DCD

APR 16 1993

Docket No. 50-255

Consumers Power Company
ATTN: Gerald B. Slade
General Manager
Palisades Nuclear Generating Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

Dear Mr. Slade:

SUBJECT: ROUTINE CHEMISTRY INSPECTION AT THE PALISADES NUCLEAR PLANT

This refers to the routine safety inspection conducted by Dr. J. House of this office on April 5 through 8, 1993. The inspection included a review of authorized activities for your Palisades facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during this inspection are identified in the report. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No violations of NRC requirements were identified during the course of this inspection.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter and the enclosed inspection report will be placed in the NRC Public Document Room.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

Original Signed By William Snell

William Snell, Chief
Radiological Controls Section 2

Enclosure: Inspection Report
No. 50-255/93006(DRSS)

See Attached Distribution

210082

RIII	RIII	RIII
House	Jorgensen	Snell
04/16/93	4/16/93	4/16/93

JE 06

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cc w/enclosure:
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/93006(DRSS)

Docket No. 50-255 License No. DPR-20

Licensee: Consumers Power Company
27780 Blue Star Memorial Highway
Covert, MI 49043

Facility Name: Palisades Nuclear Plant

Inspection At: Palisades Site, Covert, MI

Inspection Conducted: April 5-8, 1993

Inspector: J. House 4-16-93
Date

Approved by: William Snell 4/16/93
William Snell, Chief Date
Radiological Controls Section 2

Inspection Summary

Inspection on April 5-8, 1993 (Report No. 50-255/93006(DRSS))
Areas Inspected: Routine, announced inspection of the chemistry program including: audits, quality assurance, chemistry comparisons, radiological environmental monitoring program (REMP), dry cask fuel storage, and an inspection followup item.
Results: The licensee's performance in the chemistry comparison program was excellent (31 agreements in 32 comparisons). The laboratory QA/QC program was well managed. The water chemistry program and plant water quality were very good; the licensee removed a total of only 30 pounds of sludge from both steam generators at the end of the first refueling outage following steam generator replacement which was very good. Audits were performance based and thorough. The REMP was well managed, and the radiation monitoring program for dry cask fuel storage appeared adequate.

DETAILS

1. Persons Contacted

*B. Baker, Chemistry Supervisor
G. Foster, Mechanical Equipment Supervisor
*K. Haas, Radiological Services Manager
D. Malone, Radiological Services Superintendent
*J. McElrath, Chemical Engineering Section Head
*M. Mennucci, Health Physics Technical Supervisor
*T. Palmisano, Operations Manager
*T. Popp, Project REMP Coordinator
*M. Sullivan, Chemistry Performance Analyst

*J. Heller, Senior Resident Inspector, NRC

The inspector contacted other licensee personnel during the inspection.

*Present at the exit meeting on April 8, 1993.

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

(Closed) Open Item (50-255/91016-01): The licensee will split a liquid radwaste sample and have their vendor laboratory analyze for tritium, strontium-89, strontium-90, and gross beta. The results will be sent to Region III for comparison with results from the NRC reference laboratory. No comparisons could be made as the NRC reference laboratory did not analyze the sample. This item is closed.

3. Management, Organization, and Training (IP 84750)

The chemistry superintendent reports to the operations manager. A laboratory supervisor, a performance analyst, a chemistry support specialist, a chemical engineering section head, and the environmental coordinator report to the superintendent. Five senior chemistry technicians and six technicians report to the laboratory supervisor. One of the technicians is on loan to the systems engineering group and one technician is in training. All technicians, except for the one in training, meet the American National Standards Institute N18.1-1971 criteria for technicians.

Due to low staff turnover, the laboratory has an experienced technical staff with approximately 45% of the personnel at the senior technician level. This is not an automatic promotion based on time in grade, but is a promotion based on experience, knowledge, and laboratory skills and requires the approval of chemistry supervision. The laboratory has strong management support as evidenced by recent equipment purchases including a new graphite furnace atomic absorption spectrophotometer and modifications to an ion chromatograph. The chemistry staff was very capable and is a strength.

No violations or deviations were identified.

4. Water Chemistry Control Program (IP 84750)

The licensee's water chemistry program conforms to the Electric Power Research Institute (EPRI) guidelines for primary and secondary water chemistry. A review of selected trend chart data from the previous 12 months indicated that primary system chemistry parameters were well within the guidelines. Fluoride, chloride, sulfate, and dissolved oxygen levels averaged less than 20 parts per billion (ppb), 20 ppb, 20 ppb, and 2 ppb with EPRI guidelines of 50 ppb, 50 ppb, 50 ppb, and 5 ppb, respectively. Dissolved hydrogen was maintained within the EPRI window. The laboratory recently reduced the lower limit of detection (LLD) for chloride, fluoride, and sulfate from 20 ppb to 1 ppb by upgrading the Ion Chromatograph. This provides a more realistic estimate of these anions in the primary coolant since the actual concentrations of these anions appeared to be much lower than the previous detection limits of 20 ppb.

Secondary system chemistry was very good with steam generator (S/G) blowdown levels of sodium, chloride, sulfate, silica, and conductivity averaging less than 4 ppb, 4 ppb, 3 ppb, 100 ppb, and 0.8 micro Siemen/cm (μS/cm) with guidelines of 20 ppb, 20 ppb, 20 ppb, 300 ppb, and 0.8 μS/cm, respectively. Feedwater dissolved oxygen, iron, and copper levels averaged less than 0.5 ppb, 2 ppb, and 2 ppb with guideline levels of 5 ppb, 20 ppb, and 2 ppb, respectively. Hydrazine levels were adequate for removing dissolved oxygen from steam generator feedwater. Chemistry parameters were reviewed daily by chemistry management and a report of selected parameters was sent to plant management. The chemical engineering section prepares a monthly report of chemistry trends and significant observations are forwarded to plant management for review. A contractor reviews chemistry data daily and prepares a monthly report for plant management. The licensee's water quality program is excellent.

The chemistry department monitors corrosion products in the steam generators. A licensee representative stated that during the last refueling outage, 14 pounds of sludge was removed from one steam generator (S/G) and 16 pounds was removed from the other S/G. This was very good when compared with the previous (1987) sludge lancing of the original steam generators during which approximately 4438 pounds of sludge were removed from both generators. In addition, no S/G tubes had to be plugged during the most recent outage. The licensee uses boric acid to reduce corrosion and morpholine for pH control in the steam generators.

The inspector compared boron concentrations in various plant systems during the past 12 months with Technical Specification (T/S) requirements. The spent fuel pool concentration met the 1720 parts per million (ppm) minimum; the boric acid storage tanks were within the T/S range of 6.25-10%; the safety injection refueling water tank was within the 1720-2500 ppm range; and the boron concentration in the safety injection tanks were within the 1720-2500 ppm window.

No violations or deviations were identified.

5. Chemistry Comparison Program (IP 84750)

The inspector submitted chemistry samples to the licensee for analysis 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 and standardized 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 dilutions were prepared from each sample by licensee personnel in order to bring the concentrations within the ranges normally analyzed 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 agreement. These criteria are based on ORNL analyses of the standards and on the relative standard deviations (RSD) derived from the results of nuclear power plants participating in a 1986 interlaboratory comparison (Table 2.1, NUREG/CR-5442, Evaluation of Non-Radiological Water Chemistry at Power Reactors). The acceptance criteria were that the licensee's value should be within 2 Standard Deviations (SD) of the ORNL 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 ten unknowns at three concentrations and one at two concentrations. Of the 32 comparisons, 31 were agreements (Table 1). The three hydrazine results had larger biases than are usually seen; however, only the middle hydrazine concentration was a disagreement. When the three hydrazine unknowns were rediluted and analyzed with no calibration or reagent changes, the results (agreements) were within two percent of the reference values which was a significant improvement. This indicated that a dilution error produced the original disagreement and biases. Overall, licensee performance in the chemistry comparison program was excellent.

No violations or deviations were identified.

6. Chemistry Quality Assurance/Quality Control (IP 84750)

The inspector reviewed the chemistry quality assurance (QA) program defined by Laboratory Quality Control Program, Procedure 1.3, Revision 3, March 5, 1990. The program incorporated statistically based

control charts, independent controls, and multiple point calibration curves. Control charts were reviewed by technicians when performing an assay and weekly by supervisors. Data from selected control charts was randomly scattered about the mean indicating that instrument performance was under statistical control. Concentrations of the independent controls were in the ranges of plant samples which is a good practice. Control charts were manually plotted, were neat, and provided an easy appraisal of instrument performance.

The licensee had two laboratory cross check programs. The first was a vendor supplied interlaboratory cross check program which measured overall laboratory performance. This program was well organized and incorporated licensee developed acceptance criteria which were based on industry standards. Each unknown was analyzed by five technicians and their results were compared to the acceptance criteria. Technicians whose results were outside of the criteria reanalyzed the unknowns. The average values for the five technicians were then compared to the vendor's values using the acceptance criteria. The second program was an intralaboratory cross check program in which unknowns were prepared by laboratory supervisors. Technicians were required to be tested twice per year in this program. From a review of selected data it appeared that all technicians were tested twice annually. The licensee's quality assurance program was very well managed.

No violations or deviations were identified.

7. Audits (IP 84750)

Surveillance S-AP-92-014 was conducted March 3-June 30, 1992, to assess the adequacy of hazardous waste generation and control practices. The auditors reviewed chemical inventories, shelf lives, chemical usage, types of chemical waste produced, waste reduction, and disposal efforts. There were no major findings, although a number of minor observations for program improvement were made. Audit PT-92-07 assessed the effectiveness of the Radiological Services Department in meeting applicable T/S, procedures, and regulatory criteria. Auditors reviewed the REMP operation including procedures, equipment condition, observation of sample collection, and data acquisition. There were no findings for the REMP. The audit and surveillance were detailed, and the audit teams appeared to be very knowledgeable.

No violations or deviations were identified.

8. Radiological Environmental Monitoring Program (IP 84750)

The inspector reviewed the Radiological Environmental Monitoring Program (REMP) as defined by Procedure HP 10.1, Radiological Environmental Monitoring Program Surveillances, Revision 3, January 1, 1993. The 1991 Annual Operating Report appeared to comply with the REMP requirements. All of the required samples were collected and analyzed, except as noted in the report. Missing samples were documented and the causes were investigated as required by procedure.

A tour of selected air sampling stations was conducted with the REMP coordinator who was responsible for oversight of the REMP including contractor performance in filter media changeout and maintenance of the air samplers. The equipment was in very good condition and calibrations were current. The coordinator was a health physicist with power plant experience and was very knowledgeable of the REMP.

No violations or deviations were identified.

9. Dry Fuel Storage Radiation Monitoring (IP 84750)

The dry fuel storage area is a concrete pad with a locked security fence surrounding it. Three guard stations have been built around this fenced area. The dry fuel storage location is designated a radiological controlled area (RCA) and will not be included in the REMP. This is a conservative approach as considerably more monitoring is required for an RCA than is performed in the REMP, and the REMP program is designed to detect any radiological releases from the plant including the dry fuel storage area. Monitoring will include contamination surveys, thermoluminescent dosimeters (TLDs), and electronic dosimeters (EDs). TLDs and EDs will be placed at various locations around the fenced pad including the guard stations and the administration building. The operations department will monitor cask vent temperatures daily. The radiation monitoring plan appeared to be adequate.

No violations or deviations were identified.

10. Inspection Followup Items

Inspection Followup Items are matters which have been discussed with the licensee, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or licensee or both. One Inspection Followup Item is closed in Section 2.

11. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on April 8, 1993. The inspector discussed the Inspection Followup Item in Section 2, licensee performance in the chemistry comparison program along with observations on laboratory quality assurance, the water chemistry program, radiation monitoring for dry fuel storage, 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 during the inspection. Licensee representatives did not identify any such documents or processes as proprietary.

Attachment: Table 1, Chemistry
Comparison Results, 2nd
Quarter 1993

TABLE 1
Nonradiological Chemistry Comparisons Results
Palisades Nuclear Generating Plant
April 5-8, 1993

Analyte	Method[1]		Conc[2]	Ratio[3]	Acceptance Ranges[4] ± 2RSD	± 3RSD	Result[5]
			ppb				
Fluoride	A	IC	5	0.956	0.875-1.125	0.813-1.187	A
	B		10	0.955	0.875-1.125	0.813-1.187	A
	C		20	0.950	0.875-1.125	0.813-1.187	A
Chloride	A	IC	5	0.954	0.933-1.067	0.900-1.100	A
	B		10	0.916	0.919-1.081	0.887-1.113	A+
	C		20	0.946	0.926-1.074	0.895-1.105	A
Sulfate	A	IC	5	0.925	0.895-1.105	0.842-1.158	A
	B		10	0.927	0.895-1.105	0.868-1.132	A
	C		20	0.959	0.900-1.100	0.867-1.133	A
Iron	G	AA/FU	5	1.076	0.904-1.096	0.854-1.146	A
	H		10	1.038	0.903-1.097	0.857-1.143	A
	I		20	1.047	0.903-1.097	0.855-1.145	A
Copper	G	AA/FU	5	1.031	0.904-1.095	0.859-1.141	A
	H		10	0.963	0.904-1.096	0.857-1.143	A
	I		20	0.973	0.904-1.096	0.857-1.143	A
Sodium	J	AA/FU	5	1.047	0.863-1.137	0.784-1.216	A
	K		10	1.013	0.859-1.141	0.788-1.212	A
	L		15	0.997	0.862-1.138	0.789-1.211	A
Lithium	JJ	AA/FL	500	1.099	0.859-1.141	0.788-1.212	A
	KK		1000	1.045	0.859-1.141	0.788-1.212	A
	LL		2000	1.026	0.868-1.142	0.787-1.213	A
Ammonia	M	Spec	1000	0.984	0.902-1.098	0.856-1.147	A
	N		3000	1.045	0.902-1.098	0.856-1.147	A
	O		5000	1.048	0.902-1.098	0.856-1.147	A
Hydrazine	P	Spec	50	0.901	0.922-1.078	0.888-1.118	A+
	Q		100	0.864	0.922-1.078	0.888-1.118	D
	R		250	1.070	0.922-1.078	0.888-1.118	A
Rerun	P	Spec	50	0.989	0.922-1.078	0.888-1.118	A
	Q		100	1.006	0.922-1.078	0.888-1.118	A
	R		250	0.986	0.922-1.078	0.888-1.118	A

Analyte	Method[1]		Conc[2]	Ratio[3]	Acceptance Ranges[4] ± 2RSD	± 3RSD	Result[5]
			ppb				
Silica	T	Spec	100	1.001	0.906-1.094	0.859-1.141	A
	U		250	1.053	0.909-1.091	0.860-1.136	A
			ppm				
Boron	D	Titr	1000	1.004	0.979-1.021	0.968-1.032	A
	E		3000	1.028	0.979-1.021	0.968-1.032	A+
	F		5000	1.009	0.979-1.021	0.968-1.032	A
	E	Rerun	3000	1.005	0.979-1.021	0.968-1.032	A

1. Methods: Titr - Titration
   IC - Ion Chromatography
   Spec - Ultraviolet/Visible Spectrophotometry
   AA/FL - Atomic Absorption Spectrophotometry Flame
   AA/FU - Atomic Absorption Spectrophotometry Furnace

2. Conc: Approximate concentration analyzed.

3. Ratio of Licensee mean value to NRC mean value.

4. The relative standard deviations (RSD) in the sixth and seventh 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 is between ±2 and ±3 SDs of the NRC value.
   D = Disagreement: licensee value is outside ±3 SDs.