

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 70-984/85-01

Docket No. 70-984

License No. SNM-942

Safeguards Group: V

Licensee: Battelle Pacific Northwest Laboratories  
P. O. Box 999  
Richland, Washington

Facility Name: Pacific Northwest Laboratories

Inspection at: Richland, Washington

Inspection conducted: June 25-28, 1985

Inspector: *B. L. Brock* 7/17/85  
B. L. Brock, Fuel Facilities Inspector Date Signed

Approved By: *B. A. Riedlinger* 7/17/85  
for R. D. Thomas, Chief Date Signed  
Nuclear Materials Safety Section

Summary:

Inspection on June 25-28, 1985 (Report No. 70-984/85-01)

Areas Inspected: A routine unannounced safety inspection was conducted of management organization and controls; operator training and retraining; criticality safety; operations review; radiation protection; transportation/radioactive waste management/10 CFR Part 61; emergency preparedness, and environmental programs.

The inspection involved a total of 24 hours onsite by one regionally based inspector.

Results: No violations were identified in the ten areas inspected.

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## DETAILS

### 1. Persons Contacted

R. R. King, Jr., Manager, Facilities and Operations  
\*C. R. Richey, Manager, Laboratory Safety Department  
J. R. Berry, Manager, Radiation Protection Section  
\*J. Denovan, Technical Leader, Nuclear Safety  
M. W. Leale, Senior Technical Specialist  
T. Graham, Emergency Preparedness Coordinator  
M. Sula, Manager, Hanford Internal Dosimetry Program  
P. H. Burke, Hazardous Material Transportation  
\*V. C. Asmund, Senior Development Engineer  
S. C. Hawley, Senior Engineer, Nuclear Safety  
\*R. C. Schrotke, Sr., Radiation Supervisor  
J. C. Dunn, Building Manager  
J. R. Abraham, Radiation Protection Technologist  
J. L. Allen, Specialist, Radiation Protection  
\*N. P. Nisick, Staff Engineer  
D. E. Lucas, Senior Development Engineer  
\*J. D. Hudspeth, Sr., Supervisor, Radiation Protection  
P. M. Hickey, Safety Training Coordinator  
K. Price, Senior Research Scientist  
M. Hensyel, Technical Specialist  
G. Skvarek, Clerk

\*Denotes those individuals attending the exit interview.

### 2. Management Organization and Controls

The licensee is authorized to use Special Nuclear Material (SNM) under license SNM-942 in accordance with the statements, representations, and conditions contained in Part 1.0, "Criteria and Administrative Procedures," of the licensee's application dated May 9, 1979.

#### A. Organizational Structure

Section 1.3(A) of Part 1 of License SNM-942 requires that the licensee maintain a unique department responsible for the establishment and conduct of all radiation protection and nuclear safety programs. This department will be separate from the operating departments.

The licensee maintains the required separation of functions and is in compliance with the requirements of his license.

#### B. Procedure Controls

Section 1.3 (page 6) of Part 1 of License SNM-942 requires that the licensee maintain formal administrative procedures for radiation protection and criticality safety.

The licensee maintains a radiation protection procedures manual. The manual was revised since the last inspection and was reviewed and approved by the manager of radiation protection as required.

The licensee maintains a criticality safety procedures manual. Portions of the manual are currently being revised. The approval of the revisions will be reviewed during the next inspection (85-01-01).

### C. Safety Committee

Section 1.3(E) requires the licensee to maintain a Safety Review Council as established in Management Guide 12.7 to review program designs and safety analyses where the direct or indirect consequences of a credible accident are deemed to be of substantial magnitude.

The licensee maintains a Safety Review Council as required. In addition, on June 26, 1984, the Director of the Laboratory (PNL) appointed an ad hoc committee to review the status of the laboratory's performance in the area of Radiological and Industrial Safety. The committee's report, dated November 1984, indicated that while the licensee's overall performance compared well with other Department of Energy (DOE) facilities, there was room for improvement in upper management's demonstration of their dedication to safety. This continuing and visible interest in safety by upper management would by example lead the individual contributors and the section managers. The success of upper management's "Integrated Safety Plan," a collegial approach to safety, would also be facilitated. The committee noted that staffing in radiological and nuclear safety was marginal and further that the multiplicity of safety manuals would benefit from the publication of the planned "Managers Guide to Safety." The licensee's response to the ad hoc committee's report will be reviewed during the next inspection (85-01-02).

No violations were identified.

### 3. Operator Training and Retraining

Section 1.3 (pages 7 and 17) of Part 1 of License SNM-942 requires that the licensee provide training in radiation protection and criticality safety.

The licensee's training program involves general training in radiological and criticality safety by the Laboratory Safety Department. Training specific to a project is the responsibility of the manager of the project. The new Safety Training Coordinator was familiar with the division of training responsibility. His current training effort incorporated the use of the new Radiation Protection Manual as part of the licensee's program of retraining personnel to assure they have sufficient knowledge of current radiation protection procedures and practices. The Senior Engineer, Nuclear Safety, continues to train the Criticality Safety Representatives who in turn provide operations

specific training to operations personnel. The records reflecting the training for specific Criticality Safety Specifications (operations specific training) will be reviewed during the next inspection (85-01-03).

No violations were identified.

#### 4. Criticality Safety

Section 1.3 (page 7) of Part 1 of License SNM-942 requires that for work involving fissionable material, the licensee follow the Two-Contingency Policy and maintain formal procedures for implementation of the policy. The principal procedure for control of fissionable material is the Criticality Safety Specification (CSS), which provides limits that ensure criticality safety in specific operations with fissionable materials.

##### A. Criticality Safety Analysis

No criticality safety analyses were required for licensed materials since the last inspection.

The inspector's review of the Off-Normal-Event file indicated a transfer of two glove boxes appeared to result in exceeding the Isolation Facility Authorization (IFA) at the receiving facility (Building 231-Z). The preliminary measurements, made after the receipt of the glove boxes indicated the presence of more plutonium holdup than the shipper's records indicated. When added to the plutonium already on the Building 231-Z inventory, the IFA appeared to be exceeded. The licensee suspended operations, formed a Recovery Committee, developed a Recovery Plan and implemented the plan. The licensee's review found he had not exceeded 45 percent of a minimum critical mass for plutonium of the isotopic composition that had been processed in the glove boxes. Final measurements reported by telephone on July 17, 1985 indicated that Pu inventory was 35 percent below the IFA. Including the limit of error reduces this difference to 14 percent. The final report on this item involving license-exempt material will be reviewed during the next inspection (85-01-04).

##### B. Criticality Calibrations and Monitoring System

The criticality warning system in Building 306-W (which contains 90 percent of the licensed material) performed normally during the routine test of the system during this inspection. The test, required quarterly, was conducted during the swing shift.

The licensee maintains the system by replacing detectors with calibrated units annually on a rotating basis.

No violations were identified.

## 5. Operations Review

Section 1.1 (Page 2) of Part 1 of License SNM-942 provides the criteria and administrative procedures set up to assure the maintenance of high quality health and safety conditions for all Battelle-Northwest work performed under this special nuclear material license.

### A. Conduct of Operations

No processing of licensed material has occurred since the last inspection. The licensed material has been reduced by almost twenty percent through disposal of material no longer needed. Ninety percent of the inventory is stored in the vault of Building 306-W with the balance in storage in the Physical Science Laboratory (PSL) Building. The Building 306-W storage vault was included in the facility tour.

### B. Housekeeping

The production areas were very clean. The vestibule just outside the Building 306-W vault was being used for storage of equipment and appeared to warrant additional housekeeping attention. No poor health physics practices were identified.

No violations were identified.

## 6. Radiation protection

Protection against radiation hazards associated with licensed activities is required by 10 CFR Part 20.

### A. Bioassay Program Performance

Inspection Report 70-984/84-02 identified the need for bioassay samples for two persons. The samples were taken and the results were received thus closing item 84-02-04. The licensee is planning to have the contract laboratory send sample kits to employee homes so they can readily provide the required samples. This will not only improve acquisition of required samples but it will result in samples generally larger than those obtained at the time of the lung count which are often too small for analysis. The larger samples also yield better measurement results. The inspector noted that four of eighteen persons whose records he reviewed missed required annual bioassays, however, he subsequently learned they were working on license-exempt activities and thus were under DOE jurisdiction. The planned changes should assure acquisition of the required samples.

The inspector's review noted several workers with slightly elevated bioassay results. The licensee had previously noticed these results, identified the group of workers (machinists) and began a special study of them. The progress of the study will be reviewed during the next inspection (85-01-05).



The contract laboratory performing the bioassays recently improved its sensitivity by a factor of ten to 0.03 ug/sample at a volume of about one liter.

B. Contamination Control

The licensee's control of contamination was improved by relocating the survey instrument to within reach of a person standing on the step-off pad. This closes item 84-03-05.

The licensee's report of the incident involving the unauthorized removal of a tool, contaminated with byproduct material, from the site was reviewed by the inspector. The inspector concluded that the incident was expeditiously controlled and corrected. The person involved in the incident was precluded from returning to the site. The material involved was under the jurisdiction of the State of Washington.

The inspector reviewed the licensee's experience with the recirculation pipe sections sent from the Monticello Nuclear Reactor for examination. The review indicated that the licensee's use of good radiation safety procedures and practices assured control of the alpha contamination identified. In preparation for working on the pipe the licensee had placed it in a 'greenhouse' and took and measured swipes which identified the presence of the alpha contamination before the pipe examination was begun. Workers wore anti-C clothing and used respiratory protection. Bioassays and lung counts have not indicated any ingestion of Am-241, the identified source of the alpha contamination, or of the byproduct materials.

7. Transportation/Radioactive Waste Management/10 CFR Part 61

Transportation of licensed materials are regulated by 49 CFR 100-177, 10 CFR 71 and 10 CFR 20.311. Additionally, 10 CFR 20.301 to 20.401 regulates waste disposal. 10 CFR Part 61 requires that all radioactive waste prepared for disposal be classified in accordance with Section 61.55 and meet the waste requirements in Section 61.56.

Responsibility for management of these activities has been assigned to the Hazardous Materials Transportation Officer (HMTO).

Appropriate procedures exist for meeting the regulatory requirements, PNL-MA-8 addresses preparation of radioactive wastes for disposal and PNL-MA-812 addresses preparation of hazardous wastes for disposal. Annual audits by the HMTO are supplemented by more frequent unannounced inspections to assess compliance with the procedures. The Quality Assurance group also conducts appraisals of the licensee's compliance with Waste Transportation requirements. Corrective actions are taken expeditiously where warranted.

The HMTO has current copies of the waste disposal site operator's State of Washington license and NRC license.

No violations were identified.

## 8. Emergency Preparedness

Section 1.3 (page 20) of Part 1 of License SNM-942 requires that emergency procedures for each separate facility conform to the plan for that plant area regardless of which Hanford contractor may operate the facility.

### A. Tests and Drills

The licensee participated in 72 Building Evacuation drills in 1984, and ten such drills between January and June 1985. Three more drills are planned before September. Three telephone notification exercises where actions were simulated were conducted in 1984, and one is scheduled to occur in July 1985. The drills frequently include the three contractors serving the area. The recommendation from the critique of the May 1984 major site-wide exercise has been implemented. A single contractor (Westinghouse) is now responsible for operation of the Emergency Control Center (ECC). This responsibility no longer changes as an event progresses, even if the principal location of the event changes. Each of the three contractors provides technical support to the Emergency Director, so that contractor specific information is immediately available. Additionally, RPTs from PNL are on standby support whenever the ECC is activated. This closes item 84-02-01.

### B. Fire Protection

The licensee had completed installation testing and acceptance of the fire alarm recommended for Room B-16 of Building 320. The 'As-Built' engineering drawings revised March 27, 1985, reflected the installation. This closes item 83-01-02.

The inspector's review of the status of fire extinguisher inspections found they were all current. Two fire extinguishers in Building 306-W needed to be inspected before the end of June.

No violations were identified.

## 9. Environmental Programs

Section 1.3 (page 22) of Part 1 of License SNM-942 requires that gaseous effluent systems keep effluent releases as far below the limits specified in 10 CFR Part 20 as practicable.

The inspector's review of the licensee's stack effluent data indicated that no releases exceeded the quarterly or annual release limits.

No violations were identified.

#### 10. Exit Meeting

The results of the inspection were discussed with the licensee's staff identified in Section 1.

The topics included:

- ° Closure of the four open items from previous inspections.
- ° Closure of the review of the event related to removal of a contaminated tool from the site (State of Washington jurisdiction)
- ° Closure of the review of the contamination 'problem' resulting from the examination of the Monticello recirculation pipe section.
- ° Interest in reviewing (during the next inspection) the records kept by managers now responsible for job-specific radiological and nuclear safety training.
- ° The need for positively identifying persons who have missed required bioassay samples (This is necessary because four of eighteen persons whose records were reviewed missed required annual bioassays. However, they were under DOE jurisdiction).
- ° The need to include the limit of error when evaluating whether a criticality safety limit has been exceeded.
- ° Concurrence in the licensee's planned emphasis on safety.

The licensee indicated the implementation of the plan to have bioassay samples taken at the employees' home should preclude missing required samples. Licensee representatives stated that consideration will be given to other steps which may improve the sample acquisition success rate.