U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports Nos. 50-237/92006(DRSS); 50-249/92006(DRSS)

Docket Nos. 50-237; 50-249 License Nos. DPR-19; DPR-25

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

Facility Name: Dresden Nuclear Generating Station, Units 2 and 3

Inspection At: Dresden Site, Morris, Illinois

Inspection Conducted: March 16 - 19, 1992

Inspector: A. G. Januska 4/3/92
Date

Approved By: M. C. Schumacher, Chief 4/3/92
Radiological Controls and Date
Chemistry Section

Inspection Summary

Inspection on March 16 - 19, 1992 Report Nos. 50-237/92006(DRSS); 50-249/92006(DRSS))

Areas Inspected: Routine unannounced inspection of: (1) the chemistry program including procedures, organization and training (IP 84750); (2) reactor systems water quality control programs (IP 84750); (3) quality assurance/quality control program in the laboratory (IP 84750); (4) nonradiological confirmatory measurements (IP 84750); (5) the Radiological Environmental Monitoring Program (REMP) (IP 84750); and (6) the close out of open items from previous inspections.

Results: The licensee continued to maintain excellent reactor water quality and ranked high among the better performing plants. The nonradiological confirmatory measurements continue to be good. The continuing chemistry technician training program appears to be comprehensive and well managed.

DETAILS

1. Persons Contacted

[1]R. Berg, Chemistry Instructor
P. Boyle, Unit 2 Chemist
[1]R. Budzynski, Chemistry Technician
[1]E. Carroll, Regulatory Assurance
[1]D. Ferguson, Chemistry Technician
[1]L. Gerner, Technical Superintendent
[1]K. Kociuba, Nuclear Quality Programs Superintendent
[1]D. Malauskas, Quality Chemist
[1]D. Morey, Chemistry Supervisor
[1]L. Oshier, Lead Health Physicist-Operations
[1]R. Polk, Lab Supervisor
[1]C. Schroeder, Station Manager
[1]K. Shembarger, Reactor Engineer
[1]J. Strmec, Lab Chemist
[1]K. Whittum, Lead Chemist

[1]K. Shembarger, Regional Inspector, NRC

1Present at the Exit Meeting on March 19, 1992

2. Licensee Action on Previous Inspection Findings

(Closed) Open Item (50-237/91020-01; 50-249/91020-01): Licensee to count a liquid sample and report the results to Region III for comparison. The results are contained in Table 1; the comparison criteria are contained in Attachment 1. The comparisons resulted in two agreements, two no comparisons because of poor counting statistics and one disagreement for Fe-55. Because of the poor counting statistics and the Fe-55 disagreement, a spiked liquid sample will be sent to the licensee for analysis and comparison and will be followed under Open Item 50-237/92006-01; 50-249/92006-01.

(Closed) Open Item (50-237/91013-01; 50-249/91012-01): Quality Control (QC) of the High Radiation Sample System (HRSS) should be included in the Chemistry Surveillance Program. The inspector saw evidence in the Nuclear Quality Programs Field Monitoring Reports that QC of the HRSS has been performed on 10 occasions during 1991 and 1992.

3. Management Controls Organization and Training (IP 84750)

Management structure of the laboratory has changed since last reported in Region III Inspection Report Nos. 50-237/91013; 50-249/91012. A Lead Chemist, Quality Chemist, Waste Products Chemist, Chemical Control Coordinator, Procedures Writer and Operations Manager, two of which are contracted positions and three degreed, report to the Chemistry Supervisor. Fourteen Chemistry Technicians (CTs), an increase of two technicians, report to two Laboratory Supervisors who in turn report to

the Operations Manager. Reporting to the Lead Chemist are a Lab Manager, a Data Specialist, Two Lab Chemists, Chemists for Unit 2 and Unit 3, and a Radwaste Chemist. Five of these positions are filled by degreed employees; one is a contractor. The contractor position will be filled by a Chemical Engineer who has accepted the position. Previous chemist position responsibilities have been absorbed into the positions currently under the Lead Chemist. Turnover in the chemistry department has been in low, and the staffing appeared adequate to perform the required chemistry for plant operations. The personnel contacted appeared knowledgeable and technically competent.

No violations or deviations were identified

4. Water Chemistry Control Program (IP 84750)

The inspector reviewed the water chemistry control program. The operational chemistry limits and action levels were consistent with the EPRI BWR Owners Group Guidelines. Sample panels have been installed but have not been accepted for operation. Reactor coolant samples are collected using the HRSS. In line Ion Chromatographs (IC) have been installed in each unit with the unit 2 system currently under test.

Chemistry parameters are reviewed by laboratory personnel and trend plotted. Trend charts are available for tracking various reactor and cleanup water parameters including conductivity, silica, dissolved oxygen, sulfate, and chloride along with reactor power levels.

The inspector reviewed selected trend charts and supporting data which indicated that except for excursions during power changes or during startup/shutdown conditions, conductivity, chloride and sulfate averaged less than 0.01 microSiemen/cm(uS/cm), 1.0 and 2.0 parts per billion (ppb), respectively, for both units, well below EPRI achievable values of less that 0.20 uS/cm, 15 and 15 ppb respectively. Feedwater conductivity and dissolved oxygen were generally within the achievable values of less that 0.06 uS/cm and within 20-50 ppb. Both units ranked among the better performing plants in the country on an industry chemistry performance index in 1991.

No violations or deviations were identified.

5. Confirmatory Measurements (IP 84750)

The inspector 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.

The samples were appropriately diluted by licensee personnel and analyzed at high concentrations and also within the ranges normally analyzed by the laboratory. In both cases the equipment was appropriately calibrated prior to performing the analyses. A single analysis was performed on

each dilution in a manner similar to that of routine samples. The results are presented in Table 2 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 that the licensee's value should be within 2 Standard Deviations of the BNL value for agreement and between 2 and 3 SD for qualified agreement. A qualified agreement may indicate a bias in the assay.

The licensee analyzed multiple concentrations of 11 analytes (Table 2). Of the initial 38 analyses, 32 were agreements, 5 were qualified agreements and one was a disagreement. There were three disagreements for nickel (not shown on Table 2). The chloride disagreement had a bias of 16% and after recalibration the IC the result became a qualified agreement. The metal unknowns are a matrix of iron, copper, nickel and chrome. Since the licensee calibrated each metal with a pure standard, an interference caused by a matrix effect of the metals was suspected as the cause of the disagreements. The licensee recalibrated using solutions containing all four metals and reanalysis of the three nickel concentrations resulted in agreements. The iron results however did not change appreciably remaining qualified agreements. Chemistry personnel involved in the dilution, calibration and analyses used good laboratory techniques.

No violations or deviations were identified.

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

The inspector reviewed the chemistry QA/QC program as defined by "Nuclear Stations Chemistry Quality Control Program Manual", Revision 10, dated December 31, 1991. Since the last inspection of cold chemistry the Manual has been revised twice to address control charts, corrective actions and documentation, standards, nonchemical calibrations, and trend charts. The licensee has control charts, independent controls and multiple point calibration curves. Charts are reviewed by chemists daily. Data from selected control charts reviewed appeared to have a random scatter.

The licensee's corporate Interlaboratory Comparison Program results for the third quarter of 1991 and the first quarter of 1992 were 97% and 90% agreements respectively. The 1992 data included a new analysis, oil, for the first time which accounted for three of the four disagreements. The inspector noted no analyses differed by more than 9% from the corporate values which is comparable with results examined during the last inspection and represents good performance.

The licensee's Chemical Technician (CT) Testing Program is conducted at the Production Training Center (PTC) as reported in Inspection Report Nos. 50-237/91013; 50-249/91012. In addition to this one week course three weeks of continuing training is provided to the CTs at the Dresden Training Center. During the three weeks modules, which include topics such as industrial events, OSHA, new instrumentation, trouble shooting of laboratory instruments, Radiation Protection, HRSS and GSEP are

presented. The inspector saw selected personnel training files demonstrating that tests were given and passing grades achieved. The program continues to be a laboratory strength.

The inspector examined the operation of the Unit 3 HRSS system including a tour of the facility. The operability of each unit's system is the responsibility of one of the Unit Chemists. The systems are currently used for the routine collection of primary coolant samples until the sample panels are operational and accepted. The inspector reviewed the HRSS surveillance schedule and operability sign off sheets and noted that although surveillances had been performed, on numerous occasions in late 1991 through March 1992 the sign off sheets had not been reviewed by either a chemist or a chemistry foreman (Lab Supervisor). This appeared to be a repeat of the same problem noted in Inspection 50-237/91013; 50-249/91012. Further discussion with the licensee revealed that during a current procedure upgrade the procedure governing this surveillance was rewritten but the old procedure was not deleted. All of the required surveillances appeared to have been performed and reviewed as required.

No violations or deviations were identified.

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

The inspector reviewed the REMP including the 1991 Annual Environmental Report and the December monthly report from the vendor which is a summary of the years monthly reports. In addition the inspector compared the program which was implemented against the Technical Specifications requirement. The program for 1991 appeared to comply with the REMP requirements. Missed samples were appropriately identified and listed. The inspector noted that low level positive tritium activity was seen in a nearby waterwell in mid-1992 samples. The licensee is investigating the matter and has increased the frequency of sampling. An inlet canal sample which also showed anomalous results is also under investigation. The results of these investigations will be reviewed during subsequent inspections (Open Item 50-237/92006-02; 50-249/92006-02)

No violations or deviations were identified.

8. Audits and Appraisals (IP 84750)

The inspector reviewed audits, assessments and Field Monitoring Reports (FMRs). Nuclear Quality Programs (NQP) Audit 12-91-12 conducted on December 6-20, 1991 reviewed implementation of the Quality Assurance program for chemistry. The audit involved observation of personnel, the HRSS system, and calibration of inline instruments. The audit determined that the HRSS was operable and that samples could be drawn.

Dresden Combined Assessment performed January 17-25, 1991, indicated performance assessment of chemistry. The assessment noted strengths in chemistry, equipment performance, HRSS operation, and quality controls applied to the ion chromatograph.

No violations or deviations were identified.

9. Open Items

Open items are matters which have been discussed with the licensee, which will be reviewed further by the inspectors, and which involve some action on the part of the NRC or licensee, or both. An open items disclosed during the inspection is discussed in Sections 2 and 7.

10. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on March, 19, 1992. The inspector discussed the confirmatory measurements results, audits and the REMP. During the exit interview, the inspector 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.

Attachments:
1. Table 1, Confirmatory Measurements Program Results, Second Quarter 1991
2. Attachment 1, Criteria for Comparing Analytical Measurements
3. Table 2, Nonradiological Confirmatory Measurements Results, March 16-19, 1991

TABLE 1

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

FACILITY: DRESDEN

FOR THE 2ND QUARTER 1991

SAMPLE	NUCLIDE	NRC VAL.	NRC ERR.	LIC.VAL.	LIC.ERR.	RATIO	RESOL.	RESULT
LIQUID	G BETA	1.20E-06	6.00E-08	<1.20E-06	0.00E+00	1.00	20.0	A
	H-3	7.09E-04	8.00E-06	6.20E-04	0.00E+00	0.87	88.6	A
	SR-89	3.00E-09	8.00E-09	2.00E-09	0.00E+00	0.67	0.4	N
	SR-90	6.00E-09	3.00E-09	5.26E-09	0.00E+00	0.88	2.0	N
	FE-55	1.91E-06	5.00E-08	1.09E-06	0.00E+00	0.57	38.2	D

A = AGREEMENT
D = DISAGREEMENT
N = NO COMPARISON
* - CRITERIA RELAXED

TABLE 2
Nonradiological Confirmatory Measurements Results
Dresden Nuclear Station
March 16 - 19, 1992

Analyte	Method[1]		Concn[2]	Ratio[3]	Acceptance Ranges[4] ± 2RSD	± 3RSD	Result[5]
			ppb				
Fluoride	A	IC	4	0.874	0.875-1.125	0.813-1.187	A+
	B		4	0.935	0.875-1.125	0.813-1.187	A
	C		4	0.931	0.875-1.125	0.813-1.187	A
Chloride	A	IC	4	0.991	0.933-1.067	0.900-1.100	A
	B		4	1.017	0.919-1.081	0.887-1.113	A
	C		4	1.039	0.926-1.074	0.895-1.105	A
Sulfate	A	IC	4	1.041	0.895-1.105	0.842-1.158	A
	B		4	0.992	0.895-1.105	0.868-1.132	A
	C		4	0.969	0.900-1.100	0.867-1.133	A
Fluoride	A	IC	20	1.040	0.875-1.125	0.813-1.187	A
	B		40	0.969	0.875-1.125	0.813-1.187	A
	C		80	0.976	0.875-1.125	0.813-1.187	A
Chloride	A	IC	20	1.157	0.933-1.067	0.900-1.100	D
	B		35	1.014	0.919-1.081	0.887-1.113	A
	C		70	1.017	0.926-1.074	0.895-1.105	A
Rerun	A		20	1.078	0.933-1.067	0.900-1.100	A*
Sulfate	A	IC	20	1.052	0.895-1.105	0.842-1.158	A
	B		40	0.989	0.895-1.105	0.868-1.132	A
	C		80	0.933	0.900-1.100	0.867-1.133	A
Iron	G	AA/Fl	1	0.888	0.904-1.096	0.854-1.146	A+
	H		1	0.867	0.903-1.097	0.857-1.143	A+
	I		1	0.865	0.903-1.097	0.855-1.145	A+
Rerun	G		1	0.885	0.904-1.096	0.854-1.146	A+
	H		1	0.872	0.903-1.097	0.857-1.143	A+
	I		1	0.859	0.903-1.097	0.855-1.145	A+
Copper	G	AA/Fl	1	1.056	0.904-1.095	0.859-1.141	A
	H		1	1.041	0.904-1.096	0.857-1.143	A
	I		1	1.008	0.904-1.096	0.857-1.143	A

Analyte	Method[1]		Concn[2]	Ratio[3]	Acceptance Ranges[4] ± 2RSD	± 3RSD	Result[5]

Nickel	G		1	0.946	0.936-1.064	0.906-1.094	A
Rerun	H		1	0.951	0.938-1.062	0.908-1.092	A
	I		1	0.955	0.938-1.062	0.907-1.093	A
Chrome	G	AA/Fl	1	1.142	0.905-1.095	0.855-1.145	A+
	H		1	0.905	0.903-1.097	0.854-1.146	A
	I		1	0.975	0.903-1.097	0.853-1.147	A
Sodium	J	IC	5	1.000	0.863-1.137	0.784-1.216	A
	K		10	0.989	0.859-1.141	0.788-1.212	A
	L		15	0.993	0.862-1.138	0.789-1.211	A
Lithium	JJ	IC	5	0.875	0.859-1.141	0.793-1.207	A
	KK		10	0.916	0.860-1.140	0.785-1.215	A
	LL		25	0.958	0.861-1.139	0.790-1.210	A
Silica	S	Color	50	1.032	0.906-1.094	0.859-1.141	A
	T		100	1.053	0.909-1.091	0.860-1.136	A

			ppm				
Boron	D	Titr	1025	1.004	0.979-1.021	0.968-1.032	A
	E		3025	1.000	0.979-1.021	0.968-1.032	A
	F		5025	1.010	0.979-1.021	0.968-1.032	A

1. Methods: Titr - Titration
   IC - Ion Chromatography
   Color - Colorimetric
   AA/Fl 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.

ATTACHMENT 1

CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This attachment provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In these criteria, the judgment limits are variable in relation to the comparison of the NRC's value to its associated one sigma uncertainty. As that ratio, referred to in this program as "Resolution", increases, the acceptability of a licensee's measurement should be more selective. Conversely, poorer agreement should be considered acceptable as the resolution decreases. The values in the ratio criteria may be rounded to fewer significant figures reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance.

RESOLUTION	RATIO = LICENSEE VALUE/NRC REFERENCE VALUE
	Agreement
<4	NO COMPARISON
4 - 7	0.5 - 2.0
8 - 15	0.6 - 1.66
16 - 50	0.75 - 1.33
51 - 200	0.80 - 1.25
200 -	0.85 - 1.18

Some discrepancies may result from the use of different equipment, techniques, and for some specific nuclides. These may be factored into the acceptance criteria and identified on the data sheet.