U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGUALTION

Docket No:	50-146
License No:	DPR-4
Report No:	1999-201
Licensees:	GPU Nuclear Corporation and Saxton Nuclear Experimental Corporation
Facility:	Saxton Nuclear Experimental Facility
Location:	Saxton, Pennsylvania
Dates:	February 16-18, 1999
Inspectors:	Thomas F. Dragoun Jason C. Jang
Approved by:	Seymour H. Weiss, Director Non-Power Reactors and Decommissioning Project Directorate Division of Regulatory Improvement Programs Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Programs to control and quantify effluent releases from the site were effectively implemented. The means of calculating doses to the public was verified. Environmental sampling, laboratory analysis, and quality control of results were satisfactory and confirmed that exposures of the public were well below the limits. Acceptable effort was underway to identify and address Year 2000 computer problems. No safety concerns or violations of regulatory requirements were identified.

Report Details

Summary of Plant Status

Dismantlement activities were continuing. A fuel rack was loaded into a van placed inside the containment vessel (CV) in preparation for shipment and disposal. Concrete scrabbling equipment designed for decontamination was available on-site for worker training.

1.0 Offsite Dose Calculation Manual (ODCM)

The Offsite Dose Calculation Manual (ODCM) provides descriptions of the sampling and analysis programs for radioactive liquid and particulate samples and radiological environmental samples. The ODCM also provides necessary parameters, such as effluent radiation monitor setpoint calculation methodologies, dose assessment methodology, and site-specific dilution factors.

e. Inspection Scope (Inspection Procedure 80745)

The inspector reviewed the ODCM, Revision 0, dated June 3, 1997. The inspector reviewed the following items:

- radioactive effluent controls and instrumentation, including setpoints,
- Radiological Environmental Monitoring Program (REMP) implementation, and
- site specific parameters for the dose assessment, such as dilution factors and dose pathways.

b. Observations and Findings

The ODCM contained appropriate radioactive liquid and particulate effluent controls requirements, including setpoint calculation methodology for the radiation monitoring system. The inspector determined that the particulate radiation monitor (RMA-1) alarm setpoint calculation methodology was acceptable.

Sample media and sampling frequencies for the REMP are listed in the ODCM, as well as analytical sensitivity requirements. Environmental sample media are: air particulate, aquatic sediment, direct radiation level using thermoluminescent dosimetry (TLD), ground/surface water, milk (as needed), and vegetation. The licensee's ODCM contained sufficient specifications, information, and instructions to acceptably implement and maintain the REMP. All necessary specific parameters, such as meteorological parameters and dose factors were listed. The inspector reviewed the projected dose calculation methodologies and the methods were acceptable.

c. Conclusions

The ODCM contained sufficient specifications, information, and instructions to acceptably implement and maintain the radioactive liquid and particulate effluent control programs and the REMP.

2.0 Implementation of the Radioactive Liquid and Particulate Effluent Control Programs

a. Inspection Scope (Inspection Procedure 80745)

The inspector reviewed:

- radioactive liquid and particulate effluent control procedures,
- unplanned or unmonitored release pathways, and
- the 1997 annual report.

The inspector toured the CV, the particulate effluent radiation monitoring system (RMS), and the ventilation exhaust treatment system.

b. Observations and Findings

The procedures were detailed, easy to follow, and ODCM requirements were incorporated into the appropriate procedures.

The inspector discussed unplanned or unmonitored radioactive liquid and/or particulate releases with the licensee. The licensee indicated that there were no unplanned or unmonitored radioactive liquid or particulate releases to the environment.

The 1997 Annual Report contained data regarding various site activities, such as radioactive shipments and CV entries. Radiation levels at the site boundary area (used for projected doses to the public) were listed and found to be well below the Technical Specification (TS) limits.

The effluent radiation monitor and the ventilation exhaust treatment system were operable at the time of the plant tour. The CV and associated areas are maintained at a negative pressure to prevent any unmonitored radioactive material release. The inspector noted that heat tracing and thermal insulation had been added to the particulate monitor RMA 1 sample line. The need for this modification had been discussed with the licensee during NRC inspection No. 50-146/1998203. This matter is closed.

c. Conclusions

The licensee maintained and implemented effective radioactive liquid and particulate effluent control programs.

3.0 Calibration of Effluent Radiation Monitoring Systems (RMS) and Flow Rate Monitors

a. Inspection Scope (Inspection Procedure 80745)

The inspector reviewed the most recent calibration results of the particulate monitor RMA 1 located in the station ventilation system; and the station ventilation stack flow rate.

b. Observations and Findings

All calibration results reviewed were within the acceptance criteria as defined by the licensee's procedures. The calibration data indicated that the RMS were responding in a linear manner, as expected. Licensee tracking and trending efforts provided sufficient information to assess the RMS system performance.

The calibration results of the station ventilation stack flow rate were within the licensee's acceptance criteria.

c. Conclusions

The licensee established, implemented, and maintained an effective radiation monitoring system and the station ventilation stack flow rate calibration program.

4.0 Ventilation Exhaust Treatment System

a. Inspection Scope (Inspection Procedure 80745)

The most recent surveillance test results for the ventilation exhaust treatment system (in-place HEPA leak tests, air capacity tests, and pressure drop tests) were reviewed to determine the implementation of Section 2.2 2.3 of the ODCM requirements.

b. Observations and Findings

All surveillance results were either within the ODCM acceptance criteria or the administrative acceptance criteria. The responsible individual had good knowledge of testing methodologies and acceptance criteria.

c. Conclusions

The licensee established, implemented, and maintained an effective ventilation system surveillance program with respect to HEPA mechanical efficiency, and air capacity tests.

5.0 Comparison of the Projected Dose Calculation Method

a. Inspection Scope

The licensee's projected dose calculation program, including the applicable computer code, was examined to validate the licensee's capability for calculating projected doses to the public, required by the TS and ODCM. The NRC PCDOSE code was used for an independent comparison.

Projected dose comparisons were made using tritium (H-3), cesium-137 (Cs-137), and cobalt-60 (Co-60).

b. Observations and Findings

The inspector and the licensee performed projected dose calculations at the Saxton site and the Environmental Radioactivity Laboratory (ERL). The inspector used the licensee's specific parameters, such as atmospheric dispersion factor (χ/Q) and a tritium dose conversion factor. The comparisons of calculated projected doses to the public by the NRC and the licensee were good. In fact, the calculated projected doses were the same.

c. Conclusions

The licensee established an acceptable means to calculate projected doses to the public as required by the TS and ODCM.

6.0 Implementation of the Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope (Inspection Procedure 80745)

The inspector reviewed the following areas of the REMP:

- selected sampling locations and stations specified by the ODCM,
- selected REMP procedures,
- thermoluminescent dosimeters program,
- 1998 environmental sample analytical results,
- Land Use Census results, and
- the 1997 Annual REMP report.

b. Observations and Findings

Several environmental monitoring stations were examined during the site tour. The air samplers, water sampling, and thermoluminescent dosimeters (TLDs) were placed at the locations designated in the ODCM. The air sampling equipment was operable. Vegetation samples were also collected from the locations specified in the ODCM.

Overall, the REMP procedures provided appropriate direction and guidance to prepare, sample, and analyze the environmental sample media. Analytical procedures used by the Environmental Radioactivity Laboratory (ERL) were appropriate. Analytical procedures for actinide analyses (uranium, curium, americium, and plutonium) were well written and easy to follow.

Saxton's environmental TLDs were processed by the TLD Laboratory. The inspector toured the TLD Laboratory and the TLD irradiation facility. The licensee's equipment included environmental TLDs (Panasonic Model 814AS) and the TLD reader (Panasonic Model 710A). The licensee used the Shepherd Panoramic Irradiator to determine the Element Correction Factor (ECF) of TLDs. The ECF is the ratio of the delivered radiation over the measured radiation. Measured TLD data were reviewed by a senior environmental scientist. The inspector interviewed the senior environmental scientist and the TLD laboratory personnel. Responsible individuals had very good knowledge of the characteristics of environmental TLDs, the application of the transit dose, and the data evaluation methodology. The licensee handled TLDs appropriately to minimize transient exposure.

The inspector reviewed selected analytical results of the 1998 environmental samples. All REMP samples were analyzed by the ERL. The data indicated that the environmental samples were collected and analyzed at the frequencies required in the ODCM. The licensee met the environmental lower limits of detection (LLD), required by the ODCM. There were no anomalous analytical results.

The annual Land Use Census was performed during the growing season, as required by the ODCM. A thorough land use survey, including a resident, garden, and collection of broadleaf vegetation was performed. No significant changes were made to the REMP program as a result of the census.

The 1997 Annual Radiological Environmental Monitoring Report included results of the environmental monitoring program, program changes, land use census, and interlaboratory comparison program, as required by TS. The report provided a comprehensive summary of the results of the REMP around the site and met TS reporting requirements.

c. Conclusions

Overall, the licensee effectively maintained and implemented a radiological environmental monitoring program that exceeded regulatory requirements.

7.0 Quality Assurance (QA)/Quality Control (QC)

a. Inspection Scope (Inspection Procedure 84750-01)

The inspector reviewed:

- the 1998 QA audit required by the ODCM,
- the Saxton Nuclear Experimental Corporation Facility Decommissioning QA Plan (Procedure Number 1000-PLN-3000.05),
- implementation of the measurement laboratory quality control (QC) program for actinide samples, and
- the QC program for the TLD Laboratory.

b. Observations and Findings

The 1998 QA audit (S-SAX-98-01) findings did not identify any significant regulatory or safety issues. However, findings and recommendations were identified to improve program performance. Responses to audit findings were timely.

The inspector reviewed the QA plan for the Saxton Nuclear Experimental Corporation Facility Decommissioning and discussed it with the licensee staff. The inspector determined that the QA plan contained sufficient QA policies and staff had appropriate knowledge and understood the QA plan.

The QA/QC program for analyses of REMP samples is conducted by the ERL. The QA/QC program, with the exception of actinide analyses, was reviewed and reported as acceptable during a previous inspection report (NRC Inspection Report No. 50-289/98-07). Therefore, the inspector reviewed the QC program for actinide during this inspection. Quality control charts for alpha spectrometry (Canberra Alpha Analyst) were frequently reviewed by licensee staff and used as a mechanism to assess laboratory performance. The QC program consisted of measurements of blind duplicate, spike, and split samples. The ERL participated in interlaboratory comparisons with the Department of Energy-Environmental Measurements Laboratory. All measurement comparisons reviewed were within the licensee's acceptance criteria.

The inspector reviewed the QC program for the environmental TLD laboratory. The licensee tracked the element correction factor (ECF), dark current for the reader, and spiked TLD reading results. The inspector determined that the licensee's QC program for the environmental TLDs was appropriate.

c. Conclusions

The licensee established, implemented, and maintained an effective QA audit program for the radioactive effluent controls and REMP with respect to audit scope and depth, audit team experience, and response to audit findings. The licensee (ERL and TLD Laboratory) also implemented an effective QC program to validate measurement results for actinide radioactive effluent, particulate effluent samples, REMP samples and environmental TLDs.

9.0 Year 2000 Concerns

a. Inspection Scope

The inspector reviewed with licensee representatives a 10 item questionnaire developed by NRC staff regarding Year 2000 (Y2K) computer concerns. The questionnaire is included as an attachment to this report.

b. Observations and Findings

The Saxton Radiation Safety Officer is responsible for addressing Y2K computer problems at the site. He stated that all systems were Y2K compliant or Y2K ready except for a pressurized ion chamber (Reuter-Stokes) located at the Tussey Mountain High School. Since this equipment is not required by the TS, options regarding this installation are still under review. The software spreadsheet used to record effluent releases and perform the ODCM dose calculations (SNECAER.XLT) was validated against hand calculations and verified for year 2000 roll-over.

The ERL facility also has a knowledgeable person responsible for Y2K concerns. Hardware and software problems are assessed using a five-step program. All vendor supplied fixes are verified and validated using a formal procedure (TMI Procedure1430-IC-2). Currently, no threat to public health and safety from Y2K problems has been identified. Since the ERL will soon become Amergen property as a result of the sale of TMI, by contractual agreement, all Y2K issues must be resolved before April 15, 1999.

c. Conclusions

The licensee's efforts to identify and correct Y2K problems appears to be well organized and effective.

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on February 18, 1999. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONS CONTACTED

Licensee
Timothy Bradley, Sr. Environmental Scientist
J. Patrick Donnachie, ERL Manager
David Dussinger, Sr. Environmental Scientist
Roger Gill, Sr. Environmental Scientist
G. A. Kuehn, SNEC Program Director
Joseph Melnic, Sr. Environmental Scientist
Bradley Parfitt, Sr. Engineer
Arthur Paynter, SNEC Radiation Safety Officer
Lawrence Poppenwimer, Associate Dosimetry Engineer

Saxton Citizens Task Force
Charles Barker, member

NRC
Alexander Adams, Jr., Senior Project Manager

INSPECTION PROCEDURES USED

IP 80745	CLASS I NON-POWER REACTOR EFFLUENT AND ENVIRONMENTAL MONITORING
IP 84750	RADIOACTIVE WASTE TREATMENT AND EFFLUENT AND ENVIRONMENTAL MONITORING

ITEMS OPENED, CLOSED, AND DISCUSSED

OPENED:	None
CLOSED:	None

LIST OF ACRONYMS USED

CV	Containment Vessel
ECF	Element Correction Factor
ERL	Environmental Radioactivity Laboratory
HEPA	High Efficiency Particulate
LLD	Lower Limit of Detection
ODCM	Offsite Dose Calculation Manual
QA	Quality Assurance
QC	Quality Control
REMP	Radiological Environmental Monitoring Program
RMS	Radiation Monitoring System
TLD	Thermoluminescent Dosimetry
TMI	Three Mile Island power plant
TS	Technical Specifications

ATTACHMENT

NRC Questionnaire - Year 200 Concerns

1) What programmatic steps are you taking to assess the scope of the problem as it directly or indirectly affects your radiation safety program?

2) To whom have you assigned overall responsibility for resolving the Year 2000 problem?

3) What is your schedule for completing your review of computer systems within your organization?

4) Does your organization have, or have access to, the technical expertise needed for the identification and evaluation of the nature and extent of the Year 2000 problem at your facility? If the expertise is not available, do you plan to obtain such expertise?

5) Identify the hardware and software systems relating to radiation safety either directly or indirectly that are in use at your facility. Examples of such systems include embedded systems, treatment planning systems, dosimetry programs, microprocessors, decay programs, physical security, material control and accountability, analytical systems that rely on microprocessors and software controls, and interlocks. Describe your systems testing protocol to detect Year 2000 problems. Does your testing protocol extend beyond merely considering only time- or date-related functions?

6) How will you keep track of the changes that are made to solve each individual Year 2000 problem and make sure that the changes do not affect other parts of the facility? What contingency plans have you developed for systems that may not be Year 2000 compliant?

7) List the manufactures of systems or products relating to radiation safety and nuclear safety and safeguards systems used at your facility that you have contacted or you have been contacted by. How are they addressing the problem? To what extent do you intend to rely on vendor certifications or claims for Year 2000 compliance and what is the basis (e.g. functional testing, audits, certification) for this reliance?

8) Have you received NRC's Information Notice (IN) 96-70 ("Year 2000 Effect on Computer System Software")? The IN describes an internet list server on the Year 2000 problem. Do you subscribe to the Year 2000 list server?

9) Would you be willing to share information and details concerning problems encountered and their solutions through some sort of organized mechanism (e.g. list server described in IN 96-70)?

10) As a result of your review, are you aware of any instance in which the Year 2000 computer issue might pose a threat to public health or safety? What are your plans to correct the problem?