U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-219/80-20

Docket No. 50-219

License No. DPR-16 Priority _____ Category C

Licensee: Jersey Central Power and Light Company

Madison Avenue at Punch Bowl Road

Morristown, New Jersey 07960

Facility Name: Oyster Creek Nuclear Generating Station

Inspection at: Forked River, New Jersey

Inspection conducted: May 13-15. 1980

Inspectors: Robert G Bores for J. J. Kottan, Radiation Specialist — 7/10/80 date signed

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Approved by: Robert G Bores — 7/10/80 date signed
R. J. Bores, Chief, Environmental and Special Projects Section, FF&MS Branch

Inspection Summary:
Inspection on May 13-15, 1980 (Report No. 50-219/80-20)
Areas Inspected: Routine, unannounced inspection of the licensee's chemical and radiochemical measurements program using NRC:I Mobile Radiological Measurements Laboratory and laboratory assistance provided by DOE Radiological and Environmental Services Laboratory. Areas reviewed included: program for quality control of analytical measurements; audit results; performance on radiological analyses of split actual effluent samples; and vent monitor calibrations. The inspection involved 20 inspector-hours onsite by one NRC regionally based inspector.
Results: Of the four areas inspected, no items of noncompliance were identified.

## DETAILS

1. Persons Contacted

Principal Licensee Employees

J. T. Carroll, Station Superintendent
*J. L. Sullivan, Unit Superintendent
*K. O. E. Fickeissen, Plant Support Superintendent
*J. R. Pelrine, Chemistry Supervisor
*R. B. Somers, Group Chemistry Supervisor

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

*denotes those present at the exit interview.

2. Laboratory QC Program

The inspector reviewed the licensee's program for the quality control of analytical measurements. The inspector noted that the licensee had written procedures covering laboratory and analytical quality control. The inspector determined that the licensee was performing daily source and background checks and that his Ge (Li) multichannel analyzer system was calibrated and checked using NBS or NBS traceable standards. In addition the licensee is performing duplicate analyses on approximately five percent of his liquid radwaste samples. The inspector discussed laboratory QC with the licensee including various aspect of NRC Regulatory Guide 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment. The inspector had no further questions in this area.

No items of noncompliance were identified.

3. Audit Results

The inspector determined that the licensee's effluent analyses and chemistry program were on the corporate QA audit list. The inspector reviewed Audit 79-20 dated December 21, 1979. The inspector had no further questions in this area.

No items of noncompliance were identified.

4. Confirmatory Measurements

During the inspection, actual liquid and airborne particulate effluent samples were split between the licensee and NRC:I for the purpose of intercomparison. The effluent samples were analyzed by the licensee using his normal methods and equipment, and by the NRC using the NRC:I Mobile Radiological Measurements Laboratory. Joint analyses of actual effluent samples are used to determine the licensee's capability to measure radioactivity in effluent samples. Simulated charcoal cartridge and off gas standards were submitted to the licensee for analyses because the facility was shut down for refueling and these types of effluent samples were not available.

In addition, a liquid effluent sample was sent to the NRC reference laboratory, Department of Energy, Radiological and Environmental Services Laboratory (RESL), for analyses requiring wet chemistry. The analyses to be performed on the sample are: Sr-89, Sr-90, gross alpha, gross beta, and tritium. These results will be compared with the licensee's results when received at a later date, and will be documented in a subsequent inspection report.

The results of the sample measurement intercomparisons indicated that all of the measurements were in agreement or possible agreement under the criteria used for comparing results. (See Attachment 1.) The results of the comparisons are listed in Table I.

5. Vent Monitors

The inspector reviewed the licensee's calibration data for the new radwaste building ventilation monitors. This included calibration for the gaseous, charcoal cartridge, and particulate filter monitors. The licensee stated that procedures for periodic sampling and analysis of the new radwaste ventilation system had not been formally approved and implemented. The inspector noted that the calibration and sampling of the new radwaste vent monitors had been previously identified as an item of noncompliance (50-219/79-18-30). The inspector stated that this area will be reviewed during a subsequent inspection upon completion and implementation of all procedures in this area.

No items of noncompliance were identified.

6. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on May 15, 1980. The inspector summarized the purpose and scope of the inspection and the inspection findings.

The licensee agreed to perform the analyses listed in Paragraph 4 and report the results to the NRC.

TABLE 1

OYSTER CREEK VERIFICATION TEST RESULTS

| SAMPLE | ISOTOPE | NRC VALUE | LICENSEE VALUE | COMPARISON |
|---|---|---|---|---|
| | | RESULTS IN MICROCURIES PER MILLILITER | | |
| Waste Sample | | | | |
| Tank TK-13 | Mn-54 | 5.8±1.2E-7 | < 1.35E-6 | |
| 1430 hrs | Cs-137 | 1.66±0.15E-6 | 1.43±02.9E-6 | Agreement |
| 5-13-80 | Co-60 | 8.1±0.8E-6 | 6.4±0.8E-6 | Agreement |
| Reactor Water | | | | |
| 0700 hrs | Mn-54 | 2.8±0.3E-5 | 4.5±0.8E-5 | Agreement |
| 5-14-80 | Cs-137 | 2.42±0.19E-5 | 2.63±0.67E-5 | Agreement |
| | Co-60 | 4.0±0.4E-4 | 4.11±.18E-4 | Agreement |
| Stack Particulate | | | | |
| Filter | Cs-137 | 3.4±0.3E-13 | < 5.5E-13 | ---- |
| 0818 hrs | Co-60 | 2.0±0.2E-12 | 2.31±0.35E-12 | Agreement |
| 5-17-80 | Mn-54 | 3.5±0.4E-13 | 5.26±1.58E-13 | Agreement |
| | | RESULTS IN TOTAL MICROCURIES | | |
| Standard Charcoal Cartridge 62H 3-1-79 | Ba-133 | 0.160±0.016 | 0.164±0.001 | Agreement |

TABLE 1

OYSTER CREEK VERIFICATION TEST RESULTS (Continued)

| SAMPLE | ENERGY (KEV) | NRC VALUE | LICENSEE VALUE | COMPARISON |
|---|---|---|---|---|
| | | RESULTS IN GAMMAS PER MINUTE | | |
| NRC Simulated Off Gas Sample* | 81 | 281,000±14,000 | 563,145±4.5% | Possible Agreement |
| | 303 | 156,000±9,000 | 124,174±10.2% | Agreement |
| | 346 | 2,650,000±160,000 | 2,439,759±1.2% | Agreement |
| | 356 | 460,000±30,000 | 464,062±3.5% | Agreement |
| | 779 | 1,270,000±80,000 | 1,226,357±3.2% | Agreement |
| | 964 | 1,430,000±90,000 | 1,394,000±3.1% | Agreement |
| | 1408 | 2,030,000±160,000 | 2,252,308±2.7% | Agreement |

*At the time of the inspection, the licensee's facility was shut down for refueling, and, therefore, no offgas sample was available. An NRC simulated offgas sample was given to the licensee. The results for the various photo peaks in the spectrum were compared in gammas per minute emitted from the sample.

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 judgement limits are variable in relation to the comparison of the NRC Reference Laboratory's value to its associated 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 must be considered acceptable as the resolution decreases.

$$\text{RATIO} = \frac{\text{LICENSEE VALUE}}{\text{NRC REFERENCE VALUE}}$$

| Resolution | Agreement | Possible Agreement A | Possible Agreement B |
|---|---|---|---|
| <3 | 0.4 - 2.5 | 0.3 - 3.0 | No Comparison |
| 4 - 7 | 0.5 - 2.0 | 0.4 - 2.5 | 0.3 - 3.0 |
| 8 - 15 | 0.6 - 1.66 | 0.5 - 2.0 | 0.4 - 2.5 |
| 16 - 50 | 0.75 - 1.33 | 0.6 - 1.66 | 0.5 - 2.0 |
| 51 - 200 | 0.80 - 1.25 | 0.75 - 1.33 | 0.6 - 1.66 |
| >200 | 0.85 - 1.18 | 0.80 - 1.25 | 0.75 - 1.33 |

"A" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is greater than 250 Kev.

Tritium analyses of liquid samples.

Iodine on absorbers

"B" criteria are applied to the following analyses:

Gamma Spectrometry where principal gamma energy used for identification is less than 250 Kev.

89Sr and 90Sr Determinations.

Gross Beta where samples are counted on the same date using the same reference nuclide.