U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-54/89-02
70-687/89-02

Docket Nos. 50-54
70-687

License Nos. R-81
SNM-639 Priority - Category -

Licensee: Cintichem, Incorporated
P. O. Box 324
Tuxedo, New York

Facility Name: Hot Laboratory and Reactor

Inspection At: Tuxedo, New York

Inspection Conducted: March 28-31, 1989

Inspector: for R. L. Nimitz, Senior Radiation Specialist — 4/18/89 date

Approved by: M. Shanbaky, Chief, Facilities Radiation Protection Section — 4/26/89 date

Inspection Summary: Inspection Conducted on March 28-31, 1989 (Combined Report Nos. 50-54/89-02; 70-687/89-02)

Areas Inspected: Routine unannounced radiological controls inspection of the following: radiological controls; licensee action on previous findings and licensee implementation of Confirmatory Action Letter No. 88-15.

Results: One apparent violation was identified (failure of personnel to make notifications of personnel contaminations as required. Details in Section 5.). Weaknesses were also identified in the areas of personnel contamination control, worker practices, and posting and barricading.

DETAILS

1.0 Persons Contacted

1.1 Cintichem, Incorporated

+*J. McGovern, Plant Manager
+*L. Thelin, Staff Health Physicist
+J. Stewart, Radiation Protection Supervisor
+*W. Ruzicka, Manager, Nuclear Operations
*L. Babcock, Health Physics Technician

*The above individuals attended the exit meeting on March 31, 1989.
+Participated in the April 5, 1989 telephone discussion.

The inspector also contacted other licensee personnel.

1.2 NRC

+P. Swetland, Chief, Projects Section 2B
+N. Dudley, Project Engineer
+R. Bellamy, Chief, Facilities Radiological Safety and Safeguards Branch
+J. Roth, Project Engineer

+Participated in the April 5, 1989 telephone discussion.

2.0 Purpose of Inspection

This was a routine radiological controls inspection. The following matters were reviewed:

- licensee action on previous NRC findings
- implementation of licensee commitments outlined in NRC Confirmatory Action Letter (CAL) No. 88-15, dated June 30, 1989
- routine radiological controls practices

3.0 Licensee Action on Previous Findings

3.1 (Closed) Violation (70-687/85-01-01)

Alpha hand and foot counter not available at entrance/exit to facility. The licensee implemented the corrective action outlined in his March 29, 1985 letter to NRC. An alpha hand and foot monitor was placed at the entrance/exit of the facility. An alpha survey meter is also available at the Plating Lab and the QC Lab. This item is closed.

3.2 (Closed) Inspector Follow-Up Item (70-687/85-02-01)

Review licensee method of verification of C-14, Tc-99 and I-129 for 10 CFR Part 61. The licensee performed a comprehensive review to determine the quantities of these radionuclides contained in radwaste. Verification consisted of offsite analyses of representative samples and quantification using appropriately benchmarked computer codes. This item is closed.

3.3 (Closed) Violation (70-687/87-01-08)

Failure to post a high radiation area in accordance with 10 CFR 20.203(c)(i). The licensee implemented the corrective action outlined in his April 23, 1987 letter to NRC. Inspector tours during the inspection and performance of independent radiation surveys did not identify any problems. This item is closed.

3.4 (Closed) Violation (70-687/87-01-09)

Failure to lock a high radiation area in accordance with 10 CFR 20.203(c)(2)(iii). The licensee implemented the corrective action outlined in his April 23, 1987 letter to NRC. A special high radiation area access control procedure (HP-A-12) was developed to provide guidance for access control. Inspector tours during the inspection and performance of independent radiation surveys did not identify any concerns. This item is closed.

The inspector did identify that the lock for the QC P-32 vault, located on the reactor operating floor, was broken. Access could easily be gained to the vault. The inspector noted this area was designated as a locked High Radiation Area. The licensee's Radiation Protection Supervisor was unaware of the broken lock. The licensee immediately initiated action to lock the vault. Although the area did not exhibit high radiation, the fact that the lock was broken, the area was required to be secured, and the licensee's radiation protection supervisor was unaware of the broken lock indicates some apparent weaknesses in oversight of locked high radiation areas.

3.5 (Closed) Violation (70-687/87-01-02)

Failure to make appropriate notifications following an apparent overexposure. The licensee implemented the corrective action outlined in his April 23, 1987 letter to NRC. A special procedure (HP-B-11) regarding notifications was developed. Special procedures were also developed to review anomalous exposure results. Appropriate notifications are to be made if overexposures are identified. This item is closed.

3.6 (Closed) Violation (70-687/87-01-04)

Failure to evaluate potential exposures to hands. The licensee implemented the corrective action outlined in his April 23, 1987 letter to NRC. The licensee now provides finger ring TLD badges to monitor exposure to the hands. Anomalous dosimetry readout results are investigated. This item is closed.

At the time of this inspection, procedures for use of licensee supplied ring TLDs were not in place. Procedures were in place for use of vendor TLD rings. The licensee-supplied badges were being used to quickly check exposures following a work activity in lieu of waiting for vendor results. The use of the supplemental badge was a good licensee initiative. This matter will be reviewed during a future inspection.

3.7 (Closed) Violation (70-687/87-01-05)

Failure to document or maintain surveys for manipulator hand repair. The licensee implemented the corrective action outlined in his April 23, 1987 letter to NRC. Special procedures requiring documentation of surveys were established. Inspector review of recent manipulator repair activities indicated documentation of surveys was performed. This item is closed.

3.8 (Closed) Violation (70-687/87-01-01)

An individual sustained an overexposure of the extremity while performing manipulator repair. The licensee implemented the corrective action outlined in his April 23, 1987 letter to NRC. A special procedure for manipulator repair was established. Standard radiation work permits for the task were established and allowable maximum exposure limits on manipulator components handled was established. This item is closed.

3.9 (Closed) Unresolved Items (50-54/86-04-03; 70-687/86-05-03)

NRC to review adequacy of airborne radioactivity sampling during hot cell operations. Airborne radioactivity sampling was reviewed during the inspection and during NRC Inspection No. 70-687/88-02. A violation was issued during the referenced inspection for inadequate air sampling within the hot cells. The licensee implemented corrective actions for the violation (reference NRC Item 70-687/88-02-03). These items are closed.

3.10 (Closed) Inspector Follow-Up Item (70-687/86-05-02)

Licensee to review potential for plateout of radioactivity on the walls of containers used to collect composite waste samples. The licensee performed an evaluation of plateout. Although none was found, the licensee changed the type of container used and now acidifies composite waste samples to minimize plateout. This item is closed.

3.11 (Closed) Unresolved Item (70-687/88-04-06)

Licensee to review adequacy of liquid effluent release limits. The licensee was using a limit based on Sr-90 and no apparent evaluation of concentrations of alpha emitters relative to applicable release limits was made. The licensee's review indicated no significant release rates to date have occurred. Release rates to date have met requirements of 10 CFR 20.106 using the release limits based on Sr-90. Inspector review indicated release rates met 10 CFR 20.106 requirements. The licensee revised procedures to incorporate release limits outlined in 10 CFR 20, Appendix B to account for other radionuclides. This item is closed.

3.12 (Closed) Unresolved Item (70-687/88-02-05)

Licensee to evaluate adequacy of maximum permissible concentration (MPC) used for hot cell work. The licensee concluded the MPC should be lowered by a factor of 10 (3×10^{-9} uCi/ml to 3×10^{-10} uCi/ml). Procedures were changed to reflect the new MPC. No significant, apparent exposures had occurred based on using the lower MPC value. This item is closed.

3.13 (Closed) Unresolved Item (70-687/88-02-03)

Licensee to complete skin dose evaluation for individual who was contaminated on the lower left leg during hot cell work on March 3, 1988. The licensee completed the dose evaluation. Maximum exposure sustained to 1 cm^2 of skin was about 410 millirem. No overexposure occurred. This item is closed.

3.14 (Closed) Violation (70-687/88-04-02)

Failure to monitor effluent releases from the hot cell emergency ventilation system. The licensee implemented the corrective action outlined in his August 12, 1988 letter to NRC. The licensee installed a calibrated isokinetic particulate and iodine sampling system on the exhaust. The exhaust was tied into the existing facility effluent release pathway (stack) which provides for monitoring of noble gases. This item is closed.

At the time of this inspection, no procedures were in place for performing periodic testing and maintenance of the new particulate and iodine monitoring system. This matter will be reviewed during a subsequent inspection.

3.15 (Closed) Violation (70-687/88-02-03)

Failure to monitor airborne radioactivity in the hot cells. The licensee implemented the corrective action outlined in his May 16, 1988 letter to NRC. Special procedures were established to provide guidance for monitoring airborne radioactivity in the hot cells. Special sampling equipment has been purchased and placed in service to collect air samples. This item is closed.

3.16 (Closed) Violation (70-687/88-02-01)

Licensee did not provide adequate instruction to a visitor regarding personnel contamination monitoring contrary to 10 CFR 19. The licensee implemented the corrective action outlined in his May 16, 1988 letter to NRC. The licensee purchased a high sensitivity portable frisking machine. All personnel were provided guidance on use of the equipment. Visitor training has been upgraded to address contamination monitoring. Visitor escorts are required to sign-off at the end of each day indicating the individual performed an adequate frisk. This item is closed.

3.17 (Closed) Unresolved Item (50-54/79-02-07)

Licensee to review the isokinetic sampling characteristics of particulate effluent sampling system. The licensee reviewed the sampling characteristics and ensured flow rate of the samples was comparable with fan flow in early 1979. A re-review of this matter prompted by NRC Inspection No. 70-687/88-04 found that the particulate sampling velocities for the reactor building and hot lab were based on rated fan flow rather than actual exhaust flow from these two areas. The sampling system flow rates were re-set in December 1988 to reflect actual velocities encountered in the exhaust ducts. This item is closed.

Preliminary inspector review, based strictly on sampler flow and stack release effluent velocities, indicated the particulate releases from the reactor building may have been slightly underestimated while those from the hot lab may have been overestimated. The need to update previous effluent release information will be reviewed during a subsequent inspection. No apparent significant particulate releases were noted.

3.18 (Closed) Violation (70-687/88-04-03)

Failure to perform quarterly testing of hot cell emergency exhaust ventilation system. The licensee implemented the corrective action outlined in his August 12, 1988 letter to NRC. This ventilation system was added to the quarterly testing schedule. The charcoal filter system was tested and found to perform below acceptance criteria. Charcoal filters were replaced, tested and found to meet acceptance criteria. This item is closed.

4.0 Review of Confirmatory Action Letter Implementation

The inspector reviewed the implementation of licensee commitments documented in NRC Confirmatory Action Letter (CAL) No. 88-15, dated June 30, 1988. The CAL dealt with unmonitored releases from the hot cells via an unmonitored emergency ventilation system.

Preliminary review of implementation was made during NRC Combined Inspection Nos. 50-54/88-02; 70-687/88-06.

The inspector evaluated implementation via review of on-going hot lab operations, review of documentation, and discussion with personnel.

Inspector review indicated the licensee implemented the commitments documented in the CAL.

The following matters were identified as needing further licensee attention:

- At the time of the inspection, no procedures had been established for periodic surveillance and maintenance of the Hot Cell Emergency Ventilation System particulate and iodine effluent sampling equipment.

- The Reactor Building Emergency Ventilation System, which is not routinely used, was found to tie into the plant release point (stack) down stream of the particulate and iodine effluent monitors that have been determined to collect samples in an isokinetic manner.

The above matters will be reviewed during a subsequent inspection. The licensee indicated the above matters would be reviewed

5.0 Routine Radiological Controls Review

The inspector toured the facility during the inspection. The following matters were reviewed.

- organization, staffing, training and qualification of the radiological control organization

- external exposure control including posting, barricading and locking of high radiation areas

- internal exposure controls including air sampling and use of respiratory protection equipment

- radioactive and contaminated material control including control of contaminated areas

Evaluation of licensee performance was based on review of on-going activities and discussions with personnel.

Within the scope of this review the following observations were made:

- Numerous individuals were identified as sustaining personnel contamination, primarily on the foot areas, when exiting the main access/egress point of the reactor building and hot cell area. The contamination ranged from 1000 dpm/100 cm^2 to 300,000 dpm/100 cm^2. The inspector and a licensee Radiation Protection Supervisor estimated that 20% of the individuals simply washed their shoes off at a nearby hot sink and exited the facility. There was no apparent follow-up to identify sources of the routine personnel contamination and initiate action to preclude recurrence.

  The inspector noted that SNM License No. 639 requires in Section 3.2.1.1, that hand and foot counters capable of detecting alpha and or beta-gamma radiation as appropriate shall be provided at the routine exits of the facility. Employees shall be required to monitor themselves and report contamination levels above the alarm set points. Contrary to the above requirement, numerous individuals sustained personnel contamination above the alarm set points and made no notification of the event. Rather, the individuals cleaned their shoes and simply left the facility. This is an apparent violation of SNM-639 Section 3.2.1.1 (70-687/89-02-01).

- Contamination zones and boundaries were posted in a haphazard manner. It was unclear in some instances where the clean zone ended and the contaminated zone began.

- Personnel exhibited poor practices when removing protective clothing and exiting contaminated areas.

- Health Physics Technicians, indicated as fully qualified to monitor safety significant activities (e.g. manipulator repair) did not have complete qualification record sign-offs.

- Personnel were using the incorrect instrument when surveying for alpha contamination in the QC lab area.

- Potentially contaminated protective boots were left on the reactor bridge in a clean zone.

The licensee indicated the above matters would be reviewed. The inspector indicated that the number of poor work practices observed appeared to indicate weaknesses in oversight of facility activities.

The licensee indicated an Action Plan would be developed to address the inspector concerns. The licensee indicated the following areas would be addressed as a minimum:

- improving management of NRC inspection findings and documentation to demonstrate appropriate closure action
- enhancement of supervisory and management oversight of facility activities including worker practices
- enhancement of audits
- contamination control
- adequacy of radiation protection personnel staffing levels
- training and qualification of radiation protection personnel

The licensee indicated the Action Plan would be submitted by April 31, 1989.

6.0 Exit Meeting

The inspector met with licensee representatives (denoted in Section 1.0) at the conclusion of the inspection on March 31, 1989. The inspector summarized the purpose, scope and findings of the inspector.