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U.S. Department of Energy, Richland Operations Office and the
Office of River Protection

Plutonium Finishing Plant Environmental Compliance Assessment

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Analysis & Evaluation Division Assessment A&E-SEC-01-015

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Executive Summary

A U.S. Department of Energy, Richland Operations Office (RL), Analysis and Evaluation Division (A&E) assessment for environmental regulations compliance was performed at the Plutonium Finishing Plant (PFP) during February - April, 2001. The scope of the assessment was the contractor's compliance with the Washington Administrative Code (WAC) requirements covering the treatment, storage and disposal of hazardous and mixed waste. In addition to verifying compliance to WAC requirements, the assessment evaluated the overall facility management effectiveness taking into account day-to-day operations, radiation protection, industrial safety and management self-assessments. An entrance meeting was conducted on February 1, 2001 at PFP. The A&E assessment team and the Fluor Hanford Inc. (FHI) points of contact and subject matter experts attended the meeting. The exit meeting was held on June 28, 2001, at PFP.

Special attention was made to determine the extent of characterization of equipment that has no future use. Lack of progress with this issue has been a repeated concern of the Washington State Department of Ecology. To complete the assessment scope, all rooms and vaults inside the facility as well as all areas and buildings within the surrounding facility complex were inspected. The only exceptions were building 242-Z (McCluskey room) and building 232-Z (incinerator) that have not been used for many years. Visual inspection was not possible from outside and the current condition is unknown.

The contractor had performed a facility vulnerability study after the Plutonium Reclamation Facility (PRF) explosion in 1997 that should have identified all the tanks that were a potential problem. However, no complete evaluation, to date, has been performed on the remaining facility systems and equipment. Consequently, the contractor could not provide the assessment team with a complete facility inventory of vessels, tanks and systems that would provide complete waste designation and characterization data. The contractor provided some initial incomplete information from previous studies that will be used as the basis for a complete and accurate characterization study in the future. No schedule for completion of the characterization work was provided.

The assessment is rated as yellow – several and/or continuing deficiencies.

The assessment concluded four findings and no observations. The findings identified issues relating to the abandoned process vessels and systems, satellite accumulation areas, used oil disposition, and posting and labeling in equipment and piping that is no longer in use.

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I. Introduction and Scope

A. Background

The PFP facility is involved in plutonium stabilization and facility transition activities. However, significant portions of plant equipment and systems have no designated future use. Much of this equipment has not been in use for over ten years.

B. Assessment

This assessment covers the permittee's program for compliance with the Washington Administrative Code (WAC) requirements pertaining to the identification, treatment, storage and disposition of hazardous waste at the PFP. In addition, for any non-compliant items, the assessment was to determine whether those items were stored in a safe manner and were being appropriately maintained.

The assessment focused on how well the facility is identifying, characterizing, and disposing of waste. To complete the assessment scope, all rooms and vaults inside the facility as well as all areas and buildings within the surrounding facility complex were inspected. The only exceptions were Building 242-Z (McCluskey room) and Building 232-Z (incinerator). Neither area have been entered or used for many years. Visual inspection is not possible from outside and the status is unknown. In the case of Building 242-Z, the space has been sealed from entry or inspection since 1989 due to previous contamination incidents dating back to 1976.

II. Method

An assessment entry meeting was held at the facility on February1, 2001. The assessment team members were identified. The purpose of the assessment was declared and the scope of the assessment was described. The conduct of the assessment was reviewed along with the assessment schedule.

The method used for this assessment was a combination of facility walkdown/inspection and interviews. This assessment focused on the facility's status of identifying, characterizing, and dispositioning hazardous waste and associated equipment. This assessment was conducted to determine whether or not waste management at PFP was adequate, if all waste streams had been identified, and if the current activities support the transition of PFP to a deactivated status.

III. Results

A. General

The facility walkdown was started on February 28, 2001. The assessment team held a meeting with facility staff early in the assessment to determine the status of the facility's process for identifying and characterizing used equipment and systems for disposal. The contractor staff told the assessment team that the facility vulnerability study completed after the PRF explosion incident identified all the tanks that were a potential problem. However, no complete evaluation had been performed on the remaining facility systems and equipment. As a result, the contractor could not provide the assessment team with a complete facility inventory of vessels, tanks and systems that would provide waste designation and characterization data. The contractor provided some initial incomplete information from previous studies that will be used as the basis for a complete characterization study in the future. No schedule or completion date for this characterization work is available.

The assessment team could not make a determination as to the safe condition or compliant status of PFP's vessels that may contain potentially regulated materials. Many systems and associated equipment have been inoperative for more that ten years. Several deficiencies noted by this assessment team were previously noted by Ecology during their inspections in 1998 and 2000.

During the assessment, the team also noted eight different posting and labeling deficiencies that indicated a general lack of rigor in management self-assessments.

Areas not inspected:

1) Building 242-Z (McCluskey room); area not entered or used for many years. Visual inspection was not possible from outside the room. The space has been sealed from entry or inspection for over ten years due to a contamination incident that occurred in 1976.

2) Building 232-Z (incinerator); area not entered or used for many years. Visual inspection was made through the windows and doors where some equipment and tools were observed, but the main process room could not be inspected. Inside the building was posted as a radiological contaminated area (RCA).

B. Specific

The areas listed below were walked down in the order listed:

1) Outside peripheral areas (February 28, 2001): Outside yard areas around the 234-5Z building including miscellaneous storage containers, 90 day storage pads, Satellite Accumulation Areas (SAA's) and miscellaneous buildings.

   Result: Finding A&E-SEC-01-015-F004, Posting and Labeling Processes.

2) The 236-Z Building (PRF), (March 5, 2001): Entry required PPE because it was posted as a RCA. No lighting was available for adequate inspection inside the glove boxes. The viewing windows were dirty to the point that visual inspection was impossible.

   Result: Finding A&E-SEC-01-015-F004, Posting and Labeling Processes.

3) The 234-5Z building front side areas (March 6, 2001): Areas consisted of storage lockers with janitorial supplies, the mechanical shop, the welding area, engraving room, non-radiological waste, etc.

   Result: Findings
   - A&E-SEC-01-015-F001, Inactive Process Vessels and Ancillary Equipment
   - A&E-SEC-01-015-F004, Posting and Labeling Processes.

4) The 291-Z building or "stack" (March 9, 2001): The area was clean demonstrating good housekeeping practices. There was minor contaminated equipment, properly labeled and segregated.

   Result: No deficiencies noted.

5) The tunnel/roof/duct levels in 234-5Z (March 12, 2001): Most of the duct level was posted as a RCA. The roof was generally clean. Some minor ventilation ducting and equipment was present but no debris was noted. The tunnel was clean with no debris in area. The duct level had several temporary ventilation ducts routed through the space to support decontamination and piping removal work. Some areas were not inspected due to radiological conditions.

   Result: No deficiencies noted.

6) The RMC/RMA lines, 234-5Z building, first floor (March 13, 2001): Most of the rooms were posted as a RCA. Room 227 contained the feed system for the MgOH and RMC/RMA lines. The housekeeping was acceptable. The fluorinator and other old glove boxes, no longer in use, were inspected.

   Result: Finding A&E-SEC-01-015-F004, Posting and Labeling Processes.

7) The 1st floor of 234-5Z (March 14, 2001): Inspected 90 day storage areas, SAAs, old glove boxes no longer in use, old hoods, product receiver (PR) can storage room, insulators shop, and the paint shop.

   Result: Finding A&E-SEC-01-015-F004, Posting and Labeling Processes.

8) Chemical Management System Review (March 15, 2001): The process was demonstrated and a tour was conducted of the chemical storage areas to verify program effectiveness. Other associated issues are discussed in the RL assessment on the chemical management program.

   Result: See chemical management assessment number A&E-JE-01-014.

9) A Lab, analytical labs (March 19, 2001): Housekeeping was generally good except for Room 134 that contained an old mass spectrometer, two hoods, miscellaneous chemicals in the process of being cleaned out and several bottles with no bar coding. A chemical solution tracking system is being used in A Lab to track milliliter amounts of chemicals based on the chemical processing procedure being used. Older unused glove boxes were inspected. Chemical bar coding was verified and 90-day storage pads and SAAs were inspected. Room 143 was locked and not entered due to the high RCA from a spill over a year ago. No work or chemical status inspections have been performed since that time. Subsequent to this teams inspection, Room 143 was decontaminated for continued use.

   Result: Finding A&E-SEC-01-015-F002, Satellite Accumulation Areas Management.

   Noteworthy Practice: Lab waste generation of small quantity liquids (slop jars): The facility had accumulated at the time of the assessment a significant quantity of liquid (20+ gallons) in slop jars (containing radiological materials). It was planned to dispose of these wastes via the sink drain in Room 143 to the D-8 tank. The accumulation represented a significant departure from expectations of the WAC. However, the project to open the drain line system was successfully completed and a majority of the material (17 gallons) was transferred to D-8 on May 8, 2001. The remaining legacy materials of this type were scheduled to be disposed of during the week of May 14, 2001. The facility plans using the reopened system on a continuous basis in the future. Based on this development, no finding is issued on the

accumulation of liquid waste and is noted here as a significant accomplishment in plant cleanup operations.

10) Building 2736 vaults (March 21, 2001): The vault areas were clean. No hazardous waste was identified. Construction activities for W-460 were observed in Rooms 641, 641A and 642.

    Result: No deficiencies noted.

11) Duct level tour with Facility Representative (FR) (March 23, 2001): The duct level was walked down again. Most of the duct level was posted as a RCA.

    Result: No deficiencies noted.

12) PRF tour with the FR (March 27, 2001): The PRF was walked down again. The condition of the PRF, as noted, made visual inspection impossible to determine the materials remaining inside the glove boxes.
    a) The glove boxes in corridors 11 and 14 contained piping, valves, pumps, etc. The lighting was insufficient to ascertain the condition inside the boxes.
    b) The corridor 10 HEPA Filters wood frames appeared "wetted." In addition, a crystalline build-up was noted. The corridor 11 HEPA filters FO-10W and FB-10E had insufficient lighting in which to inspect the glove box internals.
    c) The corridor 21 glove box could not be inspected due to poor lighting.
    d) The corridor 20 HEPA filters contained wetted wood framework with some unknown build-up.
    e) The corridor 25 glove boxes had insufficient lighting in which to inspect the glove box internals.
    f) In Room 27, glove box 27 contained tools, parts, and a 1-qt. container labeled "cement".
    g) In Room 42, the column hood glove box had rusty piping/equipment inside.
    h) In Room 41, the MT5 Hood glove box had a liquid on bottom of the box and in glove box MT6 there was a white powder (crystals) on bottom of the box. Both of these materials were identified by Ecology in 1998. Lighting was very poor in the remainder of the glove boxes. The FR identified nitric rags in one of the boxes.
    i) In Room 40, the air supply system to the tanks is still in operation and may contain oil, thereby introducing organic contaminants into the tanks. There were nitric acid rags on the concentrated HNO3 tank. The status of the HNO3 tank is unknown because the tanks are not marked in any way. Other tanks in the same area are marked as "empty", etc.
    j) In Room 50, the Column Hood glove box HEPA filter had an unknown residue/rust blocking view through window.
    k) On the sixth level, there are mercury columns on the south wall. There is no apparent use of this system.

Result: Findings

- A&E-SEC-01-015-F001, Inactive Process Vessels and Ancillary Equipment
- A&E-SEC-01-015-F003, Used Oil Disposition.

13) Walkdown of PPSL (March 29,2001): In Room 179, inside the glove boxes was loaded with miscellaneous chemical, empty containers, tools, equipment, etc. The staff stated that work was continuing to resolve this concern.

    Result: Finding A&E-SEC-01-015-F002, Satellite Accumulation Areas Management.

14) Building 234-5Z front side rooms (April 4, 2001): The rooms consisted of office areas, janitorial and office supply storage areas.

    Result: Finding A&E-SEC-01-015-F004, Posting and Labeling Processes.

IV. Findings

A&E-SEC-01-015-F001- *Inactive Process Vessels and Ancillary Equipment.*

Requirements:

- WAC 173-303-016 (4) (c), Identifying Solid Waste

- FH Contract DE-AC06-RL 13200, Mod M126; section J, Appendix D, FHI Comprehensive-1: Performance Objective: Safety: The contractor shall protect worker safety and health, public safety and health, and the environment. Performance Expectation: Self-disclose regulatory non-compliance and enact self-correction of the situation in a timely manner in order to maintain compliance with applicable federal, state, and local statutes and regulations.

- FH Contract DE-AC06-RL 13200, Mod M126; section J, Appendix D, FHI Comprehensive-4: Effective Leadership: Provide leadership to ensure management effectiveness, meet customer needs and respond to areas for improvement. Performance Expectation: Constructive cooperation and openness with regulators and stakeholders.

Discussion: The PFP infrastructure includes process systems and equipment that have been permanently shut down and left in place. Many of these systems processed materials subject to dangerous waste regulations and some systems still maintain inventories of regulated material. Since the process is not active, these inventories are considered waste by regulation. Some of these systems contain only residual levels of hazardous constituents but have not been dispositioned as required by regulation.

This assessment has determined that the contractor has not actively maintained the configuration and status of the equipment in question. Additionally, inspection of the facility with the resident FRs has demonstrated that in some instances maintenance of safety related issues (including active and past leaks) exist with some of this equipment. Some examples are the white powder on the floor of glovebox MT-6 and the liquid on the floor of glovebox MT-5. The FR program has noted that the facility has not responded to these situations in a timely manner.

RL and PFP Facility Management are cognizant of this issue. PFP has, since the initiation of this assessment, initiated proposals for work to ascertain the status of some of the vessels. As of the date of this report, no plan or schedule has been generated for the completion of the vessel and systems characterization.

A&E-SEC-01-015-F002- *Satellite Accumulation Areas Management.*

Requirements: WAC 173-303-200 and WAC 173-303-150.

Discussion: WAC 173-303-200, Accumulating Dangerous Waste On-Site, states a generator may accumulate as much as fifty-five gallons of dangerous waste or one quart of acutely hazardous waste per waste stream in containers at or near any point of generation where waste initially accumulates (defined as a satellite accumulation area). WAC 173-303-150 states for the purposes of designation, quantities of continuously generated wastes must be summed monthly. All wastes generated less frequently than once a month will be considered as batch or single event wastes.

Single event wastes were observed in SAAs within PFP in conflict with WAC code. Some of these materials have been held for significant periods. Single event wastes are those generated one time and generally not part of a designated waste stream. These wastes are subject to the 90-day storage process (180-day for small quantity generators) rather than the SAA rules. SAA rules apply to waste streams (wastes generated on a continuous or semi-continuous basis). Although the definition of waste streams may be interpreted broadly to include compatible materials collected to form economic,

consolidated "lab packs", formal designation of the stream contributing to this accumulation is expected.

The assessment team was told that many of the observed single event wastes were generated as part of campaigns to remove excess, expired and undesirable chemicals from facility inventories. Lack of a clear policy or process for the transition of these chemicals from the CMS to the waste program has resulted in a significant backlog of wastes that do not comply with regulation. Additionally, non-compliant waste will continue to be generated until this issue is resolved.

Noteworthy Practice: It was noted that the PFP process lab is developing a process that will predict the waste stream designations and will seek to establish broad waste stream designations for compatible wastes.

A&E-SEC-01-015-F003- *Used Oil Disposition.*

Requirement: WAC 173-303-016 (4) (c), Identifying Solid Waste

Discussion: Several overflow or surge glasses within the 234-5Z ventilation system were filled with oil. This presents an upset condition within the facility. The FRs indicated that this is a long-term condition. Oil in the lines represents generation of a waste that is not being properly addressed. In addition, oil represents a source of potential organic contamination for down stream systems and equipment.

A&E-SEC-01-015-F004- *Posting and Labeling Processes.*

Requirements: FY01-FY06 Contract Performance incentive: FHI Comprehensive-1, performance Objective/Measure 2, "Project and Operational Management".

Discussion: All normally accessible areas of the facility were inspected during the assessment. The following eight posting or labeling deficiencies were noted, indicating a lack of management field presence and procedure compliance.

Incorrect labeling on an isolated transport container (ITC) container: In Room 166, an ITC still had the radioactive material label attached to the handle.

Incorrect labeling on a product can: In Room 235B a locker in the lower level had empty product cans with lids on them that had fissile material labels on the outside and were not otherwise identified as empty.

Incorrect labeling on chemical waste container: In Room 336, inside a SAA, a container was incorrectly labeled; a bottle was labeled with Z00106 containing hydraxylanine, sulfate mixture, however the SAA log recorded the contents as nitric acid. Contractor staff confirmed that the container contained nitric acid. The container was then labeled correctly. Incorrectly labeled chemicals can result in chemical compatibility issue, which could result in an explosive reaction or other hazardous condition.

Inappropriate posting in lunchroom: In Room 209 (lunch room), a magnetic yellow "toxic" sign was attached to the door of the lunchroom refrigerator.

Incorrect posting at an RBA: At the entry/exit door to the PRF airlock the RBA required only a hand and foot survey when exiting. However posting on the floor at the exit stated that a full body survey was required. This incorrect posting appeared to be left from old radiological posting.

In the outside yard areas the following deficiencies were identified:

Radioactive Material Area (RMA) signs laying on the ground adjacent to a posted RMA: this condition lasted for several weeks until brought to the attention of an NCO who corrected the problem.

Inadequate posting of a construction area on the south side of 234-5Z: A construction barrier posting, requiring hard hat and safety glasses was in place for only one side of the area; apparently the other half of the construction barrier posting was removed at some point and never reposted or completely removed. During the assessment, no work was observed in this area, and it is unclear what work operations would require the posted safety equipment. This condition remained through the entire two-month assessment period.

A dumpster filled with asbestos was not labeled: The dumpster was located adjacent to building 2729-Z (insulators shop). This condition was not corrected during the assessment period.

While each condition by itself would not be a cause for concern, the number and variety of the deficiencies indicates a general lack of attention to the proper posting and labeling practices at the facility.

Posting and labeling is used to alert personnel to presence of hazards, correct procedures and radiological materials and conditions and aid them is minimizing their exposures and preventing the spread of contamination from hazardous and radioactive materials. It is imperative that posting and labeling are maintained correctly to reflect the actual conditions at all times to ensure a safe work environment for staff.

The assessment team notes that the facility has had recent reportable occurrences involving failure to follow posted requirements for entry and exit from posted areas. Management needs to perform routine worksite inspections to ensure that posting and labeling is properly maintained and is appropriate for the existing conditions.

V. Personnel Interviewed

Ken Reynolds, FHI
Kevin Stephens, FHI
Jimmy "Tex" Griffin, FHI
Jim Bailey, FHI
Jim Todd, DOE
Mike Kiehn, FHI
Marion Shuck, FHI
Les Smith, FHI
Dale Harder, FHI
Barb Woodford, FHI
Jim Morrison, FHI
E.W. Curfman, FHI
Bill White, FHI
John Ewalt, FHI
Marv McCollum, FHI

VI. Signatures

S.E. Chalk, Acting Team Leader — Date: 9/12/01

D.W. Roha, Assessment Team Leader — Date: 9/12/01

C.R. Richins, Team Lead — Date: 9/12/01