



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

Docket Nos. 50-54
70-687

JAN 7 4 1993

Mr. James J. McGovern
Plant Manager
Cintichem, Inc.
P. O. Box 816
Tuxedo, New York 10987

Dear Mr. McGovern:

Subject: Combined Inspection Nos. 50-54/93-03 and 70-687/93-03

An announced safety inspection was conducted by Ms. Laurie Peluso and Mr. Thomas Dragoun of this office, accompanied by Ms. Barbara Youngberg of NYS Department of Environmental Conservation, on November 16-18, 1993, of decommissioning activities at your facility authorized by NRC License Nos. R-81 and SNM-639. Discussions of our findings were held by Ms. Peluso and Mr. Dragoun with you and members of your staff at the conclusion of this inspection on November 18, 1993.

Areas reviewed included the status of previously identified items, maintenance of the exhaust gas monitoring system, laboratory quality assurance, procedures and recordkeeping, strontium analysis program, and the water management program. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this review, no safety concerns or violations of NRC requirements were observed. The overall quality of your laboratory programs was good. No reply to this letter is required.

Your cooperation with us is appreciated.

Sincerely,

James H. Joyner, Chief
Facilities Radiological Safety
and Safeguards Branch
Division of Radiation Safety
and Safeguards

Cintichem, Inc.

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Enclosure:

NRC Combined Inspection Report Nos. 50-54/93-03 and 70-687/93-03

cc w/encl:

J. Adler, Manager, Health, Safety, and Environmental Affairs

F. Morse, Project Manager, Decommissioning

Dr. W. Vernetson, TRTR

Ms. A. Dorozynski, Town of Tuxedo Supervisor

Dr. P. Merges, Director, Bureau of Radiation, NYS-DEC

Mr. G. L. Kasyk, Principal Radiophysicist, Radiological Health Unit, NYS-DOL

Berle, Kass, and Case

EPA Region II

K. Abraham, PAO (2)

Public Document Room (PDR)

Nuclear Safety Information Center (NSIC)

State of New York

Cintichem, Inc.

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bcc w/encl:

Region I Docket Room (with concurrences)

N. Orlando, NMSS, (OWFN 5 E2)

S. Weiss, NRR (OWFN 11 B20)

V. McCree, OEDO (OWFN 17 G21)

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos.: 50-54/93-03 and 70-687/93-03

Docket Nos.: 50-54 and 70-687

License Nos.: R-81 and SNM-639

Licensee: Cintichem, Inc.
P. O. Box 816
Tuxedo, New York 10987

Facility Name: Research Reactor and Radiochemical Processing Laboratory

Inspection At: Tuxedo, New York

Inspection Conducted: November 16-18, 1993

Inspectors: *Thomas Dragoun* 1/13/94
Thomas Dragoun, Project Scientist, Effluents
Radiation Protection Section (ERPS), Facilities
Radiological Safety and Safeguards Branch (FRSSB)
date

Laurie Peluso for 1/13/94
Laurie Peluso, Radiation Physicist, ERPS, FRSSB
date

Approved By: *Judith A. Jaustra* 1/13/94
Judith Jaustra, Chief, ERPS, FRSSB,
Division of Radiation Safety and Safeguards
date

Areas Inspected: Status of previously identified items, maintenance of the exhaust gas monitoring system, laboratory quality assurance, procedures and recordkeeping, strontium analysis program, and the water management program.

Results: No safety concerns or violations of NRC regulatory requirements were observed.

DETAILS

1.0 Persons Contacted

1.1 Licensee Personnel

*J. Adler, Manager, Health, Safety, and Environmental Affairs (TLG)

L. Glander, Supervisor, Health Physics

J. Garrett, Manager, Site Operations and Security

*J. McGovern, Plant Manager

*F. Morse, Project Manager, Decommissioning

J. Olynyk, Laboratory Supervisor

R. Strack, Manager, Quality Assurance

L. Thelin, Health Physicist

*E. Truskowski, Manager, Health Physics and Environmental Monitoring

1.2 New York State Personnel

*B. Youngberg, NYS Department of Environmental Conservation

*Attended the exit interview on 11/18/93. Other licensee and contractor personnel were interviewed during the course of the inspection.

2.0 Status of Previously Identified Items

2.1 (Closed) Followup Item (50-54/93-02-02) Licensee to ensure that the flow rate in the airborne exhaust monitoring systems are adjusted to ensure isokinetic sampling. The Health Physics Manager was made responsible for determining if flow in the exhaust duct had changed and if the sampling system flowrate needed adjustment. The responsibility for adjustment of the sampling system flowrate was assigned to the Health Physics Supervisor. A review of records indicated that the sampling systems were properly adjusted.

2.2 (Open) Followup Item (50-54/93-02-03) Increase the sensitivity of the laboratory analysis of airborne exhaust samples by increasing count times and compositing samples. Count times were increased from one minute to ten minutes. Weekly samples are now composited and counted quarterly. Filter media samples from 1992 and 1993 held in storage were composited and counted. The licensee is evaluating methods for statistical assessment of analytical results, many of which are less than minimum detectable activity (negative values). This final item will be reviewed in a future inspection.

3.0 Maintenance of the Exhaust Stack Monitoring System

The exhaust stack monitoring system continuously monitors the airborne gaseous and particulate activity in the main duct leading to the elevated stack. This equipment was checked daily by an instrument technician and the results recorded. There are two alarms, one for an instantaneous concentration, and the other for a weekly average concentration set at 25% of the maximum permissible concentration specified in NRC regulations. The alarm setpoints are based on calculations by the Health Physicist which factored in the contributions from the various radioactive isotopes in the Reactor Building and Hot Lab Building, which both discharge into this duct. This approach appeared to be reasonable. A review of records indicated that all discharges were within limits.

4.0 Analytical Laboratory Performance

In addition to the continuous stack monitor, there are separate sampling systems on the Reactor Building and Hot Lab Building ducts which feed into the main exhaust duct. These sampling systems contain particulate and carbon cartridge filters that are changed weekly. There is also a weekly charcoal filter sample drawn from the main stack. All filter media are analyzed for activity in the on-site laboratory, which also analyses liquid effluent samples. The inspector reviewed the performance of the laboratory program through observations of maintenance and calibration of equipment, interviews with laboratory and Quality Control personnel, and a review of procedures and recordkeeping.

4.1 Quality Assurance

The site Quality Assurance group consists of a supervisor and an auditor with a chemistry background. The QA program for the laboratory consists of maintaining control charts, providing spiked samples for analysis, periodic audits, and participation in the EPA Laboratory Intercomparison (EPA Lab) program. Parameters to be control charted are determined by the QA group. The lab technicians report any out-of-band condition to the QA group and place the effected apparatus out-of-commission until an evaluation is completed. The QA group also prepares spiked samples using radioactive material obtained from the EPA and certified by NIST. The number of spiked samples is targeted to be about 10% of the total number of samples processed by the lab. Some spiked samples are decay corrected and reused. An audit was conducted from February to April 1993. No major deficiencies were noted in the report.

The licensee participates in several categories of the EPA Lab program including measurement of alpha, beta, and gamma emitters on airborne filter media (began in 1991), gamma emitters in water (began in 1992), and strontium 90 in water (began in 1993). All results met the EPA acceptance criteria. The inspector observed that the

analytical results for gamma activity were consistently reported near the high end of the EPA acceptance band. This observation was confirmed by the QA auditor and laboratory supervisor. The lab supervisor stated that in order to get a broad energy spectrum for the calibration of the thin window, high efficiency, N-type germanium detectors a mixed standard source consisting of antimony-125, europium-154, and europium-155 was used for the annual calibration. This calibration extended the useful range of the detectors into the soft x-ray region (< 10 Kev) and allowed identification of atoms from their characteristic x-ray emission (usually the K-alpha spectral line). As a result, the analytical capability of the laboratory was excellent. However, the lab supervisor determined that four of the gamma peaks from the Eu-154 were coinciding with gamma peaks from the other isotopes in the standard source. The effect of this coincidence counting was to lower the apparent efficiency of the detector by 10% to 20% in the range between 247 Kev and 873 Kev. The computer software then raised the corrected counts for samples with gamma peaks in this region. The reported activity was therefore 10% to 20% higher than the actual activity. The lab supervisor stated that although the reported activities were always conservative, the software will be modified to eliminate the coincidence counting. The results for the 1994 EPA comparison are expected to be much closer to the mean value. This represents an excellent licensee initiative.

Within the scope of this review, no safety concerns were identified. The inspector concluded that the assurance of quality in the laboratory was excellent.

4.2 Procedures and Record Keeping

The inspector reviewed the procedure manuals to evaluate the implementation of the effluent control programs in accordance with Section 7.0 of the NRC-approved Decommissioning Plan. The Health Physics (HP-M) and the Health Physics Environmental Laboratory (HP-EM) Manuals contained the procedures for soil and water sampling, sample preparation and analysis, calibration of counting instrumentation, quality assurance and quality control procedures, and the water management program. The procedures were clear, concise, and contained the required direction and guidance for implementing effective programs. The inspector noted that several of the procedures were in the process of revision to reflect program changes. Procedures of the HP-EM manual correctly referenced procedures and forms of the HP-M. The inspector noted that there were no obvious mistakes or omissions. The inspector noted that the licensees record keeping was very good. The licensee was able to locate files and records upon request in a timely manner. Forms, such as the water release permit forms contained the appropriate information, and accurately coincided with the appropriate procedures, with one minor exception. The licensee made a note and will correct immediately. Chain of custody, release permit,

and sample control forms were effectively used according to procedures. Based on the procedure review and discussions with personnel, the inspector determined that the licensee has in place effective procedures and recordkeeping for the effluent controls program.

4.3 Sample Preparation and Counting

The inspector reviewed laboratory activities including processing, preparation, analysis of the sample media, and reporting of results. The inspector also followed an actual sample through this process. The inspector noted that after samples had been analyzed, the results were transferred by hand into a logbook and were subsequently transferred to a computer spread sheet which was used to produce reports to the NYS-DEC. The records indicated that all gaseous and liquid discharges were within limits specified in 10 CFR 20, Appendix B, Table II. During a review of these final steps, the inspector and licensee found that a former employee had made errors in transcribing data from the computer spreadsheet to the report form. The licensee has initiated an investigation and will take steps to ensure that transcription errors are detected and corrected. This was an isolated case and is not an NRC regulatory concern. The inspector noted that the licensee counts samples twice, once to meet their release criteria and once to meet analysis criteria. The release criteria was logged but the analysis criteria was not logged. The inspector noted that the difference in the two results did not significantly alter the final results. Within the scope of this review, no safety concerns were identified.

4.4 Strontium Analysis

The radioactive isotope Sr-90 has presented unique problems for the licensee. It has been frequently detected in the water in sump S-4, it is one of the limiting isotopes in the NRC approved soil release criteria, and is difficult to quantify. The licensee used the services of an off-site analytical laboratory but experienced delays in obtaining results. To resolve these issues, the licensee recently developed an on-site laboratory program for strontium analysis. The inspector interviewed the lab personnel and determined that they were experienced and qualified. Both water and soil samples are prepared in the lab. The analytical technique consists of passing a prepared liquid sample through an ion specific resin column. The strontium is then eluted from the column with nitric acid, the eluant is dried on a planchet and counted with a thin window alpha-beta detector. The detector system is calibrated with an Sr-90 and Pu-239 standard sources. The lab reports the sample counts to the lab supervisor who corrects for in-growth of Y-90 using a computer spreadsheet program. The minimum detectable activity of this procedure for water samples was reported to be about $8E-10$ $\mu\text{Ci/ml}$ and about 0.2 pCi/mg in soil. Both values are well below the applicable limit. The licensee is participating in the EPA Lab program for Sr-90 and achieved acceptable results in the 1993 round.

Within the scope of this review, no safety concerns were identified. Licensee management was commended for developing this program.

5.0 Water Management Program

The inspector reviewed the water management program to verify the licensee's ability to effectively control liquid releases to the environment in accordance with the Decommissioning Plan. The Manager of Maintenance and Security has the responsibility for the water management program. The inspector toured the licensee's facility including the reactor building (Bldg 1), the hot cell building (Bldg 2), and the locations of the 5,000, 10,000 gallon storage tanks and the mobile tankers. Water from buildings 1 and 2 flow to the 5K tanks and water from other ground/surface water sources flows to the retention pond. The 10K tanks are no longer used. After the tanks and/or pond has been sampled, analyzed, and verified for release, the Utilities Technicians release the tanks. The inspector noted that the Utilities Supervisor reviews the release log book daily and confirms that the status of the tanks and the position of the valves are correct. Based on the above review and discussions with personnel, the inspector determined that the staff members understood the importance of the effluent control program and implemented the program effectively and professionally.

6.0 Exit Interview

The inspector met with the licensee representatives indicated in Section 1.0 of this report on November 18, 1993 and summarized the scope and findings of this inspection. The licensee acknowledged the findings.