U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/81-24

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

Licensee: Consumers Power Company
212 W. Michigan Avenue
Jackson, MI 49201

Facility Name: Palisades Nuclear Generating Plant

Inspection At: Palisades Site, Covert, MI

Inspection Conducted: October 26-29, 1981

Inspectors: R. A. Nicholson for A. G. Januska for NRR3PEM — Nov. 19, 1981
R. A. Nicholson for S. Rozak — Nov. 19, 1981

Approved By: R. A. Nicholson for M. C. Schumacher, Chief — Nov. 19, 1981
Independent Measurements and
Environmental Protection Section

C. J. Paperiello — Nov 20, 1981
C. J. Paperiello, Chief
Emergency Preparedness and Program
Support Branch

Inspection Summary

Inspection on October 26-29, 1981 (Report No. 50-255/81-24)
Areas Inspected: Routine unannounced inspection of Confirmatory Measurements including discussion of previous sample results analyzed by the NRC's Reference Laboratory; collection of samples; analysis onsite with the Region III Measurements Van and discussion of results; and program for Quality Assurance and Quality Control of analytical measurements. The inspection involved 43 inspector-hours onsite by two NRC inspectors.
Results: No items of noncompliance or deviations were identified.

## DETAILS

1. Persons Contacted

*R. Montross, Plant Manager
*A. Kowalczuk, Chemistry/Health Physics Superintendent
*W. Mullins, Plant Heath Physicist
*S. Pierce, RMC Supervisor
*D. Clement, Lab Supervisor
*J. Hager, Chem. Tech.

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

a. (Closed) Item of noncompliance (50-255/80-19-01): Failure of the licensee to submit the annual environmental monitoring report within the required time. The "1979 Nonradiological Environmental Monitoring Program" report was issued on October 23, 1980. The inspectors have no further questions regarding this item.

b. (Closed) Item of noncompliance (50-255/80-19-02): Failure of the licensee to submit the topics required by Section 4.11 of the Technical Specifications in the annual Nonradiological Environmental Monitoring Report. The licensee submitted a report entitled 1979 Nonradiological Environmental Monitoring Report in a letter dated January 16, 1981 which summarized narrative summaries of the programs involved. The inspectors have no further questions regarding this item.

c. (Closed) Item of noncompliance (50-255/80-19-03): Hourly recordings of water temperature prior to discharge to the lake were not performed during the period April 28, 1980 through July 31, 1980. The licensee was relieved of nonradiological monitoring Technical Specifications requirements by Technical Specifications Amendment 63 dated January 22, 1981. The inspectors have no further questions regarding this item.

d. (Closed) Item of noncompliance (50-255/80-19-04): Failure of the licensee to accurately report the curie content of particulates released from the site. The licensee has changed his method of quantification of particulates being released by summing particulates on both the particulate filter and the charcoal adsorber. The inspectors have no further questions regarding this item.

3. Confirmatory Measurements

a. Fourth quarter 1980 Split

Analyses which could not be performed onsite during the split sampling of inspection 255/80-19 are shown in Table I and the comparison criteria in Attachment 1.

b. Fourth quarter 1981 Split

Collected liquid, particulate and charcoal samples were analyzed by the licensee and by NRC inspectors using the Region III Mobile Laboratory. No gaseous waste was available for comparison. In addition, an NBS traceable spiked air particulate filter and an NBS traceable spiked charcoal cartridge were analyzed by the licensee at the request of the inspectors. Results of the analyses are shown in Table II.

An examination of the licensee's analytical data and a spectral display indicated that the performance of his gamma spectroscopy system in the low level counting room is deteriorating. The licensee's results tended to be high compared to NRC results. This is especially evident for comparisons on the spiked samples. The full width at half maximum (FWHM) of the 1332 keV Co-60 peak for his system is now 2.5 keV whereas undamaged detectors of this size and vintage generally have a FWHM of about 2.0 keV. The licensee is forced to use a wide (2keV) energy tolerance in identifying peaks due to his energy calibration drifting. Futhermore, the peak shapes on the spectral display indicated a strong distortion in the low energy side. This would result in difficulties in quantifying energy and activity.

The licensee admitted that his detector had suffered physical damage at the beginning of 1981. It had been subsequently repaired; however, the ancillary electronics had never been readjusted for optimum performance. Settings on the amplifier used with this system also had been changed significantly at one time and again no readjustments for optimum performance had been done. The licensee also has difficulty in controlling temperature and humidity in his counting rooms, which also adversely affects the stability of the system.

The licensee recognized that these problems need to be corrected and committed to repairing and/or adjusting his system for optimum performance and recalibrating all geometries. The licensee has already purchased new calibration standards in preparation for routine recalibration. The licensee agreed to have the adjustments and calibrations completed by January 1, 1982.

4. Procedure Review

The inspectors reviewed procedures which related to effluent monitoring equipment. The inspectors noted that some procedures exist for equipment no longer in use, some revised procedures are in for review and some have been recently revised to reflect currently used equipment. A procedure for the calibration of gas containers has never been written and a licensee representative stated that the calibration, although performed, did not account for self-absorption factors. The inspectors discussed the need for the completion of procedure revisions, and overreporting of gaseous effluents when self absorption factors are not used in gas calibrations. The licensee acknowledged the inspectors comments.

5. Equipment

Equipment used for effluent monitoring was examined. Except for the scintillation system used for tritium analyses, they are checked daily. The scintillation system is checked prior to use.

6. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 28, 1981. The inspectors summarized the scope and findings of the inspection. The licensee made the following remarks in response to certain of the items discussed by the inspectors:

a. Acknowledged statements by the inspectors with respect to a deteriorating gamma spectroscopy system (Paragraph 3).

b. Agreed to repair and/or adjust his gamma spectroscopy system and complete all recalibrations by January 1, 1982. (Open Item 255/81-24-02)

c. Agreed to count and report the results of gross beta, Sr-89, Sr-90 and H-3 of a split liquid sample to Region III. (Open Item 255/81-24-01)

Attachments:
1. Attachment 1, Criteria for Comparing Analytical Measurements
2. Table I, Confirmatory Measurements Program Results, 4th Quarter 1980
3. Table II, Confirmatory Measurements Program Results, 4th Quarter 1981

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 Reference Laboratory'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 to maintain statistical consistency with the number of significant figures reported by the NRC Reference Laboratory, unless such rounding will result in a narrowed category of acceptance. The acceptance category reported will be the narrowest into which the ratio fits for the resolution being used.

| RESOLUTION | RATIO = LICENSEE VALUE/NRC REFERENCE VALUE | | |
|---|---|---|---|
| | Agreement | Possible Agreement "A" | Possible Agreeable "B" |
| <3 | No Comparison | No Comparison | No Comparison |
| ≥3 and <4 | 0.4 - 2.5 | 0.3 - 3.0 | No Comparison |
| ≥4 and <8 | 0.5 - 2.0 | 0.4 - 2.5 | 0.3 - 3.0 |
| ≥8 and <16 | 0.6 - 1.67 | 0.5 - 2.0 | 0.4 - 2.5 |
| ≥16 and <51 | 0.75 - 1.33 | 0.6 - 1.67 | 0.5 - 2.0 |
| ≥51 and <200 | 0.80 - 1.25 | 0.75 - 1.33 | 0.6 - 1.67 |
| ≥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.

"B" criteria are applied to the following analyses:

Gamma spectrometry, where principal gamma energy used for identification is less than 250 keV.

Sr-89 and Sr-90 determinations.

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

TABLE I

U S NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

CONFIRMATORY MEASUREMENTS PROGRAM
FACILITY: PALISADES
FOR THE 4 QUARTER OF 1980

| | | ------NRC------- | | ---LICENSEE----- | | ---NRC:LICENSEE---- | | |
|---|---|---|---|---|---|---|---|---|
| SAMPLE | ISOTOPE | RESULT | ERROR | RESULT | ERROR | RATIO | RES | T |
| L WASTE | BETA | 1.0E-03 | 4.0E-05 | 1.1E-03 | 2.9E-05 | 1.1E+00 | 2.5E+01 | A |
| | H 3 | 1.7E-01 | 2.0E-03 | 1.9E-01 | 6.0E-04 | 1.1E+00 | 8.5E+01 | A |

T TEST RESULTS:
A=AGREEMENT
D=DISAGREEMENT
P=POSSIBLE AGREEMENT
N=NO COMPARISON

TABLE II

U S NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

CONFIRMATORY MEASUREMENTS PROGRAM
FACILITY: PALISADES
FOR THE 4 QUARTER OF 1981

| | | ------NRC------- | | ---LICENSEE----- | | ---NRC:LICENSEE---- | | |
|---|---|---|---|---|---|---|---|---|
| SAMPLE | ISOTOPE | RESULT | ERROR | RESULT | ERROR | RATIO | RES | T |
| P FILTER | CO 58 | 5.3E-05 | 7.5E-06 | 5.1E-05 | 5.4E-06 | 9.6E-01 | 7.1E+00 | A |
| | CO 60 | 4.6E-05 | 1.4E-05 | 3.5E-05 | 1.0E-05 | 7.6E-01 | 3.3E+00 | A |
| | CS 137 | 3.8E-05 | 7.1E-06 | 3.3E-05 | 6.0E-06 | 8.7E-01 | 5.4E+00 | A |
| C FILTER | GAMMA A | 3.6E-05 | 7.6E-06 | 4.6E-05 | 6.2E-06 | 1.3E+00 | 4.7E+00 | A |
| | I 131 | 3.5E-04 | 1.3E-05 | 4.7E-04 | 1.4E-05 | 1.3E+00 | 2.7E+01 | P |
| | CS 137 | 3.2E-05 | 7.5E-06 | 1.7E-05 | 5.3E-06 | 5.3E-01 | 4.3E+00 | A |
| F SPIKED | CO 57 | 4.4E+03 | 1.8E+02 | 5.3E+03 | 0.0 | 1.2E+00 | 2.4E+01 | A |
| | CS 137 | 2.5E+04 | 3.0E+02 | 3.2E+04 | 0.0 | 1.3E+00 | 8.3E+01 | P |
| | CO 60 | 3.9E+04 | 4.0E+02 | 4.5E+04 | 0.0 | 1.2E+00 | 9.8E+01 | A |
| C SPIKED | CO 57 | 1.1E+04 | 5.0E+02 | 1.4E+04 | 0.0 | 1.3E+00 | 2.2E+01 | A |
| | CS 137 | 6.2E+04 | 2.5E+03 | 8.5E+04 | 0.0 | 1.4E+00 | 2.5E+01 | P |
| | CO 60 | 9.8E+02 | 3.9E+03 | 1.2E+05 | 0.0 | 1.2E+02 | 2.5E-01 | N |

T TEST RESULTS:
A=AGREEMENT
D=DISAGREEMENT
P=POSSIBLE AGREEMENT
N=NO COMPARISON