U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-244/93-14

Docket No. 50-244

License No. DPR-18

Licensee: Rochester Gas and Electric Corporation
89 East Avenue
Rochester, New York 14649

Facility Name: Ginna Nuclear Power Plant

Inspection At: Ontario, New York

Inspection Conducted: July 12 - 16, 1993

Inspector: J. Noggle 7/24/93
J. Noggle, Senior Radiation Specialist Date
Facilities Radiation Protection Section

Approved by: W. Pasciak 7-27-93
W. Pasciak, Chief, Facilities Date
Radiation Protection Section

Areas Inspected: Areas covered in this inspection included a review of: air sampling, respiratory protection, and internal dosimetry programs. In addition, your staff provided the inspector with the status of radiological controls input to the steam generator replacement project and status of the Health Physics and Chemistry procedure upgrade project.

Results: Based on the results from the Spring 1993 refueling outage, the licensee implemented effective air sampling and respiratory protection programs. The maximum internal exposure documented was 10.1 maximum permissible concentration-hours, which is very low. In addition, the inspector noted a strength in your in-house quality assurance surveillance program that recently reviewed the respiratory protection program. Overall, the inspector was very satisfied with the performance of your staff in the subject inspection areas.

DETAILS

1.0 Persons Contacted

1.1 Rochester Gas and Electric Corporation

* S. Adams, Superintendent of Support Services
  J. Catlin, Respiratory Protection Technician
* A. Harhay, Manager of Health Physics and Chemistry
  A. Hedges, Procedure Upgrade Specialist
  R. Kennon, Whole Body Counter Lead Technician
* K. Lang, Health Physicist
  K. Magnuson, Respiratory Protection Technician
* F. Mis, Health Physicist
* B. Quinn, Corporate Health Physicist
  J. Schultz, Respiratory Protection Instructor
* J. St. Martin, Corrective Action Coordinator
* B. Thomson, Health Physicist

1.2 USNRC Personnel

* E. Knutson, Resident Inspector

* Denotes attendance at the exit meeting on July 16, 1993.

2.0 Purpose

This inspection was an announced safety inspection of the Ginna Nuclear Power Plant internal exposure radiation control programs.

3.0 Air Sampling

The licensee utilizes a broad-based program for sampling of airborne radionuclides. This consists of continuous monitoring of plant ventilation and containment ventilation exhausts, local area continuous air monitors (CAMs), stationary grab samplers, and lapel air samplers that are worn by workers as they perform their tasks. The last two types of air sampling were utilized by the licensee to a large extent during refueling and maintenance outages. During standard plant operations for normal surveillance activities, the first two air monitor types were used. The ventilation exhaust monitors read out in the control room and are provided with alarms and setpoints determined to maintain the offsite dose within regulatory limits. To alert onsite personnel of any unexpected airborne radiological hazards during plant operations, CAMs were used that sample particulate, iodine and noble gas activities and alarm when the local air concentration exceeds a preset alarm level.

The inspector noted one CAM in use by the spent fuel pool and one running in the basement of the auxiliary building. No other CAMs were in service at the time of the inspection. The final safety analysis report (FSAR) for Ginna NPP states in Section 12.3.3.2 that several CAMs are provided for the auxiliary building. One monitor is located on each of the three levels and has channels that continuously monitor for iodine, particulate, or radiogas activity or a combination of these activities. The licensee had not performed a technical evaluation to justify the reduction in continuous air monitoring and had not submitted a 10 CFR 50.59 safety analysis and FSAR change to allow the current practice. The licensee promptly moved the spent fuel pool CAM to the top floor of the auxiliary building and added a stationary grab sampler on the middle auxiliary building elevation, which met the intent of the FSAR. The licensee indicated they would initiate a study to evaluate the air flow characteristics in the station inhabited areas and pursue any necessary FSAR changes at that time.

For the calculation of air sample results, the licensee has developed a computer program to reduce the errors normally associated with manual calculations and this has, in fact, reduced the errors that were reported in a previous inspection report[1], however, this program has no documentation or procedure to enable scaling factor changes to be reviewed or changed. The inspector reviewed the calculation terms used and their basis with the licensee. Procedure No. HP-14.0, Rev. 7,"Guideline for the Use of Air Sampling Equipment," provides as an attachment, an evaluation for determining an unidentified alpha isotope maximum permissible concentration (MPC) value from a gross alpha measurement. The procedure utilizes a value determined from a study that was performed approximately seven years ago. The inspector questioned the licensee as to its continued validity. The inspector pointed out that the licensee has various radioactive waste streams that are analyzed for alpha, beta, and gamma emitting constituents on an annual and biennial basis and could make use of these data to determine if the unmeasured MPC components of the air sample have changed. The licensee agreed to revise procedure No. HP-14.0 to incorporate a programmatic review of these waste stream analyses. This will be reviewed in a future inspection (50-244/93-14-01).

4.0 Respiratory Protection

The inspector reviewed the licensee's respiratory protection program by conducting interviews and through the review of procedures and various licensee records. This review was made with respect to 10 CFR 20 requirements and with respect to NUREG-0041, ANSI Z86.1-1972, and ANSI Z88.2-1991 guidelines.

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[1] Inspection Report No. 50-244/92-19

The licensee maintains a modern respiratory protection equipment washing, repairing and testing facility. A commercial dishwasher uses detergent and a sanitizing agent to clean and disinfect the respirators. Respirators are dryed in a controlled temperature drying cabinet and each is inspected for defects and repaired as necessary. Appropriate procedures require air particle penetration testing for respirators that have been repaired where leak tightness of the respirator may have been affected. The approved respirators are bagged, sealed, and stored in cabinets until needed. The respirator filter canisters are externally decontaminated and subjected to an air particle penetration test and a filter plugging test prior to recycling the respirator filters back into service. The inspector reviewed the technical bases and adequacy of these test procedures and found them adequate.

Federal regulations state that only respiratory protection devices that were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH/MSHA) may be used. The licensee currently uses the following respiratory protection devices and the inspector verified the NIOSH/MSHA certifications of each.

Type of Respiratory Device	ID No.	NIOSH Cert.
Scottoramic Full Face, Particles	6160-0050	TC-21C-149
Scottoramic FF, Iodine	63R-TEDA-H	TC-14G-118
Scottoramic FF, Airline	801548-00	TC-19C-74
Scott-O-Vista FF, Particles	65H	TC-21C-199
Scott-O-Vista FF, Iodine	63-TEDA-H	TC-14G-118
Scott-O-Vista FF, Airline	801548-04	TC-19C-74
Scott 4.5 Self Contained Breathing Apparatus, FF	900469-02	TC-13F-96
MSA Ultravue FF, Powered Air-Purifying Respirator	7-203-1	TC-21C-468
MSA Tyvek Hood, PAPR	486485	TC-21C-472
Lancs Hood (Bubble Suit)	LI-520Y-HA	TC-19C-160

The inspector reviewed the breathing air supply controls and air quality testing data provided by the licensee. The station breathing air system is supplied by an oil lubricated air compressor. The oil and excess water are removed by a Deltech Pyramid Model 8000, which is a filter and condensing unit. Downstream from the Deltech unit is an air supply buffer module called an "egress unit" that consists of

four pressurized air bottles (352 ft^3 bottles @ 3600 psi) with an air supply pressure monitor that will alarm if the air supply source is lost. An additional egress unit is stationed at each end user location and the primary egress unit air supply failure alarm is wired to alarm at each remote egress unit. The egress units are designed to continue to supply breathing air until airline users egress to a safe respirator removal location upon air supply failure. This is an excellent breathing air supply system feature.

The inspector reviewed laboratory testing results of station breathing air and self contained breathing air (SCBA) bottle air. Both had been performed within one year and qualified as Grade D quality air as defined by the Compressed Gas Association.

The inspector reviewed a recent Quality Assurance Surveillance Report (No. 93031) that reviewed the respiratory protection program that was performed on March 12, 1993 through April 26, 1993. This was a thorough program review that resulted in two significant findings. During the past spring 1993 refueling outage, approximately 80 air-purifying respirators were used by station workers without the normal issue control by the HP department to screen for respirator user qualification. During the outage, there was a satellite respirator issue location in the basement of the intermediate building and during night shift, this location was not always manned and the respirator issue locker was not secured. The licensee has indicated that in the future, any unmanned respirator issue locations (other than emergency kits) will be secured. The other significant finding identified in the report revealed that the various breathing air line fittings were not incompatible with other station air lines, for instance, air-powered pneumatic tools. NUREG-0041 and ANSI Z88.2-1991 specify that breathing air system fittings shall not be compatible with other gas supplying hose fittings. The inspector was satisfied that a very good quality review of this program was made and that the air hose fitting problem was being tracked for closure by the licensee's quality assurance organization.

The inspector reviewed the adminstrative controls to ensure only qualified individuals were issued the appropriate respiratory equipment that they were qualified to use. The licensee has four qualification criteria that must be met. The individual must successfully pass the general radiation worker training and respiratory protection training courses within a two year period. Also on a biennial basis, the individual must successfully pass a respirator fit test to ensure that the features of his or her face will allow for a leak free seal with the respirator. On an annual basis, the individual must be examined by a medical nurse or physician and found to be physically fit to wear a respirator. The individual is also required to obtain a whole body count on an annual basis. The training test results, fit test documentation, medical exam forms, and whole body count results are routed to the dosimetry department and are input to a computer database system called the Radiation Dose Management System, which generates a respirator users' list once per month during routine plant operations, and generally daily during refueling outage peak periods. This list is used to determine

whether an individual is authorized to wear a respirator and which type(s). The inspector verified that the respirator storage area was controlled and that a current respirator users' list was available for use and that the respirator issue log was being used appropriately.

The licensee provides a 2½-hour "Respirator Training Course," GRC 03C, Rev. 4, consisting of a 40-minute video presentation followed by a live instruction period. Basic inhalation pathway and particle clearance pathways were covered as well as an introduction to the types of respiratory protection devices used at the Ginna Nuclear Power Plant. This section of the video presentation was updated approximately one year ago and accurately reflects current station practice. The live instruction material includes demonstration of each respirator and discussion of the radiological hazards that may be encountered in the work place. In addition, the new 10 CFR 20 concepts and units of internal dose are explained.

The fit testing of individuals is performed at the training facility. The licensee uses a Portacount instrument to measure the protection factor of the respirator wearer while performing seven different physical exercises. The acceptance criteria is a minimum protection factor of 100 during each of the seven tests and a minimum average protection factor of 1000 taken from all of the seven test cycles. The licensee has three Portacount instruments that are calibrated annually by the manufacturer on a rotational basis.

The inspector witnessed the storage condition of each of the emergency respirator kits on site to ensure emergency response capability is maintained. Two emergency response SCBA units were inspected in the control room. The two air bottles indicated full pressurization and the respirator equipment was ready for use. A check sheet in each emergency kit indicated that monthly inspections had been carried out regularly. Located at the entrance to the Radiological Controlled Area (RCA) were four emergency response SCBA units and four additional SCBA bottles. All of these were verified by the inspector to be fully pressurized and all respirator equipment was ready for use.

5.0 Internal Dosimetry

5.1 Internal Exposure Tracking

The inspector reviewed the licensee's MPC-hr tracking log for 1993, which included the last refueling outage. The licensee maintains a log of each seven-day period and logs the accumulated MPC-hrs for any worker with positive results for a rolling seven-day period at which time the MPC-hr accounting drops off. The maximum internal exposure logged for any seven-day period from January 1, 1993 through July 10, 1993 was 10.1 MPC-hrs for one individual during one seven-day period. Federal

regulations limit internal exposure to 520 MPC-hrs per calendar quarter for an average of 40 MPC-hrs per week sustained over 13 weeks.

5.2 Internal Exposure Assessment

The inspector reviewed the licensee's internal exposure assessment, or bioassay program, through licensee demonstrations of their whole body chair counter calibration setup, through a review of calibration and records, and through discussions with knowledgable station personnel. The inspector's review was with respect to 10 CFR 20, ANSI N343-1978, and ICRP 2.

The licensee utilizes two whole body counting systems for the measurement of internally deposited gamma emitting radioisotopes in the body. The principal counting system is a closed geometry, three sodium-iodide detector, Nuclear Data whole body chair counter. The inspector reviewed the calibration setup utilizing a tissue-equivalent phantom with vials of liquid containing National Institute of Standards Technology (NIST) traceable sources. Due to the overlapping view of the lower torso and lung detectors, separate calibration sources of differing gamma energy levels were used during five separate calibration counts in order to limit the crosstalk between the detectors and derive more accurate results. The inspector reviewed the results from the latest calibration of the chair counter that was completed on May 20, 1993. The stand-up Canberra Fastscan unit is reserved for emergency use in the training facility and is kept calibrated and ready for use. The latest calibration for this instrument was completed on May 4, 1993. With respect to the Nuclear Data chair whole body counter, the energy and efficiency calibration data were complete and were used to develop a quality control (QC) chart to plot daily source counts within statistical accuracy limits of ± 2 and ± 3 standard deviations. The inspector reviewed the latest QC chart and verified that the licensee has been performing daily source count verifications of the chair whole body counter, however, the inspector noted deteriorating detector performance for the number 2 detector (the lung detector), which was currently producing source count results below the two standard deviation range. The licensee was aware of the trend and reported regular cyclic almost seasonal variations in this one detector's response characteristics. The licensee is commended on conscientiously following effective quality control practices, however, the inspector questioned why no action was taken to resolve the fluctuating response of the detector to ensure accurate bioassay measurements were obtained. The licensee agreed to investigate the cause(s) of the lung detector's performance trend.

Due to a good level of operational HP controls, including effective RWP controls, air sampling, use of local HEPA ventilation, and effective application of respiratory protection requirements, there have not been any internal exposures that required internal dose assessment and assignment during the past refueling outage. The

inspector reviewed the licensee's procedures governing internal dose assessment and determined that the licensee has correctly incorporated Reg Guide 8.26, ANSI N343-1978, and ICRP Publication 2 methodologies. No discrepancies were noted.

The licensee was also exploring the capability of the personnel contamination monitors to detect internal contamination. When fully evaluated with respect to Ginna specific radionuclides, and in consideration of internal personnel contamination combined in the presence of external personnel contamination, the incorporation of these personnel monitors into the internal exposure monitoring program could be of great benefit. They could provide for the early screening and bioassay of individuals and lend to a more accurate determination of internal exposure assessments of individuals. This is considered an excellent licensee initiative.

6.0 Other Health Physics Initiatives

The licensee provided the inspector with a status of the steam generator replacement project, which is scheduled for the Spring 1996 refueling outage. Approximately three years prior to project commencement, the licensee established a steam generator replacement organization, which included fulltime representation from the health physics organization. This early involvement has already provided for some ALARA benefits to include: station HP/ALARA to provide all health physics services during the replacement project, involving an experienced steam generator replacement HP/ALARA vendor for 2½ years to ensure industry-wide lessons learned are incorporated into the station's HP program. New steam generator channel heads are to be electropolished to retard the buildup of radiation levels on these components. The new steam generators are to be made of lower cobalt containing materials (Inconel 690), which should introduce less of the easily activated cobalt material into the reactor and reduce the future addition to the radioactive source term. The licensee has also included the purchase of a new steam generator mockup to allow for accurate rehearsals for steam generator installation activities and for the use of future outage maintenance activities. The licensee has also been closely following the European development of a 'hard' chemical decontamination process as opposed to the conventional chemical decontamination agents used in reactor systems. The 'hard' chemical agents are being developed by Framatome for stripping more of the corrosion layer and theoretically, reducing dose rates even lower for the steam generator removal phase of the project. The inspector observed that the licensee has been aggressively working to ensure the 1996 Ginna steam generator replacement project is conducted in accordance with ALARA philosophy utilizing state-of-the-art techniques.

The licensee also briefed the inspector on the status of the HP/Chemistry Department's procedure upgrade project. A new "Radiation Protection and Chemistry Procedure Writer's Guide" has been completed. All of the department's procedures

will be reviewed over the next three years and will be revised to meet the new procedure standard. Approximately thirty procedures were being drafted at the time of the inspection to address specific new 10 CFR 20 requirements. Improvements in the HP program due to the new procedures will be reviewed in future HP inspections.

At the time of this inspection, the licensee was in the process of desludging various plant floor drains and piping systems that lead to the Waste HoldUp Tank (WHUT). The WHUT was full and in preparation for processing and shipping this waste, the licensee decided to hydrolase many of the upstream drain and piping lines leading to the tank and also to clean out the tank as well. Although this project was not complete at the time of this inspection, the licensee estimated an annual dose savings of 2 person-rem due to this hydrolasing effort.

7.0 Exit Meeting

The inspector met with licensee representatives at the end of the inspection, on July 16, 1993. The inspector reviewed the purpose and scope of the inspection and discussed the findings. The licensee acknowledged the inspection findings.