

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-244/93-04
Docket No. 50-244
License No. DPR-18
Licensee: Rochester Gas and Electric Corporation
89 East Avenue
Rochester, New York 14649
Facility Name: R. E. Ginna Nuclear Power Plant
Inspection At: Ontario, New York
Inspection Conducted: February 8-12, 1993

Inspector:

Laurie A. Peluso
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02/25/93
Date

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2-26-93
Date

Approved by:

Marie T. Miller
Marie T. Miller, Chief, ERPS, FRSSB, DRSS

2-26-93
Date

Areas Inspected: Announced inspection of the Radiological Environmental Monitoring Program (REMP) and Radioactive Effluent Control Program (RECP) including: management controls, quality assurance audits, quality assurance/quality control of measurement laboratory, surveillance procedures, meteorological monitoring program, calibration of radiation monitoring systems, testing of air cleaning systems, ODCM, and implementation of the above programs.

Results: Within the areas inspected, the improvements of the REMP and RECP were noteworthy. The responsible individuals were knowledgeable with respect to implementation of the above programs. No safety concerns or violations of regulatory requirements were identified.

DETAILS

1.0 Individuals Contacted

1.1 Licensee Personnel

- * S. Beluke, Test Engineer, Results and Test Department
- * D. Fillion, Radiochemist, Health Physics and Chemistry Department
- * R. Gasper, Health Physics Technician, HP/Chemistry
- * A. Harhay, Health Physics and Chemistry Manager
- C. Kulwicki, Lead Auditor, Quality Performance Department
- * D. Leeper, I&C Foreman, Instrument and Controls Department
- N. Leoni, Quality Improvement Specialist, HP/Chemistry
- * T. Marlow, Superintendent
- * J. McGrath, Environmental Technician, HP/Chemistry
- J. Scalzo, I&C Technician, I&C Department
- * J. St. Martin, Corrective Action Coordinator
- * B. Stanfield, Quality Assurance Engineer, Operations
- * B. Quinn, Corporate Health Physicist
- * R. Watts, Director of Corporate Radiation Protection

1.2 Nuclear Regulatory Commission

- * T. Moslak, Senior Resident Inspector
- E. Knutson, Resident Inspector

* Denotes those present at the exit interview held on February 12, 1993. Other licensee employees were contacted and interviewed during this inspection.

2.0 Purpose

The purpose of this inspection was to review the licensee's programs in the following areas.

- (1) The licensee's ability to implement the Radiological Environmental Monitoring Program (REMP), including the Meteorological Monitoring Program (MMP).
- (2) The licensee's ability to control and quantify effluent radioactive liquids, gases, and particulates.
- (3) The licensee's ability to calculate projected doses to the public from radioactive liquid and gaseous (airborne) effluent releases during normal operation.

3.0 Previously Identified Items

(Closed) Unresolved (50-244/91-08-01) Calculation of iodine-131 (I-131) activity using an incorrect self-absorption correction factor. The licensee, while in the process of converting to a new gas flow proportional counter, had been using an old correction factor for the new proportional counter. The licensee stated that (1) calculations of I-131 activity would be performed using the correct self-absorption correction factor and (2) all the results since the change in counting equipment would be recalculated using the new correction factor.

During this inspection, the inspector noted that the licensee had calculated I-131 activity using the correct self-absorption correction factor and the results were recalculated. The difference in the results, however, was negligible and was not a safety concern. This item is closed.

(Closed) Unresolved (50-244/91-08-02) Possible unmonitored radioactive effluent release pathway through the air ejector/gland seal exhaust on the turbine building roof in the event of a major primary-secondary leak.

The inspector noted that the licensee reviewed the potential release pathways in detail and identified better sampling technique to monitor the radioactive releases. The licensee installed a new sampling system to quantify actual activity released. The licensee also established Operations and Health Physics procedures that included sampling frequency and technique for smears and environmental soils. The licensee calculated the total amount released through this pathway and incorporated the results into the Semiannual Effluent Release Report. The inspector reviewed these results. The inspector determined that it was not a safety significant concern because the amount of the release through this pathway was negligible. This item is closed.

4.0 Management Controls

4.1 Organization

The inspector reviewed the licensee's organization of the REMP and RECP and discussed with members of the Health Physics/Chemistry Department any changes made since the last inspection conducted in April 1991. There have been no changes in the organization of the REMP and RECP since the previous inspection.

4.2 Quality Assurance Audits

The inspector reviewed the licensee's Quality Assurance Audit Reports (Audit Numbers 91-17 and 92-13) as part of the evaluation of the implementation of Section 6.5.2.8 of Technical Specifications. Audits 91-17 and 92-13 were

performed as scheduled in the areas of the REMP and RECP. These audits were conducted by members of the Quality Performance Department (QPD). Each audit covered the stated objectives, utilized a technical specialist, and was of sufficient technical depth to assess the above programs. Each audit identified 8 findings and 12 observations, none of which were safety significant. The QPD used a tracking system to follow the findings and observations identified during the previous audit. All the items for the 1991 audit were closed and the 1992 audit findings and observations were still open at the time of this inspection.

The inspector noted that the licensee had not formally included an audit for the meteorological monitoring program. The inspector noted however, that certain aspects of the meteorological monitoring program were reviewed and documented in audit report 92-13, because of the initiative of the technical specialist. The licensee stated that the scope of audits for the meteorological monitoring program will be evaluated and incorporated into the audit program, as appropriate.

4.3 Review of the Annual and Semiannual Reports

The inspector reviewed the Annual Radiological Environmental Operating Report for 1990, and 1991, as well as the available 1992 analytical data. The report provided a comprehensive summary of the analytical results of the REMP around the Ginna site and met Technical Specification reporting requirements. Records of the analytical results for 1992 indicated that samples were collected as required and the lower limits of detection specified in the licensee's Technical Specifications were met. No obvious omissions, trends, or anomalous measurements were identified.

The inspector also reviewed the Semiannual Radioactive Effluent Release Reports for 1991 and the first half of 1992, and determined that the licensee met the Technical Specification reporting requirements. These reports provided total released radioactivity for liquid and gaseous effluents, including the projected radiation exposure to the public.

5.0 Radiological Environmental Monitoring Program

5.1 Direct Observations

The inspector examined selected environmental sampling stations to determine whether samples were being obtained from the locations designated in Sections 3.16 and 4.10 of the Technical Specifications and the Offsite Dose Calculation Manual (ODCM) and whether the air samplers were operable, calibrated, and maintained. These stations included air samplers for particulate and airborne

iodines, intake and discharge composite water samplers, and a number of thermoluminescent dosimetry (TLD) stations for direct ambient radiation measurements. All the air sampling equipment was operational and the gas meters for the air samplers were calibrated at the time of the inspection. TLDs were placed at their designated locations, and the water compositors were operating and taking samples.

5.2 Implementation of the REMP

The inspector reviewed the following procedures as part of the examination of the implementation of the REMP as described in the Technical Specifications.

CE-2.1, Collection of Milk Samples

CE-2.2, Gamma Scan of Milk

CE-2.3, Iodine-131 Analysis of Milk

CE-2.4, Analysis for Low Level Iodine-131 in Milk and Water by Ion Exchange

CE-4.2, Collection and Gross Activity Determination on Environmental Water Samples

The above procedures included requirements for sampling frequencies and sampling techniques for various environmental sample media. The procedures provided the required direction and guidance for implementing an effective program.

The inspector noted that the Environmental Technician had the following responsibilities for maintaining the Environmental Laboratory.

- (1) Collecting and analyzing environmental samples.
- (2) Analyzing QC samples for the intra-laboratory Quality Control Program and the EPA Cross-check Program.
- (3) Reporting all analytical results.

In May of 1991, the Environmental Technician replaced the Laboratory Technician Helper who had limited knowledge of laboratory procedures. (See inspection report number 54-244/91-08 for details.) The Environmental Technician demonstrated a very good understanding of the environmental monitoring program and current industry practices, as well as knowledge of chemistry, counting statistics, and the appropriate procedures. The inspector also noted that the Environmental Technician was instrumental in greatly improving the physical condition of the Environmental Laboratory.

Based on the above the procedure review, discussions with the licensee representatives, and independent observations, the inspector determined that

the licensee has made significant improvements and has implemented the REMP effectively.

6.0 Quality Assurance/Quality Control of Analytical Measurements

The inspector reviewed the licensee's programs for quality assurance (QA) and quality control (QC) of analytical measurements to determine whether the licensee had adequate controls with respect to sampling, analyzing samples, and evaluating data for implementing the REMP. The QA and QC programs are conducted by the Quality Improvement Specialist. During the last inspection, the inspector noted that the licensee had established a QC program, including the preparation of spike samples as part of a QC check for the Environmental Laboratory.

During this inspection, the inspector noted that the licensee had initiated a Process Control Pilot Program to augment and improve the existing QC program. The inspector reviewed the results and noted that the method currently used to evaluate data and report results should be improved by using a statistical methodology (e. g., t-Test). The inspector also noted that preparation methods for duplicate and spike samples should be improved (e.g., duplicates should be a homogeneously split sample and spikes should contain enough activity to reduce counting error). The inspector discussed with the Quality Improvement Specialist the general industry practices to prepare the duplicate and spike samples. The licensee stated that this method would be reviewed, and incorporated into the program, as appropriate.

The inspector reviewed the detector calibration records and QC control charts for detector efficiency and noted that the control charts for the counting equipment were within the licensee's set criteria and calibrations were performed as scheduled. The inspector reviewed the quality assurance program, including the EPA cross-check program. The results of the EPA cross-check program were positively biased (e.g., gross beta) and certain results were not within the EPA's acceptance criteria for several gamma emitters. The inspector stated that the licensee should follow this matter aggressively in order to identify any potential weaknesses of the measurement techniques. The Environmental Technician should review the final results to assist in determining and correcting errors. Currently the Environmental Technician does not review the QC results.

Based on the above reviews, the inspector determined that the licensee had in place basic QA/QC programs for the REMP.

7.0 Meteorological Monitoring Program

The inspector reviewed the licensee's meteorological monitoring program to determine whether the instrumentation and equipment were operable, calibrated, and

maintained. The I&C Department maintains all the sensors at the main, backup and inland towers and performs the semi-annual calibrations using licensee approved vendor procedures. The inspector noted that the main tower had been relocated and all the sensors and instrumentation had been replaced. The inspector stated that the significant effort and upgrade of the meteorological monitoring instrumentation was noteworthy. The inspector reviewed the most recent calibration results and noted that the calibrations were performed as scheduled and the results were within the licensee's acceptance criteria. The inspector compared the wind speed, wind direction, and delta temperature outputs of the primary and backup towers to the outputs in the Technical Support Center. The results were in good agreement.

Based on the above review, the inspector determined that the licensee effectively implemented the meteorological monitoring program.

8.0 Radioactive Liquid and Gaseous Effluent Controls

The inspector reviewed selected radioactive liquid and gaseous effluent release control procedures and release permits as part of the examination of the implementation of the ODCM and Section 4.12 of the Technical Specifications.

Based on the review of the above documents, the inspector noted that radioactive effluent control procedures were well written and release permits met the requirements for sampling and analysis at the frequencies established in the Technical Specification requirements.

9.0 Calibration of Effluent/Process Radiation Monitors

The inspector reviewed the calibration procedures and the most recent calibration results for the following effluent/process monitors as part of the examination of the implementation of Technical Specification requirements.

- o Containment Vent Noble Gas Monitor
- o Plant Vent Noble Gas Monitor
- o Liquid Waste Disposal Radiation Monitor
- o Service Water Disposal Radiation Monitor

The inspector noted that members of the HP/Chemistry Department had the responsibility to perform the radiological calibrations, and the Instrument and Controls Department had responsibility to perform the electronic calibrations.

Upon review of the radiological calibration results during the previous inspection, the inspector identified that the licensee (1) had not used three sources to determine the linearity and conversion factors ($\mu\text{Ci/cc/CPM}$), instead, used two sources, and (2) had not used statistical analyses (i.e., linear regression) to verify linearity. During this

inspection, the inspector noted that the licensee had considered the above items and incorporated them into the calibration procedures, as appropriate. The inspector reviewed the radiological and electronic calibration procedures and results for the above radiation monitors and noted that the results were within the licensee's acceptance criteria.

Based on the above review and discussions with the licensee, the inspector determined that the licensee has improved the radiological calibrations for the radiation monitors, met Technical Specification and ODCM requirements, and had implemented the effluent control program effectively.

10.0 Comparisons of the Projected Dose Calculation Program

During this inspection, the inspector performed an independent verification of the licensee's capability for calculating projected doses to the public resulting from discharges of radioactive liquids and gases to the environment. The licensee calculated the projected dose to the public prior to discharge of radioactive liquids and/or gases based on the data incorporated into the radioactive liquid and gaseous discharge permits. The inspector also used the same parameters contained in the discharge permits (e.g., dilution factor, total amount of radioactivity released, meteorological data, etc.) to calculate the maximum projected doses to the public for intercomparison. The licensee used its computer code and the NRC used the "PCDOSE code".

The PCDOSE code was developed by Idaho National Engineering Laboratory (EG&G Idaho, Inc.) for the U.S. Nuclear Regulatory Commission. The code was designed to calculate the maximum projected radiation dose to an individual and the average dose to the population due to radionuclides in radioactive liquid and airborne effluent releases from a nuclear power plant. The code was designed for normal operation rather than for emergency situations. The code was developed from the methodology found in both NUREG-0133 and Regulatory Guide 1.109 (Revision 1). The PCDOSE code serves as a basis for comparison of similar programs conducted by individual utilities that operate nuclear power plants.

During this inspection, the inspector reviewed the Offsite Dose Calculation Manual (ODCM) for site specific parameters and current methodology for the noble gas, liquid, and particulates release pathways. The ODCM exactly coincides with the licensee's computer code, which follows NRC Regulatory Guide 1.109 for all parameters.

The inspector evaluated the licensee's computer code by assuming site specific parameters and release information. The intercomparison results for the liquid, noble gas, iodine, and particulates release pathways are listed in Tables 1, 2, 3, and 4 respectively.

The comparison results of the liquid release pathway were based on three radionuclides. The intercomparison results were excellent as illustrated in Table 1.

The comparison results of the noble gas release pathway were based on seven radionuclides for the containment purge and specific meteorological values. The intercomparison results were excellent as shown in Table 2.

The comparison results of the iodine release pathway were based on two radionuclides (I-131 and I-133) for the containment purge and site specific parameters. The intercomparison results were very good as shown in Table 3.

The comparison results of the particulates release pathway were based on one radionuclide. The intercomparison results were very good as shown in Table 4. The licensee's results were calculated by hand due to some difficulties associated with the licensee's computer codes.

Based on the above comparison results and reviews, the inspector determined that the licensee conducted an excellent projected dose calculation program. The inspector noted that the responsible individual had excellent knowledge to implement the effluent control programs.

11.0 Air Cleaning System

The inspector reviewed the licensee's procedures and most recent surveillance test results to determine the implementation of Section 4.5.2.3 of the Technical Specifications. The test results for the (1) control room emergency air treatment system, (2) post-accident charcoal system, and (3) containment recirculation system were reviewed for the following inspections and tests.

- o Visual Inspections
- o In-Place HEPA Leak Tests
- o In-Place Charcoal Leak Tests
- o System Air Flow Rate Tests
- o Pressure Drop Tests
- o Laboratory Tests for the Iodine Collection Efficiencies

During this inspection, the inspector noted that the licensee performed these surveillance tests in accord with Technical Specification frequency requirements and also met the Technical Specification acceptance criteria. The inspector discussed with the licensee the importance of the visual tests performed by the vendor. The vendor had identified during a visual inspection, several items to be corrected to prevent possible leakage. The licensee did not correct these items in a timely manner. The licensee stated that the results of the visual inspection will be reviewed and corrective actions will be taken, as appropriate.

During the previous inspection, the inspector also noted that the air flow test results for the containment recirculation system varied considerably, indicating that measurements were made near a bend at the duct. This area will be reviewed during a subsequent inspection due to insufficient information at the time of this inspection to assess the system air flow test results. This is not a safety significant item, however it is important to perform these tests accordingly.

Based on the review of the above surveillance tests, the inspector determined that the licensee implemented the TS requirements.

12.0 Exit Interview

The inspector met with the licensee representatives denoted in Section 1.0 at the conclusions of the inspection on February 12, 1993. The inspector summarized the purpose, scope, and findings, of the inspection.

Table 1. Child Dose Projection Comparisons
 (Release Source : Liquid Effluent)
 Unit : Child Dose (mrem)

	LICENSEE	NRC
BONE	1.60E-3	1.60E-3
LIVER	2.00E-3	2.00E-3
TOTAL BODY	3.66E-4	3.67E-4
THYROID	2.89E-5	2.90E-5
KIDNEY	6.33E-4	6.34E-4
LUNG	2.27E-4	2.28E-4
GI-LLI	1.15E-5	1.16E-5

Table 2. Child Dose Projection Comparisons (Noble Gases)
 (Release Source : Containment Purge)

	Total Body (mrem)	Skin (mrem)	Gamma-Air (mrad)	Beta-Air (mrad)
LICENSEE	4.40E-4	8.93E-3	4.98E-4	9.64E-4
NRC	4.40E-4	8.93E-3	4.98E-4	9.64E-4

Table 3. Child Dose Projection Comparisons (Iodines)
 (Release Source : Containment Purge)
 Unit : Child Dose (mrem)

	LICENSEE	NRC
BONE	9.72E-5	1.04E-4
LIVER	9.77E-5	1.05E-4
TOTAL BODY	5.78E-5	6.19E-5
THYROID	3.23E-2	3.47E-2
KIDNEY	1.60E-4	1.72E-4
GI-LLI	8.69E-6	9.34E-6

Table 4. Child Dose Projection Comparisons (Particulates)
 (Release Source : Containment Purge)
 Unit : Child Dose (mrem)

	LICENSEE*	NRC
BONE	1.43E-5	1.47E-5
LIVER	1.38E-5	1.40E-5
TOTAL BODY	2.02E-6**	2.07E-6**
KIDNEY	4.48E-6	4.57E-6
LUNG	1.61E-6	1.65E-6
GI-LLI	8.59E-8	8.78E-8

* Hand Calculation Results

** Ground Plane Dose Excluded