

NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 70-008/82-02(DETP); 50-006/82-01(DETP)

Docket No. 70-008; 50-006

License No. SNM-7; R-4

Licensee: Battelle Columbus Laboratories  
505 King Avenue  
Columbus, OH 43201

Inspection Conducted: October 5-8, 1982

Inspector: C. C. Peck

*JR Greger for*

10/28/82

Approved By: L. R. Greger, Chief  
Facilities & Radiation  
Protection Section

*JR Greger*

10/28/82

Summary:

Inspection on October 5-8, 1982 (Report No. 70-008/82-02(DETP); 50-006/82-01(DETP))

Areas Inspected: Routine, unannounced health and safety inspection, including: operations review, radiation protection, facility changes, safety committees, quality assurance, emergency planning and technical specifications applicable to the retired reactor facility. The inspection required 29 inspector-hours onsite by one NRC inspector.

Results: No violations were identified.

## DETAILS

### 1. Persons Contacted

- \*H. L. Toy, Nuclear Services Manager
- \*D. A. McKown, Radiological Safety Officer
- \*G. E. Kirsch, Health Physics Supervisor
- H. M. Faust, Assistant Nuclear Services Manager
- V. J. Pasupathi, Hot Cell Laboratory Manager
- A. Parsons, Hot Cell Laboratory Supervisor
- T. R. Emswiler, Transportation Specialist
- J. Wissinger, Health Physics Technician
- E. R. Swindall, Health Physics Technician
- D. G. Stewart, Health Physics Technician
- E. O. Fromm, Quality Assurance Manager
- B. E. White, Quality Assurance
- S. Landis, Safety and Health Director, Life Sciences Laboratory
- J. S. Pitman, Radiological Safety Technician, Life Sciences Laboratory

\*Denotes those present at exit interview.

### 2. General

This routine, unannounced inspection began at 8:00 a.m. on October 5, 1982 at the West Jefferson Nuclear Facility. The inspector toured the Hot Cell Laboratory, the decontaminated Plutonium Laboratory, retired reactor facility, and the Life Sciences Laboratory at King Avenue. An exit interview was conducted on October 8, 1982.

### 3. Resolution of Previous Inspection Findings

(CLOSED) Noncompliance (70-008/82-01): Failure to submit a timely Radiological Contingency Plan as required by the NRC Order to Modify License, dated March 3, 1981. The licensee subsequently submitted an acceptable plan and has taken administrative steps to prevent future misunderstandings of the type that caused the violation.

### 4. Licensing Status

The licensee's activities are performed under special nuclear material license SNM-7 and byproduct material license 34-06854-05. The licensee submitted a request for renewal of these licenses in October 1977, before their expiration date, and has since operated in timely renewal. The 1977 renewal application proposed to combine the two licenses as SNM-7. A revised renewal application was submitted in October 1981 because substantial organizational and facility changes had occurred which made the 1977 application obsolete. At the time of this inspection, NRC approval had not been received. The inspector referred to the conditions of the still-unapproved license during this inspection.

5. Facility Changes

Installation of an incineration system is planned at West Jefferson to demonstrate the effectiveness of incineration in reducing waste volume. Incineration of waste from other radwaste generators as well as waste produced onsite is contemplated. In August the licensee requested NRC to provide the criteria that will be required in preparation of a request for a license amendment. A response had not been received at the time of the inspection.

6. Operations Review

Hot Cell Laboratory

Normal work activities were in progress in the Hot Cell Laboratory. During a tour the inspector observed that safety related instruments (criticality, constant air, and stack monitors) were in operation and had been calibrated as scheduled. Housekeeping in the high level and low level cells in JN-1-A was not good in the inspector's opinion. However, these cells have recently been used infrequently, and removal of excess material would add to the already large accumulation of radioactive waste. Access to areas where high level radioactive wastes are stored was restricted as required by regulation.

A portion of the unloading of a spent fuel cask was observed. The operation was conducted safely and was concluded without incident.

Plutonium Laboratory

Decontamination of the laboratory interior has been completed. The inspector reviewed the licensee's final contamination survey records. About 8000 smears were taken in surveying about 3000 one-meter square grids into which the walls, floors, and ceilings of the laboratory were divided in accordance with ANSI Standard N13.12. The licensee is awaiting approval of the decontamination effort by the Department of Energy, who made an independent confirmation survey. Approval by DOE to release the building for unrestricted use would be acceptable to NRC, as agreed in 1978 before the cleanup effort commenced.

Outside the building, excavation of a contaminated autoclave and two large, contaminated concrete holding tanks has been completed and the holes backfilled. The tanks had not been used in many years. Leakage of residual water from at least one of the tanks resulted in contamination of soil with a low concentration of alpha activity. The licensee plans to package the soil in several hundred 55-gallon drums for eventual disposal to waste burial. Several thousand gallons of water pumped from the excavation was also slightly contaminated. This is being evaporated from a large unused tank. Disposition of the two concrete tanks will also be a problem because of their size, weight, and the fact that at least one is externally contaminated and is known to leak.

## Life Sciences Laboratory

In the Life Sciences Laboratory at King Avenue the licensee uses millicurie quantities of a number of isotopes such as tritium, carbon-14, sulfur-35, phosphorous-32, and iodine-125 and 131. The inspector toured areas of the laboratory where radioactive materials are handled, primarily in ventilated hoods which are exhausted through HEPA filters to the roof. Protective clothing, monitoring, bioassay and waste handling practices provide adequate protection against internal exposure. There is no external radiation hazard. Waste packaging and storage areas were inspected. Waste is packaged in new 55-gallon specification 17-H drums. Adequate volumes of absorbent material are used in packaging liquids, as required by DOT regulations.

## 7. Retired Reactor Facility

Compliance with the technical specifications of Amendment 13 to reactor license R-4 was inspected. The specifications require monitoring of radioactivity in water released from a basement sump to the storm sewer, periodic radiation surveys, and maintenance of barriers preventing access to the retired reactor.

<u>Specification</u>	<u>Finding</u>
2.1	Radioactivity levels in the water discharged from the basement sump have not exceeded 10 CFR Part 20 limits.
3.1	Records disclose that annual calibrations and weekly channel tests of the water monitor are performed.
3.2a	Quarterly radiation and contamination surveys are performed. Removable beta contamination did not exceed 100 dpm/100 cm <sup>2</sup> and radiation levels were generally less than 2 mR/hr.
3.2b	Environmental radiation surveys were conducted.
3.2c	Physical barriers are inspected quarterly.
5.5.1	An annual report describing radiation survey results, facility status, and surveillance and security measures is sent to NRC. The report for 1980 was submitted August 11, 1982.

No violations were identified.

## 8. Safety Committees

Minutes of monthly meetings of the West Jefferson Safety Committee and the most recent quarterly report of the Radiological Safety Officer were examined.

Reviews documented by the Radiological Safety Committee since the inspection in April 1982 were reviewed (Report No. 70-008/82-01). The Nuclear Safety Subcommittee approved the receipt of spent fuel rods from two reactors and set forth the conditions for handling the fuel in the high energy cell. The Radioactive Materials Subcommittee approved the transfer of alpha - contaminated ground water from the excavation outside the Plutonium Laboratory to a holding tank at the retired reactor building (JN-3) for storage and evaporation.

#### 9. Quality Assurance

A quality assurance section whose manager reports to the Nuclear Services Manager is responsible for the functioning of a quality assurance program which includes all safety and quality related procedures used at the West Jefferson Nuclear Facility. QA is responsible for issuing and maintaining current management - approved procedures in the following broad categories:

Hot Cell Laboratory Program - includes test plans, test procedures, fuel receipt and handling, instrument calibrations, welding qualifications, etc.

Safety Procedures - includes health physics, environmental monitoring, emergency response, and general Hot Cell Safety Procedures.

Packaging and Transportation of Nuclear Materials - includes standards, inspection procedures, and maintenance requirements for packaging used by the licensee, including shielded shipping casks.

Calibration Procedures - includes calibration procedures for survey instruments, constant air monitors, counting instruments, and test instruments used in the Hot Cell Laboratory.

Plutonium Laboratory Decontamination Procedures - consists of procedures used in the decontamination of the laboratory, including contamination monitoring requirements for release of the laboratory for unrestricted use.

In discussions of the programs with quality assurance personnel and examination of records, the inspector determined that: (1) calibrations of air and stack monitoring equipment in the Hot Cell Laboratory were current; (2) required periodic inspections of the four shielded shipping casks owned by the licensee were conducted on schedule.

QA produced records indicating that five cranes at West Jefferson, including the 50 ton crane in the fuel storage pool area have received monthly maintenance inspections. However, the requirements for periodic inspections and tests of the cranes do not appear to be described in any existing QA procedure. The inspector suggested that crane maintenance appeared an appropriate subject to be included in the QA program. Similarly, the functions and maintenance of an alarm panel located at the entrance of the Hot Cell Laboratory does

not appear to be described in the QA program. The matter was discussed at the exit interview.

## 10. Radiation Protection

### External Exposure Control

Film badge records supplied by a vendor indicated a maximum individual whole body exposure of about 2600 mrem for Hot Cell Laboratory technicians for 1982, through August. The average for these technicians was about 2000 mrem. These exposure levels are about the same as for the corresponding period in 1981. External exposures to other employees at West Jefferson and King Avenue and to visitors were not significant.

The licensee continues the experimental use of badges containing two TLD chips, in addition to the film badge program. Data were not examined. The licensee stated that, in general, TLD exposures were about half those measured by film badges. The cause of the difference, presently thought to be conservative factors used in the film badge measurements, is being evaluated.

### Internal Exposure Control

Quarterly urinalyses results for Hot Cell and Plutonium Laboratory workers and semi-annual urinalyses for King Avenue people indicated no detectable radioactivity.

The licensee requested more prompt reporting of results in a letter to the contractor laboratory. Reports are received about three months after submittal of samples. Although the licensee has an agreement that significant findings would be reported promptly after detection, there is no assurance that the information would be prompt enough for determining dose, cause, or need for a resample. No response had been received at the time of the inspection.

### Air Sampling

Effluent air from the stacks and room air are sampled continuously, and filters are counted weekly in the Hot Cell Laboratory. The counting data are now analyzed by computer. A printout tabulates average weekly, monthly, and year-to-date concentrations for each stack and constant air monitor. Stack effluents have not exceeded  $1\text{E-}13$   $\mu\text{Ci/ml}$  alpha or  $1\text{E-}12$   $\mu\text{i/ml}$  beta activity in 1982. Constant air monitors have not exceeded  $1\text{E-}12$   $\mu\text{i/ml}$  alpha or  $1\text{E-}11$   $\mu\text{i/ml}$  beta. These concentrations are less than MPC.

### Contamination Surveys

Smear and radiation survey records were examined. These surveys, conducted weekly in operating and office areas indicated there have been no significant control problems.

11. Emergency Planning

The licensee's Radiological Contingency Plan was approved July 2, 1982, by issuance of an amendment to the license which directed that the plan be implemented within 90 days.

The inspector determined that emergency equipment and the emergency response organization are in place as required. Records disclosed that the five emergency response teams (first aid unit, fire control unit, emergency site unit, environmental survey unit, and accident evaluation unit) have conducted training sessions in each of the first three quarters of 1982 as described in the plan.

12. Exit Interview

The inspector met with the licensee representatives denoted in Section 1 at the conclusion of the inspection on April 30, 1982. The inspector summarized the inspection scope and findings.

The inspector explained that the inspection had been conducted using the licensee's renewal application of August 1, 1981 as a guide and reference in determining compliance with regulatory requirements, recognizing that the application has not yet been approved. The 1981 application describes current activities and the methods used to comply with NRC regulations. The license of 1973 as amended, is in many respects obsolete. No significant deviations from commitments made in the application were identified.