U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-333/86-12

Docket No. 50-333

License No. DPR-59 Category C

Licensee: Power Authority of the State of New York
P.O. Box 41
Lycoming, New York 13093

Facility Name: James A. Fitzpatrick Nuclear Power Plant

Inspection At: Scriba, New York

Inspection Conducted: July 21-25, 1986

Inspectors: Richard H. Struckmeyer — 8/11/86
R. Struckmeyer, Radiation Specialist — date

Margaret E. Kramaric — 8/12/86
M. Kramaric, Radiation Specialist — date

Approved by: Marie T. Miller for — 8/12/86
W. Pasciak, Chief, Effluents Radiation Protection Section, EPRPB — date

Inspection Summary: Inspection on July 21-25, 1986 (Inspection Report Number 50-333/86-12

Areas Inspected: Routine, announced inspection of the radiological environmental monitoring program including: management controls; the licensee's program for quality control of analytical measurements; implementation of the radiological environmental monitoring program; and a follow-up on the licensee's actions on previous inspection findings.

Results: Within the areas inspected, one item of noncompliance was identified in one area (failure to follow procedure, paragraph 5.c).

DETAILS

1. Individuals Contacted

1.1 New York Power Authority

*J. Brons, Senior Vice President, Nuclear Generation
*R. Converse, Resident Manager
*B. Gorman, Chemistry General Supervisor, RES
L. Johnston, QA Supervisor
E. Mulcahey, Radiological & Environmental Services Superintendent
*R. Patch, QA Superintendent
E. Salvetti, Senior Technician, RES
D. Simpson, Training Superintendent
*A. Zaremba, Assistant Emergency Planning Coordinator

1.2 Niagra Mohawk Power Corporation

*H. Flanagan, Environmental Protection Coordinator
*T. Galletta, Assistant Environmental Protection Coordinator
W. Joseph, I&C Assistant Supervisor
*E. Leach, Superintendent, Chemistry and Radiation Management
J. Lupa, Nuclear Generation Specialist, I&C
*T. Perkins, General Superintendent
N. Spagnoletti, Nuclear Division
M. West, Environmental Technician A

*Denotes those present at exit interview on July 25, 1986.

2. Status of Previously Identified Items

(Closed) Inspector Follow-up Item (333/81-05-04): Calibration records for meteorological instruments and control room recorders. This item was reviewed and closed in conjunction with item number 333/83-20-04, described below.

(Closed) Inspector Follow-up Item (333/83-20-01): Review audit program with respect to implementation and adequacy of procedures for radiological environmental monitoring. Audits covering implementation of these procedures were performed in January, March, and November 1984, and August 1985. A licensee representative stated that an appraisal was recently performed covering the implementation of the Radiological Effluent Technical Specifications (RETS), of which radiological environmental monitoring is a part. The inspector reviewed the audits performed in 1984 and 1985, and found that they adequately addressed the issue of implementation of procedures. The RETS appraisal will be reviewed in a future inspection (see paragraph 3.b).

(Closed) Inspector Follow-up Item (333/83-20-02): Completeness of records of sample collection and analysis. The inspector reviewed the licensee's procedure ESP-2, "Environmental Data Review," and associated records for collection and analysis of environmental samples. These records were complete and up-to-date at the time of this inspection.

(Closed) Inspector Follow-up Item (333/83-20-03): Method for assuring operability of meteorological strip chart recorders in control room. The licensee had installed new strip chart recorders, which were operational at the time of this inspection.

In addition, the inspector reviewed Procedure No. F-IMP-17.10, "Meteorology Strip Chart Routine Maintenance and Calibration," which is performed once a year, and Procedure No. SAP-10, "Meteorological Monitoring System Surveillance," which is performed biweekly. The inspector also reviewed selected calibration and surveillance records. These procedures appear to provide an adequate method for ensuring the operability and proper functioning of the recorders.

(Closed) Inspector Follow-up Item (333/83-20-04): Method for assuring calibration of meteorological equipment. The licensee stated that the method chosen was to perform periodic audits of the calibrations performed by Nine Mile Point. The inspector reviewed copies of audits performed in 1984 and 1985. These audits covered the semiannual calibrations of the meteorological sensors and associated electronics. An audit of the semiannual calibration records has not yet been performed in 1986. This audit will be reviewed in a future inspection.

(Closed) Inspector Follow-up Item (333/83-20-05): Training program for Radiological Environmental Monitoring Program technicians. The licensee has instituted a formal training and qualification program. The inspector reviewed Training Program 9-7, "James A. Fitzpatrick Nuclear Power Plant Qualification Card and Standard for Radiological and Environmental Technician." Each technician in the Radiological and Environmental Services Department receives classroom training and on-the-job training in all areas related to chemistry, radiation protection, environmental monitoring, respiratory protection, dosimetry, and ALARA. Each technician keeps his qualification and training manual until it is completed. The successful completion of each aspect of training is indicated by the signature of the appropriate individual (training instructor, supervisor, senior technician). In addition, computerized records are updated by the training staff. The inspector reviewed the computer records for technicians working in the radiological environmental laboratory. These indicated satisfactory progress in the training program.

3. Management Controls

The inspector reviewed the licensee's management controls for the radiological environmental monitoring program, including assignment of responsibility, program audits, and corrective actions for identified inadequacies in the program.

a. Assignment of Responsibility

The inspectors reviewed the organization and administration of the environmental monitoring program. The program is administered by the site Environmental Supervisor who reports through the Chemistry Coordinator to the Radiological and Environmental Services Superintendent (RESS). The RESS reports to the Superintendent of Power, who in turn reports to the Resident Manager.

The inspector noted that responsibilities for sample collection and analysis for the the Radiological Environmental Monitoring Program (REMP) are shared between the Niagra Mohawk Power Corporation (NMPC), which operates the Nine Mile Point Nuclear Station, and the New York Power Authority (NYPA), which operates the James A. Fitzpatrick Nuclear Power Plant.

Sample collections are performed by two groups. A large portion including milk, food crops, and fish, is performed by Ecological Analysts, Inc. The remainder, including in-plant canal sampling and air samplers, is performed jointly by personnel from the Nine Mile Point Nuclear Station and the James A. Fitzpatrick Nuclear Power Plant.

The licensee stated that radiological analyses (other than those conducted on-site) are contracted to Teledyne Isotopes. Certain environmental samples are analyzed by the Site Environmental Laboratory. These samples are: air particulate filters (for gross beta and gamma spectral analysis), airborne radioiodine (gamma spectral analysis), and lake water (gamma spectral analysis).

b. Program Review and Audits

The inspector reviewed the licensee's audits of its contractors for environmental sampling and analysis. These audits are required by Appendix A of the licensee's procedure ESP-2. This procedure did not specify a minimum frequency for performance of these audits. The licensee stated that the procedure would be revised to specify a biannual frequency, as a minimum, for each contractor. This will be reviewed in a future inspection (333/86-12-01).

The inspector reviewed the audit of Ecological Analysts, Inc. (EAI), performed in January 1986, and the audit of Teledyne Isotopes, Inc., performed in January 1985. Both audits were conducted by the Environmental supervisors from NMP and JAF. The EAI audit covered

radiological sample collection, including procedures, specific sampling activities, shipping and inventory, data handling, and administrative matters. The Teledyne audit covered sample receipt and data handling, selected procedures (including those for determination of gamma emitting radioisotopes and for determination of radiostrontium in milk), instrumentation (including calibrations), and quality control. No open items were identified in either audit. The licensee stated that the audit of Teledyne's quality control covered only its performance with respect to EPA crosscheck samples. The inspector stated that the audit should also include a review of other aspects of the quality control program, including control charts, analysis of duplicate and replicate samples, etc.

Technical Specification Section 6.5.2.8.k requires that an audit of the Radiological Environmental Monitoring Program be performed at least once per 12 months under the cognizance of the Safety Review Committee. The inspector reviewed the following audits covering aspects of the Radiological Environmental Monitoring Program:

- Standard Audit 481, "Environmental Technical Specifications (ETS) Appendix B to Operating License, Section 4.3 (Including Amendment 76)," conducted January 4, 9, and 10, 1984;

- Standard Audit 492, "RETS Section 4.0 -- Sampling Locations," conducted March 19, 26, 27, 1984;

- Standard Audit 525, (no title), conducted November 29, 30, December 6, 1984. (Purpose of audit was to verify that sampling and analysis were being properly performed, reviewed, and approved as required by Technical Specifications and procedures.)

- Surveillance Audit 1051, "Analysis of Environmental Samples," conducted August 22, 1985.

These audits appeared to adequately cover the implementation of procedures used for the collection and analysis of environmental samples. The licensee stated that an appraisal was recently performed covering the implementation of the Radiological Effluent Technical Specifications (RETS), of which radiological environmental monitoring is a part. The inspector briefly reviewed the audit checklist, as the results of the audit were not yet available. The RETS Appraisal will be reviewed in a future inspection (333/86-12-02).

4. Environmental Laboratory Quality Assurance

The inspector reviewed the licensee's program for the quality assurance of radioanalytical measurements performed by the Environmental Laboratory. The program was reviewed against the criteria of Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment."

The inspector reviewed the following procedures:

°	ESP-12 (JAF) S-ENVSP-12 (NMP)	Rev.4	Environmental Surveillance Program; Quality Assurance/Quality Control Program
°	ESP-5 (JAF) S-ENVSP-5 (NMP)	Rev. 1 Rev. 8	Analysis of Environmental Samples
°	ESP-11 (JAF)	Rev. 1	Environmental Lab Gamma Ray Spectrometer System

The inspector reviewed the following quality control data:

- intercomparison results for the period January 1986 to the present;
- daily resolution, energy and source check data for germanium detectors 1, 2, and 3 during the period January 1986 to the present.
- weekly background checks for germanium detectors 1, 2, and 3 during the period January 1986 to the present.

Within the scope of this review, the following concern was identified:

- The laboratory's computer-based gamma spectroscopy system uses a built-in quality control program for resolution, energy, background and source checks. The software automatically compares the results of these checks to control limits established by the software vendor. The laboratory personnel did not appear to be familiar with the software and could not explain the basis for the calculated values or the control limits. The inspector stated that control charts established by the software, in the absence of the user's knowledge and understanding of the methodology employed, do not provide the level of control over the measurement process that can be achieved through the direct involvement of the laboratory personnel.

  In response to this concern, the licensee stated that it would initiate an improvement to the laboratory quality control program. The laboratory personnel will perform a gamma-spectral analysis for a check source daily on each of the instruments when they are in use. Control charts for each instrument will be established according to a documented method. The results of the daily source checks will be

plotted on the control charts and compared to the limits established for each instrument. As a minimum, the laboratory personnel will plot the ratio of the daily analytical result to the known value for each of three radionuclides: Cd-109, Cs-137, and Co-60; and the resolution for the 1332 KeV peak of Co-60. The licensee stated that these control charts will be in use no later than August 31, 1986, and the procedure covering Environmental Laboratory quality control will be revised to incorporate these changes no later than September 30, 1986.

The inspector also identified the following concerns:

- Procedure ESP-12 indicates that the USNRC participates in annual sample splits with the licensee. The USNRC does not participate in sample splits with any licensee for the purpose of laboratory quality control.

  The licensee stated that ESP-12 will be revised to remove the reference to the USNRC as part of the licensee's interlaboratory quality control program.

- During the review of source check data for Detector #3, the inspector noted that an efficiency calibration had not been performed for the source check geometry.

  The licensee stated that this calibration was performed prior to the conclusion of the inspection.

- Procedure ESP-5/ENVSP-5 provides instruction for the gamma spectral analysis of water samples. The preparation involves the evaporation of a 4 liter sample down to 100 milliliters, followed by the addition of nitric acid. The inspector stated that the nitric acid, which is used to prevent plate-out of nuclides, should be added at the time of sampling and not following evaporation. The inspector further stated that there is a possibility of losing volatile nuclides from the sample during the evaporation process.

  Procedure ESP-5/ENVSP-5 specifies that the 100 cc counting geometry be used for gamma analysis of vegetation samples. However, the licensee indicated that the gamma spectrometry system is also calibrated for vegetation samples using a 1 liter Marinelli beaker, and that analyses are performed using this counting geometry.

  The licensee stated that procedure ESP-5/ENVSP-5 will be revised to add the 1 liter Marinelli counting geometry for vegetation analyses and to specify that nitric acid is added to water samples at the time of sampling (this should be stated in the appropriate sampling procedure as well).

  The licensee plans to perform an evaluation of the method for analyzing samples of water by gamma spectroscopy using the 4 liter

Marinelli counting geometry instead of the evaporation technique. The licensee stated that the results of this evaluation will be used to determine the optimum method for analysis of water samples, including consideration of LLDs and sample counting time.

- Procedure ESP-11 states that plots of current energy vs channel number are typically linear and any departure from linearity suggests a problem. The inspector discussed this matter with the licensee since a non-linear fit is commonly used in an energy calibration.
  The licensee agreed that a quadratic fit or a cubic fit would also provide an effective calibration and did not necessarily indicate a problem. The licensee stated that this procedure will be revised.

The inspector stated that the procedure revisions and improvements to the Environmental Laboratory Quality Assurance Program will be reviewed in a future inspection (333/86-12-03).

5. Implementation of the Radiological Environmental Monitoring Program

a. Direct Observation

The inspector examined selected environmental monitoring stations, including air samplers for iodines and particulates, TLDs for direct radiation measurement, and continuous water sampling equipment on the inlet canal at the JAFNPP. All equipment was operational at the time of the inspection.

b. Review of Reports

The inspector reviewed the licensee's Annual Radiological Environmental Surveillance Report for 1985, and noted that all samples required by the Technical Specifications were reported for the year, as were historical data for the years prior to the report. There is also discussion of the monitoring program, the various kinds of samples analyzed, the interrelationship between the Fitzpatrick and Nine Mile Point Programs, and deviations from the required sampling schedules.

As a result of this review, the inspector determined that the licensee has complied with its Technical Specification requirements for sampling frequencies, types of measurements, analytical sensitivities, and reporting schedules.

The analysis of environmental samples indicated that doses to humans from radionuclides of station origin were negligible.

c. Procedures

The inspector reviewed selected procedures for analysis of samples by the Environmental Laboratory. Observations concerning procedures

related to laboratory quality assurance are presented in Section 4 of this report. In addition, the following procedures were reviewed:

°	ESP-2 (JAF)	Rev. 1	Environmental Data Review
°	ESP-4 (JAF) Inspection S-ENVSP-4 (NMP)	Rev. 11 Rev. 2	Environmental Station and Sample Collection
°	ESP-7 (JAF) S-ENVSP-7 (NMP)	Rev. 6 Rev. 2	Calibration of Environmental Monitors
°	ESP-9 (JAF) Proportional	Rev. 1	Low Background Counter
°	ESP-14 (JAF)	Rev. 1	LB 5100 Low Background Counter

The inspector also reviewed records and data related to these procedures. The review of ESP-14, LB 5100 Low Background Counter, indicated that a step necessary for proper calibration of the instrument was not included in the procedure, and that an existing step was not being implemented. The missing step, which was recommended in the manual supplied by the instrument manufacturer, instructs the user to move the signal cable from the beta port to the alpha-plus-beta port as part of the calibration, in order to accumulate gross counts in channel B of the instrument. This is to be followed by repeated counts of a check source at increasing voltage increments, and a graph of response (counts per minute) versus voltage is to be prepared. The procedure specified (step 4.4.8) that the user should plot averaged beta counts per minute versus voltage, and averaged alpha-plus-beta counts per minute versus voltage. The inspector reviewed calibration records for this instrument and determined that the user had not performed the plot of alpha-plus-beta counts per minute versus voltage. The inspector stated that Procedure ESP-14 was not properly implemented, and that this was a violation of Section 7.2 of the James A. Fitzpatrick Nuclear Power Plant Technical Specifications (333/86-12-04). The licensee revised the procedure to include the missing step and instructed laboratory technicians on the proper method of calibration prior to the end of the inspection. The inspectors reviewed the licensee's revised procedure and found it adequate. This item is considered closed.

6. Meteorological Monitoring

The inspector examined the meteorological monitoring system, including the primary, backup, and inland meteorological towers, as well as the digital readouts in the equipment buildings at each tower and the strip chart recorders in the control rooms. The sensors are maintained and calibrated by NMPC. JAF maintains and calibrates the strip-chart recorders in its control room. The equipment on each tower appeared to be operating properly at the time of the inspection. The primary tower has sensors for

wind speed (WS) and wind direction (WD) at three elevations: 30 feet, 100 feet, and 200 feet. In addition, this tower has provisions for measuring ΔT and sigma-theta. The backup tower has WS and WD sensors at an elevation of 92 feet. The inland tower has sensors at the 32 foot level; its purpose is to detect differences in weather conditions relative to the towers at the site, which are influenced by the effects of Lake Ontario immediately to the north.

The inspector reviewed the NMP calibration procedures for the meteorological monitoring equipment, and noted that calibrations have been performed semiannually as required by the NMP Technical Specifications. These calibrations appear to have been performed satisfactorily.

JAF performs periodic audits to confirm that these calibrations have been performed satisfactorily. The inspector reviewed the results of these audits for 1984 and 1985 and found that they were adequate. An audit of the semiannual calibration records had not yet been performed in 1986. This audit will be reviewed in a future inspection.

7. Exit Interview

The inspector met with licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on July 25, 1986. The inspector summarized the purpose and scope of the inspection, and discussed the findings. At no time during this inspection was written material provided to the licensee by the inspector.