.146	A
	H		40	0.997	0.903-1.097	0.857-1.143	A
	I		80	0.990	0.903-1.097	0.855-1.145	A
Copper	G	AA/F1	20	0.980	0.904-1.095	0.859-1.141	A
	H		40	0.953	0.904-1.096	0.857-1.143	A
	I		80	0.955	0.904-1.096	0.857-1.143	A
Nickel	G	AA/F1	20	0.985	0.935-1.064	0.906-1.094	A
	H		40	1.010	0.938-1.062	0.908-1.092	A
	I		80	1.000	0.938-1.062	0.907-1.093	A
Chrome	G	AA/F1	20	1.000	0.905-1.095	0.855-1.145	A
	H		40	1.000	0.903-1.097	0.854-1.146	A
	I		80	0.936	0.903-1.097	0.853-1.147	A
Sodium	J	IC	5	1.037	0.863-1.137	0.784-1.216	A
	K		10	0.940	0.859-1.141	0.788-1.212	A
	L		15	0.946	0.862-1.138	0.789-1.211	A
Silica	S	SPEC	50	0.906	0.906-1.094	0.859-1.141	A
	T		100	0.960	0.909-1.091	0.860-1.136	A
<u>ppm</u>							
Boron	D	Titr	1025	1.000	0.979-1.021	0.968-1.032	A
	E		3025	0.995	0.979-1.021	0.968-1.032	A
	F		5025	1.001	0.979-1.021	0.968-1.032	A

1. Methods: Titr - Titration
 IC - Ion Chromatography
 SPEC - Spectrophotometry
 AA/F1 - Flame Atomic Absorption Spectrophotometry
2. Conc: Approximate concentration analyzed.
3. Ratio of Licensee mean value to NRC mean value.
4. The SD in the fifth and sixth columns represents the coefficient of variation obtained from averaging licensee data from the preceding

cycle (Table 2.1 of NUREG/CR-5244). A result is considered to be in agreement if it falls within the ± 2 SD range; a qualified agreement if it lies outside ± 2 SD, but within ± 3 SD; and in disagreement if it is outside the ± 3 SD range.

5. Result:

- A = Agreement: licensee value is within ± 2 SDs of the NRC mean value.
- A+ = Qualified agreement: licensee value is outside ± 2 and within ± 3 SDs of the NRC value.
- D = Disagreement: licensee value is outside ± 3 SDs.