U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-247/86-07

Docket No. 50-247

License No. DPR-26 Priority -- Category C

Licensee: Consolidated Edison Company
of New York, Inc.
4 Irving Place
New York, New York 10003

Facility Name: Indian Point Nuclear Generating Station, Unit 2

Inspection At: Buchanan, New York

Inspection Conducted: February 10-13, 1986

Inspector: W. J. Pasciak 3/4/86
H. Zibulsky, Chemist date

Approved by: W. J. Pasciak 3/4/86
W. J. Pasciak, Chief, Effluents Radiation Protection Section, DRSS date

Inspection Summary:
Inspection on February 10-13, 1986 (Report No. 50-247/86-07)

Areas Inspected: Routine, announced inspection of the nonradiological chemistry program. Areas reviewed included measurement control and analytical procedure evaluations. The inspection involved 29.5 inspector hours by one NRC region-based inspector.

Results: No violations were identified.

DETAILS

1. Individuals Contacted

*S. Quinn, General Manager, Technical Support
*J. Higgins, Manager, Chemistry
*F. Poplees, Chemistry Supervisor
*S. Hayes, Chemistry Technician

*Present at the exit interview.

The inspector also interviewed other licensee employees including members of the chemistry staff.

2. Action on Previous Licensee Findings

(Closed) 84-25-01 IFI - The licensee did not have a measurement control program with analyzed standards plotted on control charts. The licensee has generated control charts with a ±2 sigma alert parameter and a ±3 sigma acceptance criteria. They are generating control charts on new instruments recently put into service. The licensee wasn't using standard stock solutions for calibration and measurement control that were independent of each other. During the inspection, the licensee designated and used independent standard solutions.

(Open) 25-00-13 TI - The inspection covered part of this item. Of the two modules included in the TI, Module 79501 was completed.

3. Measurement Control Evaluation

The licensee's measurement control program will be verified through analysis of actual plant water samples. The plant was in outage and no appropriate samples were available. When the plant returns on-line, samples from the condensate and main steam, steam generator, and the boric acid storage tanks will be taken and duplicate samples will be sent to Brookhaven National Laboratory (BNL) for independent verification. Ammonia and hydrazine analyses will be performed on the condensate and main steam samples, silica, chloride, copper and iron analyses on the steam generator sample and boron analysis on the boric acid storage tank sample. On completion of the analyses by both laboratories, a statistical evaluation will be made (Inspector Follow-up Item 86-07-01).

4. Analytical Procedures Evaluation

During the inspection, standard chemical solutions were submitted by the inspector to the licensee for analysis. The standard solutions were prepared by BNL for NRC Region I, and were analyzed by the licensee using normal methods and equipment. The analysis of standards is used to verify the various plant systems with respect to Technical Specification and other regulatory requirements. In addition, the analysis of standards is used to evaluate the licensee's analytical procedures with respect to accuracy and precision.

The results of the standard measurements comparison indicated that five out of twenty-seven comparisons were in disagreement under the criteria used for comparing results (see Attachment 1). The fluoride disagreement using the ion chromatograph was due to the use of an eluant with about four times the concentration of sodium bicarbonate than is usually present. The licensee used this eluant for the analysis of chloride and sulfate and not fluoride. The licensee is now aware that with that eluant, the fluoride recovery in the presence of more than 25 ppb of chloride, is only about 75%. The fluoride disagreement using the ion electrode was thought to be due to a sampling error. The disagreement for ammonia was due to the licensee taking the wrong dilution and the ammonia concentration was more than their highest calibration standard. The cause for the two copper disagreements was the clogging of the sample tubes.

The licensee is presently collecting data from the analyses performed on some new instrumentation to generate control charts. The licensee was using a single stock solution for calibration and measurement control. During the inspection, the licensee initiated the use of independent standard stock solutions for calibration and measurement control. The need for this was demonstrated when the ammonia control standard did not identify that the single stock solution used for calibration had deteriorated.

5. Exit Interview

The inspector met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on February 13, 1986, and summarized the scope and findings of the inspection. At no time during this inspection was written material provided to the licensee by the inspector.

CAPABILITY TEST RESULTS

INDIAN POINT NUCLEAR GENERATING STATION, UNIT 2

Chemical Parameter	NRC Value	Lic. Value	Ratio (Lic/NRC)	Comparison
		Results in parts per billion (ppb)		
Fluoride (Ion Chromatograph)	9.6 ± 0.4	9.2 ± 0.3	0.96 ± 0.05	Agreement
	32.9 ± 2	26.1 ± 0.3	0.79 ± 0.05	Disagreement
	74.5 ± 3.5	72.2 ± 2.2	0.97 ± 0.05	Agreement
Fluoride (Specific Ion Electrode)	9.6 ± 0.4	<20	----	Agreement
	32.9 ± 2	27.3 ± 0.6	0.83 ± 0.06	Disagreement
	74.5 ± 3.5	76.3 ± 1.2	1.02 ± 0.05	Agreement
Chloride (Ion Chromatograph)	10.3 ± 0.7	10.1 ± 0.5	0.98 ± 0.08	Agreement
	69.7 ± 3	73.7 ± 4.7	1.06 ± 0.08	Agreement
	27.7 ± 2.8	30.2 ± 1.5	1.09 ± 0.12	Agreement
Chloride (Specific Ion Electrode	10.3 ± 0.7	10.0 ± 0	1.0	Agreement
	69.7 ± 3	74.0 ± 0	1.06 ± 0.05	Agreement
	27.7 ± 2.8	24.3 ± 2.5	0.88 ± 0.13	Agreement
Ammonia	1168 ± 19.1	1247 ± 11.5	1.07 ± 0.02	Disagreement
	119.9 ± 3.3	113.3 ± 5.8	0.94 ± 0.05	Agreement
	356.3 ± 10.6	370 ± 10	1.04 ± 0.04	Agreement
Hydrazine	52.4 ± 1.3	49.3 ± 1.2	0.94 ± 0.03	Agreement
	19.3 ± 1.6	21.7 ± 1.5	1.12 ± 0.12	Agreement
	100.0 ± 2	103.7 ± 3.2	1.04 ± 0.04	Agreement
		Results in parts per million (ppm)		
Boron	1014 ± 15	1042 ± 0	1.03 ± 0.02	Agreement
	3047 ± 26	3006 ± 15.6	0.99 ± 0.01	Agreement
	5040 ± 130	4752 ± 32	0.94 ± 0.03	Agreement
Copper	3.1 ± 0.04	2.87 ± 0.03	0.93 ± 0.02	Disagreement
	2.07 ± 0.04	1.91 ± 0.01	0.92 ± 0.02	Disagreement
	1.03 ± 0.01	1.03 ± 0.01	1.0	Agreement
Iron	3.04 ± 0.21	3.02 ± 0.03	0.99 ± 0.07	Agreement
	2.03 ± 0.10	2.01 ± 0.03	0.99 ± 0.05	Agreement
	1.01 ± 0.09	1.04 ± 0.01	1.03 ± 0.09	Agreement

ATTACHMENT

Criteria For Comparing Analytical Management

This attachment provides criteria for comparing results of capability tests. In these criteria the judgement limits are based on the uncertainty of the ratio of the licensee's value to the NRC value. The following steps are performed:

(1) the ratio of the licensee's value to the NRC is computed

$$\left(\text{ratio} = \frac{\text{Licensee Value}}{\text{NRC Value}}\right):$$

(2) the uncertainty of the ratio is propagated.[1]

If the absolute value of one minus the ratio is less than or equal to twice the ratio uncertainty, the results are in agreement.

$$\text{If } Z = \frac{x}{y}, \text{ then } \frac{Sz^2}{Z^2} = \frac{Sx^2}{x^2} + \frac{Sy^2}{y^2}$$

(From: Bevington, P. R., Data Reduction and Error Analysis for the Physical Sciences, McGraw-Hill, New York, 1969)