



Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

11-SED-0124

JUL 07 2011

Mr. J. G. Lehew III, President
and Chief Executive Officer
CH2M HILL Plateau Remediation Company
Richland, Washington 99352

Dear Mr. Lehew:

CONTRACT NO. DE-AC06-08RL14788 – TRANSMITTAL OF SURVEILLANCE REPORT
PLANNING AND EXECUTION OF RADIOLOGICAL WORK (S-11-SED-CHPRC-PFP-002)

Pursuant to Clause E.1, "DOE Inspection and Acceptance," this letter transmits Surveillance Report S-11-SED-CHPRC-PFP-002. The attached surveillance identified one concern, twelve findings and four observations, documented in the attached report. These results have been discussed with appropriate members of your staff. The concern and the number and significance of deficiencies identified in the report, represents a significant adverse condition with respect to regulatory and contractual requirement compliance. Many of the deficiencies extended beyond Plutonium Finishing Plant (PFP). Deficiencies in the CH2M HILL Plateau Remediation Company (CHPRC) program were identified. In addition, the number and significance of findings indicates a significant programmatic Integrated Safety Management implementation weakness in the planning and execution of radiological work at PFP.

The Richland Operations Office (RL) acknowledges CHPRC's prompt compensatory actions taken at PFP in response to the issues RL identified and provided during the surveillance. The increase in radiation protection technical staff was beneficial to begin addressing technical issues and improving radiation protection involvement in work planning. However, the improvement in planning and execution of radiological work at PFP requires significant changes to the work planning process, beyond the technical support provided by the radiation protection organization.

As discussed in the meeting with your staff on June 2, 2011, CHPRC has incorporated additional actions and measures to assure short term safety of work until corrective actions are institutionalized. These measures included:

1. Completion of a Radiological Engineering Technical Evaluation to improve consistency in applying engineered controls for work.
2. Improved use of containments that prevent worker exposure, by requiring the project Director of Radiation Protection, Industrial Hygiene, and Occupational Safety approval to use other controls where containment is not practicable.
3. A Standing Operating Instruction requires a radiological engineering review of all medium and high hazard work packages before work is released. The radiological engineering organization performs a walk down with work team members to ensure all the specific work activities are understood, and appropriate controls are incorporated into the work package for all activities.

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The activities associated with A-Line and C-Line removal involve substantially increased radiological hazards. RL has significant concerns regarding CHPRC's processes to effectively define and plan work, to control radiological hazards, comply with requirements and protect the workforce. RL expects the CHPRC to use their self-assessment processes to ensure:

1. Glove boxes are adequately prepared for safe size reduction based on sound technical bases regardless of who performs the size reduction activity.
2. The facility is adequately prepared for in-situ size reduction activities.
3. Adequate field presence to ensure engineered controls are being used as intended.
4. The facility has adequately prepared for the changes in radiological postings currently being planned.

Please keep the PFP RL facility representatives informed of your ongoing self-assessment activities above.

Please provide a corrective action plan (CAP) and an extent of condition review that addresses the issues identified in the report within 30 days. Development of the CAP is to be in accordance with the criteria included in Contractor Requirements Document (CRD) O 470.2B (Supp Rev. 2), Independent Oversight and Performance Assurance Program. RL Lead Assessor closure is required for all findings and those observations marked requiring closure in the report.

If you have any questions, please contact me, or your staff may contact Roger M. Gordon, Acting Director, Safety and Engineering Division, on (509) 372-2139.

Sincerely,



Jenise C. Connerly
Contracting Officer

SED:BMP

Attachment

cc w/attach:

M. V. Bang, CHPRC
V. M. Bogenberger, CHPRC
J. A. Ciucci, CHPRC
D. C. Del Vecchio, CHPRC
R. M. Millikin, CHPRC
T. L. Vaughn, CHPRC

**Department of Energy
Richland Operations Office (RL)
Surveillance Report**

Division: Safety and Engineering Division (SED)

**Surveillance Team: Brenda Pangborn (lead), Joe DeMers, Wayne Glines, Rick Jansons,
Ed MacAlister, Ed Parsons, Kerry Schierman, Sandra Trine**

Surveillance Number: S-11-SED-CHPRC-PFP-002

Date Completed: April 29, 2011

Contractor: CH2M HILL Plateau Remediation Company (CHPRC)

Facility: Plutonium Finishing Plant (PFP)

Title: Planning and Execution of Radiological Work

Guide: 10 CFR 835

Surveillance Scope:

The objective of this surveillance was to evaluate the adequacy of planning and execution of radiological work at PFP. This was a surveillance of the work planning process that included a review of the identification, analysis and control of radiological work hazards. The surveillance reviewed work planning resources and the development of radiological work packages. This surveillance also included investigation of specific radiological deficiencies anonymously sent to the Richland Operations Office (RL).

Surveillance Summary:

The surveillance team reviewed documents, including:

- Contractor work planning documents.
 - Training course materials for both radiological work planners and the line work planners.
 - Radiological control procedures and technical basis documents.
 - Radiological performance indicators including contractor self assessments, contractor corrective action reports, and RL operational awareness (OA) reports for activities at PFP.
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- Historical documents of the PFP, including the Radiological History of the Plutonium Finishing Plant (1954-1997) that described radiological upsets in the facility (dates, locations and contamination values).
- Work packages and associated radiological screening forms, As-Low-As-Reasonably-Achievable (ALARA) Management Worksheets (AMW), and radiological work permits (RWP).

The surveillance team interviewed more than 40 personnel involved in the work planning process and execution of work in the field, including:

- Three radiological work planners;
- Eight line work planners;
- Four field work supervisors (FWS);
- Four superintendants;
- Three project managers;
- Two integration planners;
- Four radiological control supervisors (RCS);
- Eight lead radiological control technicians (lead RCT);
- One Director of Radiation Protection, Industrial Hygiene, and Occupational Safety (RHS);
- One Director of Environment Safety and Health for CHPRC;
- Two former PFP radiological control managers (RCM);
- One radiological controls mentor; and
- Three engineers or engineering managers, including the Design Authority for High Efficiency Particulate Air (HEPA) filtered ventilation system.

The surveillance team observed the following work planning processes:

- Walk downs of the work area including, scoping walk downs, workability walk downs, and Automated Job Hazard Analysis (AJHA) walk downs;
- Preliminary planning meetings (prior to AJHA meetings);
- AJHA meetings;
- Work planner schedule status meeting;
- Plan of the Day (POD) meetings;
- Pre-job meetings;
- Post-job meetings;
- Critiques; and
- Observations of work activities (e.g., Chop shop, 242Z).

The surveillance team performed a surveillance of the work planning process, looking at the PFP process for planning radiological work. From a review of the contractor procedures, and interviews of personnel, the basic simplified flow chart of the work planning process used at PFP is shown below.

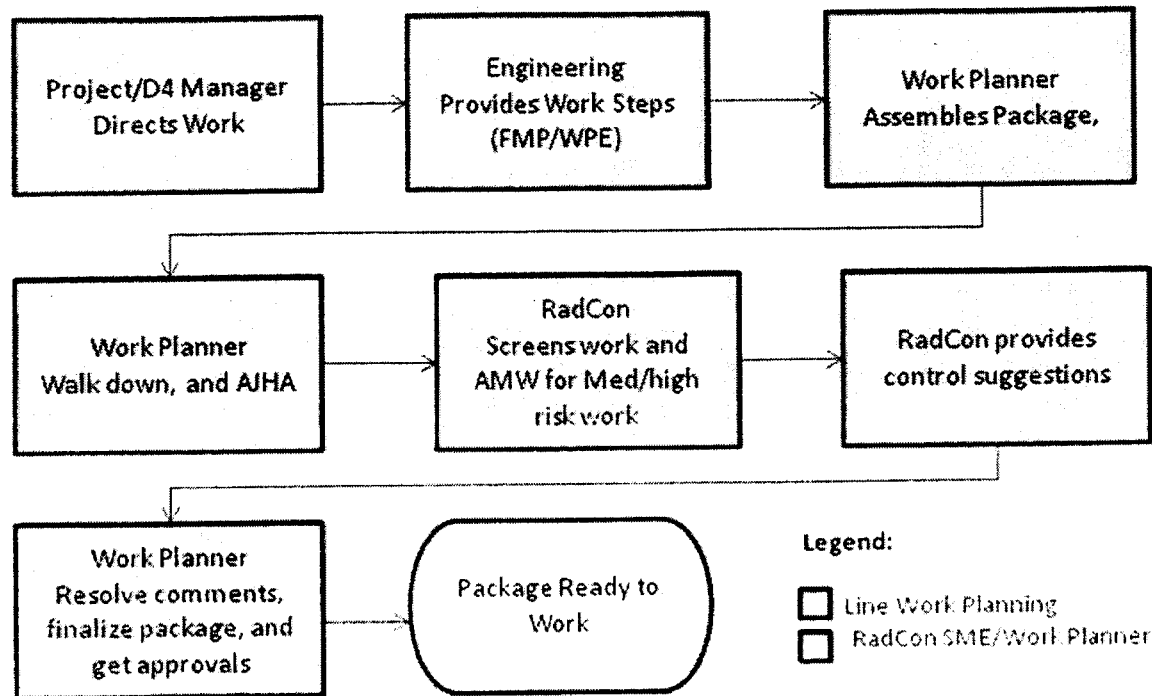


Figure 1 Simplified Work Planning Process Flow Chart

The surveillance team found multiple deficiencies in planning and execution of radiological work, and some deficiencies in other technical work performed by the PFP radiation protection organization. Deficiencies in the work planning process included less than adequate involvement of radiation protection early in the work planning process, and less than adequate involvement of radiation protection and some engineering work planning at the activity level. There were inadequate levels of radiological technical staffing, less than adequate training and qualification of radiological work planners, and unclear roles and responsibilities for determining radiation protection controls as implemented in the field. Additionally, the surveillance team identified some deficiencies in other technical aspects of the radiation protection program at PFP. Several of the deficiencies identified in this surveillance had ties back to deficiencies in the CHPRC radiological control program.

The deficiencies in radiological work planning also demonstrated weaknesses in implementation of Integrated Safety Management Systems at PFP and CHPRC.

As a result of the deficiencies identified by RL, the contractor brought in additional radiological control staff to shore up PFP's radiological control program. The project developed a living radiological control improvement plan that was adjusted as the RL surveillance team and additional contractor radiological control staff identified more deficiencies for correction.

The surveillance resulted in one concern, twelve findings and four observations.

- **S-11-SED-CHPRC-PFP-002-C01:** The radiological work planning process at PFP was less than adequate resulting in inadequate analysis of radiological hazards, inadequate use of

engineering controls for some work activities, airborne radioactivity levels that exceeded the maximum protection factor of the type of respiratory protection used, multiple low level uptakes of plutonium, and spreads of contamination. CHPRC programmatic deficiencies in the work planning process contributed to less than adequate planning at PFP.

- **S-11-SED-CHPRC-PFP-002-F01:** Less than adequate analysis of hazards has occurred at PFP resulting in airborne radioactivity above the protection factor of the respiratory protection worn and multiple events involving spread of contamination. Investigation revealed a programmatic deficiency in hazards analysis existed (OA 35469).
- **S-11-SED-CHPRC-PFP-002-F02:** Scope of Work was not always adequately defined at the activity level for hazards analysis, resulting in less than adequate radiological controls identification and implementation.
- **S-11-SED-CHPRC-PFP-002-F03:** The “flexible” Decontamination and Demolition (D&D) work packages resulted in “flexible” radiological controls in the work packages, which resulted in the actual controls being determined in the field by individuals not qualified in radiological hazards analysis resulting in inadequate hazards controls. Roles and responsibilities for determining radiological controls were not clearly defined.
- **S-11-SED-CHPRC-PFP-002-F04:** Engineering controls were not adequately incorporated to control airborne radioactivity and spread of contamination for some work activities, resulting in high airborne radioactivity and spreads of contamination. Engineering staff were not always adequately engaged in the radiological engineering of the work.
- **S-11-SED-CHPRC-PFP-002-F05:** Training and qualification of radiological work planners was found less than adequate. Training did not adequately cover applied radiological hazards analysis.
- **S-11-SED-CHPRC-PFP-002-F06:** PFP did not have a procedure on how to perform airborne radioactivity estimates for hazards analysis and work planning. The CHPRC technical basis document for workplace air monitoring did not address estimating airborne radioactivity levels for hazard analysis and work planning.
- **S-11-SED-CHPRC-PFP-002-F07:** The contractor’s radiological staffing resources were less than adequate to accommodate personnel losses and planned accelerated decontamination and demolition work.
- **S-11-SED-CHPRC-PFP-002-F08:** The Hanford Combination Neutron Dosimeter (HCND) was not assigned to multiple individuals that met the criteria for monitoring as specified in the Hanford technical basis document. The CHPRC procedure did not fully incorporate monitoring criteria from the Hanford External Dosimetry Technical Basis Manual (OA 36921).
- **S-11-SED-CHPRC-PFP-002-F09:** Technical errors were identified in five out of nineteen External Dosimetry Investigation Reports (EDIRs) (OA 36921).
- **S-11-SED-CHPRC-PFP-002-F10:** Airborne radioactivity monitoring results at PFP were not adequately reviewed to ensure individuals likely to receive a committed effective dose of 0.1 rem or more from all occupational radionuclide intakes in a year were appropriately monitored through the internal dosimetry program.
- **S-11-SED-CHPRC-PFP-002-F11:** Less than adequate conduct of operations was observed. Failures to follow procedures contributed to generation of airborne radioactivity and low level uptakes.
- **S-11-SED-CHPRC-PFP-002-F12:** Required radiological hazard controls for work were not consistently documented on the AMW as specified by the form’s instructions.

- **S-11-SED-CHPRC-PFP-002-O01:** Job Specific RWPs, were written broadly and generically to cover multiple work packages.
- **S-11-SED-CHPRC-PFP-002-O02:** The facility's technical basis for use of plutonium values as an indicator of when to perform beryllium monitoring did not identify and evaluate plutonium-beryllium sources, as a potential source of beryllium in the facility.
- **S-11-SED-CHPRC-PFP-002-O03:** Poor practices were identified in multiple EDIRs reviewed.
- **S-11-SED-CHPRC-PFP-002-O04:** The use of the CHPRC Post-ALARA / Post-Job Review (site form A-6004-821) for event investigation rather than conducting fact-finding or critique meetings did not ensure that causal factors were identified.

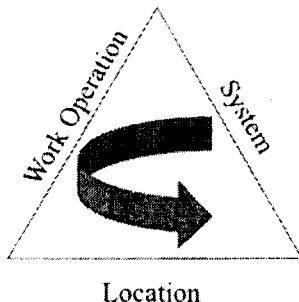
Due to the number and significance of the deficiencies identified, the contractor will be requested to submit a corrective action plan.

Surveillance Results:

Concern: S-11-SED-CHPRC-PFP-002-C01

The radiological work planning process at PFP was less than adequate resulting in inadequate analysis of radiological hazards, inadequate use of engineering controls for some work activities, airborne radioactivity levels that exceeded the maximum protection factor of the type of respiratory protection used, multiple low level uptakes of plutonium, and spreads of contamination. CHPRC programmatic deficiencies in the work planning process contributed to less than adequate planning at PFP.

Discussion:



RL performed a surveillance of planning and execution of radiological work. The surveillance included interviews of personnel involved in the work planning process, observation of work planning process activities, reviews of work planning documents, procedures and work packages, and investigation of radiological events.

To adequately plan work, the hazards associated with the work must be fully understood. The radiological hazards are the sum of the hazards from the system that is being breached, the work operation being performed, and the hazards associated with the work location.

Radiological hazards associated with the system include radionuclides present, at what concentrations, and in what chemical form. How is the system being breached? How is it constructed? What is the material of construction, how is the interior of the system designed,

what are the potentials for holdup of radioactive materials and radioactive liquids, and where is it located in the system?

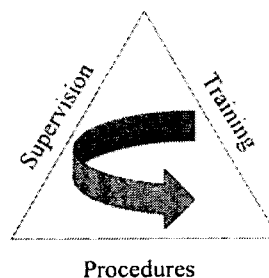
The radiological hazards associated with work operations relate to how the work operation could spread contamination or generate airborne radioactivity, and how the work operation could affect the engineered airborne radioactivity controls. As an example, a circular saw used on highly contaminated surfaces would generate high airborne radioactivity with turbulent air flow patterns. Normal ventilation is designed for laminar flow, such that it would be significantly less effective in capturing airborne radioactivity from a circular saw.

Radiological hazards associated with the work location must be adequately characterized. This should include an understanding of the history of upset conditions that resulted in spread of contamination, including the levels of radioactive contamination that could be present upon exposing surfaces that were contaminated from fires and spills involving radioactive materials.

Once the hazards are understood, the radiological controls are incorporated. These controls may involve elimination or reduction of the hazard by removal of the source term or limiting the amount of source term that is accessible (e.g., decontamination, application of fixatives). These controls also involve proper selection of the work operations (substituting less turbulent work operations where needed), and implementation of engineered controls to keep the hazard away from the worker (use of glove boxes or glove bags, and appropriately engineered ventilation). After reducing the hazards through elimination or reduction of the source term and applying engineered controls, administrative controls and personal protective equipment and clothing (PPE) are used to protect the workers.

The radiological controls are then implemented using procedures, training and supervision. The sum of the procedures, training and supervision must be adequate to ensure protection of the workers. The higher the hazard and the more complex the work, the more formal the controls that are needed.

At PFP the surveillance team observed deficiencies in multiple areas of the work planning process. The radiological hazards of the work were not properly analyzed. The radiological controls for some high hazard work were less than adequate, relying on PPE in lieu of implementing engineering controls. Personnel, who were not qualified, were found making inappropriate technical decisions in the field (i.e., decisions by first line supervision) that resulted in unplanned personnel exposures to airborne radioactivity.



RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F01

Less than adequate analysis of hazards has occurred at PFP resulting in airborne radioactivity above the protection factor of the respiratory protection worn and multiple events involving spread of contamination. Investigation revealed a programmatic deficiency in hazards analysis existed (OA 35469).

Requirements:

10 CFR 835.501(b) specifies "The degree of control shall be commensurate with existing and potential radiological hazards within the area."

10 CFR 835.501(d) specifies "Written authorizations shall be required to control entry and perform work within radiological areas. These authorizations shall specify radiation protection measures commensurate with the existing and potential hazards."

10 CFR 835.1102 (b) specifies "Any area in which contamination levels exceed the values specified in appendix D of this part shall be controlled in a manner commensurate with the physical and chemical characteristics of the contaminant, radionuclides present, and the fixed and removable surface contamination levels."

DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution, paragraph (b) specifies "...The contractor shall, in the performance of work, ensure that... (5) Before work is performed, the associated hazards are evaluated..."

Discussion:

As discussed in concern S-11-SED-CHPRC-PFP-002-C01 above, radiological work planning needs to understand the hazards associated with the system, work operations and location in order to determine appropriate controls to mitigate the hazards. Multiple examples exist where the hazards were not appropriately analyzed, resulting in airborne radioactivity generation that exceeded the applicable protection factor for the respiratory protection worn and/or spread of contamination. Contrary to the requirements of Dear 970.5223-1, analysis of hazards was less than adequate as discussed below. Contrary to the requirements of 10 CFR 835, radiological controls were not commensurate with potential hazards generated by the work activities as described below:

- 1. The hazard associated with using a circular saw to cut a highly internally contaminated glove box was not analyzed, resulting in very high airborne radioactivity that exceeded the respiratory protection factor for airline respirators.**

The work in room 172 of PFP involved cutting up highly internally contaminated glove boxes for disposal. The room is referred to as the chop shop. On December 29, 2010, workers used a circular saw to cut pieces off the back (exposing internals) of Glove box 139-3/4. The airborne radioactivity levels exceeded the respiratory protection factor for the airline respirator worn. The highest level found on the lapel was 7100 Derived Air Concentration (DAC)-hr (0.71 after taking into account the protection factor of the airline respirator). The surveillance team requested a copy of the airborne radioactivity calculations for the work operation that was performed. None was provided.

On January 25, 2011, workers again used a circular saw to size reduce a glove box. The airborne radioactivity levels jumped. The highest DAC-hr value on workers lapel air sampler was 17000 DAC-hr, 1.7 DAC-hr after adjusting for the protection factor of the airline respirator (10,000). Assuming the jump in airborne radioactivity occurred over a five minute period (time between monitoring the air sample filter), the airborne radioactivity level generated by the circular saw was more than 200,000 DAC. This was the second time the work team used a circular saw for size reducing the glove boxes and exceeded the airborne radioactivity limits of the RWP (see OA 35012).

The surveillance team again requested the work planning documentation that would indicate the project had evaluated the airborne radioactivity hazard associated with use of the circular saw. The contractor could not provide any. The contractor facility radiological control manager acknowledged no airborne radioactivity estimate had been made.

- **Investigation revealed PFP radiological work planners routinely did not perform airborne radioactivity estimates to ensure appropriate controls were selected for the work activity.**

Interviews with the radiological work planners at PFP revealed the facility did not evaluate the potential airborne radioactivity levels for use of the circular saw on contaminated glove boxes. In fact, the radiological work planners acknowledged they had never performed airborne radioactivity estimates for work at PFP. The surveillance team reviewed the work planning records for several work packages confirming there were no records of the analysis of the airborne radioactivity hazards for the work reviewed.

After initially requesting the airborne calculations after the December 29, 2010 event, the PFP Director, RHS obtained documentation from another facility on how to perform airborne radioactivity estimates and provided it to the PFP radiological work planners.

A significant contributing factor to this programmatic deficiency was the lack of training and lack of procedures provided by CHPRC that would show the radiological work planner how to analyze the airborne radioactivity hazard to ensure adequate engineered controls and/or respiratory protection are provided (see findings S-11-SED-CHPRC-PFP-002-F05 and S-11-SED-CHPRC-PFP-002-F06). In this case, no respiratory protection had a protection factor high enough for the work. The analysis of the airborne hazard would have demonstrated the need to incorporate engineered controls.

- **The Radiological Hazards Screening Form indicated no airborne radioactivity above 1000 DAC (unmitigated), even though no estimate was performed.**

One of the high hazard radiological work screening criteria is “Will predicted airborne radioactivity concentrations exceed 1000 DAC...” This block is marked no, even though no calculation was performed, and there were no limitations in the procedure on work operations (i.e., any power tool was OK to use) or accessible contamination levels within the glove boxes at the locations being cut. There were no bounds on the radiological conditions of the glove boxes provided to the chop shop except, less than 240 grams of plutonium (Pu). Since airborne radioactivity generation depends on the amount of accessible contamination being disturbed and the work activity disturbing the contamination, there is no technical basis for the conclusion that unmitigated DAC values would be below 1000 DAC. This lack of analysis resulted in repetitive generation of much higher levels of airborne radioactivity at the chop shop.

- **Investigation revealed the effectiveness of the point source ventilation used in the chop shop for removing airborne radioactivity during cutting with the circular saw had not been evaluated by PFP engineering.**

The surveillance team interviewed the design authority for HEPA ventilation and requested a copy of the ventilation calculations that would demonstrate the effectiveness of the spot ventilation when using a circular saw. The project could not produce the calculations and acknowledged that they had not been performed.

Interviews indicated that the ventilation engineers were primarily involved in ensuring the PFP HEPA ventilation system and air flow through the plant was not adversely impacted by changes to the system, and ensuring HEPA ventilation systems for tents were adequate to provide appropriate air changes. Some evaluation of point source ventilation had been performed, but not where turbulent air flow patterns were involved. The engineer provided an example of an evaluation of a point source ventilation calculation with typical laminar flow. The work planning process at PFP did not ensure that engineering was adequately utilized in the work planning process. Since DOE identified this deficiency, there has been greater use of engineered ventilation and participation by engineering in its design.

- **Air monitoring in the chop shop with DAC-hr limiting conditions have kept personnel from getting a significant uptake to date, but has not been a cost effective means of performing the work due to multiple shut downs of the work for re-planning.**

To control worker exposures to airborne radioactivity, the project incorporated airborne radioactivity void limits. While this process is more of an emergency response, and has minimized the potential dose consequences to the workers to date, it does not control the generation of airborne radioactivity or prevent airborne that exceeds the respiratory protection factor of equipment worn, and creates a highly inefficient work process.

A review of the contractors work records between December 15, 2010 (the start of cutting operations in the chop shop) and March 16, 2011, indicated that work was performed in room

172 for 40 days. Out of those days of work, cutting of glove boxes occurred during 20 days. Airborne radioactivity levels exceeded the radiological work permit DAC-hr limits during 30% (6 out of 20) of the days where glove box cutting occurred. These events resulted in stopping work operations to re-plan work.

- **Continued problems in the chop shop revealed glove boxes were not adequately prepared for safe size reduction; fixatives were not adequately applied before the boxes were removed from the E-4 ventilation system and sent to the chop shop.**

After shut down of the chop shop on March 16, work restarted April 20, 2011, with the first intrusive work performed on April 25, 2011. On that day, airborne radioactivity levels increased and personnel stopped work within a half hour. On the next day, airborne radioactivity levels exceeded the limiting conditions of the RWP. At the post job, workers revealed the glove boxes were not being provided to the chop shop in a condition that would permit safe size reduction. The glove box they were working on had bare metal inside, indicating less than adequate application of fixatives, gloves were not properly rolled up and secured (making fixative application less effective), and pie plates were improperly secured (OA 37140). A review of a sample of glove box removal work packages confirmed there were no quality assurance steps in the procedures to verify adequacy of glove box preparation for the chop shop. Additionally, the chop shop work package contained two "size reduction hand-off checklists", one for glove-box 139-5, and one for 139-6. Both check lists showed the "Contamination fixed inside/outside" block left blank, indicating the action was not completed.

2. **The high contamination hazard associated with exposing and cutting a neoprene gasket exposed to historical releases of airborne radioactivity was not recognized or analyzed resulting in four individuals receiving a low level uptake of plutonium.**

On March 28, 2011, four individuals received small uptakes of plutonium while disassembling a Plexiglas window with neoprene gasket between rooms 230C/235B. Airborne radioactivity was generated when the neoprene gasket was exposed, cut and swipe surveyed (50,000 dpm alpha). Personnel were not wearing respiratory protection.

Historical records indicated several significant spreads of contamination in room 230 and 235 from undetected glove breeches to explosions and resulting fires. Contamination levels between 2000 and 6×10^6 dpm alpha are described (FSP-PFP-IP-003, Radiological History of the Plutonium Finishing Plant (1954 – 1997)). Historical records indicated the contractors partially decontaminated the surfaces and then applied paint to fix the contamination, indicating the likelihood of uncovering contamination when exposing previously inaccessible surfaces. PFP has also experienced a greater hazard of loose surface contamination associated with gaskets. For example, on 10/22/10 open air separation of Glove box 139-1/2, exposed previously inaccessible areas and resulted in a spread of contamination when the gasket between glove boxes swung free. On 3/16/11 airborne radioactivity levels increased above the limiting conditions of the RWP for the chop shop when workers cut an area where a gasket had been removed without application of fixative (OA36431).

- **Less than adequate involvement of PFP engineering in the work planning process resulted in incorrect work instructions.**

Work instruction 2Z-09-06644/M WCN2, step 6.10.2, specified "Cut wallboard/Plexiglas panels surrounding Conveyor HC-4 in room 230C & 235B." The wall was not constructed of wallboard, but had stainless steel plates bolted in place around the Plexiglas windows with neoprene gaskets. The wall had been painted over due to the historical spreads of contamination in the area. The engineer did not provide drawings of the wall construction to the work planner, providing a missed opportunity to plan for the hazard associated with a gasket exposed to contamination being uncovered. The surveillance team requested a copy of the engineering drawing associated with the wall. The drawing identified the existence of the neoprene gasket and steel plates.

- **The AMW did not address the hazards associated with removal of a portion of the wall and Plexiglas windows.**

AMW 5549, rev 0, for work package 2Z-09-6644, dated January 26, 2011, did not address the hazards associated with removing a portion of the wall between rooms 230C and 235B. The AMW only addressed breaching radioactive systems.

- **CHPRC review of the work package identified the AMW did not address each task, but did not ensure correction of the deficiency prior to releasing the work.**

During the third week of fieldwork, RL requested the contractor perform compensatory actions to shore up weaknesses in the radiological control program at PFP. One of the actions taken by CHPRC was to bring a team in to review the high risk work packages. During this review on March 6, 2011, the CHPRC task team identified the deficiency in the AMW not addressing each task, but no action was taken to correct the issue prior to releasing the work.

- **When the work team performed their workability walk down, the team determined unbolting the steel plates was easier, and safer, but did not make a change to the procedure.**

During the workability walk down prior to performing the work, the work team decided unbolting (vice cutting) the wall would be safer, but no change to the procedure was made. The field work supervisor, in consultation with the lead RCT, determined respiratory protection was not needed since they were not cutting. Unbolting the steel plates, using the wet method, was started with no airborne generation. It was not until the gasket around the Plexiglas window was disturbed that high contamination levels were found (50,000 dpm/swipe alpha), exceeding the limits in the RWP. One low level nasal smear was found, but in performing additional voluntary bioassays, a total of four individuals were found to have had low level uptakes of plutonium (56 person-mrem committed effective dose)).

Failure to obtain a procedure change was a missed opportunity to identify and analyze the hazard. The deficiencies in conduct of operation, and clearly defined roles and responsibilities

are addressed in S-11-SED-CHPRC-PFP-002-F11 and S-11-SED-CHPRC-PFP-002-F03 respectively.

3. Airborne radioactivity generation hazards for Glove box WT-4 size reduction and glove box floor removal was not adequately analyzed, resulting in high airborne radioactivity that exceeded the supplied airline respiratory protection factor.

Glove box WT-4 is in the control room of the Americium Recovery Facility (242-Z). The work package, 2Z-10-02068, was for removal of glove boxes WT-3, WT-4, and WT-5. On April 6, 2011, airborne radioactivity was generated that exceeded the limits of the radiological work permit (OA 36771), and the respiratory protection factor for the supplied airline respirator.

The airborne radioactivity was generated during use of a crow bar to pry up and remove a polyethylene liner on the floor of the glove box (shown in drawing H-2-24954). The crow bar was used to pry up flashing ("20 GA S STL") used to hold the liner in place, and then to pry up the polyethylene. During the post job, the workers indicated there were some hot spots (4-5 rem/hr) on the floor of the glove box, indicating very high levels of contamination. The airborne radioactivity hazard associated with the activity of scraping on this highly contaminated surface was not analyzed.

4. Inadequate analysis of material compatibility results in a spill of an acidic plutonium material; additionally, a precursor event was not appropriately analyzed.

Work package 2Z-10-0679, involved removing plutonium chemical transfer lines. These lines contained three individual lines inside a protective pipe. The packaging included insertion of a rubber plug to hold the three chemical transfer lines in place within the protective pipe. A red cap was placed over the pipe end to prevent the sharp ends of the pipe cut from damaging the packaging. The cut pipe was "horse tailed" out of the glove bag containment (poly-vinyl-chloride (PVC) sleeve) and sealed using duct tape. A reinforced bag was placed over the horse tail, and sealed with "chem" tape. Then a PVC rigid cap is placed over that and secured with "chem" tape.

The team had successfully made 17 cuts using glove bags (engineered barrier), but found some liquid (described as runny like water) in two cuts made prior to the events described herein.

On 3/30/2011, while performing post job surveys, an RCT identified 600,000 dpm/100cm² alpha contamination on the bottom of a packaged pipe end. Even though the contamination was found on the bottom of the pipe, where the PVC rigid cap (sealed with "chem." tape) meets the pipe, the work team did not recognize this as an indicator of a breach of the sealing system. While recovering from this event, a second cut in the system, with the same packaging system, sat an additional six days.

On 4/6/2011, the second pipe end was flipped up to drain the pipe into the glove bag. As workers exited the area, six persons were found to have contamination on their PPE. Contamination above the limiting condition of the RWP was found on surfaces in the exit path. The full extent of the spread of contamination was not understood until a recovery team entered.

A visible spill of a thick (honey like) brown plutonium substance was found. Contamination in the spill area was as high as 150,000,000 dpm/100cm² alpha. The floor in the area contained crevices, complicating clean-up. Disposable surfaces below the work area to protect the floor in case of a spill, were not adequately used during the job. A partial decontamination was performed and the area painted over to fix the contamination.

The work team believes the plutonium acidic material broke through the adhesive in the tape, spilling out of the sleeve onto the floor. RL requested the Project's D&D engineer to provide the chemical compatibility information for the tape used. The information provided to RL from the manufacturer showed it was not rated for nitric acid (expected chemical form in the pipe). Discussions with the field work supervisor indicated they were not aware of any specific time limitations to maintain a satisfactory seal due to the nitric acid that was anticipated.

5. Inadequate hazards analysis results in workers drilling into the E-3 HEPA ventilation ducting.

On April 7, 2011, workers, installing anchors in room 235B, inadvertently drilled into the contaminated E-3 HEPA filtered ventilation duct located inside the wall. The E-3 duct is a void in the wall, thus it contains no metal. The work planning was less than adequate in that drawings that show the location of the E-3 ventilation were not appropriately used in determining the location of the anchors (OA 36775).

6. Less than adequate analysis of hazards results in airborne radioactivity release while breaking a bagged Pyrex tank.

On January 27, 2011, a Pyrex tank was removed from glove box 522. The bagged tank was too big to fit into the 55-gallon waste drum. The workers attempted to size reduce the Pyrex tank by padding the tank and hitting it with a pipe wrench. The bag holding the tank was breached, resulting in high airborne radioactivity and continuous airborne radioactivity monitor (CAM) alarm. (OA 35484)

7. Deficiencies in analysis of hazards extend beyond radiation protection. A potential fire was narrowly averted when a worker questioned cutting on a pipe containing plutonium contaminated combustible material.

During interviews of personnel, workers reported a near miss that occurred in January of 2011. Work package 2Z-10-07673, Separate Glove box 100C from Glove box 200 in room 235D, specified cutting a hydraulic ram that was filled with plutonium contaminated combustible waste (paper, plastic and miscellaneous step off pad waste). At the pre-job briefing a worker raised a concern regarding the potential for the heat generated by the blade during the cutting reaching temperatures that could ignite the material inside the pipe. When the concern was raised, a mock-up was performed and the mock-up demonstrated the cutting operation started a fire.

The contractor issued a lessons learned praising the workers attentiveness and questioning attitude. However, corrective actions for preventing recurrence of the inadequate hazard analysis were not identified.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F02

Scope of Work was not always adequately defined at the activity level for hazards analysis, resulting in less than adequate radiological controls identification and implementation.

Requirements:

DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution, paragraph (c), specifies "The contractor shall manage and perform work in accordance with a documented Safety Management System (System)... Documentation of the System shall describe how the contractor will: (1) Define the scope of work...."

PRC-MP-MS-003, Integrated Safety Management System/Environmental Management System Description (ISMSD), section 3.1 Define Scope of Work, third paragraph, specifies "Work identified in the [work breakdown structure] is further divided into discrete tasks that are individually planned for execution using PRC-PRO-WKM-12115, Work Management, which describes the process for initiating, authorizing, performing, and conducting field work."

PRC-PRO-WKM-12115, Work Management, section 3.2.3, Plan Work, Step 19 states "...State the precise scope of work, including the methods of performing the work.... The scope description must be detailed enough to support the development of effective and accurate hazard controls for the proposed work activity.... Work steps provide the sequence and technical information for the work team to accomplish work that was described in the scope statement. The [field work supervisor] is responsible to direct the work team in a manner that complies with the approved instructions...."

PRC-PRO-WKM-079, section 3.1 Review the work scope, states "1. REVIEW work scope to be sure it is adequately defined.... 2. IF the work scope is not adequately defined, THEN UPDATE work scope in accordance with PRO-WKM-12115 or PRC-PRO-MS-589."

Discussion:

As discussed in the concern above, analysis of hazards includes the hazards associated with the system being breached, the work operations performed, and the location of the work. To appropriately analyze the hazards of the work at the activity level, the work scope must be clearly defined. This means the individuals analyzing the hazards must know the details of how the job will be performed. As specified in PRC-PRO-WKM-12115, the work scope description must be detailed enough to support the development of effective and accurate hazards controls for the proposed work activity.

Less than adequate hazards analysis and implementation of controls is in part a result of less than adequate definition of the work scope. Contrary to the requirements above, scope of work was

not always clearly defined. Examples of less than adequate definition of work scope from Finding S-11-SED-CHPRC-PFP-002-F01, include:

- **Work scope definition/limitations for size reduction of Glove box 522 Pyrex tanks was not adequate, and therefore adequate controls were not established to prevent an airborne radioactivity release (OA 35484).**

Airborne radioactivity was generated 1/27/11, room 152 when workers attempted to size reduce a Pyrex tank from Glove box 522 by padding it on the outside of its containment bag, and then striking it with a pipe wrench. This work activity was not identified in the work package. The work instruction in (2Z-10-03825) in general, and section 6.4.2.4 (disconnect/removal of Pyrex tanks) in particular, did not identify a need, option, or instructions to size-reduce the Pyrex tank, to fit it into the waste container.

- **Work scope definition for removing Plexiglas windows with radioactively contaminated neoprene gaskets between PFP room 230C and 235B was not adequate.**

On March 28, 2011, four individuals received small uptakes of plutonium while disassembling a Plexiglas window with a neoprene gasket between rooms 230C/235B. The procedure did not adequately define the scope of work.

RL Lead Assessor Closure Required:

YES[X] NO | |

Finding: S-11-SED-CHPRC-PFP-002-F03

The “flexible” Decontamination and Demolition (D&D) work packages resulted in “flexible” radiological controls in the work packages, which resulted in the actual controls being determined in the field by individuals not qualified in radiological hazards analysis resulting in inadequate hazards controls. Roles and responsibilities for determining radiological controls were not clearly defined.

Requirements:

DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution, paragraph (b) specifies “The contractor shall, in the performance of work, ensure that... (2) Clear and unambiguous lines of authority and responsibility for ensuring (ES&H) are established and maintained at all organizational levels.”

DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution, paragraph (b) specifies “The contractor shall, in the performance of work, ensure that... (3) Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.”

Discussion:

Contrary to the requirements above, for clearly defined roles and responsibilities, these roles and responsibilities were not clearly defined in the area of who determined the radiological controls implemented for work.

The surveillance team interviewed more than 40 individuals involved in work planning, including work planners, radiological work planners, lead RCTs, RCSs, FWSs, project managers, safety and health managers, a radiation protection corporate mentor, and some radiation protection personnel that left PFP to work elsewhere. Additionally, the team interfaced with workers during observation of work planning processes.

Interviews revealed that there was a lot of frustration felt by both workers and managers that was a result of work planning being performed in the field, instead of being planned up front. Disagreements on the appropriate radiological controls to implement for a work activity resulted in everything from work stoppages, to implementation of inadequate controls.

- **Work packages were built with “flexibility”, so the procedure would not tie the work team down as to how the work was performed; Radiological controls were “flexible” to accommodate decisions on how to do the work in the field.**

The work team and management expressed the desire for flexibility in how the work was performed, letting this be skilled based. Consequently, the radiological work planners specified “flexible” radiological controls in the work packages. This resulted in management abdication of their responsibility for hazards assessment and controls.

Some examples include generic instructions such as:

Chop shop: 2Z-10-05648, room 172 size reduction operations, 6.2.5 “Perform size reduction activities using power tools (i.e., nibbler, sawzall, circular saw, bandsaw) on hood/glove box/ducting... Move point source ventilation as needed for contamination control during cutting... Implement contamination control, as needed, using hand held fogging unit....”

2Z-09-3291, Rm 139 Glove Box Removal, section 4.6 “Use wet methods, sleeving and/or HEPA filtered spot ventilation to control contamination, as necessary.”

Work package 2Z-10-2115/M, 4.6.4 included the following, “Wet towels, HEPA vacuum, glove bags/sleeving and or catch bags shall be used as the main engineering controls during the task as necessary.”

When RL debriefed the contractor on preliminary findings, RL requested CHPRC to implement compensatory actions to shore up the radiation protection organization at PFP. One of the compensatory actions was to review high risk work packages for adequacy of radiological controls.

- **Roles and Responsibilities for the FWSs, lead RCTs, and other craft work team members are not intended to include radiological hazards analysis. Radiological training programs for these individuals did not include this qualification.**

The absence of specific radiological hazard controls in work instructions/packages resulted in radiological hazard control decisions being done by the field work team. These individuals were not technically qualified to analyze radiological hazards.

While the FWSs and lead RCTs have extensive experience in their roles, the surveillance team review of the FWS and RCT training revealed it was less than adequate to qualify them for radiological hazards analysis and control. The FWS training and qualification in radiological subject areas was limited to Radiological Worker II training. Radiological Worker II did not provide qualification on radiological hazard analysis and control selection. The surveillance team reviewed the RCT training, which is based on the DOE training standards. While the level of training exceeds radiological worker II training, RCT training objectives were not intended or designed to provide qualification on radiological hazards analysis and selection of engineered controls for work. The surveillance team also found that the training for lead RCTs did not include additional hazard analysis and control topics. The training reviewed for FWSs and RCTs did not include appropriate education, training, and skills to discharge these responsibilities, specifically the radiological hazard analysis and selection of engineered controls.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F04

Engineering controls were not adequately incorporated to control airborne radioactivity and spread of contamination for some work activities, resulting in high airborne radioactivity and spreads of contamination. Engineering staff were not always adequately engaged in the radiological engineering of the work.

Requirements:

10 CFR 835.1001 Design and control, (a) specifies "Measures shall be taken to maintain radiation exposure in controlled areas ALARA through engineered and administrative controls. The primary methods used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls shall be employed only as supplemental methods to control radiation exposure."

10 CFR 835.1002 Facility design and modifications, (c) specifies "Regarding the control of airborne radioactive material, the design objective shall be, under normal conditions, to avoid releases to the workplace atmosphere and in any situation, to control the inhalation of such material by workers to levels that are ALARA; confinement and ventilation shall normally be used."

10 CFR 835.1003 Workplace controls specifies "During routine operations, the combination of engineered and administrative controls shall provide that...(b) The ALARA process is utilized for personnel exposures to ionizing radiation."

DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution, paragraph (b) specifies "...The contractor shall, in the performance of work, ensure that...(6) Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures."

Discussion:

Engineering controls are required to be the first line of defense against airborne radioactivity and spread of contamination. Some work teams have appropriately performed work activities using glove bags and glove boxes, to keep the worker from being exposed to the source of contamination.

Contrary to the requirements of 10 CFR 835, engineering controls were not adequately incorporated for some work projects. Examples of poor use of engineering controls include:

- **Less than adequate use of engineering controls at the chop shop**

Work in the chop shop directly exposes personnel to high contamination levels inside glove boxes that are not designed for human entry. The chop shop and the work performed there was not properly designed up front with adequate engineering controls. As a result, airborne radioactivity levels exceeded the respiratory protection factor for the airline respirator multiple times, and the project continually struggled with back fitting radiological controls. The facility did not use the glove box itself, and the facility ventilation system (E-4), to adequately reduce the hazards prior to disconnection from the E-4 system and transporting the glove boxes to the chop shop, nor designed the chop shop facility for size reducing the glove boxes inside an engineered barrier (glove box or engineered ventilation hood).

- **Less than adequate use of engineered ventilation in general, and less than adequate involvement of engineering in the design of spot ventilation.**

Engineered ventilation was not always used. An example included scraping of the polyethylene liner with high dose rates, indicative of high contamination, at the bottom of glove box WT-4, without engineered spot ventilation (see Finding S-11-SED-CHPRC-PFP-002-F01).

Spot ventilation being used at the facility was not always adequately designed to meet its intended use. Elephant trunks and HEPA filtered vacuum cleaners had been used, but were not always adequate. Examples include the use of an elephant trunk for engineered ventilation while cutting a glove box with a circular saw (see Finding S-11-SED-CHPRC-PFP-002-F01).

As the RL surveillance progressed, more involvement of the ventilation engineer in spot source ventilation design was observed. A corporate mentor had previously brought up the need for PFP to use a B-box, a spot ventilation used at Rocky Flats. Facility action was not observed by the surveillance team until compensatory actions to shore up the radiological controls at PFP were implemented by the contractor.

RL Lead Assessor Closure Required:
Finding: S-11-SED-CHPRC-PFP-002-F05

YES[X] NO []

Training and qualification of radiological work planners was found less than adequate. Training did not adequately cover applied radiological hazards analysis.

Requirements:

10 CFR 835.103 Education, Training and Skills, specifies "Individuals responsible for developing and implementing measures necessary for ensuring compliance with the requirements of this part shall have the appropriate education, training, and skills to discharge these responsibilities."

CHPRC-00072, Appendix A, Policy and Commitment Basis for 835.103 specifies "CHPRC shall [835.103] identify positions that develop and implement measures necessary to comply with 10 CFR 835. At a minimum, this includes those individuals filling the following positions.... Facility/Project Rad Con technical staff...."

Discussion:

Training and qualification of radiological work planners did not ensure that individuals, who were determining and implementing radiological controls, were appropriately trained and qualified to perform applied radiological hazards analysis. Although these individuals met the educational requirements of CRD 5480.20A and DOE-STD-1107-97, contrary to 10 CFR 835.103, the CHPRC training did not ensure the individuals had all the skills necessary to discharge their assigned responsibilities in the area of applied hazards analysis.

- **The Radiological Control Work Planning training course did not adequately address applied hazards analysis.**

Course number 022801, Planning Radiological Work – Initial, section F, Purpose and Overview, specifies "This course does not attempt to teach radiological work planning...." The course does not teach how to plan work, nor does it provide instruction on how to perform applied hazard analysis.

Some radiological work planners were RCTs that were promoted to work planners. The RCT qualification program does not teach personnel applied radiological hazards analysis. There was no documented training or demonstration of knowledge on how to perform applied hazard analysis prior to assignment as a radiological work planner.

The primary emphasis of course 022801 is to teach the radiological work planners how to fill out the radiological hazards screening and ALARA Management Worksheet forms to support the work management process. The course contains general discussion on factors affecting radiological hazards, but does not adequately cover practical application of hazards analysis and selection of controls.

- **Radiological work planner training did not demonstrate how to perform airborne radioactivity estimates based on contamination levels, work operations, and application of airborne radioactivity controls.**

A review of radiological work planning training documents and interviews found that the training did not provide adequate instruction on how to predict airborne concentrations. The training materials directed the trainee to use the facility Technical Evaluation (TE) to predict airborne concentration. The PFP TE did not contain guidance on how to estimate airborne concentrations. The training material did not demonstrate how to perform these airborne radioactivity calculations.

- **Selection of appropriate respiratory protection requires the ability to calculate airborne estimates.**

The radiological work planning course does not show the work planner how to select respiratory protection based on estimated airborne radioactivity levels.

- **Radiological work planning training did not adequately cover limitations of HEPA filtered ventilation as an engineered control.**

Interviews found that staff did not understand the limitations of ventilation as an engineered control. Personnel did not demonstrate an understanding that ventilation is typically designed for laminar flow. Ventilation is significantly less effective when generating turbulent air flow patterns, such as those created with a circular saw. This is important to understand, so that radiological work planners do not specify ineffective controls.

The radiological work planner training course did not cover the technical aspects of engineered ventilation or the need to engage engineering in its design.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F06

PFP did not have a procedure on how to perform airborne radioactivity estimates for hazards analysis and work planning. The CHPRC technical basis document for workplace air monitoring did not address estimating airborne radioactivity levels for hazard analysis and work planning.

Requirements:

10 CFR 835.104 Written Procedures, specifies "Written procedures shall be developed and implemented as necessary to ensure compliance with this part, commensurate with the radiological hazards created by the activity and consistent with the education, training, and skills of the individuals exposed to those hazards."

Discussion:

The surveillance team reviewed the CHPRC and PFP list of procedures on line and technical basis documents. PFP did not have a procedure on how to perform airborne radioactivity estimates for hazards analysis and work planning. The CHPRC had a technical basis document for workplace air monitoring. This technical basis document included formulas to determine if air sampling is required. The technical basis document did not specifically address estimating airborne radioactivity levels for hazards analysis and work planning. Contrary to the requirements of 10CFR835.104, CHPRC did not have adequate procedures for airborne radioactivity estimates for hazards analysis and work planning, consistent with the education, training and skills of the individuals performing the hazards analysis.

Airborne radioactivity estimates were needed to complete the Radiological Work Screening process (PRC-PRO-RP-40108, "Radiological Hazard Screening," and Site form A-6004-654). Some CHPRC projects and other Hanford Site contractors had procedures for performing airborne radioactivity calculations for hazards analysis and work planning. After the deficiency in performing airborne radioactivity calculations was identified by RL, PFP obtained another CHPRC project's methodology for performing airborne radioactivity calculations to develop their own instructions.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F07

The contractor's radiological staffing resources were less than adequate to accommodate personnel losses and planned accelerated decontamination and demolition work

Requirements:

CRD O 5480.19 Chg 2 (Supp Rev 4) Conduct of Operations Requirements for DOE Facilities Chapter I, Operations Organization Administration: C. Guidelines; (2) Resources: specifies "The operations supervisor for DOE facilities should be provided with sufficient... personnel to accomplish assigned tasks without requiring excessive overtime by the operations staff. These resources should include technical personnel needed to support the operations. A long-range staffing plan that anticipates personnel losses should be developed and implemented."

Discussion:

In decontamination and decommissioning of a facility, an increased level of radiological risk and potential for rapidly changing conditions are expected. Multiple systems are being breached, facility engineered controls are being deactivated, etc. Planning for appropriate additional staff is critical to effectively handle the increased work and continual changes in facility conditions.

Contrary to the requirements above, the contractor did not ensure adequate radiological staffing resources at PFP.

- **PFP experienced the loss of the facility RadCon Manager, a key position, in June 2010 and did not permanently replace the manager until March 7, 2011.**

The lack of priority and urgency in filling this key position for a high risk and accelerated project demonstrated less than adequate planning and response to key personnel losses. The high risk and accelerated nature of PFP work should have driven a more expedient permanent replacement for this key role. For approximately eight months, the project did not have a permanent RadCon Manager.

PFP assigned personnel as temporary radiological control managers. The RHS Director intermittently acted as RadCon manager. However, the RHS Director's other duties combined with the RadCon organization's span of control, made this approach less than adequate. For five months (August through December), the facility had a central RadCon staff member acting in a temporary capacity. After the central RadCon staff member went back to the central organization, the radiological control manager position was rotated among the radiological control supervisors. Experience shows personnel in a temporary position are not as effective because staff know they are temporary.

- **There was insufficient radiological technical staff to adequately manage the work planning process.**

The radiological work planner and engineers need to be an integral part of the work planning team. They need to be there at the start of the work planning, providing input into how the work is performed from a risk assessment perspective. If the work operations are not clearly defined during the planning, hazards assessments may not be accurate, as was observed for some work activities during this surveillance. This contributed to the adverse outcomes realized during work (e.g., RWP voids, high airborne generation, contamination spreads, and radiological uptakes).

At the start of this surveillance, the project had three radiological work planners. This resource level was not adequate to support work planning based on the level of hazards in the facility and the pace of work at PFP. Based on organizational chart reviews and interviews, the three radiological work planners supported approximately twenty-six line work planners.

- **Insufficient numbers of radiological work planners did not permit adequate engagement of the work planner during performance of work.**

The radiological work planners need to be engaged during performance of the work. Field presence by radiological technical support and work planners helps to validate and ensure that radiological controls are implemented as intended. As the level of flexibility in work operations and changing conditions increase, field observations provide for early recognition and correction of potential inadequacies in engineered controls. The shortage of radiological work planners resulted in their limited field presence. Lack of observation of the implementation of controls in the field represents a program weakness and a missed feedback opportunity.

In response to the RL surveillance, the contractor added a radiological engineering manager and additional radiological work planners at PFP.

- **PFP had insufficient numbers of first line radiological control supervisors (RCS) to effectively support radiological work.**

A review of the PFP organizational chart and interviews with the PFP RCS found that approximately 102 RCTs were supervised by five RCS. Interviews indicated the following. One of these RCS had double duty as PFP's acting radiological control manager. One of the RCS was assigned Duty RCS for making personnel assignments, responding to emergencies, and completing other administrative duties. Additionally, RCSs review completed radiological surveys. As a result, only two RCS were typically available to oversee the ongoing work. The ratio of RCTs to RCS was very high considering the level of radiological hazard associated with the work at PFP.

Since RL identified the overall weaknesses in radiological staffing at PFP, the contractor has increased the number of RCS.

- **Fifty percent of the RCTs at PFP were junior.**

Interviews with personnel indicated fifty percent of the RCTs at PFP were junior, meaning they were not qualified to work alone on high risk work activities and required more oversight by the lead RCTs on the work team.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F08

The HCND was not assigned to multiple individuals that met the criteria for monitoring as specified in the Hanford technical basis document. The CHPRC procedure did not fully incorporate monitoring criteria from the Hanford External Dosimetry Technical Basis Manual (OA 36921).

Requirements:

10 CFR 835, Subpart E-Monitoring of Individuals and Areas, Article 835.401(b) "Instruments and equipment used for monitoring shall be... (2) Appropriate for the type(s), levels, and energies of the radiation(s) encountered..."

DOE/RL-2002-12, Hanford Radiological Health and Safety Document, section F External Dosimetry, paragraph 3, specifies "The contractor shall participate in the development and maintenance of a Hanford site-wide external dosimetry basis document. The contractor's external dosimetry program shall be performed in accordance with this technical basis document."

PNNL-15750 Rev. 1, PNL-MA-842, Hanford External Dosimetry Technical Basis Manual, section 6.3, Selection of Dosimeter Types to Use, specifies "Individuals who are likely to receive Hp(10)n greater than 100 mrem per year should be issued a HCND, which provides a more accurate measurement of neutron dose. In addition, individuals who routinely have Hp(10)n greater than 100 mrem per year reported on an [Hanford Standard Dosimeter (HSD)] should be issued a HCND."

Discussion:

The surveillance team reviewed the CHPRC deficiency reports for PFP. Multiple deficiency reports identified "HSD over-response to neutrons" from personnel wearing the HSD at PFP. RL investigated the issue and found it to be programmatic at CHPRC.

Contrary to 10 CFR 835.401(b), some individuals that met the regulatory criteria for monitoring, a dose of 100 mrem in a year, were assigned a HSD in lieu of the HCND. The HSD is not appropriate for monitoring neutrons with the range of energy levels of neutrons at PFP.

The HSD can measure neutron, and is U.S. Department of Energy (DOE) Laboratory Accreditation Program (DOELAP) accredited based on its response to a bare californium neutron source (fast neutron). The HSD over-responds to a moderated neutron flux. Depending on the neutron energy where the individual was exposed, correction factors between 2 and 5 were used. At PFP, the energy levels of the neutrons vary depending on location. The HCND is a neutron dosimeter which has multiple thermoluminescent dosimeters (TLDs) inside that respond to different neutron energy levels and thus more accurately measure neutron dose, but costs more.

CHPRC reduced the numbers of personnel monitored with HCND to reduce costs. The HSD costs \$45.00 to process, while the HCND costs \$68.00 to process (data from DOE Dosimetry point of contact). This cost is less than the contractor's estimated man-hours costs taken to investigate and correct the neutron dose.

In the process of reducing the number of personnel assigned a HCND, individuals who should have been wearing the combination neutron dosimeter were not appropriately monitored in accordance with 10 CFR 835.401(b) and the Hanford External Dosimetry Technical Basis.

In 2010, CHPRC processed 119 EDIRs to correct the neutron reading from a HSD. Many more individual dose records were reviewed for high neutron doses, where doses indicated personnel should have been assigned a HCND, but were not, and the project decided not to make a change in the individual's dose of record.

Contrary to the requirements of DOE/RL-2002-12, the CHPRC procedure did not fully incorporate monitoring criteria from the Hanford External Dosimetry Technical Basis Manual. A review of the CHPRC External Dosimetry Program, PRC-PRO-RP-379, revealed the document is inconsistent with the Hanford External Dosimetry Technical Basis Document. While PNL-MA-842 specifies personnel who routinely have neutron dose, as reported on an HSD, should be issued a HCND, CHPRC has not implemented this in their External Dosimetry

Program. PRC-PRO-RP-379, section 3.15, step 5, only specifies to change the dosimeter from a HSD to a HCND if the corrected neutron dose (vice reported dose) is greater than 100 mrem.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F09

Technical errors were identified in five out of nineteen EDIRs.

Requirements:

PRC-PRO-RP-379, External Dosimetry Program, section 3.15, Neutron Correction to HSD Measurements, step 2 specifies “IF calendar year-to-date (CTD) uncorrected neutron exposure is [greater than or equal to] 100 mrem, THEN correct readings using the following correction factors: PFP = 2, ISA = 5, Others = 3.” “Note: Justification is required in the project's technical equivalent document if there is a deviation from the given correction factors per project.” Step 3 specifies “IF corrected exposure is \geq 100 mrem or if record correction is desired, THEN NOTIFY [Dosimetry Operations] AND REQUEST an EDIR number, AND COMPLETE AND SUBMIT [EDIR] to correct the recorded dose.”

10 CFR 830.122 Quality Assurance Criteria (c) specifies “Criterion 3 Management/Quality Improvement (1) Establish and implement processes to detect and prevent quality problems. (2) Identify, control, and correct items, services, and processes that do not meet established requirements. (3) Identify causes of problems and work to prevent recurrence as a part of correcting the problem. (4) Review item characteristics, process implementation, and other quality related information to identify items, services, and processes needing improvement.”

DOE/RL-2002-12, Hanford Radiological Health and Safety Document, section J, Radiological Records, paragraph 2, specifies “The contractor shall ensure that permanent radiological records are accurate....”

Discussion:

The surveillance team reviewed 19 out of 119 EDIR that involved adjusting neutron doses from the HSD readings. Contrary to the requirements of DOE/RL-2002-12, technical errors (math errors, wrong radiation type, zeroing dose without adequate technical justification) were identified in five out of 19 (26 percent) of the EDIRs. There were other potential issues in 4 other EDIRs reviewed. The following technical errors were identified:

- **Several EDIRs contained math errors.**

EDIR-10-223 divided 20 mrem neutron by a correction factor of 3, and specified the corrected dose as 3 mrem neutron (20 divided by 3 is 6.67, or rounded to the nearest mrem is 7 mrem, not 3 mrem). EDIR-10-077 took 60 mrem neutron divided by a correction factor of 3 and said the resulting dose was 17 mrem neutron. EDIR-10-179 erroneously added the gamma dose to the

neutron dose when correcting the neutron dose (520 neutron +53 gamma = 573; 573 divided by 2 = 287). The corrected neutron dose should have been 520 divided by 2 = 260 mrem neutron.

- **One workers dose was corrected twice, but the dose was assigned as neutron vice gamma.**

EDIR-10-060 information from the facility did not specify the type of radiation, nor was a radiation survey record attached. The worker had been taking photographs in PFP A-labs, for a total of two hours, and lost his HSD. The EDIR specified general radiation levels in A labs as 0.5 mrem/hr, but did not specify whether that was gamma radiation vice neutron. PFP general area radiation levels are both gamma and neutron in most places, and 0.5 mrem/hr is the typical minimum detectable activity (MDA) of the gamma dose reading instrument. The 0.5 mrem/hr dose rate was likely a gamma reading based on the location, A-Labs. The EDIR should have contained both gamma and neutron dose rates for preparation of the dose estimate. The first time the dose was corrected, a math error was made, 2 hrs times 0.5 mrem per hr, was recorded as 2 mrem neutron. The contractor caught the math error and changed the dose to 1 mrem neutron, but did not catch the error of no radiation type being specified by the facility providing the dose rate data.

- **A neutron dose record indicating 31 mrem neutron was changed to zero (see EDIR-10-176).**

The 31 mrem recorded neutron was corrected by dividing by 3 (10 mrem neutron), but then recorded as zero, without appropriate technical justification. Discussions with PNNL dosimetry program technical personnel indicated recording this corrected neutron dose as zero was not consistent with the Hanford external dosimetry technical basis manual.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F10

Airborne radioactivity monitoring results at PFP were not adequately reviewed to ensure individuals likely to receive a committed effective dose of 0.1 rem or more from all occupational radionuclide intakes in a year were appropriately monitored through the internal dosimetry program.

Requirements:

10 CFR 835.403 Air monitoring, specifies "(a) Monitoring of airborne radioactivity shall be performed (1) Where an individual is likely to receive an exposure of 40 or more [Derived-Air Concentration (DAC)]-hours in a year...." Monitoring per the definition in 10 CFR 835, includes analysis of the data.

10 CFR 835.402 (c) specifies "For the purpose of monitoring individual exposures to internal radiation, internal dosimetry programs (including routine bioassay programs) shall be conducted

for: (1) radiological workers who, under typical conditions, are likely to receive a committed effective dose of 0.1 rem (0.001 Sv) or more from all occupational radionuclide intakes in a year....”

Discussion:

Contrary to the requirements above, airborne radioactivity monitoring results at PFP were not adequately reviewed to ensure individuals likely to receive a committed effective dose of 0.1 rem or more from all occupational radionuclides intakes in a year were appropriately monitored through the internal dosimetry program.

The surveillance team reviewed four quarterly PFP workplace Air Monitoring Tracking and Trending Reports (Calendar year 2010). This review was performed in response to an earlier discovery of the tracking and trending not being performed (OA 33986) and an employee concern at PFP over the sporadic elevations of airborne radioactivity in the plant.

- **PFP Closure Project Workplace Air Monitoring Tracking and Trending reports identify locations with unexplained elevated airborne radioactivity above one DAC-hr.**

The surveillance team verified that Workplace Air Monitoring Tracking and Trending Reports have identified areas with sporadic unexplained elevated airborne radioactivity. As an example, the Third Quarter 2010 PFP Closure Project Workplace Air Monitoring Tracking and Trending Report identified six areas with greater than 1 DAC-hr airborne radioactivity. The third quarter 2010 report did not provide any actions taken to ensure unmonitored personnel receive less than 40 DAC-hr (100 mrem internal dose) in a year, or actions taken to monitor exposed individuals through bioassay or a DAC-hr tracking program.

- **The third and fourth quarter reports did not contain any trending data for locations with elevated airborne radioactivity.**

Review of the third and fourth Air Monitoring Tracking and Trending Reports confirmed they did not include any trending data for the locations with elevated airborne radioactivity. Interviews with radiological control technical staff indicated the staffing shortages were a major contributor to the task not being completed.

After RL expressed concern over the shortage of radiological technical staff at PFP, CHPRC added staffing to shore up the radiological control program. An individual with expertise in airborne radioactivity monitoring programs performed a trending analysis for data from March 2010 through March 2011 to complete the missing analyses.

- **The PFP administrative trigger level for investigating elevated airborne radioactivity was 1 DAC-hr in a week (50 DAC-hr per year for a 50 week work year), which was inconsistent with 40 DAC-hr in a year regulatory requirement.**

A fixed head air monitor draws airborne radioactivity into it and collects the contamination on a filter. When the filter is counted, the contamination is a direct measure of DAC-hr. The airborne radioactivity could have occurred in a short period of time as a result of a work activity, or be the collection of ambient low level airborne radioactivity. Assuming the airborne radioactivity actually occurs when people are in the area as a result of their activities, 40 DAC-hr per year would be 0.8 DAC-hr per week (for 50 work weeks in a year). It is unclear why the facility has used a higher trigger for investigation than that which ensures compliance with 10 CFR 835.

- **Airborne radioactivity area (ARA) posting at PFP goes up and down daily, it is not clear how the air monitoring program verifies personnel not in respiratory protection receive less than 100 mrem internal dose (40 DAC-hr) in a year when these areas are not posted ARA.**

Interviews with the radiological control technical staff and reviews of the quarterly workplace air monitoring tracking and trending reports revealed the fixed head air monitors run both during the period when the area is not a posted airborne radioactivity area and during airborne radioactivity work. When high fixed head airborne radioactivity levels are reported, the radiological technical staff indicated they send an e-mail to the radiological control supervisors to determine what work went on in the area. If airborne radioactivity work occurred, this is identified in the report. It is unclear how this process ensures personnel who are not monitored for internal exposure and are not wearing respiratory protection, do not exceed 100 mrem internal dose in a year.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F11

Less than adequate conduct of operations was observed. Failures to follow procedure contributed to generation of airborne radioactivity and low level uptakes.

Requirements:

10 CFR 830.122 Quality assurance criteria, (e) Criterion 5 Performance/work processes (1) specifies "Perform work consistent with technical standards, administrative controls and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means."

DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities, Chapter XVI Operations Procedures, B. Discussion, specifies "...operations procedures should be sufficiently detailed to perform the required functions without direct supervision.... Operators should not be expected to compensate for shortcomings in such procedures... C. Guidelines ...7. Procedure Use,... Facility operation should be conducted in accordance with applicable procedures... If procedures are deficient, a procedure change should be initiated...."

Discussion:

The surveillance team observed post job reviews and critiques. A contributing factor to events was poor conduct of operations. Contrary to the requirements above, the following are examples of personnel not following appropriate requirements for use of procedures:

- **Less than adequate conduct of operations contributed to personnel receiving low level uptakes during removal of a Plexiglas window between PFP rooms 230C and 235B.**

As discussed in Finding S-11-SED-CHPRC-PFP-002-F01, the work team identified the wall surrounding the Plexiglas windows was made of stainless steel sheets bolted in place. The team decided to unbolt the stainless steel plates in lieu of cutting as identified in the procedure. Because of the perceived safer condition, the FWS and lead RCT decided respiratory protection was not needed. The work team did not make an appropriate change to the work package prior to performing the work. An unanalyzed hazard associated with contamination on the gasket around the Plexiglas window resulted in four low level uptakes.

- **Personnel observed not following controls established in the procedure contributed to generation of airborne radioactivity above the respiratory protection factor of the airline respirator at the chop shop.**

As discussed in Finding S-11-SED-CHPRC-PFP-002-F01, airborne radioactivity levels during work in chop shop repetitively exceeded respiratory protection factors of the airline respirator. The facility modified the chop shop work package to add additional radiological work instructions on March 10, 2011. When the chop shop work team commenced work on March 16, 2011, the corporate radiological control mentor identified workers had not implemented several of the radiological control requirements in the procedure. Airborne radioactivity levels exceeded the RWP limits for airborne radioactivity and work was stopped.

- **Personnel did not stop when Pyrex tank did not fit into 55 gallon drum. Unplanned work resulted in airborne radioactivity and spread of contamination (OA 35484).**

The work instruction (2Z-10-03825) for preparation of glove box 522 for removal did not identify a need, option, or instructions to size reduce a Pyrex tank in the glove box. The Pyrex tank was sleeved out of the glove box, but did not fit into the 55 gallon drum staged for its disposal. When personnel in the field concluded the tank should be size reduced, they did not recognize work instructions and controls should have been specified and approved prior to performing the actions they took to size reduce the tank. While attempting to break the Pyrex tank with a pipe wrench, a release of airborne radioactivity occurred when the sleeving around the tank was breeched.

RL Lead Assessor Closure Required:

YES[X] NO []

Finding: S-11-SED-CHPRC-PFP-002-F12

Required radiological hazard controls for work were not consistently documented on the AMW as specified by the form's instructions.

Requirements:

10 CFR 830.122(c)(1) Establish and implement processes to detect and prevent quality problems.

Form A-6004-634 specifies, "If there are radiological controls to be incorporated into the work instructions then check the box on the left and identify all radiological controls that are to be incorporated into the work instructions with BOLD lettering. These instructions/controls will be in the work document, procedure, or instructions, not in supporting documentation or permits."

Discussion:

The AMW documents the radiological considerations, analysis, and controls to be incorporated for high and medium risk radiological work. Contrary to the requirements in Form A-6004-634, documentation on the AMW Part II, Radiological Protective Measures/Considerations was not consistently completed per the form's instructions. The AMW form specifies, "If there are radiological controls to be incorporated into the work instructions then check the box on the left and identify all radiological controls that are to be incorporated into the work instructions with BOLD lettering. These instructions/controls will be in the work document, procedure, or instructions, not in supporting documentation or permits."

The surveillance team reviewed seven released complete work packages supplied by PFP; the AMWs associated with these work packages did not fully follow the previously stated instruction. The surveillance team found sections on each AMW where the radiological work planner checked, "Incorporate into work instruction," without any text being bolded for inclusion. Failure to follow the forms instructions, e.g., lack of bold text, potentially contributed to the less than adequate inclusion of intended controls in work instructions.

RL Lead Assessor Closure Required:

YES[X] NO []

Observation: S-11-SED-CHPRC-PFP-002-O01

Job Specific RWPs were written broadly and generically to cover multiple work packages.

Discussion:

As part of the PFP work planning surveillance, the team noted that RWPs were written to cover multiple work packages and were broad and general in nature. An example of this is RWP Z-005, "Perform Glove box Work Activities (As per Listed Work Procedures), Handling/Movement of Radioactive Material, Low Level Waste Handling & Disposal and Minor Decontamination." This RWP had been revised 72 times, covered six PFP procedures and 28 work packages.

RL Lead Assessor Closure Required:

YES[X] NO []

Observation: S-11-SED-CHPRC-PFP-002-O02

The facility's technical basis for use of plutonium values as an indicator of when to perform beryllium monitoring did not identify and evaluate plutonium-beryllium sources, as a potential source of beryllium in the facility.

Discussion:

During the surveillance, there were a lot of concerns expressed by workers on the use of plutonium levels for determining when beryllium monitoring was required. The workers expressed concern over the accuracy of the technical basis for the policy and on lack of follow through by facility management in performing beryllium characterization.

During review of FSP-PFP-IP-003, Radiological History of the Plutonium Finishing Plant (1954-1997), the surveillance team noted on page 20 of the report that a spread of contamination from a plutonium-beryllium source occurred in 1981 in room 236. This source of beryllium was not evaluated by the facility in the development of their beryllium monitoring program.

The additional technical staff brought into PFP had an additional benefit of supporting resolution of worker concerns in the beryllium monitoring program. When the additional source of beryllium contamination was identified by RL, the additional staff reviewed its potential impact on the PFP beryllium monitoring program.

RL Lead Assessor Closure Required:

YES[X] NO []

Observation: S-11-SED-CHPRC-PFP-002-O03

Poor practices were identified in multiple EDIRs reviewed.

Discussion:

The following additional poor practices were observed:

- **Poor resolution to a technical issue.**

EDIR-10-077 indicated a technical issue existed with the type of direct reading dosimeters (DRD) used at WRAP. The EDIR specified the cause of "ACES report indicated that estimated dose recorded was grossly underreported for [DRD]," was "DRD do not detect neutron radiation and electronic dosimeters can under respond to lower energy spectra." The resolution states: "Return to monthly dosimeter issuance." This resolution does not address the technical shortfall of the equipment. Therefore, the response was less than adequate. 10 CFR 835 requires

monitoring be performed with equipment appropriate for the type and energy of radiation encountered.

- **Gross inconsistencies in whose neutron dose from the HSD gets corrected in the individuals record.**

There were gross inconsistencies in whose neutron dose from the HSD got corrected in the individuals record and whose did not. Examples include: A neutron dose correction of 1 mrem was made in one EDIR, a dose of 31 was zeroed in another, and a HDS dose of 199 mrem (99.5 mrem with PFP correction factor applied), was not corrected at all.

- **Rounding is inconsistent.**

Some EDIRs truncated the fraction of a mrem, while others used normal rounding practices. Had the 99.5 mrem corrected value from the example above used normal rounding practices, the corrected dose would be 100 mrem and the CHPRC procedure would require dose correction.

- **Technical justification for use of inconsistent neutron correction factors for ISA pad work was not documented in the EDIR.**

All four EDIR reports for individuals working at ISA pad (correction factor five) that the surveillance team reviewed had neutron dose and no gamma dose. Two individuals also had some entries into CSB. The correction factor applied to those individuals was three. There was no documentation that indicated why the facility chose to use the three over the five. The correction factor of three resulted in a conservative higher dose in the record.

RL Lead Assessor Closure Required: YES[X] NO []

Observation: S-11-SED-CHPRC-PFP-002-O04

The use of the PRC Post-ALARA / Post-Job Review (site form A-6004-821) for event investigation rather than conducting fact-finding or critique meetings did not ensure that causal factors are identified.

Discussion:

As part of the PFP work planning process surveillance, the team observed PFP investigate upset conditions and events using the ALARA post-job review, which is not a fact finding tool. By design, the ALARA post-job review did not provide sufficient fact finding guidance to discover the event details needed to identify failure points and prevent recurrence. The site form (site form A-6004-821) provided questions not geared toward gathering factual details. The contractor should provide a more appropriate and effective process for gathering and identifying facts related to upset conditions.

RL Lead Assessor Closure Required: YES[] NO [X]

Contractor Self-Assessment:

The surveillance team reviewed the contractor's self-assessments and corrective action data base for PFP deficiencies for June 2010 through April 2011.

Issues with radiological work control planning and implementation have been previously identified by the CHPRC. On July 13, 2010, CHPRC identified within a conditional report (CR) three Stop Works at PFP related to Procedure Compliance, Entry Requirements and RWP Violations. These formal Stop Works were recorded in CR-2010-2201 to document issues with scope creep, procedure compliance, hazards and controls, pre- job briefs, and duct level entry requirements. As a result of the evaluation of the Stop Work issues, this CR was screened as adverse.

Analysis contained within CR-2010-2201 revealed that multiple issues throughout most aspects of work performance had risen to a level that workers felt the need to implement the formal Stop Work process in order to see that they were adequately addressed. Ten corrective actions were established to resolve these issues.

On October 22, 2010, CR-2010-3327, Contamination Spread in Multiple Rooms during Glove Box Separation Activities, was initiated due to contamination spread during glove box separation activities in room 139 of A Labs. Analysis of this event determined that the work controls were not adequate to handle the potential levels of contamination in areas inaccessible for survey and the configuration of the glove box was such that engineered barriers were considered impractical. Two work control corrective actions were identified in response to this event.

However, the number of radiological work planning events and deficiencies identified during this surveillance, indicates the corrective actions associated with the above issues were not sufficiently effective. This assessment of PFP's radiological work planning corrective action effectiveness aligns with RL's overall evaluation of CHPRC's corrective action management performance (See letter CHPRC-1100939, Integrated Corrective Action Plan).

Contractor Self-Assessment Adequate:

YES [] NO [X]

Management Debriefed:

David Del Vecchio, CHPRC
Terry Vaughn, CHPRC
Curtis Bean, CHPRC
Tom Bratvold, CHPRC



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #: 36889
Date Entered: 04/14/2011

Date Observed: 04/13/2011
Hours in Field:

Entry Type: ARRA

Include in CIR: No

Title:

Room 263 Recovery Plan Activities

Summary:

On April 13, a Revision 2 to the Room 263 Recovery Plan (PFPR-11-009) and a Revision 47 to the "recovery action" Radiological Work Permit (RWP Z-314) were issued to address 5M dpm/100 cm² contamination levels identified during Revision 1 characterization activities (see OA 36838) on April 11. The revision established a three phase approach to further characterization, decontamination, and recovery:

- 1 - Radiological Control Technicians (RCT) enter to survey and sample to determine actual contamination levels.
- 2 - Nuclear Chemical Operators (NCO) and RCTs neutralize fluid spill using sodium bicarbonate solution and decontaminate the floor area of most concern, then separate the remaining piping section from the glovebag and re-seal/re-bag/re-cap the pipe.
- 3 - UPP pad and over-bag the pipe section and re-locate the pipe first to a designated "warm zone" area in Room 263 and then to a solid waste box in Room 161. Then perform final decon/sample/survey of Room 263 and downpost.

Due to the high surface contamination levels that could go airborne, personnel entering Room 263 during the first two phases of the recovery were to utilize Self-Contained Breathing Apparatus (SCBA) for respiratory protection. Sixty minute air bottles were obtained for use.

The FR and a RL radiological subject matter expert (SME) observed the pre-job briefing for the recovery plan. The briefing was extremely thorough. Of particular note was that each person involved was asked to describe their role in the activity. Because some apprehension was expressed about the use of SCBA and how the SCBA was managed during the PPE doffing process, one of the RCTs, who also functions as a respiratory protection instructor at HAMMER, volunteered to provide a demonstration of SCBA use and PPE don/doff (see good practice below).

Following the demonstration (also observed by the FR and RL radiological SME), the Field Work Supervisor decided that due to time considerations only Phase 1 of the recovery would be attempted that afternoon. The FR observed recovery actions from Room 262, where personnel conducting the surveys exited and doffed their outer set of PPE.

Personnel exited Room 263 when surveys identified surface contamination levels of approximately 150M dpm/100 cm², which voided the revised RWP.

One observation was identified (see below) for inadequate radiological management of access to the Door 358 landing and stairway during exit of personnel from Room 263. No other issues were identified by the FR.

A Senior Supervisory Oversight individual was also present at the pre-job briefing and in the field during work activities.

Issue Type: Good Workpractice

Significance Level:

Statement:

Providing a refresher demonstration of Self-Contained Breathing Apparatus (SCBA) use and how it interfaces with doffing PPE clothing prior to using the equipment for the Room 263 recovery plan was a good practice.

Discussion:

At the April 13 pre-job briefing for Room 263 recovery plan activities, some of the involved personnel expressed apprehension about the use of SCBAs, since they were not often being used at the facility. In response, one of the Radiological Control Technicians, who was also a respiratory protection instructor at HAMMER, provided a demonstration of preparing and using a SCBA, how to manage it during PPE doffing activities, and answered questions from those observing. The activity appeared to make personnel more comfortable and adept with SCBA use.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
IS	IS-IH	ANLYZE	Competent	Issue Number: 9801

Issue Type: Observation

Significance Level:

Statement:

Prevention of cross-contamination from the Room 263 High Contamination Area (HCA) to the Room 262 Contamination Area (CA) was not well managed.

Discussion:

Following recovery plan activities in Room 263 (a HCA) on April 13, personnel exited Room 263 via Door 358 to a landing in Room 262 (a CA), down a stairway, and onto a Herculite pad where undress-assist personnel removed their outer pair of PPE clothing. The FR noted that once personnel began to exit Room 263, Room 262 personnel were walking on the stairway behind personnel being undressed and back out into the room or onto and off the Herculite pad without being surveyed for the spread of contamination. The FR pointed out each instance observed to RCTs surveying the exiting personnel. In response, the RCTs performed foot surveys of the personnel that walked through the extended HCA. They also performed area surveys after the work activities completed. No spread of contamination was identified.

The following morning the FR discussed with the lead RCT his concern with not adequately managing the landing and the stairway as an extension of the HCA. At that day's pre-job briefing both the Field Work Supervisor and the lead RCT stressed that personnel should not walk in and out of those areas, but if they needed to they should be surveyed prior to exiting.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	RADCON-RADPRC	WORK	BalPrior	Issue Number: 9801



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36838

04/12/2011

04/11/2011

Entry Type: ARRA

Include in CIR: No

Title:

Recovery Plan in Room 263 - Extremely High Contamination Levels Identified

Summary:

On April 12 personnel entered Room 263 to perform radiological surveys and conduct decontamination activities in accordance with recovery plan PFPR-11-009. The recovery plan was implemented to address high levels of contamination identified on the personal protective equipment (PPE) of personnel as they exited Room 263 on April 6 after performing process transfer line pipe cuts (see OA 36774). Upon entry into the room, however, contamination levels identified by surveys exceeded the void limit of the associated Radiological Work Permit (RWP Z-314) prior to any decontamination activities being performed. Personnel exited the room.

The FR, the RL Radiological Controls Manager, and a RL radiological subject matter expert observed a post job review of the activity several hours later. Personnel reported that they could see what appeared to be a brown puddle of syrupy liquid under the 3" to 6" transition piece (pipe) that had been rotated on April 6 in an attempt to empty any liquid content from the pipe (none was identified at that time) to a glovebag. The source of the liquid appeared to be from the containment bag and tape seal at the drop end of the piping, but actual flow was not observed. Personnel began to detect contamination several meters away as they surveyed toward the puddle and their survey instrument range (5 million DPM) was exceeded before they could reach the puddle. No Continuous Air Monitors (there were four in the room, with two very close to the work area) were alarming.

Personnel discussed at the post-job meeting how/why they thought the containment was leaking and also what revisions they considered were necessary to the RWP and the recovery plan to allow recovery actions to resume. The meeting was adjourned with personnel assigned to commence drafting revisions to each. Preparations were also started to support re-entry into the room utilizing supplied air. The post-job meeting was helpful in understanding what had occurred and what actions were intended going forward. It appeared actions taken by personnel upon identifying the contamination source and levels had been appropriate. Concerns remain on whether contamination will go airborne as the liquid dries and also on the integrity of containment materials currently installed on the pipe.

Rooms sharing the air space with Room 263 (primarily RMC line) remain in Airborne Radioactivity Area status.



OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36685

03/31/2011

03/31/2011

Entry Type: Routine Oversight

Include in CIR: No

Title:

Closure of Stop Work for Activities Above Eight Feet in Radiological Areas and Standing Orders Issued for Radiological and Beryllium Work Practices

Summary:

On March 31, the employee who invoked Stop Work for activities above eight feet in radiological areas (see OA 36562) agreed to release the Stop Work based upon the content of a Standing Operating Instruction (11-003-SOI-Rev. 0) issued on the same date. The SOI outlined the following process for work above eight feet:

- In CAs RCT performs pre-job survey with ARA controls and beryllium personal air sampling monitor.
- If contamination is detected within RWP/BWP control set ARA controls remain in effect, and beryllium personal air sampling monitors will be worn for representative number of workers
- If no contamination is detected ARA may be down posted in accordance with requirements of RWP and work document.
- RCTs performing radiological surveys in RBAs above eight feet, will establish a CA posting and don PPE accordingly.

Controls are implemented for initial characterization in a work area and if weekly survey continuity is not maintained. The SOI will remain in effect until the controls are incorporated into work governing documents (no target date specified).

A second SOI (11-004-SOI-Rev. 0) was issued on March 31, establishing an interim control to ensure radiological controls were commensurate with hazards and tailored to the work tasks. The SOI required that all high and medium risk screened work packages will not be released until they have received external reviews for radiological controls. Personnel designated to perform the reviews were specified and a work record entry was to be made in each work package to document the review, and reviewers concurrence with the package controls. The SOI remains in effect until further notice.

Finally, a third SOI (11-005-SOI-Rev. 0) was issued to establish more clarity for Industrial Hygiene wipe sampling during radiological events that void BWP contamination thresholds. It states, "Industrial Hygiene will perform ghost wipes of the event area within the room or designated area, per the recovery and concurrently with the decontamination work. Radiological Control Technicians will not decontaminate prior to obtaining beryllium wipe samples." The SOI addresses a long-standing issue where personnel questioned the validity of beryllium wipe sample results because they were often obtained after decontamination activities. The SOI remains in effect until BWPs are revised to contain the requirement. The target date for incorporation was specified as April 6.



OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

38586

07/21/2011

07/20/2011

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Improvement Initiative Independent Review Close-out Meeting

Summary:

The FR attended the close-out meeting for the recent Radiological Improvement Initiative independent review. The meeting was conducted by the review team lead. For specific issues that were addressed by the initiative he provided the following feedback:

- Radiological Instrument Shortage - No longer considered a problem.
- Radiological Posting - Progress was observed, but more work was necessary.
- Response to Breached Gloves - No longer an issue.
- Continuous Air Monitor Location Placement - Smoke testing has been performed in 50% of areas where work is being performed, and in 100% of high risk areas.
- Alpha Analysis Equipment - Nearly closed; only training of radiological controls personnel remains.
- Air Monitoring and DAC Hour Tracking - No longer an issue; now compliant with the site program.
- Neutron Dosimetry Use - Now adequately defined; change to contract-wide procedure necessary.

In the area of field observations of impact on conduct of work:

- Communication needs improvement. There is no formal dialogue on the initiative or what is being done and why. Says people are still on different pages.
- Rules and changes are being implemented via emails, memos, and standing operating instructions. Need to transition to procedures, work packages, and Radiological Work Permits (work documents).
- The Radiological Control organization 7 AM meeting is a good thing, but communication to outside organizations is still a challenge. There are inconsistent policies and discussions on roles, responsibilities, and lines of authority for work decisions.
- Radiological Control personnel resources need to be utilized more effectively. Only 52-58 are available each day and shift mismatches with work teams hurt efficiency.
- New radiological control personnel need to get qualified and supervisors need to get to the field more.
- In the area of Work Planning huge improvement was noted. Work packages look cleaner.
- Radiological Work Permits need a lot of work. They are not consistent with the AMWs for the packages they govern and are too vague for selection of PPE.
- The Radiological Survey Report error frequency was still too high.

The team lead recommended a phase II improvement plan be developed and implemented to further refine processes. He also recommended it be called just a PFP improvement plan rather than a radiological improvement plan because it cross cuts into other areas, but personnel outside the radiological controls arena are not aware of it or invested in it because they do not consider it applies to them or they have responsibilities to help implement it. The team lead did not provide a date when a draft report would be available.



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

Rpt #: 36972
Date Entered: 04/20/2011

PFP

Date Observed: 04/20/2011
Hours in Field:

Entry Type: ARRA

Include in CIR: No

Title:

Room 172 (Chop Shop) Glovebox Size Reduction Enclosure Activities

Summary:

On April 20, the FR observed the pre-job briefing for the morning's intended activities in the Room 172 glovebox size reduction enclosure. The morning's scope was for two Nuclear Chemical Operators and one Radiological Control Technician to make an entry into the cutting enclosure to package out waste (to two Solid Waste Operations NCOs and an RCT at the Solid Waste Box outside the enclosure), re-wrap glovebox HA-22 with plastic wrap, and perform smoke testing within the enclosure. The briefing was conducted consistent with the pre-job briefing checklist, but could have more optimally ensured involved personnel were prepared to perform their assigned duties. This was of heightened importance because no operations had been conducted in the enclosure since March 17, and some of the involved personnel were new to the size reduction activity (although new personnel were assigned to less complex roles and with some mentoring provided).

The FR then observed the activities in the enclosure. No issues were initially identified.

A Senior Supervisory Oversight individual and a Radiological Engineer were both present for both the briefing and the field activities.

On April 25, the FR again observed the pre-job briefing for the day's Room 172 size reduction tent activities. The day's scope was to remove Glovebox HA-22 windows and if time and conditions permitted to begin cutting on the box. The briefing was similar to the April 20 briefing - excellent detail and coverage of the pre-job briefing checklist items by the Field Work Supervisor (FWS), but little demonstration of knowledge/understanding of roles required of the personnel involved in the activities.

The FR again observed activities in the enclosure. When the first window was removed airborne contamination levels on the traveling sampler were measured at about 5000 DPM. When the second window was removed airborne levels were measured at 40,000 DPM. The FWS directed personnel first to pause to allow air flow to remove contaminants, then to install the top hat into the TRU-Sleeve and remove waste from the enclosure. Coincidental to this activity another sample measurement was performed and the airborne contamination level was identified to be 50,000 DPM. This was at approximately 1/2-hour after work had begun in the tent. Personnel were directed to remove the top hat, cover the waste port, and exit the tent. Personnel exited with no contamination identified on their anti-contamination clothing, their modesty clothing, or themselves. Later survey of lapel samplers identified a high corrected value of 0.14 DAC on one of the individuals working in the tent.

The FR observed that workers were taking precautions to ensure they remained upwind of work activities. They validated the conditions with a smoke tester.

The FR also observed a post-job review conducted by the FWS. Personnel discussed how they considered the evolution had progressed. They considered all aspects of their work to have gone well, but were concerned that when they removed the windows they could see there was significant bare metal visible inside the box where PBS coverage had not

been achieved. They were also concerned that the spray can of fixative they were using as they removed the windows and window gaskets did not provide adequate coverage either. They could see the spray being pulled into the box by the localized ventilation hooked up to the box. They provided suggestions for the next entry to use a sprayer to apply PBS-type material with increased volume and coverage area than their spray cans.

Both a radiological engineer and a Senior Supervisory oversight individual were present for the briefing, field work, and post-job review.

See the below observation on the apparent lack of control over tent airborne contamination conditions.

Issue Type: Observation

Significance Level: 2

Statement:

Positive control of airborne contamination levels in the Room 172 glovebox size reduction tent was not apparent.

Discussion:

After issues were identified with work controls in the Room 172 glovebox size reduction tent on March 17, work activities were suspended to review and revise controls to better assure worker safety.

On April 20, work activities resumed with a revised work package and enhanced oversight. On that date activities were conducted to better prepare Glovebox HA-22 for size reduction. Of most significance, smoke testing was performed to optimize worker and glovebox placement, and per one of the tent operator's request the glovebox was wrapped with plastic wrap.

Intrusive activities began on April 25, with the removal of two glovebox windows. The operation included removal of window hold-down nuts with a portable electric drill, removal of the window, removal of residual gasket material with a prying device (chisel), spray down of the newly exposed surface with fixative, and placement of plastic wrap over the newly exposed opening.

Airborne levels after removing the first window were 5000 DPM. Several minutes later after removing the second window they were 40,000 DPM, and soon peaked at 50,000 DPM, at which time work was suspended. Personnel did nothing different on the second window from the first, and although the Radiological Work Permit void level (57,000 DPM) for airborne radioactivity was not reached, it was apparent the workers had little control over whatever had caused the significant increase in airborne contamination levels or how to prevent it.

At a post-job review personnel made suggestions to facilitate more optimal control of airborne contamination, but without knowing the specific cause of the high airborne levels, there was little assurance the actions would be effective in reducing airborne contamination levels.

Funct. Area:

Trend Code:

ISMS Funct.:

Causal Code:

RP

RADCON-RADPRC

WORK

TalrdCntls

Issue Number: 9839



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Ed MacAlister

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36771

04/07/2011

04/06/2011

Entry Type: ARRA

Include in CIR: No

Title:

242-Z work activities oversight - High DAC areas observed during work activities

Summary:

Facrep attended pre-job briefing, observed conduct of glove box size reduction work, response to high airborne contamination event, and attend formal post job work associated with 242-Z. Pre-job briefing was well conducted with FWS utilizing pre-job check list. Prior to pre-job all work assignments were detailed with personnel well aware of work scope for specific areas. These areas were covered throughout pre-job briefing. This is an experienced work team with a couple of extra personnel assigned to support the work activity. No issues with pre-job briefing.

During conduct of work activities, high airborne radioactivity levels occurred which exceeded the RWP limits for this work. Details of event are captured below.

Issue Type: Event

Significance Level:

Statement:

RWP void limit exceeded due to very high airborne contamination levels

Discussion:

FacRep observed performance of size reduction activities via video on the adjacent trailer. FWS, lead RCT and NCO were also in trailer observing work activities. FacRep observed NCO's performing size reduction on the remaining sections of WT-4 and WT-5 utilizing nibbler, sawzall, and portaband. During use of these tools, the airborne contamination levels remained within normally expected levels. During work, a question arose on ventilation in the room and the camera was swung over to the door and discussions were had regarding the trunk hose off the E-3 ducting that had been installed by the team. After this discussion, the FacRep heard a noise in the 242-Z control room that was not associated with the previously identified size reduction tools. The camera was swung back to observe the workers, and a NCO was using a crow bar to remove material from the floor of WT-4. Very shortly after this, the RCT in the control room was heard over the radio stating that the radiological readings on the fixed head sampler were at 9000 cpm (approx. 54,000 dpm) and they needed to stop work and begin an orderly exit. Void limits in the RWP are at 57,000 dpm. NCO's stopped work in glove boxes WT-4 and WT-5 and one began exiting process. The other NCO was observed spraying PBS/water mixture on area where crow bar had been being used, then placing waste that previously been removed into a canvas bag and taping the bag. Afterwards he went through doffing process. Just prior to RCT exiting the control room, she took a final reading on the fixed head air sampler and measured 200,000 cpm, or approximately 1.2 Million dpm, well above the RWP void limit.

Upon notification of this level, the FWS immediately notified SOM then notified his management chain. Lead RCT had left trailer earlier and returned that the DRCM had been notified of the high levels. Work team performed as trained and safely exited the control room without any contamination spread issues. No issues noted regarding work team response to event.

A formal post job was conducted later that morning. Radcon and Project Management personnel were in attendance. All required personnel involved in work activities were in attendance and provided good input during post job. FWS lead

formal post job review utilizing form A-6004-821, PRC POST-ALARA/POST-JOB REVIEW form. Scope of work was reviewed and time line of work activities was covered. Area of primary focus was the use of the crow bar, which appeared to be when the upset condition occurred. NCO and FWS described how a crow bar was necessary to pry up a polyethylene coating that was found on the floor of WT-4 and WT-5 gloveboxes. This coating edge was held down on the edges with metal that was crimped over the edges. The crow bar was used to "uncrimp" the metal off the polyethylene, and then to pry the coating from the glove box metal floor. All the coating in glovebox WT-5 had been removed using this method, and no issues had occurred. However, there was a known hotspot of approx 4R/hr in the area where the coating was being removed in WT-4 at the time of the high airborne event. Also, the continued use of PBS during previous work activities creates layers of captured contamination that are also disturbed during removal of the coating.

Results of post job identified the probably cause of high airborne was use of crow bar during removal of polyethylene coating in approximate area of previously measured hot spot which led to an undiscovered condition. Path forward was for radcon organization to perform additional radiological engineering evaluations based on new information and revise work instructions to include new controls during removal of polyethylene coating. Potential corrective actions identified at post job were: 1) utilize point source ventilation while removing coating, 2) slow down/use less energetic actions during removal of coating, 3) spray pbs/water fixative while breaking up coating.

Additional planning is to be conducted with radcon support to develop recovery plan for entry into the room to remove the filter from the fixed head sampler for additional evaluation. Post evaluation, radiological engineering evaluations will be conducted with revisions to the ALARA Management Worksheet and subsequent revision to work instructions.

The NCO's and RCT that entered the control room all wore lapel air samplers as required. The highest reading on the lapel air samplers was 26,037 cpm. Upon performance of calculation and taking into considering protection factor of tight fitting face piece with supplied air, the calculated DAC levels in the personnel breathing space could be as high as 6.38 DAC-hrs. Based on this, all three personnel are having bioassay analysis conducted and cannot perform additional radiological work until results are received.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
MT	MAINT-PLNG	DEFINE	TalrdCntls	Issue Number: 9774



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36619

03/30/2011

03/30/2011

Entry Type: ARRA

Include in CIR: No

Title:

Radiological Contamination Identified Next to PVC Pipe Cap at Recent Transfer Piping Cut Location

Summary:

See below event report.

Issue Type: Event

Significance Level:

Statement:

Radiological Contamination Identified Next to PVC Pipe Cap at Recent Transfer Piping Cut Location

Discussion:

While performing post-job surveys a Radiological Control Technician (RCT) identified greater than 600,000 DPM contamination adjacent to an end cap placed over the sleeving containing a recently cut piece of transfer line piping in Room 263. The room was not an Airborne Radioactivity Area (ARA) at the time of discovery. The condition was announced. The RCT and a Nuclear Chemical Operator also in the room exited, along with other personnel in rooms sharing the same air space. An Incident Command Post (ICP) was established, which the FR observed.

The affected rooms were posted ARA per ZSP-006. Nasal smears were performed on the two individuals that had been in Room 263. Results were less than detectable for both individuals. Personnel in adjacent rooms were offered nasal smears, but all declined. Upon receipt of nasal smear results the ICP was disestablished.

The standing recovery plan work package will be prepared, approved, and partially released to allow room recovery on March 31.

The FR had no issues with facility response observed.

Funct. Area:

Trend Code:

ISMS Funct.:

Causal Code:

RP

RADCON-RADPRC

WORK

Competent

Issue Number: 9731



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #: 36555
Date Entered: 03/28/2011

Date Observed: 03/28/2011
Hours in Field:

Entry Type: ARRA

Include in CIR: No

Title:

Radiological Contamination Identified in Room 230C While Removing Windows Around Glovebox HC-4 Between Rooms 230C and 235B and Leaking Drum Identified in Corridor 14 of Plutonium Reclamation Facility

Summary:

See below event discussions and finding.

Due to the issue identified in the below finding, management elected to suspend work activities mid-shift on swing-shift, March 28, until management expectations for work control could be reemphasized with appropriate personnel. At the 0630 meeting on March 29, the PFP Closure Project Manager provided a briefing to PFP managers and supervisors on expectations to follow work instructions. Upon completion he stated work crews were to also be briefing on the management expectations, and must acknowledge they understand and will comply with them. Upon completion of the worker briefings and acknowledgements for a particular work team, the work release authority would authorize release for work via work package release. Work activities began to re-commence about 1000.

Issue Type: Finding

Significance Level:

Statement:

Personnel did not establish Airborne Radioactivity Area controls when directed by work package 2Z-09-06644, Removal of Conveyors HC-3 & HC-4 in Room 230B & 230C.

Discussion:

In relation to the above event where radiological contamination was identified in Room 230C while removing windows around Glovebox HC-4 between Rooms 230C and 235B, subsequent investigation determined airborne radioactivity controls required by the associated work package (2Z-09-06644) were not followed.

Work package 2Z-09-06644, WCN 2, Section 6.10.2, stated, "Cut wallboard/Plexiglass panels surrounding Conveyor HC-4 in Rooms 230C & 235B." To the left of the step was an "ARA" annotation, which is the PFP method of directing the establishment of Airborne Radioactivity Area controls for a work activity.

The removal of the plexiglass panels on March 28 was conducted without ARA conditions established and therefore personnel were not wearing respiratory protective equipment.

A critique meeting was scheduled for March 29 to better understand the event.

Requirements:

PRC-PRO-WKM-12115, 3.2.5.7.i, states, "If unexpected conditions are encountered, work area conditions have changed since the work activity was planned, or any situation arises that requires reanalysis of hazards or changing the work package, go to step 12."

3.2.5.12.b, states, "Incorporate necessary changes into the work package in accordance with the instructions contained in Section 3.3.2."

3.3.2, states in part, "Issues encountered during the Perform Work Function (Section 3.2.5) may require a work package change to resolve an issue. Changes may involve a support document (permits, design documents, pre-approved procedure, data sheets, etc.) or self-contained work instructions...Whether a change to the WD is a result of issues encountered in the field during performance of work, or the work instructions must be changed to comply with updated support documents, a technical review of the WD must occur prior to continuing on with the work activity...."

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number:
D&D	MAINT-ACT	WORK	BalPrior	9721

Issue Type: Event

Significance Level: 2

Statement:

Radiological Contamination Identified in Room 230C While Removing Windows Around Glovebox HC-4 Between Rooms 230C and 235B

Discussion:

On March 28, an Incident Command Post was established when personnel working to work package 2Z-09-06644 in Room 230C to remove windows around Glovebox HC-4 between Rooms 230C and 235B reported identifying localized radiological contamination of 50,000 DPM/100 cm² in the work area, and also contamination at levels of 1000 to 8000 DPM on gloves and shoe covers of personnel in room. Neither room was in Airborne Radioactivity Area status at the time of the event. The Building Emergency Director directed an orderly evacuation of all RMA and RMC line rooms and posting of the rooms per ZSP-006 (radiological airborne contamination) and ZSP-019 (beryllium airborne contamination).

Thirty personnel were working in either Room 230C or 235B at the time of the event. Nasal smears were obtained from all individuals. Nasal smears from the sheet metal worker physically removing the windows were initially 2 counts and 2 counts (per nostril). Subsequent surveys of the smears at 20 minute intervals produced 2 counts and 3 counts, then 1 count and 3 counts. Subsequent nasal smears on the same individual were less than detectable. Bio-assay has been directed for the individual, but due to the low contamination levels observed a chest count has not. Nasal smears surveyed for the remaining 29 potentially affected individuals from the two rooms were all less than detectable. Nine additional workers from adjacent rooms also elected to provide nasal smears. All of them surveyed less than detectable. All personnel involved successfully cleared the PCM IIBs.

Upon completion of the room evacuation, posting, and radiological surveys of personnel, the Incident Command Post was disestablished. Recovery plans (potentially radiological and beryllium) were being developed.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number:
RP	RADCON-RADPRC	WORK	TalrdCntls	9714

Issue Type: Event

Significance Level: 1

Statement:

Leaking Drum in Corridor 14 of Plutonium Reclamation Facility (PRF).

Discussion:

While addressing the March 28, 230C contamination event above, a report came to the Incident Command Post that an approximately 1 foot by 1 foot liquid spill had been identified from an apparent pin-hole leak in a drum labeled Closed Loop Cooling in Corridor 14 of PRF. Personnel were evacuated from the area. The area was posted to prevent inadvertent entry.

Although a serial number was identified on the drum, initial attempts to determine the drum's content were unsuccessful. Personnel considered, however, the drum contained either low contamination or non-contaminated water.

A recovery plan was being formulated when the Incident Command Post was disestablished.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number:
RP	RADCON-RADPRC	ANLYZE	TalrdCntls	9715



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #: 36431
Date Entered: 03/22/2011

Date Observed: 03/16/2011
Hours in Field:

Entry Type: ARRA

Include in CIR: No

Title:

Room 172 Glovebox Size Reduction Radiological Work Permit Void

Summary:

See below event discussion.

Issue Type: Event

Significance Level: 2

Statement:

Room 172 Glovebox Size Reduction Radiological Work Permit Void

Discussion:

On March 16, the FR was notified by the Shift Operations Manager that while performing glovebox cutting operations (with a Nibbler) in the Room 172 tent, fixed head air sampler surveys suddenly increased from about 38,000 DPM to 340,000 DPM. Since this condition voided the Radiological Work Permit (RWP Z-977), which contained an airborne contamination limit of 57,000 DPM, work was immediately stopped, the work area placed in a safe condition, and personnel performed an orderly exit from the glovebox size reduction tent. All personnel cleared the PCM-IIB and surveys of nasal smears obtained detected no contamination.

On March 17, the FR observed a formal post-job review led by the Field Work Supervisor. The meeting included significant management oversight, including the associated D&D Manager, the Radiological, Hygiene, and Safety Director, the Radiological Controls Manager, and two radiological control mentors. At the meeting it was further provided that one of the exiting workers had 2000 DPM on his outer hood as he was exiting the cutting area, but no other contamination was identified on exiting workers. Lapel sample surveys indicated a high of 3600 DPM in the breathing area of personnel that were working in the tent at the time of the fixed head sampler spike, corresponding to a dose significantly below 1 DAC-hr. Operations and oversight personnel present during the work stated that although the Radiological Control Technician (RCT) was following airborne contamination control guidance (PRC-PRO-RP-40031) in place regarding placement of the sampler head, its near proximity to the cutting area did not provide contamination levels consistent with the breathing zones of the workers. The RCT acknowledged that may be the case, but the placement had been consistent with past practices and inspection of the filter paper following the event indicated no visible metal chards present. He stated he considered cutting personnel were not adequately observing contamination control guidelines provided in the work instruction (2Z-10-05648), specifically:

"Fixative was not regularly applied to area and several areas of the box that had been fixed previously had the fixative scraped or vacuumed off during the job leaving the bare glove box exposed to the environment. Plastic draping was not properly oriented to funnel airborne contamination through air exhauster and glovebox was not properly positioned as required in work package." [Documented by the RCT in Condition Report CR-2011-0938, and discussed at the post-job meeting]

It was further discussed that similar airflow direction between the local ventilation and the tent ventilation was not maintained, wet towels were not adequately used to capture cutting spoils, workers were not consistently upwind from cutting operations, and no tape or fixative was applied (prior to cutting) to an area where a gasket had been removed.

More specific radiological controls than had previously been in the work instruction had been added over the previous week. Workers stated they had not adequately been a part of reviewing and approving the new controls because they had been farmed out to other work teams while the changes were being developed, reviewed, and approved. Although the changes had been discussed prior to implementation, they did not consider they were well-versed in the content. They further stated that continually adding additional layers of controls, or changing them, was difficult to implement in the field with significant personnel protective equipment in use and limited communication capabilities available.

Personnel stated radiological work practices and controls would again be reviewed prior to resumption of work. The Radiological Controls Manager stated he maintained approval authority for resumption of work. The meeting was conducted consistent with the formal post-job review format.

The Room 172 size reduction RWP has been voided multiple times due to high localized airborne contamination levels. Although controls have been re-evaluated several times and also changed, actions taken to date have not been effective in preventing recurrence.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	RADCON-RADPRC	WORK	Competent	Issue Number: 9685



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #: 35484
Date Entered: 01/31/2011

Date Observed: 01/28/2011
Hours in Field:

Entry Type: ARRA

Include in CIR: No

Title:

Continuous Air Monitor (CAM) Alarm During Room 152 Glovebox 522 Seal-Out Activities

Summary:

See below January 27 CAM alarm event discussion.

On January 28, the FR attended the pre-job briefing for recovery from the previous evening's CAM alarm in Room 152. The alarm occurred while personnel were attempting to size-reduce a bagged tank from Glovebox 522, when the tank would not fit within a waste drum (see below work planning observation and finding).

The briefing content and presentation were adequate. The FR observed team field activities as they prepared to perform recovery actions (contain the tank within the drum, place the drum into a Solid Waste Box, and decontaminate Room 152). The FR was diverted off to an Emergency Preparedness drill prior to the commencement of work, but the Field Work Supervisor later informed the FR that all activities had been successful and the Airborne Radioactivity Area release filter was ready to be counted.

Issue Type: Event

Significance Level:

Statement:

Continuous Air Monitor (CAM) alarm during Glovebox 522 seal-outs in Room 152.

Discussion:

A FR was informed by the Shift Operations Manager that during seal-out activities in Room 152 (which was a posted Airborne Radioactivity Area at the time) on swingshift of January 27, a CAM alarm was received. Personnel exited the air space. Subsequent information obtained identified the room's CAM alarm had been set at 40 DAC-hrs. Room conditions measured by the CAM peaked at 96 DAC-hrs. 3600 DPM was identified on the gloves and 2000 DPM on the anti-contamination clothing thigh of one of the workers exiting the room. General area contamination levels in the room prior to exit had not exceeded 1800 DPM. No contamination was identified on any worker's skin or personal clothing and all nasal smears taken were less than minimum detectable.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number: 9480
RP	RADCON-RADPRC	WORK	Competent	

Issue Type: Finding

Significance Level:

Statement:

Work scope definition/limitations for size reduction of Glovebox 522 pyrex tanks was not adequate, and therefore adequate controls were not established to prevent an airborne release.

Discussion:

Several days after the above event was reported, through various informal communications the FR became aware that work personnel had attempted to size-reduce the pyrex tank by attempting to break it with a pipe wrench while it was in the 55-gallon waste drum. The FR requested an explanation from the cognizant D&D Manager. On February 11, the D&D Manager confirmed personnel had attempted to break the pyrex tank by padding it on the outside of its containment bag, then striking it with a pipe wrench. It was during this process that the CAM alarm occurred.

The work instruction (2Z-10-03825) in general, and Section 6.4.2.4 (disconnect/removal of pyrex tanks) in particular, did not identify a need, option, or instruction to size-reduce the pyrex tanks. When personnel in the field concluded the tank should be size-reduced they did not recognize work instructions/controls should have been specified/approved prior to performing the actions they did.

Requirements:

PRC-PRO-WKM-12115, Section 19, states in part, "For planned work instructions use the standard outline format provided below...State the precise scope of the work, including the methods of performing the work. Ensure that the work team knows exactly what is included in the work activity and scope that is not to be included. The scope description must be detailed enough to support the development of effective and accurate hazard controls for the proposed work activity...Work steps provide the sequence and technical information for the work team to accomplish the work that was described in the scope statement. The FWS is responsible to direct the work team in a manner that complies with the approved instructions."

PRC-PRO-WKM-079, Section 3.1, states in part, Job Hazard Analysis personnel, "REVIEW work scope to be performed to ensure it is adequately defined...IF work scope is not adequately defined, THEN UPDATE workscope in accordance with PRO-WKM-12115 or PRC-PRO-MS-589."

DOE 5480.19, Attachment I, Chapter XVI, Section C.7, states in part, "If procedures are deficient, a procedure change should be initiated."

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
D&D	MAINT-ACT	WORK	BalPrior	Issue Number: 9550

Issue Type: Observation

Significance Level: 1

Statement:

Work planning for removal of tanks from Glovebox 522 did not adequately identify component size considerations for waste handling/disposal.

Discussion:

When removing tanks internal to Glovebox 522 on January 27, personnel determined one of the tanks was too tall to fit in the 55-gallon waste drum they had prepared to contain it. A high airborne condition occurred while personnel were preparing the tank package for transfer from the 55-gallon drum to an alternate disposal container.

Pre-job planning and document preparation (work package 2Z-10-03825 and associated attachments/references) did not adequately identify the size discrepancy between the tank and the disposal container selected for use.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
WM	MAINT-PLNG	ANLYZE	TalrdCntls	Issue Number: 9481



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35412

01/26/2011

01/26/2011

Entry Type: ARRA

Include in CIR: No

Title:

High Airborne Contamination Levels in Room 172 Size Reduction Tent

Summary:

See below event discussion.

Issue Type: Event

Significance Level:

Statement:

High Airborne Contamination Levels in Room 172 Size Reduction Tent.

Discussion:

During cutting activities in the Room 172 Size Reduction Tent on January 25, a circular saw was used for cutting for the first time since very early in the size reduction process. It was reported to the FR that airborne radioactivity levels in the tent while using the circular saw were significantly higher (50,000 DPM on the fixed head sampler) than had been seen in the room since personnel had refined work practices using Nibblers and Sawzalls. Work was secured to avoid exceeding the Radiological Work Permit void limit of 57,000 DPM.

The FR was informed later in the day by the Radiological, Hygiene, and Safety Director that counts on lapel samplers of the workers in the tent were identified to be as high as 1.7 DAC-hrs. Two of the workers were conservatively put on bioassay to determine if an exposure had occurred.

Funct. Area:

Trend Code:

ISMS Funct.:

Causal Code:

RP

RADCON-RADPRC

WORK

TalrdCntls

Issue Number: 9463



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35182

01/12/2011

01/12/2011

Entry Type: ARRA

Include in CIR: No

Title:

Room 172 Size Reduction Activities

Summary:

On January 11, the FR observed the pre-job briefing, work activities, and post-job review for Room 172 size reduction activities per work package 2Z-10-05648.

The pre-job briefing was adequate in content and presentation.

Cutting activities on an uncontaminated portion of the 139-3/4 glovebox assembly lasted just six minutes before airborne contamination levels of greater than 60,000 DPM (1600 DAC-hrs) voided the associated Radiological Work Permit (Z-977 Rev 3). This was despite work practice changes to spray Invisi-Blue on loose cuttings and in the cut area during cutting activities, cover surfaces where cutting residuals had accumulated with a wet rag, and use spot ventilation at cut locations. OAs 35012 and 35109 document two previous Room 172 cutting activities where the RWP was also voided for high airborne conditions. The work practice changes had been implemented to address speculated causes of the previous high airborne conditions.

Personnel responded appropriately to the void condition, securing work activities and exiting the containment tent. No contamination was identified on any of the three individuals that were in the tent and nasal smears were negative. Counts on fixed head filter papers and lapel samplers were pending. The FR identified no issues with radiological or industrial work practices, but work planning and hazard controls being implemented were still ineffective in establishing conditions that would allow cutting activities to be successful.

Speculation during the post-job review was that vibration caused by the saws (Nibbler and Sawzall - a circular saw was no longer being used due to noise levels it generated) being utilized was disturbing residual material in the bottom of the glovebox from previous cutting evolutions. No work area cleanup, beyond packaging out the large pieces cut from the box, had pursued to date. Personnel at the post-job were asked to brainstorm potential actions that could reduce airborne releases. Also, Radiological Controls management discussed changing the Radiological Work Permit void limit to 10,000 DAC-hrs and also provide an action level (the RWP did not currently contain one). Near term, the Field Work Supervisor suggested vacuuming up the residue from previous cutting activities. Vacuuming had not previously been attempted due to concerns that the vacuum exhaust would cause air swirling that would elevate airborne contamination levels. This was planned for the following day.

On January 12, the FR observed the pre-job briefing for containment tent cleanup activities and observed subsequent work activities. Waste materials in the tent were packaged and sealed out and vacuuming of residuals was performed. Work activities extended for approximately 1.5 hours until personnel considered they had removed what they could. Airborne contamination levels peaked at 35,000 DPM during the work activity. No issues were identified with activities observed.

Contractor oversight of the activities included a Senior Supervisor for both briefings and work activities and also the cognizant D&D Manager, Project Manager, and Radiological, Hygiene and Safety Director for the post-job review.

Several issues were identified with room conditions (see below).

Issue Type: Observation

Significance Level:

Statement:

Issues were identified with housekeeping conditions in Room 172.

Discussion:

As was also identified on December 29 (and corrected at that time), materials/debris were noted to be uncontrolled on the floor across the Contamination Area boundary around the Solid Waste Box (SWB). In each instance cut pieces of bungee cord were present and in this instance SWB cover clamps were also positioned such that it was indistinguishable whether they were inside or outside the CA. Each time the condition was addressed immediately when the FR identified it to the work team.

Electrical spider #29, located south of the containment tent, was labeled with masking tape stating "Monthly GFCI /10" and "Quarterly Assured Grounding /10" (no months documented). The FR pointed the condition out to the Senior Supervisory Oversight (SSO) individual. The SSO later informed the FR that she had discussed the condition with Temporary Power and Isolations personnel and no completion months have been marked on the labels because complete testing of the spider cannot be performed due to D&D personnel being unable to secure ventilation (which the spider powers) to the containment tent.

Heavy levels of loose dust (primarily corrosion products from the metal plates under the containment tent) were building up in the RMA and SWB CA.

Funct. Area:

Trend Code:

ISMS Funct.:

Causal Code:

RP

RADCON-RADPRC

WORK

TalrdCntls

Issue Number: 943



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Kerry Schierman

PFP

Rpt #: 35012
Date Entered: 12/30/2010

Date Observed: 12/29/2010
Hours in Field:

Entry Type: ARRA

Include in CIR: No

Title:

Room 172 Glovebox Size Reduction Activities

Summary:

The FR observed the pre-job briefing for Room 172 glovebox size reduction activities. Content was extremely thorough to prepare a composite crew comprised of most of the normal work team, supplemented by personnel from other teams.

The FR also observed activities in the field. Several issues/enhancements were identified and provided to oversight personnel present in the field. Senior Supervisory Oversight, a fresh-air experienced Field Work Supervisor, an Industrial Hygienist, and an Industrial Safety Engineer, were all also observing work activities.

Work was suspended due to achieving airborne radioactivity levels that exceeded the void limit of the Radiological Work Permit (see below event discussion).

The FR observed post-job reviews of the work activity - the first to discuss the airborne activity issue and another to discuss issues identified by workers and oversight personnel during the work evolution. FR-identified issues were adequately discussed during the second post-job.

Issue Type: Event

Significance Level: 2

Statement:

Radiological Work Permit (RWP) void limit exceeded during glovebox cutting activities in Room 172.

Discussion:

RWP Z-977 Rev 003 included a Fresh Air/SkaPak void limit of 57,000 DPM (equivalent to 1600 DAC-hrs) airborne radioactivity. While cutting pieces off the back (exposing the internals) of Glovebox 139-3/4 with a circular saw the Radiological Control Technician reported identifying a level of 60,000 DPM on a direct survey of the filter of a fixed head sampler drawing air from the breathing zone of the personnel making the cuts at the back of the glovebox. Work was immediately suspended when the void limit exceedence was identified and personnel proceeded with normal decontamination and undress procedures. Personnel were in double sets of anti-contamination clothing and wearing tight-fitting respirators with supplied air. A maximum contamination level of 12,000 DPM was identified on the anti-contamination clothing of workers and on the work tent's internal surfaces. No contamination was identified on the inner anti-contamination clothing of the worker's and none on their skin or modesty clothing. Nasal smears of the individuals identified less than detectable contamination levels. Counts on lapel samplers worn by the workers identified a maximum level of 0.71 DAC-hrs prior to decay.

A post-job review was conducted after all personnel had exited the work area. It was determined personnel responded appropriately to conditions identified. The FR had no issues with actions taken.

Discussion then centered on what actions could be taken to minimize recurrences. The glovebox being size-reduced had low levels compared to many of the gloveboxes yet to be sized-reduced, so personnel were rightfully concerned that airborne levels need to be better controlled/minimized during future activities. Enhanced use of spot ventilation appeared

to be the primary recommendation, but further evaluation was to occur prior to another attempt to cut. The meeting was well-attended by Safety and Radiological Controls management.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number:
RP	RADCON-RADPRC	WORK	TalrdCntls	9406

Issue Type: Observation

Significance Level:

Statement:

Issues/enhancements were identified for Room 172 size reduction activities.

Discussion:

The following issues/enhancements were identified by the work team and oversight personnel (FR comments made to oversight personnel in the field were included) during the post-job review of December 29 size reduction activities in Room 172:

- There was confusion between the Field Work Supervisor and the Shift Office on the appropriate keys needed to access the room.
- The Conex box used to store material outside the Room 171 entry door was found to be flooded by rainwater.
- Personnel in the cutting tent complained of ringing in their ears despite wearing disposable hearing protection specified.
- The protective plastic hoods worn over the respirators had holes or did not fit correctly.
- The worker replacing saw blades removed his HexArmor gloves to provide dexterity.
- Some problems were experienced with the tight fit of the pass through port liner.
- A table used to wrap cuttings was not anchored and pressed against the side of the tent while wrapping activities were performed.
- The containment over the Solid Waste Box was bungeed in a way that pulled plastic and cords into the face and head areas of the workers trying to utilize the containment gloves.
- Additional knee pads were warranted.
- Attention to hose management, especially around saws was discussed.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number:
RP	RADCON-RADPRC	WORK	TalrdCntls	9407



OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Sandy Trine

PFP

Rpt #: 36775
Date Entered: 04/07/2011

Date Observed: 04/07/2011
Hours in Field:

Entry Type: Routine Oversight

Include in CIR: No

Title:

Unexpected Conditions Encountered While Installing Anchors in Room 235B

Summary:

In the afternoon on April 7th the FR was informed that after starting to drill a 4.75 inch hole in the wall on the south side of room 235B mezzanine level, the drill bit very quickly came to area with minimal resistance. Nearly the full length of the nine inch bit went into the wall. The SOM was notified. The area in 235B was posted with a stop sign. Drill and bit were left as is with the drill bit in the wall. The drill was unplugged. Current conditions are judged to be safe.

The wall was estimated to be eight inches thick. Room 230C is on the other side of the wall. All of RMC line including 230C was posted as an ARA because of the loss of radioactive contamination control that occurred in room 263 on April 6th. Thus, the investigation following the event did not include entry into 230C to see if the drill bit had penetrated through the wall. Representatives from the 235 B work team convened with cognizant engineers. Based on drawings it was postulated that the drill bit went into the E-3 Duct for room 230C. It is not known at this time why the location of the duct was not determined prior to drilling. Task 16 in work package 2Z-10 0652 Remove HA-28 (attached to database record) had a note at the beginning of the task stating, "A design/engineering review was performed for the installation of expansion anchors in the Room 235B south wall (at the mezzanine level). Drawings were reviewed, a walk down was performed and a scan of the three locations (see pictures below) was performed. There are electrical panels on the opposite side of the wall but only a 4¾" embedment is needed in the 8" wall. The only obstruction embedded in the wall is rebar." The proposed path forward is to remove the drill bit and patch the wall. The details of this path will be worked out with radiological control personnel, operations and engineering prior to execution.

The purpose for drilling the hole was to install anchors in the wall for one of three brackets. The brackets were to be used to support a beam. Support of the beam will allow removal of pipe columns. The drill in use had a "Stop Box". Per discussion with PFP personnel and review of the work package, a "Stop Box" stops the drill motor if drill bit comes into contact with a conductor. This should prevent penetration of electrical panels, ducts or rebar. The FR has been told that the E-3 duct penetrated was part of the original concrete pour and consequently there was no metal in the portion penetrated.

All information in this report should be considered preliminary and subject to change. If you have any questions please contact me on 509-372-2346.

Images for Activity:

Image 1

Issue Type: Event

Significance Level:

Statement:

Drill penetrated deeper than expected during installation of anchors in room 235B.

Discussion:

See Summary section above

Funct. Area:

Trend Code:

ISMS Funct.:

Causal Code:

MT

MAINT-PLNG

WORK

IDStd

Issue Number: 9777

Title:

PFP Radiological Work Planning Follow-Up

Summary:

The RL RadCon Manger and RadCon SME attended a contractor briefing on the work planning enhancements for PFP RMA/RMC work. The actions discussed were developed in response to RL's recent PFP radiological work planning surveillance. Overall, the items and actions discussed should provide better radiological hazard control once fully implemented.

The items presented included:

- Additional staffing and resources;
- The radiological engineering enhancements including the new Technical Evaluation (Tech. Basis);
- Incorporation of specific radiological controls, the elimination of vague controls and inappropriate work flexibility in work packages; and
- Conducted additional research, characterization, history and process understanding of the RMA/RMC equipment and areas.

There were no issues identified from this activity.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

38543

07/20/2011

07/19/2011

2.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Executive Safety Review Board (ESRB) Rooms 230C and 235B Contamination/Uptake Event

Summary:

A PFP facility representative and an RL Radiological Control SME observed the contractors ESRB for the subject event. Overall, the review and interchange observed was adequate for the stated ESRB role. The ESRB oversees and monitors the effectiveness of programs and processes associated with Safety Management Programs, Quality Assurance Program, Integrated Safety Management System (ISMS)/Environmental Management System (EMS) implementation activities and the Price-Anderson Amendments Act (PAAA) program.

The project D&D manager provided a presentation that included background information, a brief timeline of the event, root causes, contributing causes, and actions taken. During the presentation, contractor participants asked questions and added additional actions to address the event. In particular the participants, discussed the need to evaluate and institutionalize the process improvements; and that additional run time is needed to evaluate the effectiveness of the currently completed actions.

There were no findings or observations from this activity.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe DemersRpt #:
38219Date Entered:
06/30/2011**PFP**Date Observed:
06/30/2011Hours in Field:
4

Entry Type: Routine Oversight

Include in CIR: No

Title:

Work Planning and Execution Follow Up

Summary:

An RL RadCon SME visited the facility in follow up on ongoing improvement actions. Part of the visit, included discussion on upcoming work, recent changes and events with the facility representatives (FR). The SME also met with the contractor's point of contact (POC) overseeing the improvement actions. The contractor's POC provided information on the improvement plan and information on an independent assessment being done to evaluate the improvements to date.

There were no new issues identified during this activity and RL continues to monitor the contractor's improvement activities.

OpAware: Project/Issue Detail**Plutonium Finishing Plant Project****Joe Demers**Rpt #:
37168Date Entered:
04/28/2011**PFP**Date Observed:
04/27/2011Hours in Field:
3.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Room 172 RWP Airborne Radioactivity Limit Exceeded

Summary:

The Facility Representative, RL RadCon Manager, and RadCon SME attended the contractor's "informal post job review" in response exceeding the RWP limit. The post job review tool, while valuable, was not effective at documenting the events leading up to, and/or causing the airborne radioactivity problem leading to the work exceeding the RWP. A fact finding or critique type process would provide a better tool to diagnose upset and unplanned events, such as this.

On 4/26/2011 while preparing a glovebox for size reduction the "traveler" air sample exceeded the RWP limit (57000 dpm/sample roughly 1600 DAC-h, 0.16 DAC-h w/respiratory protection, PF=10000). The RCT stopped the work and the work team exited the area. The room 172 team had to prepare the glovebox as a lead overlay had not been removed, the glove ports had not been properly deactivated and the PBS fixative coating was less than adequate. During the meeting, the team indicated a weakness in how gloveboxes were prepared once they were no longer considered for low level disposal. The problems discussed included less than desired decontamination, inconsistent PBS fixative application and some deactivation tasks not completed.

As noted the meeting did not identify a specific cause but did result in actions that the team felt would mitigate future problems. However, the limitations of the post job review process limit the likelihood of identifying causes and developing effective solutions. Work planning process deficiencies from this event will be captured in the ongoing RL surveillance report of PFP work planning.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36856

04/13/2011

04/13/2011

5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Room 263 Transfer Line Decontamination, Recovery

Summary:

The Facility Representative and RadCon SME observed the pre-job and PPE don/doff walkthrough for room 263 recovery and decontamination work. Overall the pre-job was adequate and the PPE don/doff walkthrough was a good practice as the work involves a non-standard PPE set and use of SCBA respiratory protection. In addition, the work team had been supplemented with an individual who provides respiratory training on SCBAs, who provided an SCBA refresher briefing to the work team.

The work plan is arranged into three phases: Phase 1, primarily RadCon characterization, surveys and set-up; Phase two, consists of spill neutralization, decontamination, and separation (and re-sealing) of the pipe from the glovebag; Phase three, consists of moving and packaging the pipe in an SWB box, and final decontamination/survey for down posting.

After the PPE don/doff walkthrough and the SCBA briefing, the team discussed the work to determine how much of the work would be practical for the remainder of the day. With input from the team, the Field Work Supervisor decided that working through Phase one would be appropriate and working the remaining phases starting the next day.

There were no findings or observations noted, however the surveillants will continue to observe the recovery efforts as they progress.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36614

03/30/2011

03/30/2011

5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Pre-Job Briefings 145 Glove Box Surveys and 232A Hot Tap Installation

Summary:

As part of the surveillance of radiological work planning, the surveillants observed pre-job briefings for A-Labs glove box surveys and for installation of hot taps in room 232A.

The first pre-job observed covered radiological surveys of the room 145 glove box. The field work supervisor (FWS) conducted the brief using a checklist to ensure that appropriate topics were covered. Work activities for the day were to conduct radiological surveys to identify highly contaminated areas such as window gaskets. The lead RCT covered the RWP and associated controls and updated the current radiological conditions. Overall, the hazard briefings adequately covered the work activity's hazards. The FWS discussed recent activities, lessons learned (specifically a critique of a

contamination spread (HCA levels) in another part of the facility. Overall, the FWS adequately addressed scope of work, the work location, crew assignments, limitations on the work, hazards, controls and emergency response

The second pre-job survey addressed installation of 3 hot taps in room 232A. This was a partial release of the associated work package to permit the installation only, no cutting or draining was released. Following the recently revised pre-job checklist, the FWS covered the scope of work, the work location, crew assignments, limitations on the work, hazards, controls and emergency response. To address the radiological controls, the lead RCT reviewed the RWP with the work team. While the RWP was adequately covered, details on the current radiological conditions (dose rates, and contamination levels) were not discussed. Frequent public address (PAX) announcements interfered with the briefing. During the first part of the brief, the briefing participants continued discussions while the announcement was in progress. This made hearing the brief difficult.

Findings and observations from this OA activity will be captured in the formal surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36612	03/30/2011	03/29/2011	3.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Work Planning, Scoping Meeting & Walk Down for Glove Box 179-9

Summary:

The surveillant observed the work planning/scoping meeting and walk down in preparation for glove box drain line separation/removal. Activities associated with the work include, developing/implementing portable ventilation system (engineered to function as an open face hood), measuring/validating airflow, establishing contamination controls, and unbolting/removal of the drain pipe assembly.

During the meeting the team discussed the vent enclosure design, specific types of filtration, capture velocity, and how to measure effectiveness quantitatively. In addition to the design discussion, the team discussed physical limitations on the work process of removing the bolts, moving the flange and pipe system. The team also discussed safety considerations and contamination controls needed to remove the system after the pipe was removed. Based on questions that came to light in the meeting, the team decided that they would adjourn and conduct a walk down for the system.

After the meeting, the FWS conducted a briefing and the lead RCT briefed the team for room 179 entry. The team entered the room and observed the glove box and drain configuration. Craft had assembled much of the enclosure and put most of it in place. The glove box is very close to the floor and the amount of space to manipulate the flange bolts is limited. During the entry, craft supporting the walk down established HEPA ventilation and the RCTs performed smoke tests, which showed the airflow was going into the test enclosure. The craft then constructed an additional spacer to better control the airflow. Again the RCT smoke tested the assembly and visually it appeared to work more effectively. The team discussed their path forward to finalize the physical design and perform anemometer flow rate tests to finalize and approve the ventilation system.

Findings and observations from this OA activity will be captured in the formal surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

Rpt #:

36608

Date Entered:

03/30/2011

PFP

Date Observed:

03/29/2011

Hours in Field:

3

Entry Type: Routine Oversight

Include in CIR: No

Title:

Pre-Job Brief Room 145 Glove Box Decontamination

Summary:

As part of the surveillance of radiological work planning, the surveillants observed pre-job briefings for A-Labs glove box Pro-Rad decontamination activities.

The work scope supports efforts to clear the glove box for disposal as low level (SCO) waste. The field work supervisor (FWS) conducted the brief using a checklist to ensure that appropriate topics were covered. Work activities for the day included, use of Pro-Rad decontamination agents inside the enclosure focusing on highly contaminated areas such as window gaskets. The FWS addressed the chemical hazards of the decontamination agents and precautions for use. A lead RCT covered the RWP and associated controls. Overall, the hazard briefings adequately covered the work activity's hazards. The lead RCT appropriately specified extremity dosimetry (finger rings), however the RWP did not include them as required. The RCT stated that he had requested an RWP revision to include extremity dosimetry approximately one week prior but the RWP had not been revised. As the brief progressed the FWS discussed recent activities, lessons learned (specifically a discovery of contamination (HCA levels) and suspect liquid.

Findings and observations from this OA activity will be captured in the formal surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

Rpt #:

36554

Date Entered:

03/28/2011

PFP

Date Observed:

03/28/2011

Hours in Field:

4

Entry Type: Routine Oversight

Include in CIR: No

Title:

Scaffold Removal and MWT Pre-Job Briefings

Summary:

The surveillant observed pre-job briefings for work in room 228B in support of glove box removal. The first pre-job covered craft that would be dismantling one scaffold and moving a second out of the room. The second job briefed consisted of sheet metal workers taking measurements under a minor work ticket (MWT) to fabricate metal plates to protect the floor.

In both briefings, the FWS did a good job covering the work scope, the hazards associated with the work, including the radiological hazards. The project has noted paint damage to the floor that has resulted in contaminated paint chips. The field work supervisor (FWS) noted this to the work crew and stressed the need to use the RCT support if kneeling would be needed. The FWS effectively used the pre-job briefing checklist and covered appropriate details, including adjacent work, human factors, lessons learned and emergency response. RadCon and the FWS did a good job discussing the current radiological conditions in the work space and RWP void limits.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36500	03/25/2011	03/25/2011	6

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Qualification Implementation (PBS-11/PFP)

Summary:

The surveillant reviewed the radiological work planning qualification process. In addition the surveillants interviewed the project radiological control work engineers who plan radiological work. Finally the surveillance team looked at organization structure and roles/responsibilities for the radiological engineers.

Radiological work planner qualification consists of classroom instruction, satisfactory performance of OJT/OJE training and final authorization by the individual's Radiological Control Manager.

The class room portion of the qualification requires Radiological Worker 2 training as a prerequisite, and is approximately 6-9 hours in length. Course materials include objectives that focus on the physical processes of planning work, e.g. completion of required steps and correct documentation of radiological screening and ALARA Management Work Sheets. In addition, the classroom training provides the trainee with basic knowledge of the work planning process. Following the classroom instruction, individuals complete the OJT/OJE, which provides the opportunity to practice work planning and demonstrate competency using simulated planning scenarios.

Overall, the process is not designed or intended to "teach" how to do work planning. Rather the training presumes that the participants have existing knowledge and understand the work planning process. As a result, the information reviewed does not indicate how an individual learns radiological work planning skills, such as estimation of airborne generation during work.

CHPRC implements this training project wide, including the PBS-11/PFP project. Additional review of radiological control work planner qualification is a part of the ongoing surveillance at the PFP facility. Findings and observations relating to the radiological work planner qualification process will be documented in the PFP work planning process surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36467	03/23/2011	03/23/2011	9

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning Oversight Activities

Summary:

As part of the radiological work planning process surveillance, the surveillant observed 2 field activities:

1. The contractor held pre-job briefing for glove box HC-4/4 separation, and
2. HF piping removal preliminary scoping meeting and field walk down.

The surveillant and facility representative observed the pre-Job. The Field Work Supervisor (FWS) lead the pre-job meeting. As parts of the work had been previously worked by the same crew and for efficiency, he held the pre-job in two parts. First, a tailgate pre-job for RadCon and Operations to enter to prepare the area and second the full work scope for the glove box separation. Overall, the FWS did a good job covering the work scope as planned and discussed the staging of support resources, e.g. jack stands, lift tables. Discussion by the FWS indicated that there were some challenges in the separation due to the need to raise/lower and move the box during the separation and that some of the details would need to be planned in the field. During the pre-job, RadCon briefed on the RWP (Z-864, Rev 55) and discussed the discovery of high levels of contamination found on a stud during bolt removal. Current radiological conditions, such as dose rates and contamination levels were not discussed further. The RWP provides for entry into multiple radiological hazards, e.g. CA, HCA, ARA, RA, and RadCon discussed the void levels for each type of entry. The FWS did a good job in discussing what if, human factors, and emergency response.

In the afternoon, the surveillant observed preliminary scoping meeting and field walk down for HF piping removal. The team first met and discussed the area, scope of work, RWP, and reviewed pictures of the pipe/work area. After the meeting the team entered PFP's duct level and physically inspected the work area, scope and interferences. Participants included appropriate craft, engineering, work planner, FWS, lead RCT and radiological engineer. The team identified hazards, such as a previous HNO spill residue, and obstructions such as conduit and piping. Overall, the walk down represents the first opportunity to scope the work and begin the planning process.

As the surveillance team is conducting an ongoing process surveillance at PFP. Findings and observations from this surveillance will be captured in the final surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers
PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36398	03/21/2011	03/21/2011	4.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

RCT Morning/Safety Meeting and A-Lab E-4 Pipe Duct Removal/Disposal

Summary:

As part of the work planning process surveillance, the surveillance team observed the RCT morning/safety meeting and the pre-job for Rm-145 vent duct removal. The RCT meeting covered the weekly safety topics and a brief on electronic dosimetry. Following the safety topics, the Duty RCM announced job assignments.

The pre-job meeting started at approximately 8:00 and lasted just over an hour. Three RCTs attended the pre-job in support of the following scope: work site walk down, air curtain removal, smoke testing, and removal of E-4 duct pipe and isolation valve. Workers attempted to do this work the previous day but had questions regarding the method used to support the pipe during the removal. Based on information discussed at the pre-job, there were questions regarding the weight of the E-4 duct pipe, which could not be resolved on the previous day. The DA (engineer) who was present at the pre-job stated that the pipe was schedule 10 and the total weight of the pipe was around 70 pounds. In addition to the weight question, the pre-job also indicated questions regarding air flow. To address this question, the RCTs would perform smoke tests during the initial entry. During the pre-job the work team finalized the following details of the work scope:

- Support for the E-4 pipe using two pipe stands
- Support for the isolation valve using a Genie lift
- Use of lifting straps and a boom (if one can be found) to move the isolation valve
- The use of sleeve, clamp and unbolt technique for disconnecting from the E-4

The lead RCT reviewed the RWP for the work and included recent radiological conditions providing contamination levels, and dose rates (gamma and neutron).

The surveillance team is conducting an ongoing process surveillance at PFP. Findings and observations from this surveillance will be captured in the final surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36391	03/21/2011	03/15/2011	2

Entry Type: Routine Oversight

Include in CIR: No

Title:

AJHA 2736-ZB ADS Removal and Disposition

Summary:

The surveillant observed the AJHA for the subject work. This meeting finalized previous AJHA work done and included the subcontractor personnel who will be doing a portion of the job. The work strategy included issuing a minor work ticket, to do Be and radiological surveys, prior to release of the work package. This will allow time to obtain Be results before the start of the ADS work.

This activity is part of an ongoing process surveillance at PFP. Findings and observations from this surveillance will be captured in the final surveillance report.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36241	03/11/2011	03/09/2011	4

Entry Type: Surveillance

Include in CIR: No

Title:

Radiological Work Planning Meeting

Summary:

As part of the work planning process surveillance, the surveillance team observed an in-progress work planning meeting for the room 172 size reduction work (chop shop). The meeting was held to discuss changes to the work instruction to include radiological controls. Contractor staff at the meeting included, the FWS, D&D project manager, RCTs, craft (NCOs), radiological engineering and the work planner.

Specific work scope and controls discussed included:

- The need to effectively plan the use of tent and local ventilation,
- Precautions on size reduction of E-4 duct and flange/gaskets,
- The need to minimize debris inside the equipment being size reduced to minimize airborne generation,
- Problems with some tooling and engineered controls,
- Documenting radiological controls within the work instruction,
- Duty RCM approval for open glove box work, and
- Size reduction of large glass panels

The surveillance team is conducting an ongoing process surveillance at PFP. Findings and observations from this surveillance will be captured in the final surveillance report.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36188	03/09/2011	03/08/2011	8.5

Entry Type: Surveillance

Include in CIR: No

Title:

PFP RadCon Work Planning Process Field Walk Down and AJHA Observation

Summary:

The surveillants observed two Automated Job Hazard Analysis (AJHA) meetings and participated in one field walk down. This is the second phase of the process surveillance of radiological work planning at PFP.

The first AJHA was removal of WT-1 transfer lines from room 263 to room 262. The work planner provided an overview of the system and that history indicates that the lines were probably never used. However, the work was being planned to verify this and to verify that they contained no liquid, (using ultrasonic detection). Work activities discussed included applying hazard controls (containment/ventilation), removing pipe end caps, pipe cutting and ultrasonic testing. The meeting completed the preliminary hazard identification portion of the AJHA and proceeded to work through the combined hazard analysis. During the combined hazard section, the work team discussed an alternate approach, uncapping the ends first allowing glove box E-4 ventilation to be used. After good discussion the FWS agreed that the alternative process should be developed and used. Overall, the activity was very good with good participation and open discussion by the team. Given the change in work process, the planner concluded the meeting until the package can be changed to reflect the new process.

The second activity consisted of the AJHA walk down and subsequent AJHA meeting for preparing glovebox HA-46 for D&D in room 232. The work team gathered, ACE'd in and conducted the walk down. Overall, the walk down was effective. Noise in the work area (room 232) interfered with the discussion but the FWS took action to ensure that the team heard the discussion. The walk down provided insight into the fixative application (temporary light), the criticality tank removal (attachment method, cutting and access/removal), and E-4 exhaust removal (support methods, cut/size reducing and lifting). After the walk down the team met and developed the preliminary hazard list portion of the AJHA. Based on the preliminary hazard section, follow up actions were assigned to the required SMES for analysis and document development.

The surveillance team is conducting a process surveillance at PFP. Findings and observations from this surveillance

will be captured in the final surveillance report.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36186	03/09/2011	03/07/2011	6

Entry Type: Surveillance

Include in CIR: No

Title:

PFP RadCon Work Planning Process HRB and AJHA Observation

Summary:

The surveillants observed a Hazard Review Board (HRB) meeting and an Automated Job Hazard Analysis (AJHA) meeting. This is the second phase of the process surveillance of radiological work planning at PFP.

The HRB meeting was chaired by the D&D manager and conducted using a graded approach. The D&D manager determined that the task, isolation and removal of mercury lines, was similar work and done previously and was done on a small scale. The meeting included two FWS(s), the work planner, a work planning lead, the HRB coordinator and the D&D manager (chair). The chair guided a question/answer session leading to the development of actions needed to approve the start of work. These actions included walk down of the new Variac vacuums, mentoring of one of the FWS by the other, and an action to verify the compatibility of the collection containers.

The surveillance team also observed the AJHA for HA-46 process cell isolation (room 232-A). Due to the hazardous and confined nature of the work area, the work planner provided a set of pictures of the area and components involved in the work. Work activities discussed included hot tapping, draining system piping cutting, coupon sampling and air gapping lines. The IH representative was not in attendance and worker questions regarding the potential chemical contents could not be fully addressed. The team discussed the presence of potassium hydroxide residue on the cell floor. Radiological data discussed indicated that one wall had readings greater than 600,000 alpha, (above the range of the PAM used). The meeting completed the preliminary hazard identification portion of the AJHA with actions and follow up assigned based on the areas marked "yes" or "don't know."

The surveillance team is conducting a process surveillance at PFP. Findings and observations from this surveillance will be captured in the final surveillance report.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36182	03/09/2011	03/02/2011	4

Entry Type: Surveillance

Include in CIR: No

Title:

Radiological Work Planning FWS Interviews

Summary:

The surveillants interviewed two Field Work Supervisors (FWS). The interviews were designed to gather data on FWS participation in the work planning and implementation process. The surveillants used a structured question process for the interview.

The surveillance team is conducting interviews of a statistical sampling of the FWS at PFP. Data from the staff interviews supports the process surveillance of radiological work planning at PFP. Findings and observations from this surveillance will be captured in the final surveillance report.

OpAware: Project/Issue Detail**River Corridor Project****Joe Demers****PFP**

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36180

03/09/2011

03/01/2011

8

Entry Type: Surveillance

Include in CIR: No

Title:

PFP Radiological Work Planning

Summary:

This activity consisted of observing an ALARA post-job review. The contractor called the review to go over a potential radiological intake, based on positive nasal smears. The FWS lead the meeting using the ALARA Post-Job check-list. The use of this checklist did not appear to be helpful to developing a time line or facts related to the event. At the conclusion of the meeting the cause of the positive nasal smears had not been determined. The contractor stated that they will have to follow up with the RCT, who was not available and gather data in the area to further investigate the event.

In addition the surveillants observed an informal work planning meeting for A-Labs. The meeting participants discussed the proposed process to obtain data from inside of pipe. An RCT had questions regarding the radiological controls specified, which lead to the meeting. The work team, including the FWS and Radiological Engineer concluded that appropriate controls would be to use a sleeve, with HEPA vacuum to make a small cut in the sleeve and use a Q-tip to gather gross radiological data.

These activities are part of the ongoing surveillance of radiological work planning at PFP. Findings, observations and results will be further evaluated and captured in the final surveillance report.

OpAware: Project/Issue Detail**River Corridor Project****Joe Demers****PFP**

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36059

03/02/2011

02/24/2011

3.5

Entry Type: Surveillance

Include in CIR: No

Title:

PFP Radiological Work Planning Ventilation Design Authority Interview

Summary:

The surveillants interviewed the project's ventilation design authority. This interview provided data on the process used to perform engineering review and analysis of ventilation at the facility as an engineered control.

This effort is in support of the ongoing oversight process audit of the contractors work control process.

Overall, the interview went well and provided data supporting this process audit. However, follow up is needed to review engineering review and calculation relative to the use of localized ventilation as an engineered control. There were no findings or observations directly from this activity.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35973

02/24/2011

02/23/2011

9

Entry Type: Surveillance

Include in CIR: No

Title:

PRP Radiological Work Planning Process Interviews

Summary:

The surveillants interviewed the PRC Worker Protection Programs Director, three PFP line work planners and one lead RCT. Interview of the PRC Worker Protection Programs Director provided information on the central program involvement in the ongoing work at PFP project. Interviews of the PFP work planners provide data on the process used to development work documents and hazard analyses in support of facility activities. Finally, interviews of Lead RCTs provide additional information on the planning and hazard control process.

This effort is in support of the ongoing oversight process audit of the contractors work control process.

Overall, the interviews went well and provided data supporting this process audit. There were no findings or observations directly from this activity.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35971

02/24/2011

02/22/2011

8

Entry Type: Surveillance

Include in CIR: No

Title:

PFP Radiological Work Planning Process

Summary:

The surveillants interviewed four PFP line work planners. The PFP work planners provide development of work documents and hazard analysis in support of the facility activities. Interviewees included one lead work planner and three D&D work planers. This effort is in support of the ongoing oversight process audit of the contractors work control process.

Overall, the interviews went well and provided data supporting this process audit. There were no findings or observations directly from this activity.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
35921	02/23/2011	02/17/2011	4

Entry Type: Surveillance

Include in CIR: No

Title:

PFP Work Control Assessment RC Meeting and Work Control Manager Interview

Summary:

The surveillants observed the PFP morning radiological control meeting and interviewed the PFP line work control manager. This effort is in support of the ongoing oversight process audit of the contractors work control process. The PFP work control manager provides functional oversight and direction to the line work planners.

Overall, the morning meeting and interview went well and provided data supporting this process audit. There were no findings or observations directly from this activity.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
35920	02/23/2011	02/16/2011	5

Entry Type: Surveillance

Include in CIR: No

Title:

PFP Work Control Process Assessment

Summary:

During this activity the surveillants observed the PFP morning radiological control meeting and interviewed two radiological control supervisors. This effort is in support of the ongoing oversight process audit of the contractors work control process. Overall, the morning meeting and interviews went well and provided data supporting this process audit.

There were no findings or observations directly from this activity.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35810

02/15/2011

02/15/2011

5

Entry Type: Surveillance

Include in CIR: No

Title:

Radiological Work Planner and RadCon Supervisor Interviews

Summary:

The surveillance team interviewed the third radiological work planner/radiological engineer and one RadCon supervisor assigned to PFP. The lines of questioning used inquired about their background, training qualifications, experience, work planning process and documentation requirements.

The results of the interviews will support the final process mapping and help gather objective evidence supporting the work planning process surveillance.

OpAware: Project/Issue Detail

River Corridor Project

Joe Demers

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35808

02/15/2011

02/14/2011

5

Entry Type: Surveillance

Include in CIR: No

Title:

Work Planning Process Surveillance, Radiological Work Planner Interviews

Summary:

The surveillance team interviewed two of the three radiological work planner/radiological engineers assigned to PFP. The lines of questioning used inquired about their background, training qualifications, experience, work planning process and documentation requirements.

The results of the interviews will support the final process mapping and help gather objective evidence supporting the work planning process surveillance.



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

37304

05/06/2011

04/27/2011

16

Entry Type: Routine Oversight

Include in CIR: No

Title:

Actions taken during response to a continuous air monitor (CAM) alarm in Rooms 230C and 230B on April 27, 2011

Summary:

On April 27, 2011, workers were placing and securing a metal plate to the horse-tailed end of a section of glovebox/conveyor in Room 230C when a CAM alarm occurred. The CAM alarms initiated in Room 230C, followed very quickly by another CAM alarm in Room 230B (the room immediately "down wind" of the 230C airspace.) This OA entry describes recovery actions taken on swingshift after affected personnel were surveyed out of the area, and the 230C airspace was ready for reentry.

Issue Type: Observation

Significance Level: C

Statement:

Casualty response actions and subsequent recovery activities to respond to CAM alarms in Rooms 230C and 230 B were not adequately planned, although the work team compensated for the lack of planning and adequately performed recovery actions.

Discussion:

On Wednesday, April 27 swing shift, the surveillant attended the pre-job briefing and accompanied the responders into Room 230 C for the CAM alarm response this evening. The work crew waited until about 7:00 PM for the pre-job briefing. The briefing was thorough. However, only hand-written instructions in a work package (2Z-10-6367, "Recovery Plan for Areas Exceeding BWP/RWP Limits," which provides a package for this recovery plan) provided any direction for posting, reentry, surveys to find the source, containment of the source, and decontamination/removal of the room from ARA/HCA status.

The work instruction for this activity stated, in total: "Perform the following to restore Rooms 230C, B, A, 228C doing the following, Post Areas, Change Cams and Fixed heads, surveys, Pull onion skins, waste cleanup, stop source/decon."

These work instructions were not adequate to direct the actions of the work team. The surveillant communicated this issue to the RadCon FLM present at the briefing.

Because of the lack of written guidance, the briefing was essentially a work planning session. During the briefing, the workers discussed and decided where to enter C Line; whether or not to respond to the CAM alarm in 230B on this entry, and if so whether to respond to 230B first or 230C first; how to egress the area (where to drop the outer pair of PPE); whether or not to use a CAM, and if so, at what alarm set point.

The work team came up with a good plan during the pre-job briefing, but the plan was not defined in the work instructions.

The surveillant accompanied the work team on their response. They demonstrated good contamination control, found the source of contamination (the partially sealed end of the glove-box conveyor assembly), sealed the source of contamination (maximum levels of 12,000 dpm/100 cm2 removable), and decontaminated the work area. The work team

did a good job in the room despite the lack of adequate work instructions.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	CONOPS-PROCS	DEFINE	TalrdCntls	Issue Number: 9884

Issue Type: Finding

Significance Level: 2

Statement:

PFP Management did not follow all procedure requirements of Casualty Response Procedure ZCR-001, "Continuous Air Monitor Alarm," Revision A, Change 9 during response actions for continuous air monitor alarms in Rooms 230C and 230B on April 27, 2011.

Discussion:

The surveillant reviewed actions taken during response to a continuous air monitor (CAM) alarm in Rooms 230C and 230B on April 27, 2011. Casualty Response Procedure ZCR-001, "Continuous Air Monitor Alarm," directs Facility Emergency Response Organization (FERO) actions for response to CAM alarms. One of the Immediate Actions of the procedure requires the Radiological Control Organization to respond per procedure ZRC-100-009, "Continuous Air Monitor Alarm Response for Breathing Air."

Plutonium Finishing Plant Radiological Controls Technical Procedure ZRC-100-009, "Continuous Air Monitor Alarm Response for Breathing Air," Revision C, Change 8, Follow-up Actions, Section 2 provides directions for responding to a CAM alarm such as those occurring in Rooms 230B and 230C. The procedure includes provisions for special tools and equipment needed for the response, and directions to perform surveys, exchange CAM filters and fixed head air samples (FHAS), obtain grab air samples, and perform calculations and report results.

Instead of using this procedure for these actions, PFP management utilized work package 2Z-10-06367, "Recovery Plan for Areas Exceeding BWP/RWP Limits." This work package/recovery plan did not reference ZRC-100-009 or contain directions for responding to a CAM alarm. Section 1.1, Purpose, of the work package states, "The purpose of this work package is to assist in the decontamination controlled areas that exceed the beryllium work permit (BWP) limits and/or the radiological work permit (RWP) limits." No mention is made of CAM alarm response anywhere in the work package.

During discussions with PFP Shift Operations Manager, Radiological Control Management, and the ESH Manager, no rationale was provided for not using ZRC-100-009, and the interviewees did not know why the work package was used in place of the response procedure. Failure to provide instructions to workers responding to a confirmed spread of surface and airborne radioactivity could lead to personnel skin and internal contamination. In this case, the experience of the two Lead RCTs assigned to the overtime task led to a safe reentry.

Requirements:

Plutonium Finishing Plant Surveillance Casualty Response Procedure ZCR-001, "Continuous Air Monitor Alarm," Revision A, Change 9, Immediate Actions states, in part:

"RESPOND per procedure ZRC-100-009, Continuous Air Monitor Alarm Response for Breathing Air."

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
ER	CONOPS-PROCS	WORK	OpExcel	Issue Number: 9885

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
37025	04/22/2011	04/21/2011	4

Entry Type: Routine Oversight

Include in CIR: No

Title:

Observed swing shift work activities cutting E-4 piping to separate glovebox 179-9 from the E-4 system using Work Package 2Z-10-04397, "Removal of Gloveboxes GB-179-6 and GB-179-9."

Summary:

On April 21, 2011, the surveillant observed swing shift work activities to cut and remove glovebox 179-9 from the E-4 system using Work Package 2Z-10-04397, "Removal of Gloveboxes GB-179-6 and GB-179-9."

The pre-job briefing was performed and adequately addressed the scope of work. The scope of work for the pre-job briefing was as follows:

- Post Room 179 as an Airborne Radioactivity Area (ARA).
- Shut E-4 dampers to reduce differential pressure between Room 179 ambient pressure and the E-4 system pressure.
- Cut the approximately 4 ½" OD E-4 Exhaust piping from glovebox 179-9 using a sawzall in the installed and certified glove-bag containment.
- Remove the clamps at the flange holding the E-4 pipe in the glove-bag containment from the E-4 pipe ceiling penetration.
- Horsetail the glove-bag from the E-4 Exhaust ceiling penetration, leaving a seal-out stub. Cover and tape in place a metal blank over the stub.
- Horsetail the glovebox from the E-4 Exhaust pipe remaining on glovebox 179-9. Cover and tape in place a metal blank over the stub.
- Return E-4 system vacuum pressure to normal specifications using glovebox 179-4 differential pressure gauge.
- Collapse the glove-bag containment and place into either a 55-gallon drum, or into a Waste Box if too large for the drum.
- Perform air samples necessary to down post Room 179 from ARA status.

The FWS provided directions on work activities covered and discussed Beryllium controls contained in BWP-PFP-PPSL, Revision 2.2. The FWS discussed the need for hearing protection during cutting activities. The FWS and team discussed actions for building fire or fire alarm, criticality, CAM alarm in Room 179 and egress routes. The Lead Radiological Control Technician (RCT) reviewed Radiological Work Permit (RWP) Z-951, Revision 16, governing work activities. The FWS discussed extra precautions necessary for working on the elevated platform needed to access the piping cut area.

The FWS stated that the work package had been modified to remove the requirements for a hold point requiring signatures from Radiological Engineering, Criticality Safety Representative, Fire Protection, and HVAC Design Authority. The signatures in the work package were duplicates of the signatures already provided for the containment design per ZO-170-300, "Install/Remove Temporary Radiological Containments," included in the work package. The appropriate approvals had been obtained by the FWS to make this change to the work package.

The FWS also discussed the possibility of a blue-green/aquamarine substance being present inside the E-4 system and visible after cutting and removing the section of pipe. If personnel observe this substance, the waste package is to be labeled "Waste Pending Analysis" and segregated from other waste.

The review of the work package and RWP was adequately conducted.

The surveillant observed work activities in Room 179, and observed the work team conducted work activities in accordance with the work package directions. Radiological and beryllium controls were observed. Contamination and dose rate surveys were taken as required. The pipe was cut and removed from the system; no blue-green/aquamarine substance was observed. The glove-bag containment with a section of E-4 pipe, and HEPA vacuum knock-out box were collapsed and placed into the waste drum. Contamination surveys were performed and indicated no contamination escaped the glove-bag containment during the work evolution.

Upon completion of the assigned work activities, personnel egressed the room in an orderly fashion. The requirements of the Beryllium Work Permit, BWP-PFP-PPSL, Revision 2.2, were followed; following hand and foot surveys by the RCT in the room, personnel doffed the boot covers and outer pair of surgeon's gloves per the BWP upon egress of Room 179. The person then donned new boot covers staged for that use in the corridor outside Room 179. The hood and hands of personnel were surveyed in the corridor outside Room 179, and the respirator hood was doffed.

No issues were noted with the pre-job briefing and conduct of the work crew in Room 179.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
37016	04/22/2011	04/21/2011	4

Entry Type: Routine Oversight

Include in CIR: No

Title:

Observed swing shift work activities to install and certify glovebag to cut E-4 piping for Work Package 2Z-10-04397, "Removal of Gloveboxes GB-179-6 and GB-179-9."

Summary:

On April 21, 2011, the surveillant observed swing shift work activities for Work Package 2Z-10-04397, "Removal of Gloveboxes GB-179-6 and GB-179-9."

The pre-job briefing was performed and adequately addressed the scope of work. The scope of work for the pre-job briefing was as follows:

- Install containment glove-bag around a section of glovebox 179-9 E-4 Exhaust near the ceiling penetration to allow sheetmetal workers to cut and separate the glovebox from the E-4 system.
- Smoke test and certify the glove-bag containment.

The FWS provided directions on work activities covered and discussed Beryllium controls contained in BWP-PFP-PPSL, Revision 2.2. The FWS and team discussed actions for building fire or fire alarm, criticality, CAM alarm in Room 179 and egress routes. The Lead Radiological Control Technician (RCT) reviewed Radiological Work Permit (RWP) Z-951, Revision 16, governing work activities. The FWS discussed extra precautions necessary for working on the elevated platform needed to access the piping cut area. The review of the work package and RWP was adequately conducted.

The surveillant observed work activities in Room 179, and observed the work team conducted work activities in accordance with the work package directions. Head knockers were padded in the elevated work area. The glove-bag was installed, smoke tested (with glove-bag installation corrections made as necessary), and certified per ZO-170-300, "Install/Remove Temporary Radiological Containments."

Upon completion of the assigned work activities, personnel egressed the room in an orderly fashion. The requirements of the Beryllium Work Permit, BWP-PFP-PPSL, Revision 2.2, were followed; following hand and foot surveys by the RCT in the room, personnel doffed the boot covers and outer pair of surgeon's gloves per the BWP upon egress of Room 179. The person then donned new boot covers staged for that use in the corridor outside Room 179.

No issues were noted with the pre-job briefing and conduct of the work crew in Room 179.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36969

04/20/2011

04/19/2011

8

Entry Type: Routine Oversight

Include in CIR: No

Title:

Observed Room 262 and 263 entry for decontamination activities per Recovery Plan PFPR-11-09.

Summary:

On April 19, 2011, the surveillant observed work performed to complete remaining equipment (jackstand) containment/removal and decontamination in Room 263 following a previous spill of Pu Nitrate from a transfer line remnant. Work was performed in accordance with PFPR-11-009, Revision 3, "Room 263 Transfer Line Decontamination." The associated Radiological Work Permit (RWP) was Z-314, Revision 48.

The pre-job briefing was performed and adequately addressed the scope of work for the portion of the Recovery Plan being worked on swing shift. The Field Work Supervisor (FWS) provided a summary of the contamination spread event, subsequent actions to neutralize and cover the contamination, previous work to contain and remove the pipe remnant, and explained the role of the work crew in performing the remaining recovery actions.

The scope of work for swing shift was to disassemble the pipe stand, remove and contain the UPP pads, partially decontaminate the covered spill area, then paint the area that had been covered by the UPP pads.

The FWS provided directions on work activities covered in the Recovery Plan and discussed Beryllium controls. The FWS emphasize proper donning and fit of SCBA masks, citing the two recent events when workers lost the seal of their SCBA respirators during decontamination activities in Room 263. The FWS discussed emergency conditions, including for building fire or fire alarm, criticality, CAM alarm in Room 262, and egress routes. The Lead Radiological Control Technician (RCT) reviewed Radiological Work Permit (RWP) Z-314, Revision 48, governing work activities. The review of the Recovery Plan and RWP was adequately conducted.

No issues were noted with the pre-job briefing and conduct of the work crew in Rooms 262 and 263. One positive practice was noted when the FWS asked each person at the pre-job briefing to state what work activity they were going to perform, which room they were going to work in, and what PPE they were required to wear. This positive practice allowed the FWS to ensure each worker (including the surveillant) understood the work activity and safety practices/equipment prior to concluding the pre-job briefing.

The surveillant accompanied the work team into Room 262 utilizing two pair PPE and a PAPR. The work group performed per the FWS instructions and tracked personnel SCBA time upon entering Room 263, and adequately performed required survey, undress, and safe egress of personnel from Room 263 when the SCBA bottle was running low. One of the approximately 12 workers who entered Room 263 exited the room after approximately 10 minutes because he had lost his seal on the SCBA respirator mask. The team adequately surveyed the person and enabled him to egress the ARA promptly. The PFP Duty Radiological Control Manager (DRCM) requested nasal smears of the individual, which were taken and reported to be less than detectable.

No issues were noted with the observed work activity.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36871	04/14/2011	04/13/2011	7

Entry Type: Routine Oversight

Include in CIR: No

Title:

Observation of work activities in Room 642 on work package 2Z-10-1948, "Removal of Contaminated Duct and HEPA Filter Housing in Room 642."

Summary:

On April 13, 2011, the surveillant observed work activities in Room 642 on work package 2Z-10-1948, "Removal of Contaminated Duct and HEPA Filter Housing in Room 642."

The Field Work Supervisor (FWS) conducted the pre-job briefing in 2736-ZB. The scope of the work for swing shift was to certify the glove-bag containment, establish an Airborne Radioactivity Area (ARA) in Room 642, perform a cut of the contaminated ducting in the glove-bag using a porta-band saw, seal out the two pipe remnants and package them as fissile material/TRU waste, collapse and remove the glove-bag containment and package the containment in a waste drum, and safely egress the work area.

The FWS discussed changes in the configuration of Room 642. The normal access door (Door 484) was blocked due to temporary scaffold and access (and emergency egress) from the room will be through Door 488A.

The FWS discussed personal protective equipment (PPE), including safety glasses, safety shoes, ear protection during cutting activities, and the use of leather gloves for drum and pipe handling. This PPE is in addition to the PPE required by the applicable Radiological Work Permit (RWP).

The work area will be posted as an ARA per procedure ZSP-006. The affected airspace for the work includes only Room 642. Procedure ZSP-002 will be used for any fissile material move. The FWS verified with the Shift Operations Office that appropriate controls (e.g., TSRs) are in place to support movement of the fissile material.

The Lead Radiological Control Technician (RCT) presented the requirements of RWP Z-963, Revision 21. PPE requirements, void limits, and other special instructions were adequately presented and discussed. Respiratory protection requirements prescribed were Powered Air Purifying Hood (PAPR) with P-100 HEPA filters.

The FWS discussed beryllium controls, including the requirements of Beryllium Work Permit (BWP) BWP-001 and BWP-002. Should the workers encounter contamination levels exceeding 2,000 dpm/100 cm² the associated BWP level has also been reached.

The FWS discussed emergency response actions for the work area. The facility is a "criticality incredible" facility and does not have criticality alarms. If criticality alarms are activated in 234-5Z, the actions for workers in 2736-ZB are to egress normally, exit the facility and proceed to the facility boundary fence, then follow the fence to the staging area. In the event of a CAM alarm, the next airspace is Room 641. Workers were directed to exit the airspace into Room 641. Fire alarms and other general hazards were discussed at the pre-job briefing.

After the briefing was concluded, workers ACED, obtained respiratory protection and donned PPE. The surveillant observed workers perform the work scope in Room 642. Work was performed in accordance with work package 2Z-10-1948, "Removal of Contaminated Duct and HEPA Filter Housing in Room 642," step 6.4.7 which stated, "Size reduce and remove the normal exhaust line to BFD-25BA at designated locations." The RCTs performed a thorough certification of the glove-bag containment, including smoke testing to verify containment integrity. Workers were observed to wear appropriate PPE throughout the work evolution.

The work crew worked to ensure both ends of the pipe were secure during cutting operations, and other workers held portions of the glove-bag containment to ensure the containment wasn't damaged during work. The ends of the cut pipes were covered with pads and taped in place to minimize/prevent puncture or tears of the glove-bag sleeving during seal-out. The seal-outs of both pipe pieces were performed well, with adequate contamination control (damp rags) and adequate subsequent radiological contamination surveys. After sealing out the pipe, Nuclear Chemical Operators (NCOs) covered the ends of the pipe with metal caps, which were then taped in place to create a "packaged" fissile material pipe. The glove-bag containment was then collapsed with the HEPA vacuum, sealed from the vacuum, and placed into a waste drum. Appropriate radiological surveys were taken during each of these work activities.

Upon completion of work activities in Room 642, personnel egressed the room, performed undress from the PPE, and conducted whole body alpha contamination surveys using a portable alpha meter (PAM). The surveillant observed several contamination surveys, which were performed in accordance with the posted instructions.

No issues were noted during the work activities.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36844

04/13/2011

04/11/2011

4

Entry Type: Routine Oversight

Include in CIR: No

Title:

Post-job review for PFPR-11-009, "Room 263 Transfer Line Decontamination."

Summary:

On April 11, 2011, the surveillant attended the post-job review for PFPR-11-009, "Room 263 Transfer Line Decontamination." The associated Radiological Work Permit (RWP) was Z-314, Revision 46.

Workers entered Room 263 on the morning of April 11 to implement the Recovery Plan. Upon entry to the room, contamination levels were detected 10 to 15 feet from the spill in the 1000 dpm to 5000 dpm/100 cm² range, before reaching levels in excess of 5,000,000 dpm several feet from the spill. The workers reported no CAM alarms in Room 263, and one CAM tracking at approximately 1 DAC. The workers also reported a brownish, honey-thick liquid spill underneath the transfer line that was being worked when the original contamination event (last week) occurred. The liquid is assumed to be Pu Nitrate at potentially greater than gram quantities. The workers exited the area due to exceeding the PAPR contamination void limit of 2M dpm/100 cm² alpha.

During the post-job review the Field Work Supervisor (FWS) discussed the area conditions and worked with team members to determine a path forward. The FWS said he had three primary objectives for the meeting:

1. There is a contamination spread in Room 263 that prevents his team from reaching the leaking pipe. How does the team get to the pipe to stop the leak?
2. Once the team reaches the pipe, what method/containment should the team use to stop the leak?
3. How does the team dispose of the pipe (after the leak is stopped) and decontaminate/contain the spill in Room 263?

The team discussed a plan that would use personnel in SCBA which would increase the contamination void levels per RWP Z-314 to general area alpha contamination of 20 M dpm/100 cm². The team discussed placing absorbant pads over the spill area to allow workers to seal the pipe out from the glove bag containment, double bag the pipe to prevent further leaks, and transport the pipe to a hard storage container on the first floor of PFP in order to stop the spill. This work would be done with staggered entry teams in order to not exceed the air supply of a 60-minute SCBA bottle. In other words, the first team may enter and place absorbant pads and then exit. The second team may then enter and perform the seal-out and then exit. The third team may then complete the job.

The team also discussed chemical hazards from the Pu Nitrate and possible controls, including use of a neutralizing agent for the spill and additional chemical PPE.

The team questioned whether a mock-up for dress/undress should be implemented, similar to the mock-ups used for canyon entry or Room 242 entries. The FWS stated this wasn't necessary, but no final decision seems to be made.

The work team left with the instructions that a recovery plan would be drafted and worked through the various approval authorities to enter and address the work needed in Room 263. Following the meeting, the surveillant and other DOE RL personnel met with CHPRC personnel, including the PFP Radiological Control Manager, the WRPS ESH Manager, and the RC Supervisor for this work and discussed the following:

1. Previous experience with Pu Nitrate and decontaminating the corrugated duct level floor indicates decontamination efforts will not be successful. The use of ALARA paint or shrink wrap previously used on Demisters in the duct level as a containment method for the spill area was discussed.
2. Based on the complexity of the proposed work evolution using several teams to perform the activity, and the need for prompt undress of personnel from a highly contaminated area with a limited air supply, the idea of performing a dry run or mock up to familiarize the workers with the activity and undress process was discussed.
3. Personnel discussed the idea of investigating the use of Hanford Fire Department quick disconnect SCBA bottles for the undress line should the worker require additional air supply.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36781

04/08/2011

04/07/2011

6

Entry Type: Routine Oversight

Include in CIR: No

Title:

Observation of work activities in Room 179 for Work Package 2Z-10-04397, "Removal of Gloveboxes GB-179-6 and GB-179-9."

Summary:

On April 7, 2011, the surveillant observed swing shift work activities for Work Package 2Z-10-04397, "Removal of Gloveboxes GB-179-6 and GB-179-9."

The pre-job briefing was performed and adequately addressed the scope of work. The scope of work for the evening was as follows:

- Ensure ventilation is in specification for GB 9 prior to work
- Remove piece of remnant piping from top of GB 9 using the wet rag and HEPA vacuum contamination control method
- Remove exhaust filters (4) from GB 9.
- After filter removal, SOE will adjust ventilation as necessary to ensure GB 9 is in specification for additional work
- Seal out filters and waste into waste drums.

The FWS provided directions on work activities covered and discussed Beryllium controls. The FWS and team discussed actions for building fire or fire alarm, criticality, CAM alarm in Room 179 and egress routes. The Lead Radiological Control Technician (RCT) reviewed Radiological Work Permit (RWP) Z-951, Revision 16, governing work activities. The review of the work package and RWP was adequately conducted.

The surveillant accompanied the NCO and RCT conducting posting of Room 179 as an ARA per ZSP-006. When complete and after being "ACED" in, the work team gathered necessary PPE and assembled in Room 179. The surveillant observed work activities in Room 179, and observed the work team conducted work activities in accordance with the work package directions. A during job air sample was taken and the air sample head was positioned near the work activity. Proper radiological surveys (including probe distance, speed, etc.) were conducted to evaluate area conditions during the work activity.

The piece of remnant piping was removed per work package step 6.2.9(a) which completed Task 2 of the work package. No contamination was noted during the removal of the remnant piping. The 4 exhaust filters were removed per Step 6.8.2 (Task 8). Upon removal of the HEPA filters, the work crew noticed a blue-green crystalline substance uniformly spread over the horizontal surface of the downstream side of the filter housing. The FWS notified the BED, and the job was suspended pending engineering review of the substance.

Personnel egressed the room in an orderly fashion. The requirements of the Beryllium Work Permit, BWP-PFP-PPSL, Revision 2.2, were followed. Following hand and foot surveys by the RCT in the room, personnel doffed the boot covers and outer pair of surgeon's gloves per the BWP upon egress of Room 179. The person then donned new boot covers staged for that use in the corridor outside Room 179.

No issues were noted with the pre-job briefing and conduct of the work crew in Room 179. Several issues were noted with the Radiological Work Permit governing the activities in Room 179.

Issue Type: Observation

Significance Level:

Statement:

Radiological Work Permit Z-951, Revision 16 did not provide objective radiological criteria for implementing some radiological controls.

Discussion:

The surveillant reviewed Radiological Work Permit (RWP) Z-951, Revision 16 and found several instances where objective, measurable criteria were not provided to the workers for determining when radiological controls were required. Examples include:

- No removable contamination limiting condition or void limits were provided that specified bounding controls for the planned hazards. RWP Z-951 provided only an Action Level and did not contain a Void Limit for contamination levels in the High Contamination Area (HCA).

The RWP Action Level for HCAs stated, "Action: General area removable contamination >20K dpm/100 cm2 alpha or isolated areas of removable contamination >100K dpm/100 cm2 alpha. Contact the DRCM."

Although the Action Level provided in the RWP provided clear numerical parameters, the end-point purpose of the limiting condition (work suspension, work curtailment) was not described or addressed in the work planning process. In this case, neither the RWP nor the work package provided instructions for actions to take (e.g., work suspension, work curtailment, use of additional or different PPE) should these levels be exceeded. No bounding contamination level was provided in the technical work document set.

- Special Instruction 10, bullet 2, states, "Finger rings required for working inside gloveboxes that contain High Rad items and/or handling and packaging High Rad waste." No definition of "high rad" is provided in the technical work documents, nor are numerical dose rate criteria provided for when finger ring dosimetry is required.
- Special Instruction 8, bullet 6 states, in part, "When HEPA vacuum is to be used, HPT shall ensure surfaces (areas where vacuum is to be used) are within the RWP limits prior to use." As noted above, no contamination limits are provided for HCA work, which makes it impossible to determine from the technical work documents the upper, analyzed surface contamination boundary for using the HEPA vacuum.

In addition, FSP-PFP-5-8, Section 14.17, "Control and Use of Portable HEPA Filtered Equipment," step 4.3.2 requires an additional 1st stage in-line HEPA filter between the ventilated area and a HEPA vacuum when the work is in a High Contamination Area or where work involves TRU waste or fissile material (unless justification is provided in the work document with Facility HVAC Engineer approval). Neither the RWP nor work package provides directions to implement this requirement for HEPA vacuum use in a HCA.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	RADCON-RWP	ANLYZE	TalrdCntls	Issue Number: 9786

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36758

04/07/2011

04/06/2011

8

Entry Type: Routine Oversight

Include in CIR: No

Title:

Observation of work activities for recovery of Room 262 following contamination spread.

Summary:

On April 6, 2011, the surveillant observed swing shift work activities for re-entry and decontamination of Room 262 following a contamination spread on dayshift.

The pre-job briefing was performed and adequately addressed the scope of work for the Recovery Plan. The Field Work Supervisor (FWS) provided a summary of the contamination spread event, and explained the role of the work crew in performing recovery actions for that event. The scope of the work for swing shift was to implement recovery actions in Room 262 only, including performing surveys and decontamination to enable Room 262 and the associated air space to be down posted from Airborne Radioactivity Area (ARA) status. The work team was also directed to ensure the ARA postings were correctly implemented for maintaining Room 263 and the associated airspace as an ARA per ZSP-006, Attachment 1.

The FWS provided directions on work activities covered in the Recovery Plan (PFPR-11-009, "Room 262 Transfer Line Decontamination," Revision 0) and discussed Beryllium controls. The Lead Radiological Control Technician (RCT) reviewed Radiological Work Permit (RWP) Z-314, Revision 44, governing work activities. The review of the Recovery Plan and RWP was adequately conducted.

The FWS completed the briefing without discussing emergency conditions. The Duty Radiological Control Manager (DRCM) noticed the error, and requested the FWS reconvene the pre-job briefing to address emergency response actions. This action was taken, and the FWS and team discussed actions for building fire or fire alarm, criticality, CAM alarm in Room 262 or in Room 263, and egress routes.

The work team "ACED" in, gathered necessary PPE, and assembled in ACES II for entry into the spill area in Room 262. The surveillant observed work activities in Room 262, and noted proper radiological surveys (including probe distance, speed, etc.) were conducted to evaluate area conditions and identify areas requiring decontamination. Contamination was found on the grating of Stairway 15. The Nuclear Chemical Operators (NCOs) present on the job performed decontamination activities using wet rags per ZO-170-311, "Decontaminate Surfaces Outside of Gloveboxes." The RCT and NCO actions in the ARA were in accordance with the procedure and recovery plan, and the survey and decontamination techniques were adequate.

No issues were noted with the pre-job briefing and conduct of the work crew in Room 262. One issue was noted with the lack of bounding contamination levels in the technical work documents governing the recovery activities in Room 262.

Issue Type: Observation

Significance Level:

Statement:

Bounding conditions for contamination were not provided in the technical work documents governing re-entry and recovery activities for the Room 262 contamination spread.

Discussion:

The surveillant reviewed Radiological Work Permit (RWP) Z-314, Revision 44, and Recovery Plan PFPR-11-009, "Room 262 Transfer Line Decontamination," Revision 0 and found no removable contamination limiting condition or void limits were provided that specified bounding controls for the planned hazards.

Procedure PRC-PRO-RP-40021, "Radiological Work Permits," Revision 1, Change 1, Appendix C provides definitions for Limiting Radiological Conditions, Action Levels, and Void Limits for RWPs.

Appendix C states, "Limiting radiological condition(s) are radiological conditions measurable at the work site that communicate either a radiological action level (early warning feature) or void limit boundary (usually expressed numerically) condition for a specific radiological hazard control or set of specific radiological hazard controls." In addition, "Limiting radiological condition(s) should clearly state the intended parameter(s) numerically and the end-point purpose of the limiting condition (work suspension, work curtailment) should be described and addressed in the work planning process. The limiting radiological condition should be described as either an Action Level or a Void Limit on the RWP with the associated instructions for meeting/exceedance."

In this case, RWP Z-314 provided only an Action Level and did not contain a Void Limit for contamination levels in the High Contamination Area (HCA).

The RWP Action Level for HCAs stated, "Action: General area removable contamination >20K dpm/100 cm2 alpha or isolated areas of removable contamination >100K dpm/100 cm2 alpha. Contact the DRCM."

Although the Action Level provided in the RWP provided clear numerical parameters, the end-point purpose of the limiting condition (work suspension, work curtailment) was not described or addressed in the work planning process. In this case, neither the RWP nor the Recovery Plan (PFPR-11-009, Revision 0), provided instructions for actions to take (e.g., work suspension, work curtailment, use of additional or different PPE) should these levels be exceeded. No bounding contamination level was provided in the technical work document set.

The surveillant interviewed the Duty Radiological Control Manager (DRCM) for this work activity concerning what actions he would direct should the action levels be exceeded. The DRCM stated that the expected levels from the contamination spread earlier in the day was approximately 600,000 dpm/100 cm2 alpha, which exceeds the action level. He stated that over this limit, he would probably have the crew come out and don tight-fitting face piece respirators rather than hood PAPRs for greater contamination control. He was unable to provide a numerical value or technical evaluation for when work would be stopped due to contamination.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	RADCON-RWP	ANLYZE	TalrdCntls	Issue Number: 9778

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Richard Jansons

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35317

01/21/2011

01/19/2011

4

Entry Type: Routine Oversight

Include in CIR: No

Title:

Review of activities related to airborne radioactivity controls associated with Work Document 2Z-10-05648, "Room 172 Size Reduction Operations."

Summary:

On January 19, 2011, the surveillant attended a post-job review for glove box cutting activities in Room 172 per Work Document 2Z-10-05648, "Room 172 Size Reduction Operations." Following the post-job review, the surveillant conducted interviews and discussed Room 172 activities with the PFP Nuclear Chemical Operators (NCOs) and Radiological Control Technicians (RCTs) assigned to Room 172 glove box size reduction activities to understand changes implemented in their work processes and to evaluate further actions that may be causing the increased airborne radioactivity in the work area along with mitigation strategies.

Work was conducted on January 19 to cut apart a glove box inside a containment tent in Room 172. The workers were reported to have used nibblers for the cutting activity. The RCTs reported the maximum activity on the air sample filter during the work activity was 6,000 dpm, which is well below the Airborne Radioactivity Area (ARA) Fresh Air/SkaPak Void Limit of 1600 DAC-hour (57,000 dpm on the air sample filter).

Following the post-job review and during the course of subsequent interviews, the surveillant developed several suggestions for improving ALARA and performance of glove box cutting activities.

Issue Type: Observation

Significance Level: C

Statement:

Suggested improvements/observation of improvements made in controlling airborne radioactivity during glove box cutting operations.

Discussion:

1. Expand the dedicated/assigned work crew for this high radiological risk activity. Team work, shared expectations, and experience generated by a stable team minimize the likelihood of errors which, on a high risk activity, can have significant consequences.

For example, a worker was temporarily rotated into the work crew on January 13 and assigned to monitor the bottles supplying workers in the ARA with breathing air. When the time came to replace the in-service air bottle on the bottle cart, the new worker began to shut the in-service bottle prior to placing the reserve bottle on line. This would have led to workers in the ARA losing breathing air resulting in possible personal injury or internal depositions.

Workers reported that 8 personnel are assigned to this work team on a consistent basis. Another 12 to 15 personnel rotate through the work group.

2. Although improvements in containment ventilation have been made, additional improvements are needed to more fully control and contain airborne radioactivity.

Changes have been made to the containment tent and ante-room air flow. The inner ante-room HEPA filters, for example, have been modified to ensure air flows from the outside, through the outer ante-room, through the inner ante-room and then into the tent. The previous configuration did not have this flow path and resulted in at least one instance of airborne radioactivity in the outer ante-room. The new configuration will prevent or minimize the likelihood of the recurrence of activity in the outer (cleanest area) ante-room.

Changes have also occurred in the use of HEPA vacuum cleaners while performing cutting activities. Better use of HEPA vacuums on the part of NCOs by positioning the suction very near the cutting activity has resulted in lower levels of airborne radioactivity.

The project should evaluate two additional ventilation control/work practices. First, it is reported that workers are performing cutting operations and standing between the cutting location and the containment exhaust location (i.e., in the path of airborne radioactivity). Lead NCOs, Lead RCTs and Field Work Supervision should help position craft performing cutting operations to ensure they are positioning themselves away from areas of increased radioactivity. Second, there are two "spot exhaust" trunks available for positioning near the cutting location. Incorrectly positioning these "spot exhaust" trunks can lead to very unfavorable air flow conditions. Limiting the number of "spot exhausters" to one, and ensuring the spot exhaust does not draw air in an opposite direction of the containment tent exhaust will limit the likelihood of generating unfavorable air flow conditions.

3. Improvements have been made in contamination control through the use of misting and damp rags. These work practices should be reinforced and additional measures taken for future glove box size reduction activities.

During initial cutting activities, the use of damp rags and misting was minimal. As a result, high levels of airborne radioactivity were generated. In addition, some hard-to-reach portions of the glove box interior with higher levels of Pu contamination were not, in the opinion of the workers, adequately controlled. For example, two E-4 ducts were present on the current glove box and both were considered sources of high contamination resulting in high radioactivity from the vibration occurring during cutting activities.

Future cutting activities should include heavy misting with Invisible-Blue in the hard to reach areas of the glove box. Invisible-Blue should also be used as misting at the cutting location to minimize generation of airborne radioactivity. Wet/damp rags should be placed on all horizontal glove box surfaces (e.g., the entire interior floor of the glove box) to minimize resuspension of contamination and generation of airborne radioactivity. Lead NCOs proposed slitting the plastic covering the E-4 ducting on future glove boxes, and misting/hand-painting the inside of the ducts prior to cutting activities to lock down contamination and prevent high levels of airborne radioactivity.

4. Continue to investigate the use of plasma arc cutting for glove boxes. The plant management is working to investigate methods to protect workers' hearing due to noise concerns with using circular saws for cutting operations. The use of circular saws has been suspended pending results of the investigation and IH measurements of noise levels. NCOs and craft workers report that the remaining tools used for cutting (nibblers) are not effective and very slow in cutting the stainless steel glove boxes.

Plasma arc cutting tools have previously been used in PFP glove boxes to good effect. For example, cutting operations were conducted in Room 235B in the late 1990s with very little generation of airborne radioactivity. In addition, the cutting operations were performed quickly and efficiently, resulting in less time worker exposure time. The surveillant has interviewed ESHQ, Radiological Control, Operations, and Radiological Engineering management/personnel and found no evaluation on the use of plasma arc tools.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	RADCON-ALARA	WORK	TalrdCntls	Issue Number: 9445



Department of Energy
Operational Awareness

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

39304

08/30/2011

08/30/2011

6.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Mock-ups for two different methods of cutting radiological piping systems

Summary:

The surveillants attended two mock-ups at PFP. The first mock-up was for cutting piping using crimp and cut. A vendor was brought in to demonstrate tools that they had on the shelf. They also discussed some tools that were still in design and discussed their abilities to work with the Hanford contractors to meet their needs.

The off the shelf crimping tool bent the pipe during the crimping process. The vendor indicated the seal was fairly good, but not perfect. The vendor discussed how cutting the pipe on the crimping surface would likely re-open the seal. The vendor demonstrated making an adjacent cut.

One of the field work supervisors discussed the need for an electric driven tool that both crimps and cuts at the same location. The vendor did not appear confident that an electric driven hand held tool would be capable of applying the 50,000 pounds of pressure needed to seal the pipe.

The PFP radiological engineering manager indicated the project needed more work and that his completion schedule would need to be changed.

The second mock-up was for "Score and snap". A four wheel pipe cutter is used to cut the pipe without going to breakthrough. Then wrenches are used to break the pipe.

Radiological controls for the "scoring" of the pipe included use of a five sided HEPA filtered ventilation box, partial wrapping of the 4 wheel pipe cutter to control debris from the cutting operation, airborne radioactivity area posting, PPE and respiratory protection, lapel air samplers. As long as there is no breakthru, the cutter remains clean and can be reused on the next cut. Currently, the contractor indicated the glove bag and cutting tools were wasted with each cut.

Radiological controls for the snap: Chemical absorbents are taped to each side of the pipe cut area before the "scoring". The chemical absorbents are installed to spring over the cut area when the 4 wheel pipe cutter is removed. Prior to the snap, a plastic sleeve is sealed to each side of the pipe, and the 5-sided HEPA ventilation is installed under the pipe cut area. When the pipe is "snapped", the sleeve is containment. The pipe is separated, the sleeving twisted and taped, cut, and j-sealed.

One issue was the movement of the HEPA filtered ventilation box. One person had to hold it in place. The contractor needs to consider how to secure the 5 sided HEPA vent during the score and snap process.

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

39253

08/26/2011

08/24/2011

4.0

Entry Type: Routine Oversight

Include in CIR: No

Title:

Contractor briefing to PFP on causal analysis for DOE surveillance on Planning of radiological work at PFP.

Summary:

The surveillant attended the PFP Corrective Action Review Board (CARB). At the CARB, the PRC PFP and CHPRC Health and Safety managers presented the results of the root cause analysis for the DOE surveillance of Planning of Radiological Work at PFP. The presentors provided the main root cause as inadequate management of change when significant numbers of radiological technical staff left PFP, ARRA funding brought an influx of new people, and the work scope changed to more aggressive D&D methodologies, increasing the level of hazards.

As a secondary contributing cause, the team identified the decentralized radiological control program. The team discussed how the management structure inhibited the organization in responding to negative trends in performance. A centralized radiological control program provides the needed flexibility to assign the right resources to the right projects based on needs and improves the radiological control accountability for performance of the radiological control resources within the project.

The CARB review team provided feedback on the report requesting some clarifications and enhancements. Comments will be provided, the report will be updated, and the CARB chairperson will review the incorporation of the comments prior to approval.

One of the main issues is that there are two parts to any corrective actions. There are the actions taken to address the specific deficiencies (the mechanical corrective actions for specific deficiencies), and there are the actions to fix the how did we get there in the first place (deficiencies in the management of the processes, the root cause).

The CARB team expressed the need to give themselves credit for the correction of the specific deficiencies. Not everyone on the CARB could see, or buy in to the root causes identified. There was much discussion on how fixing the identified root causes will prevent recurrence.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

38886

08/09/2011

08/08/2011

3 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Glove box 227T - formal post job

Summary:

The surveillants (RL RCM and RL SME) observed the formal post job for the work in glovebox 227T that twice generated airborne radioactivity above the protection factor of the PAPRs that were worn.

At the post job, there was a lot of contention. As a result, there was venting of issues that appeared to have been ongoing for many months, prior to the current FWS involvement in the project. The post job review format is less formal than the critique methodology. As a result, the post job itself did not appear to discuss all of the issues. Side conversations provided additional details. RL will review the post job records when they are complete to see if the records captured all of the issues for resolution. A formal critique also has the advantage of reducing tensions by focusing on identifying facts via the time line.

The main contention appears to be from less than adequate integration of IH and radiological control requirements (proper use of fixatives to control airborne radioactivity generation and also prevent nitric acid issues resulting from water activation of the solid nitric acid).

While a definitive cause of the higher than anticipated airborne radioactivity was not identified, it is suspected that the disturbance of the contamination at the floor of the glovebox is the likely cause of the airborne radioactivity. The hazards associated with the activity of disturbing the contamination on the floor of the glovebox did not appear to be adequately analyzed and controlled. The use of fixatives was not adequately defined in the work package. Fixatives were not applied to the glove box interior as a whole, leaving the hazard unmitigated for the individual with head inside the glove box. The radiological engineering group was not adequately engaged in the first informal postjob.

The RL radcon SME has written an observation on the use of post jobs in lieu of critiques. This is a repeat observation.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

38844

08/04/2011

08/04/2011

2.5 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Post Job review 227T glove box airborne radioactivity events

Summary:

The surveillant attended what was to be a post job review for the work in glove box 227T in which the contractor has twice voided the RWP for airborne radioactivity limits. There were two main workers that were not available so the post job was postponed until Monday.

However, there was a discussion of the events after the rescheduling of the post job was announced. Personnel discussed a conflict that needed a technical resolution. The workers were not permitted to use fixatives, because IH concerns over "activation" of the nitric acid. The radiological engineering manager indicated he would discuss the issue with appropriate personnel to see if an alternative to a water based fixative could resolve the IH issue and provide appropriate radiological control.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
38672	07/27/2011	07/26/2011	3 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Barrier Analysis of concern in PFP surveillance report on planning of radiological work.

Summary:

The surveillant observed the barrier analysis performed by the contractor for the concern identified in the DOE surveillance of planning of radiological work. At the end, the contractor asked individuals to look at the product and see if there were any other barriers missed. The barriers had all the mechanical stuff, training, procedures, self-assessments, but did not appear to answer how did we get there in the first place. If we do not address what went wrong to get us there in the first place, fixing the DOE specific identified deficiencies would not likely prevent recurrence.

The PRC ESH manager brought up two barriers that should have been in place that were not. One, was the organizational structure, a decentralized radiological control program, and the other was no change management process in place. These two additional barriers appeared to complete the analysis.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
38666	07/27/2011	07/26/2011	3.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Interviews with PFP Radiological engineering on A-line/C-line

Summary:

The surveillants met with the radiological engineering staff at PFP to discuss the planning process for D&D of the A-Line and C-line glove boxes. The following information was gleaned:

1. The level of technical radiological staffing has improved. The surveillants met new radiological engineering staff that are being applied to this high risk work.
2. Lessons are still being learned. The insufficient planning for the removal of the high dose HEPA filter was discussed, including the corrective actions. The ESH manager identified areas of weakness that are being addressed:
 - a. Specific corrective action to check dose rate prior to removal from glove box.
 - b. Plans on performing radiological characterization surveys inside the glove boxes.
 - c. Improving the ability of staff to perform predictive calculations of dose rates from NDA data. The NDA data indicated HEPA filter was 0 plus or minus three grams per one of the engineers. The worst case should have been used to predict the dose rate problem. The radiological engineering manager indicated back calculations from actual dose rates indicated about 2 grams Pu.
3. The staff discussed some mock-up that had been done with visual powder to demonstrate effects of the various cutting techniques with/without schroud, and with tape....
4. A potential issue came up that needs to be investigated. The new electronic dosimeter measures shallow dose per one of the radiological engineers. How this is used to correlate to whole body dose is not clear.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

38665

07/27/2011

07/25/2011

7

Entry Type: Routine Oversight

Include in CIR: No

Title:

Observation of causal analysis - PFP surveillance - planning of radiological work

Summary:

The surveillant observed the use of the "Why? stair case", process for determining cause. The team selected for the causal analysis included a PFP lead work planner, new PFP radiological control work planner, PRC ESH manager, and PFP personnel at PFP that have expertise in causal analysis. Overall, there were no deficiencies identified in the process. However, there did not appear to be any new revelations that would lead to a corrective action not already being worked. RL will continue to observe the process.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

38451

07/15/2011

07/12/2011

Entry Type: Routine Oversight

Include in CIR: No

Title:

Event: Dose rate electronic dosimeter alarm during work in room 235-A3.

Summary:

On July 12, 2011, an RL radiological SME observed work in Rooms 232 and 235-A3. During work, an individual's electronic dosimeter alarmed for dose rate (wholebody dose rate greater than 1000 mrem per hour). Investigation of the event resulted in three findings and one observation.

Issue Type: Finding

Significance Level: 2

Statement:

Pre-job briefing for removing high dose rate HEPA filter was less than adequate; Dose rates on the HEPA filter, alarm set points and alarm response for the electronic dosimeters (ED) were not covered in the briefing.

Discussion:

On July 12, 2011, an RL radiological SME observed work in Room 235-A3.

The Field Work Supervisor (FWS) performed the pre-job briefing. The scope of the work for the shift included package and seal out of glove box 9E HEPA filter in Room 235-A3. The RCT briefed the work to include the potential for the work area to be a High Radiation Area, with a RWP void limit of 1000 mrem/hour at 30 cm. The RCT discussed the requirement to use a pocket dosimeter or Electronic Dosimeter. The greater than 1 R/hr dose rate on the HEPA filter was not discussed, because it was not known (see work planning deficiency).

The FWS discussed emergency response actions. The FWS did not cover emergency response to an alarm on the electronic dosimeter.

Workers prepared to seal out a filter from the end of the conveyor closest to the door into Room 232. As the filter was brought by the NCOs to the seal out port, the filter was surveyed by the RCT and found to be 1.3 R/h on contact and approximately 500 mrem/hr general area. The high dose rate caused the dose rate alarm (1000 mrem/hr setpoint) to alarm on Electronic Dosimeters of the two NCOs handling the filter.

The Lead RCT had the entire work team stop work and exit the area. The alarms stopped when the filter was placed further back into the conveyor and the dose rate dropped below 1 R/h. The cumulative dose on the workers ED were both less than 20 mrem.

After consulting with the FWS and Duty Radiological Control Manager (a Radiological control technician supervisor) DRCM, the work team reentered Room 235A3 and placed a fire blanket over the shielded filter inside the conveyor glove box. The crew then performed seal outs of four packages from glove box HA-9E in Room 235A3. The DRCM stated that personnel should exit if the ED alarms at a cumulative dose of 50 mrem on the ED, vice exiting if either alarm on the ED went off. This is not correct in accordance with CHPRC radiological control manual and radiological worker training. Considering that the dose rate specified on the ED is the actual dose rate to the whole body, personnel should appropriately respond per training.

Requirements:

CHPRC RCM, CHPRC-00073, Article 324.3. A pre-job brief should, at a minimum, include... c. Anticipated radiological hazards and conditions due to the planned radiological work; d. Identification of specific actions and/or activities in the controlling Technical Work Document that will (or have the potential to) create a change in radiological conditions when initiated or completed...j. Emergency response provisions.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	RADCON-RADPRC	ANLYZE	TalrdCntls	Issue Number: 10134

Issue Type: Finding

Significance Level: 2

Statement:

The dose rates on the HEPA filter being removed were not adequately assessed prior to performing the work; higher than anticipated dose rates resulted in whole body dose rates above 1 R per hour.

Discussion:

On July 12, 2011, an RL radiological SME observed work in Rooms 232 and 235-A3. The Field Work Supervisor (FWS) performed the pre-job briefing. The scope of the work included package and seal out of glove box 9E HEPA filter in Room 235-A3.

Radiological Work Permit Z-799, Revision 72 requirements were briefed by the Radiological Control Technician (RCT). The RCT briefed the work to include the potential for the work area to be a High Radiation Area, with a void limit of 1000 mrem per hour at 30 cm.

The workers prepared to seal out a filter from the end of the conveyor closest to the door into Room 232. As the filter was brought by the NCOs to the seal out port, the filter was surveyed by the RCT and found to be 1.3 R per hour on contact and approximately 500 mrem per hr general area. The contact dose rate caused the dose rate alarm (1000 mrem per hr setpoint) to alarm on Electronic Dosimeters of the two NCOs handling the filter (meaning dose rates greater than 1 R per hour whole body had occurred).

The Lead RCT had the entire work team stop work and exit the area.

The greater than 1 R per hour dose rate on the HEPA filter was not known. Radiological controls to handle this high a dose rate were not pre-planned before the work started.

This is a repeat issue. Deficiencies in activity level work planning have been previously identified.

Requirements:

DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution, paragraph (b) specifies "...The contractor shall, in the performance of work, ensure that...(5) Before work is performed, the associated hazards are evaluated..."

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	RADCON-ALARA	ANLYZE	TalrdCntls	Issue Number: 10136

Issue Type: Finding

Significance Level: 2

Statement:

The dose correction factor does not appear to be taken into account for setting limiting conditions and alarm set points to implement ALARA; Lack of tailoring of RWPs to the specific work is a repeat issue.

Discussion:

On July 12, 2011, an RL radiological SME observed work in Rooms 232 and 235-A3 and reviewed the associated RWP (Z-799, rev. 72). Two issues with the RWP were identified. The correction factor for dose does not appear to have been taken into account when setting limiting conditions and alarm set points for implementing ALARA. The RWP does not specify the use of electronic dosimeters while performing work in high radiation areas.

1. Adjusting for the dose correction factor:

Radiological Work Permit Z-799, Revision 72 requirements were briefed by the Radiological Control Technician (RCT). The RCT briefed the work to include the potential for the work area to be a High Radiation Area, with a void limit of 1000 mrem per hour at 30 cm. The RCT discussed the requirement to use a pocket dosimeter or Electronic Dosimeter and ensure the dosimeter is labeled "A Line" to ensure a correction factor of 3 is applied to the results.

The correction factor is applied because the pocket dosimeters do not measure neutron dose. The correction factor is intended to correct, adjust as read pocket and electronic dosimeter readings for the unmonitored dose.

The alarm set points on the electronic dosimeter do not appear to be adjusted for the unmonitored neutron dose. Thus, an alarm set point of 1000 mrem per hour after adjustment is 3,000 mrem per hour. Permitting a whole body dose rate of 3000 mrem per hour, is not ALARA. Similarly 50 mrem cumulative, after correction is 150 mrem dose in a shift.

For the situation identified with the alarming electronic dosimeters, the radiological survey record indicated neutron dose rates were in fact only a fraction of the gamma dose rates, at the location of the work being performed.

RWPs need to be tailored to the hazards that exist at the work location. Gamma dose rate alarms need to incorporate applicable correction factors. This was discussed with the CHPRC, ESH manager, who indicated the project was considering having some electronic dosimeters adjusted by PNNL, to automatically incorporate the adjustment for the factor of three.

2. Type of personal integrating dosimeter for entry into high radiation areas, was not specified in the RWP.

2. The controlling RWP (Z-799, Rev 072) Special Instruction 10 states, in part: "(RMA-line) For entering Rooms A1, A2 or A3 a pocket dosimeter or ED is required." The RWP allows either a pencil or electronic dosimeter to be used.

No provision is made in the RWP to ensure an ED rather than a pencil is worn for HRA entries.

Requirements:

10 CFR 835.1103, Workplace controls, specifies "During routine operations, the combination of engineered and administrative controls shall provide that... (b) The ALARA process is utilized for personnel exposures to ionizing radiation."

CHPRC Radiological Control Manual, CHPRC-00073, Revision 3, Article 513.5 states, "Use of electronic dosimeters is encouraged for entry into High Radiation Areas or when planned doses greater than 100 mrem in one workday are expected. An electronic dosimeter provides an early warning of elevated exposure through the use of alarm set points at specified dose rates or integrated doses."

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	RADCON-RWP	ANLYZE	TalrdCntls	Issue Number: 10136

Issue Type: Observation

Significance Level: 2

Statement:

Training on electronic dosimeter alarm response for the workers is needed.

Discussion:

Radiological Worker II training does not specifically incorporate electronic dosimeter ALARM response.

Training on Electronic Pocket Dosimeter (EPD) Alarm Response is being provided to RCTs. The training includes EPD Alarm Response actions. This training is not being provided to all PFP EPD wearers. The course is titled, "PFP RCT Gap Training for Issuing Electronic Dosimetry," course 203312.

Training the workers on appropriate actions for responding to an electronic dosimeter alarm would increase the effectiveness of the response.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number:
RP	RADCON-RADPRC	ANLYZE	TalrdCntls	10139

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
38049	06/23/2011	06/20/2011	

Entry Type: Routine Oversight

Include in CIR: No

Title:

"Post-Job Review" for work activities conducted on June 15 and 16 for Work Package 2Z-10-07825, "HC-227T Cleanout and Decon."

Summary:

On June 20, 2011, the RL Radiological Control SME observed a "Post-Job Review" for work activities conducted on June 15 and 16 for Work Package 2Z-10-07825, "HC-227T Cleanout and Decon."

This OA resulted in one observation.

Issue Type: Observation

Significance Level: 1

Statement:

Post Job ALARA Review was less than adequate to fully identify and correct all radiological and industrial hygiene deficiencies.

Discussion:

The Field Work Supervisor and his Operations Superintendent convened the "post job review" to discuss issues related to failure to wear prescribed respiratory protection for work performed on June 15 in Room 227. NCOs and RCTs who were on the work team were present and participated.

Work was performed to move the flange/tubing assembly to the floor of hood 227T on June 15. The FWS stated workers performed the activity with a hood PAPR with HEPA cartridges. Contrary to this direction, Section 6.2.4.1, Subsection H requires, "All personnel inside 234-5Z Room 227 during removing/handling, draining and transporting to waste container will wear the PAPR hood or tight fitting face piece with the GMC-HE OV/CL/CD/HC/HS/SD/HE cartridge, reorder # 10080454." The work crew did not wear the chemical cartridge as prescribed by the work instructions.

The Operations Superintendent emphasized that the work process was changed and a chemical cartridge was not required because a glovebag was no longer being utilized. He stated that by performing the work in the hood that a chemical cartridge was no longer required. However, the Industrial Hygienist present stated that the cartridge was selected due to the potential for a splash or drops of Pu nitrate that could be propelled out of the hood while performing the mechanical separation and movement. The Operations Superintendent acknowledged that, at a minimum, the chemical cartridges should have been utilized or the package changed to remove the requirement for chemical cartridges.

Upon completion of the post-job review, the FWS asked for comments. The RL SME directed the group's attention to Section 6.2.4.1 of the work instructions (Subsection C.1) which required workers to wear acid resistant gloves, silver shield apron, silver shield arm sleeves, and silver shield overshoes outside the PPE prescribed by the RWP when removing the flange/tubing assembly to the floor of the hood. The surveillant asked whether this PPE was worn by the workers during their work performing this task on June 15. The workers responded that they did not utilize the silver shield apron or overshoes.

Also upon completion of the post-job review, the surveillant discussed restrictions on placing portions of the body further than the arms into the hood with the Operations Superintendent. In particular, the surveillant noted that the work instructions and corresponding ALARA Management Worksheet (Z-AMW-0027) did not provide controls, limitations, or analysis for the DRCM to evaluate whether or not the action of putting a significant portion of the workers body into the hood has been analyzed. The AMW provided an airborne radioactivity calculation to prescribe respiratory protection, and uses an assumed contamination value of 500,000 dpm/100 cm². However, discussions with the RC FLS and other staff, including the SSO, indicate there are significantly higher levels of loose contamination in the hood area.

Although this portion of the work activity was not conducted, it appeared the Operations Superintendent believed sufficient controls had been discussed with the radiological engineers to allow the work to proceed. The DRCM present at the post-job review disagreed and stated the package would have to be completely reviewed and reapproved for any such work activity.

In summary, the "post job ALARA review" was not sufficient to fully identify and correct all radiological and industrial hygiene deficiencies. The surveillant discussed the additional areas of concern with the PFP ES and IH Manager for resolution.

Note: The deficiencies in hazards analysis and conduct of operations were forwarded to the contractor in a separate OA.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	CONOPS-PROCESS	ANLYZE	TalrdCntls	Issue Number: 10032

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

Rpt #: 38013
Date Entered: 06/22/2011

PFP

Date Observed: 06/22/2011
Hours in Field:

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Controls and Conduct of Operations at PFP

Summary:

On June 16, 2011, a RL radiation protection SME observed work activities for Work Package 2Z-10-07825, "HC-227T Cleanout and Decon," a "continuous use" designated work activity. The RL SME observed pre-job briefings and work activities, and reviewed documents. This OA resulted in two findings and one observation. The RL SME discussed the deficiencies with appropriate PFP staff. The findings and observations are documented below.

Issue Type: Finding

Significance Level:

Statement:

Contrary to the requirements of the work package, PFP workers performed work without using the prescribed combination (chemical/particulate) filters.

Discussion:

The SSO and FWS performed a pre-job briefing. The scope of the work was to drain residual liquid (nitric acid) from the flange/tubing assembly tubes. Nitric acid was expected to be present during draining operations. The FWS stated only drips were expected, but prepared for additional volume by staging 2 500 ml glass bottles. The FWS stated two pair of anti-contamination clothing were required, along with hood PAPR with HEPA cartridges.

The RL SME noted that Section 6.2.4.1 of the work instructions (Subsection C.1) required workers to wear acid resistant gloves, silver shield apron, silver shield arm sleeves, and silver shield overshoes outside the PPE prescribed by the RWP Subsection H requires, "All personnel inside 234-5Z Room 227 during removing/handling, draining and transporting to waste container will wear the PAPR hood or tight fitting face piece with the GMC-HE OV/CL/CD/HC/HS/SD/HE cartridge, reorder # 10080454."

Contrary to these instruction, the workers were not briefed on these requirements and, when the RL SME arrived at the mask issuance station, workers were issued and preparing HEPA cartridges for use with the PAPR hoods.

The RL SME discussed the issue with the FWS and SSO, who was present for the pre-job briefing and subsequent activities. The SSO stated that these controls really weren't required and they would try to change the package. After approximately 1/2 hour, the FWS cancelled the work activity for the evening.

The RL SME reviewed mask issuance logs and discussed PPE controls with the FWS and SSO for similar work performed in Room 227 on the evening of June 15, 2011. The RL SME determined that the required chemical PPE and chemical cartridges were not used as required by the work instructions for the previous work in Room 227.

In summary, the SSO and FWS did not direct or ensure workers wore prescribed chemical PPE or ensure the designated chemical cartridges were selected for the scope of work. The RL SME determined that work was previously performed (with SSO oversight) contrary to the PPE and respiratory protection requirements of the work instructions.

Requirements:

10 CFR 830.122 Quality assurance criteria, (e) Criterion 5 Performance/work processes (1) specifies, "Perform work consistent with the technical standards, administrative controls and other hazard controls adopted to meet regulatory or contract requirements, using approved instructions, procedures, or other appropriate means."

DOE Order 5419.19, Conduct of Operations Requirements for DOE Facilities, Chapter XVI Operations Procedures, B. Discussion, specifies "...operations procedures should be sufficiently detailed to perform the required functions without direct supervision....Operators should not be expected to compensate for shortcomings of such procedures... C. Guidelines... 7. Procedure Use, ...Facility operation should be conducted in accordance with applicable procedures... If procedures are deficient, a procedure change should be initiated...."

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
RP	CONOPS-PROCS	ANLYZE	TalrdCntls	Issue Number: 10012

Issue Type: Finding

Significance Level: 3

Statement:

An incomplete activity level hazards analysis was observed. This is a repeat finding (see S-11-SED-CHPRC-PFP-002).

Discussion:

On June 16, 2011, a RL radiation protection SME observed work activities for Work Package 2Z-10-07825, "HC-227T Cleanout and Decon," a "continuous use" designated work activity.

The purpose of the package was to remove remaining equipment from the outside/inside of glovebox HC-227T in preparation for final decontamination. The work crew was initially preparing to remove a flange/tubing assembly from the upper portion of the hood area. This work required, according to PFP management, the NCO to place the upper portion of the body (including head and torso) into the hood area to detach and remove the flange/tubing assembly.

Section 4.2.7 of the work instructions is titled, "confined space entry," and states "227T is a hood designed for reaching hands into and perform work with radiological and chemical hazards. 227T hood is not designed for workers to reach into the space beyond shoulder depth or to enter any other part of the body into the hood." Subsequent to these statements, step 4.2.7.3 states, "IH and DRCM will be contacted approximately 24 hours prior to reaching beyond shoulder depth and/or entering any other part of the body into this hood."

The RL SME reviewed the remaining work instructions and corresponding ALARA Management Worksheet (Z-AMW-0027). No controls, limitations, or analysis was provided in the work documents for the DRCM to evaluate whether or not the action of putting a significant portion of the workers body into the hood had been analyzed. The AMW provided an airborne radioactivity calculation to prescribe respiratory protection, and uses an assumed contamination value of 500,000 dpm/100 cm². However, discussions with the RC FLS and other staff, including the SSO, indicate there were significantly higher levels of loose surface contamination in the hood area.

The RL SME discussed this with the Shift Radiological Control First Line Supervisor (RC FLS). The RC FLS discussed the issue with the Operations Field Work Supervisor, who agreed and cancelled that portion of the work. However, the assigned SSO then spent approximately 1 hour working with the RC FLS, a Radiological Engineer (who was not the primary or second review signature for the AMW), to attempt to continue with this scope of work. This ended when the Radiological Control personnel did not agree to continue with the scope of work.

In summary, radiological controls for performing portions of the work in Room 227 were not based on technical hazards analysis and do not appear to be adequate.

Requirements:

10 CFR 835.501(b) specifies "The degree of control shall be commensurate with existing and potential radiological hazards within the area."

10 CFR 835.501(d) specifies "Written authorizations shall be required to control entry and perform work within radiological areas. These authorizations shall specify radiation protection measures commensurate with the existing and potential hazards."

10 CFR 835.1102 (b) specifies "Any area in which contamination levels exceed the values specified in appendix D of this part shall be controlled in a manner commensurate with the physical and chemical characteristics of the contaminant, radionuclides present, and the fixed and removable surface contamination levels."

DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution, paragraph (b) specifies "...The contractor shall, in the performance of work, ensure that... (5) Before work is performed, the associated hazards are evaluated..."

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number:
RP	RADCON-ALARA	ANLYZE	TalrdCntls	10013

Issue Type: Observation

Significance Level:

Statement:

Directions for egress in event of CAM alarm appeared to contradict instructions provided to PFP personnel during implementation of HCA, ARA controls for C Line and A Line.

Discussion:

On June 16, 2011, a RL radiation protection SME observed work activities for Work Package 2Z-10-07825, "HC-227T Cleanout and Decon," a "continuous use" designated work activity.

Emergency egress, including CAM alarm, fire, criticality, evacuation and take cover alarms were discussed. The FWS stated that a CAM alarm in 227 would generally require the personnel in 227 to move "upwind" in C Line through 228 rooms for egress, but stated his work crew had decided that they would exit Room 227 immediately into corridor 5 instead. This appears to contradict instructions provided to PFP personnel during implementation of HCA, ARA controls for C Line and A Line.

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	Issue Number:
RP	CONOPS-PROCS	ANLYZE	TalrdCntls	10014

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn**PFP**

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
37921	06/16/2011	06/16/2011	9.5 hr.

Entry Type: Routine Oversight

Include in CIR: No

Title:

Participation in Site Emergency Drill at PFP

Summary:

The surveillant participated as an evaluator in the Site Emergency Drill at PFP. Deficiencies will be provided to the EP organization.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn**PFP**

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
37496	05/18/2011	05/18/2011	4.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

PFP Briefing to DNFSB staff for their Conduct of Operations review

Summary:

The surveillant attended the contractor presentation to DNFSB. The contractor reviewed the PFP organization, status of the closure project, implementation of the revised work management procedure, PFP performance indicators, radiological contrl program topics and Aspigel Process Improvements. RL discussed status of DOE Order 422.1 Implementation.

RL's surveillance report on Radiological Work Planning was not provided to the DNFSB staff at this time since the report was sent to the contractor for its factual accuracy review. It will be provided when the report is issued to the contractor. RL provided a separate briefing on the findings of the surveillance.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn**PFP**

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
37177	04/28/2011	04/28/2011	4.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Critique PFP covering spill in room 263, from first indications to recovery.

Summary:

The critique had a limited amount of time to gather information. The situation was complicated in that the critique covered the time period of March 30, 2011 to present, and included the precursor event, where contamination was found on the bagged end of one pipe end. RL will evaluate the critique minutes prior to finalizing this OA.

Points of interest:

1. The contractor believes the liquid penetrated the containments through the adhesive on the chem tape. On demonstrating the taping process, they contractor tapes the sleeve with duct tape, then uses another sleeve with chem tape. The worker taped between the duct tape and the second sleeve. When this was pointed out, the workers indicated the chem tape is wrapped around the duct tape and pipe. One individual asked why the inverted sleeve method was not used when radioactive liquid was expected.
2. The contractor believes the 6 days between cutting the pipe at the deck and flipping it up to drain was critical (too much time for the seals to be maintained).
3. After the critique, a question was asked about placing plastic down (would have made clean up easier). The FWS said they did, but it was not large enough. RL will probe further into this since this was not described at the critique.
4. RL will review the corrective actions that come out of the critique.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn		PFP	
Rpt #:	Date Entered:	Date Observed:	Hours in Field:
37140	04/28/2011	04/27/2011	4.0 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological work planning PFP - Chop shop exceeds RWP limit

Summary:

The surveillant attended a post job review concerning exceeding the RWP limit for airborne radioactivity as measured by the traveler air monitor (set for 16000 DAC-hr, 0.16 DAC-hr after taking into account the 10,000 reduction factor of an airline respirator).

The PFP facility has not used the critique process which uses a trained facilitator, and draws out the facts surrounding an event through development of a time line and then an apparent cause analysis. The team never determined why the airborne levels became elevated. However, they did discuss some deficiencies in the process for preparing the glove boxes for the chop shop. Deficiencies in the discussion included:

1. Incomplete use of fixatives (there was bare metal visible showing areas where fixative was not applied).
2. Gloves were not rolled up and tucked into place (the significance of this is that it makes areas that should be accessible to the fixative, inaccessible and thus increases the potential for loose contamination during handling of the glove box in the chop shop)
3. Pie plates over the glove ports were improperly secured.

The team discussed how they used a check list at A labs which included, among other things, a QA step where one window was left unpainted until the glove box interior was inspected to verify adequate application of the fixative. The radiological engineer was at the post job and took the action to evaluate incorporation of these preparation steps into procedures for removing a glovebox.

The workers came up with a better way to remove the gloves, maintaining contamination control through containment. The FWS also brought in an engineered plenum that the team could place under the glove port.

During the discussion, the RCTs identified deficiencies in communication. An RCT had thought she communicated a stop work until she read the traveler air sample after a pie plate fell to the floor, but work had continued. This RCT was new to the team, and did not use hand gestures for pausing work. The lead RCT indicated there were too many changes in the team, contributing to the deficiencies in communication. Although the work is very high risk, the priority of the project is low, and RCT assignment priorities did not appear to take the hazard level into consideration. The RCT supervisor took the action to make changes to get a more consistent RCT crew.

Work planning deficiencies will be incorporated into the RL surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36893

04/14/2011

04/14/2011

3.0 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning PFP

Summary:

The surveillant observed the post job from room 263 recovery plan work. In this post job, the radiological engineer was in attendance along with the radiological control supervisor and work team. There was good engagement of workers in the post job.

The team held the post job review because of the discovery of some nitric acid liquid in the wrapping around the pipe where the spill had occurred.

The recovery plan will be revised to cover the area with chem pads, and place hurculite over the chem pads to allow work on the main source of contamination. A bag would be placed over the pipe end, with chem pads inside. The sleeve with nitric acid would be cut in a controlled fashion to allow the liquid to be absorbed and the pipe would be sleeved before placing it into a waste box.

Airborne levels prior to the acid neutralization have been low. After the meeting, the surveillant asked the radiological engineer if they had thought about the impact of neutralization and wipe down on the potential for airborne generation.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36848	04/13/2011	04/12/2011	3.5 hr.

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning PFP

Summary:

The surveillants touched base with the room 263 recovery team to discuss the re-entry plan and to discuss the work planning for use of chemically compatible materials for wraps.

Seven work packages with direct changes and work logs documented were picked up for the team to review.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36847	04/13/2011	04/11/2011	4.0 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning at PFP

Summary:

The surveillant observed a second post job review for a spread of contamination at PFP, room 263. On re-entry to recover from the spill, the RWP was exceeded. Personnel identified off scale (greater than 5 million dpm per 100 cm²) alpha contamination. A small puddle of radioactive liquid, assumed to be plutonium nitrate from the pipe that was cut, was observed. The post job indicated personnel responded well, making an orderly exit.

At the post job, it was postulated that the nitric acid ate through the wraps and tape when it sat for a week as the team responded to, recovered from, finding 600K dpm on a pipe cap (different piece of the same pipe). This brings into question the adequacy of planning in regards to material compatibility. This will be pursued by the assessment team. The field work supervisor indicated the team had been warned the material would not last a long time in these conditions, but did not know any specifics (good for a day, good for 7 days, good for 30 days).

The team postulated that after the material wraps on the end of the pipe had degraded over the seven day period, when the team rotated the pipe and lifted it to drain any liquid from the pipe, that the liquid must have run down the sleeve on the outside of the pipe. The liquid was under the pipe where the outer wrap was attached to the pipe.

The work team discussed the development of a revised recovery plan.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
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36752

04/07/2011

04/06/2011

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning surveillance

Summary:

The surveillant met with PFP engineering to discuss the engineering support to the work planning process. A specific example of wrong material being specified for wall material in the work package, and the task of partial wall removal not being discussed in the FMP was discussed. A sample of work packages with the engineering documents will be provided to the surveillance team look at the extent of condition.

Two radiological events occurred today. In the first event, work in the McLusky room resulted in airborne radioactivity that exceeded the respiratory protection factor of the airline respirator. Review of the work planning showed it was a package that had no airborne radioactivity calculations in the AMW. The job being performed was removal of a poly liner on the bottom of glove box WT-4, which had dose rates as high as 5 R pre hr in one location. The tool used was a crow bar. The FR was observing work when the event happened. The FR noted the workers were not using fixative at the time of the scrapping. It is likely the scrapping of the poly uncovered loose contamination that went airborne. No spot ventilation was being used. The work package used words "as needed". The radiological engineering group developed a plan for installing a hood connected to the E-4 HEPA ventilation system, which will be installed before the work continues. One of the workers lapel air samplers had a positive indication of intake after considering the respiratory protection factor of the airline respirator.

The second event involved a spread of contamination 263/262, which caused the entire PFP backside to go ARA. The cause of the spread was not known at the time of the post job. The usefulness of the post job immediately after this event, before the source of the contamination is known, is questionable. The post job asks for conclusions about the adequacy of planning....., before the cause of the event is understood. A spread of contamination on this same job had occurred the previous week. Levels of contamination for this event were as high as 300,000 dpm per 100 cm2 alpha.

OpAware: Project/Issue Detail**Plutonium Finishing Plant Project****Brenda Pangborn****PFP**

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36716

04/04/2011

04/04/2011

7 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological work planning - PFP

Summary:

The surveillance team began review of engineering documents provided to the work planner. The review started with the work package that involved penetration in the wall between room 230 and 235, where a glove box penetrated the wall, and a potential uptake occurred when work was performed without respiratory protection.

On working with the contractor to retrieve the engineering document, it was noted that the engineering document was silent on the portion of the work that involved removal of part of the wall. The work package specified "cut wallboard". The "wall" was actually sheet metal. While the engineering document indicated a drawing number for the wall, the drawing was not included in the engineering document provided to the planner and the work scope, task to remove a portion of the wall, was not identified. Discussion with the work planner indicated there was a big difference in the engineering support for the work package provided by the mechanical engineer as compared to the electrical engineer.

The lack of detail in the engineering documents provided by the mechanical engineering group will be pursued further.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36715

04/04/2011

03/30/2011

7 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning - PFP

Summary:

The surveillant Attended pre-job briefing for room 179. Work involved use of 5 sided HEPA ventilation - taking flow measurements. RWP 951

The RCT identified the specific controls applicable to the work scope (CA/RA entry. A second RCT added information on dose rates in the area (one to one and a half mr/hr gamma, less than 0.2 neutron, except at glove ports). RCT discussed surveys under the glove box, "always been clean". Discussed how Be controls are being implemented including the use of a laydown area.

There were no specific issues associated with the pre-job briefing.

The surveillant observed a planning meeting on creation of a standing order for work above 8 feet. The standing order preparation included what controls will be used. The standing order is being developed so that the stop work order can be lifted.

No deficiencies were identified.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36568

03/29/2011

03/29/2011

9

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning - PFP

Summary:

The surveillant attended a stop work meeting and a critique.

1. The stop work meeting involved less than adequate implementation of corrective actions to a stop work. Work package 2Z-1100179, involves fire system deactivation. A stop work on work above 8 feet, room 235A1 was initiated due to high contamination, and thus potential for beryllium contamination suspected in the area from historical knowledge. The stop work was lifted with the agreement that radiological and beryllium characterization sampling would be done (under ARA controls) before work was allowed to continue.

The characterization scope of work was not incorporated into any formal work plan. The characterization work was scheduled for last Saturday, but was cancelled.

The field work supervisor for the work, asked an RCT working on an adjacent package, to perform characterization of the area, to allow work to continue on Friday. No IH was present, and the RCT did not use ARA controls. He indicated he thought the area had been surveyed within the last 7 days, and thus he did not need to wear respirator. Discussions suggested the area had not been surveyed since 3/12/11. The RCT took one swipe, found 3K dpm per swipe of 100 cm² area, backed out, posting the egress scaffolding with a contact RCT sign.

Summary: The corrective actions were not institutionalized, the work was not incorporated into any package. The RCT did not follow requirements for use of respiratory protection and no IH was present to complete the agreed to work task.

2. Critique on low level intake room 230C Part 4.

The critique was long and involved. The task involved removal of plexiglass and sheet metal in the wall between 230C and 235B, surrounding conveyor glove box that went through the wall between the two rooms. During the workability walk down on March 24th, a better way to do the job (unbolt vice cutting metal and plexiglass) was determined. The FWS did not have the procedure revised to reflect the better method and to ensure a hazards analysis was performed for the process. The Field work supervisor and RCTs "thought", since the work method was less vigorous, that use of wet method without respiratory protection was adequate. The contamination event, with positive nasals occurred when a gasket was exposed and cut. The gasket had 50,000 dpm per 100 cm² contamination. It has been a common occurrence that gaskets have retained contamination and that airborne radioactivity has been generated at higher levels when disturbing the gaskets or cutting where the gaskets were located. The room has had a history of contamination spreads including a plutonium fire. Surveys on the outside of painted surfaces are not a good indicator of no contamination on disassembly and exposure of areas not previously accessible for survey. The field work supervisor indicated the plan was to back out if contamination was found. However, based on history of the room and the experience with gaskets retaining contamination, this hazard should have been expected.

The radiological engineering organization at PFP was not included in the decision to perform this work without respiratory protection. Has the workers used respiratory protection for this work step as specified in the procedure, workers would not have been exposed to the airborne radioactivity.

A review of the airborne calculations for the work package and interview with the radiological work planner, indicated there are still deficiencies in the method of performing the radiological control hazard analysis and performance of airborne calculations.

The radiological work planner did not in fact perform separate calculations for two sources of contamination and their associated hazards (glove box breach and disturbance of wall that had internal contamination from historical airborne radioactivity events in the room).

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36567

03/29/2011

03/28/2011

7

Title:

Radiological Work Planning surveillance - PFP

Summary:

Attended pre-job briefing for work glove box 145. The scope of work discussed included, RCT survey of glove box to identify where additional decon with rad pro needed. Two rags in glove box needed neutralization and seal out. Additional chemicals for decon needed to be found and put into smaller bottles for use in the glove box. If chemicals were found, then team would proceed.

The field work supervisor used the check list for a pre-job briefing. Identified they would go ARA during seal outs nad seal ins. Went over the Beryllium work permit.

The lead RCT went over the RWP and did a thorough job. The lead RCT went over the dose rates in the area and discussed high rad levels for rad pro rags (300 mr/hr contact, 90 mr per hr field). The RCT indicated finger rings were required for seal in and seal out and supplemental dosimetry. The limiting condition was 1 R/hr for HRA work. If they find more than 100 mr/hr on the material they will bring it back into the glove box. The RCT discussed partial body entry into HCA with 3 pair of glves, but if general area HCA levels back out to put on two pair. HCA void limit of 20K dpm per 100 cm2 alpha was discussed. Discussed when hoods were required.

No issues with pre-job.

The surveillant went to RCT trainler and ran into a couple of events.

1. Loose paint chips were found in room 230C, creating a localized HCA. Discovered when people exited and found contaminated shoe covers 2-4K, but only 600 dpm per 100 cm2 on tech smears.

2. Failure of a bottle cart (third in one week). Attended 12:30 meeting on the bottle cart failure. The individuals that identified the failure of the bottle cart for the "Rally Point Bottle Cart" indicated it was a clear leakage at the "Whistle"..The system did not leak Friday, but leaked today. There was a long discussion of the "Hanford Whistle" and how they are a manufactured piece from a vendor that is incorporated in the bottle cart system (currently a duplicative warning of low pressure in bottle).

The first issue was a failed regulator (No replacement schedule). The next two events, appeared to be failures in the same location, the whistle. A tamper seal for the adjustment indicates no tampering with the system. The reason for the failure has not been determined. There were corrective actions developed after the first event, with work being allowed to continue after bottle carts were changed to ones that were inspected by Field System Maintenance. The second leakage event at the whistle, was a bottle cart that had just been inspected. The inspection process does not include periodic replacement of the whistle, only a go no go check that the whistle works. Thus it is an operate until failure.

Corrective actions include:

1. Meet with VP on Bottle Air jobs to discuss shut sown of all bottled air work.
 2. Deliver to the maintenance crew BBC-009 (which failed during use) and BBC-022 (failed pre-use) to trouble shoot what failed.
 3. Field System Maintenance evaluate and test the two bottle carts.
 4. Review bottle cart history to determine date of manufacture, receipt, replacements, service...
 5. Post evaluation to determine extent of condition at PFP
 6. PRCNS - send message
 7. Preliminary site notification, forward PRCNS
 8. Contact Issues Management, enter into CPRS
 9. Complete and issue and compliant form
 - 10 Communicate closeout.
-

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36468

03/23/2011

03/23/2011

8 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning PFP

Summary:

The surveillance team observed pre-job briefings, planning meetings and a work planning walk down.

At a pre-job for work in room 179, the field work supervisor discussed a spread of contamination from work on back shift. 24,000 dpm per 100 cm² removable contamination was identified on the lift table used. The contamination was thought to be from previous work on the table (which was obtained from room 230 and possibly contaminated during work done by the chop shop). The area was decontaminated on back shift. The lead RCT indicated they would perform a pre-job survey to verify the area was decontaminated. The lift table was taped over where the contamination could not be removed.

The surveillant attended a meeting of radiological engineering staff. At the meeting the individuals indicated there were inadequate numbers of pocket dosimeters for dose tracking. The workers were eligible for being on annual dosimetry exchange, but without adequate pocket dosimeters there was not a good way to track individual dose.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36439

03/22/2011

03/22/2011

7 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Response to radiological events at PFP

Summary:

The surveillant observed the radiological control organization response to two simultaneous events. In the first event, there was a breached glove in room 188 and in the second, 6,000 dpm on a large area wipe, and subsequently 6,000 dpm on a swipe of 100 cm² area (High contamination levels in a posted CA) in room 228B. The surveillant observed activities in room 111. These activities included personnel doffing of PPE, surveys out of the CA using both PCM and hand held instruments, surveys out of the radiological buffer area and personnel performance and counting of nasal smears.

The RCTs responding to the events, performing nasal smears, brought out their procedure. The RCTs prepared the nasal smears, the workers performed the smear, and the nasal smears were dried under a lamp before counting. No deficiencies were identified during this process.

One RCT was observed to frequently wipe the face with the back of the wrist while wearing PPE gloves.

During response to the identification of HCA levels in room 228B, there were inadequate numbers of HCA posting signs available in the area. Personnel acted as posting until more signs were found.

On a separate note, the facility representative went on a walk down for planning work for A-lines and identified that the new radiological engineering manager was at the walk down.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36400	03/21/2011	03/21/2011	7 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning - PFP

Summary:

The surveillance team observed the RCT morning meeting, pre-job briefings and a work planning meeting between the radiological work planner and a line work planner.

1. The surveillant attended the pre-job briefing for work in room 179. The field work supervisor, prior to the formal pre-job briefing, discussed with the team what they could get accomplished. This field work supervisor is new to the team (4 days). The work scope was removal of waste drums and installation of a glove bag. The field work supervisor also discussed the new process of getting turnover with the back shift and other teams in the work space.

Overall the pre-job was adequate. The field work supervisor used a new pre-job briefing check list.

The RCT went over the RWP, including identifying what PPE would be used. The work was going to be CA, without ARA controls. Partial body entry into a HCA was briefed in case they identified a small area with HCA levels. Due to another teams work scope in the same room, the team discussed bringing in PAPR after lunch. The FWS indicated he would confirm the afternoon ARA conditions for after lunch. Emergency response was also covered by the RCT.

One area that could be improved was the review of radiological conditions in the work area. The surveillant asked afterwards. The RCT indicated between the glove boxes was 1.5 mr/hr and that she identified 4,800 dpm on a LAW but could not find a source. The RCT indicated the highest was typically 600 dpm per swipe of 100 cm² area.

2. The surveillants observed a planning meeting between the radiological engineering manager, radiological work planner and a line planner. The planner discussed new changes to the procedure that required containment in lieu of wet methods. A walk down will be scheduled to identify where containments, sleeves, and wet method with engineered point source ventilation could be applied with the radiological engineering supervisor approval. T

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36371	03/17/2011	03/17/2011	

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning - PFP

Summary:

Notified of post job for chop shop. Notified of multiple issues including failure to follow the radiological control instructions in the procedure.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36368

03/17/2011

03/16/2011

8.5 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning - PFP

Summary:

1. The surveillance team toured PFP backside with the radiological work planner to look at the areas where work is in current planning. Looked at A-line C-line and more. Went down stairs to look at the piping runs that go into the trench, where work activities are being currently planned. While backside, a FWS identified a stop work had been called for his work activities.

2. The surveillance team attended the PFP process improvement meeting. Adverse trends in radiological controls and ISMS (a newly incorporated trending). LTA causal analysis was also discussed.

3. The surveillance team observed the critique that involved the stop work that was mentioned by the FWS.

Critique summary: Problem statement: On March 15, 16, 2011, it was identified by PFP NCOs that the chain of custody for Be Samples from glovebox 179-4 was not properly maintained.

a. Identified planning deficiencies - Samples storage in the CA was not adequately planned to ensure proper storage and integrity of the sample.

b. Less than adequate turnover - status of room, where multiple teams are in the area and multiple shifts exist. FWS was unaware of the status of the beryllium samples (unaware of the use of security tape to identify someone tampering with the samples, prior to his opening the cabinet and handling the samples).

c. FWS broke seal on cabinet and on one of the samples, and did not provide turnover of the status of the cabinet and samples.

4. Notified that there was a high air sample at chop shop.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36311

03/15/2011

03/15/2011

8.5 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning Surveillance PFP

Summary:

The surveillance team observed planning meetings and AJHAs with one AJHA walk down.

1. Attended a planning meeting with the facility representative "To support accelerated size reduction of glove boxes in room 235-A3, room modifications are necessary to room 235-A3 and room 233." No one from the radiological control organization attended the meeting, none were on the invitation list. This is consistent with interviews with the radiological engineers on not being invited during the planning of the work. The design authority for the ventilation system was in attendance to look at how the room could be isolated to prevent other rooms from being airborne radioactivity areas during cut-up of the glove boxes. The plan is to turn each room into its own chop shop.
2. Observed a radiological engineering group meeting that went over the new radiological engineering organization and the work assignments to resolve identified issues.
3. Observed AJHA for 2Z-11-00535, Mechanical Isolation of GBs HC-17DC, HC-17P, HC-17SBB. This AJHA had both an IH and radiological work planner in attendance. The package has 12 tasks, with one that will be added (clean out and decon of the glove boxes, to reduce doses). Again there were differences in how the AJHA was interpreted. This one checked lead abatement paint removal for the disturbance of painted surfaces. The AJHA marked chemical hazard, but specific chemicals not listed. Will have to see what final AJHA is like.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36292

03/14/2011

03/14/2011

8.5 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning PFP

Summary:

The surveillance team observed two AJHAs.

The first AJHA was for electrical work (2Z-11-0634). The package was to cover tracing of electrical lines anywhere in the plant. As such, there were hazards of the location that are not specified in the package because they are not known. Examples include work on the roof. Some electrical work could be on the roof, but they will not know until the package is used for a specific electrical task. Another example, is confined space. There are electrical lines going through confined spaces, the controls being specific to the particular space. The need for confined space controls will not be known until the package is invoked for a specific job.

The AJHA initially said no for roof work, but there was going to be a go to in the procedure to contact IS for the fall

protection requirements if needed. While the confined space guy said yes to confined space hazards, with a similar go to IH for requirements for the confined space if needed.

It seems radiological hazards would be similar also, the specific hazards of the location are unknown until the specific job is determined.

How are we appropriately analyzing the hazard when preparing such a generic catch all work package?

For duct level work, the assistant radiological work planner indicated one RWP is used for investigating contamination levels at the location (966), and another if they find contamination (314) with a reference to decon procedure 17311.

An RCT present indicated for duct level, investigatory surveys would be done on mask (above 8 feet), and the area deconned before the electricians had access. As such, the work package will be screened low hazard.

2. Second AJHA involved work with a covered trench that contained internally contaminated piping that ran from dash 5 to 241Z. A spill of activity from a break in one of the lines indicates contamination within the trench. The work will include removal of soil on top of the coverblocks, drilling holes into the coverblocks for NDA of pipe and air sampling to identify Xe formation to estimate plutonium content of spill in the trench, and grouting filling the trench, provided NDA results show below a specified amount.

The MSA craft left early as we have seen before, with the group indicating the AJHA would be reviewed with them in the morning. IH was not at the meeting because "can't get em".

This group had a different take on the PPE section than other planning groups. Yes was checked for generic hazards, while the specific additional hazard of chemical addition (foaming) was not specified. The individual indicated it would mean they had to wear the PPE for the chemicals during the entire job if they put yes to chemical PPE. This shows the struggles people have in interpreting the AJHA check list.

2.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36277

03/14/2011

03/09/2011

4.0hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning Surveillance - PFP

Summary:

The surveillance team observed a planning meeting for the chop shop (room 172) work. At this meeting the radiological work planner reviewed some changes to the procedures to enhance the radiological engineering controls. There was some tension between the radiological work planner and the work force. RL let the team understand the requirements and why it was not appropriate to plan work for 1 DAC inside the respirator. The lead NCO indicated the air sampler was located between the source and the HEPA ventilation. RL indicated this is a different issue. RL will investigate the validity of the issue through review of records.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

36276

03/14/2011

03/08/2011

8.5

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning Surveillance

Summary:

The surveillance team met with CHPRC staff on their implementation of compensatory actions at PFP, and observed two AJHAs. One of the two included a walkdown of the work area. Due to space restrictions, only one team member attended the walkdown. The results are documented in that team member's OA entry.

The CHPRC staff indicated the following on the airborne radioactivity area monitoring deficiencies:

The CHPRC confirmed the surveillance team's finding that: 1. The plant did not flag for investigation, airborne monitoring results that were greater than 2% of a DAC, instead using 20% of a DAC and 1 DAC-hr. 2. Weakness in program analysis of airborne radioactivity results to ensure unmonitored personnel do not exceed 40 DAC-hr per year. Multiple areas were identified that had one or more results greater than 2% of a DAC. The CHPRC staff member indicated RWPs would be changed to include bioassays for those CAs where greater than 2% of a DAC were identified. The examination of air monitoring results with subsequent trending analysis is now being supported by the CHPRC staff. The discussion also indicated acceleration of smoke testing in the facility to review proper air monitoring sampler locations was being done.

AJHA for Phase III Transfer Line Removal:

A positive attribute for this AJHA was that it started out with a diagram and historical review of the transfer line that will be removed. This is the first AJHA observed where the radiological condition of the system has been discussed.

This AJHA also went one level deeper than the op level questions on the existence of the hazard.

No radiological work planner attended this meeting. The radiological engineer assigned to the project was on vacation.

There was some tension at the meeting when the planner indicated "we" [meaning the engineer and himself], decided to not uncup the lines in the McLusky room to drain any residual liquids, but to use NDA to determine if the line has liquid in it and open the pipe above the level in the McLusky room using containment and negative ventilation. The craft were not comfortable with not using the negative pressure within the area of the McLusky room to ensure the pipe stayed clean and contamination was not pulled out of the McLusky room by the ventilation being added. The uncapping in the McLusky room would need to be done later anyway. The planner was visibly frustrated, even though the worker's ideas were valid.

The AJHA was suspended. RL needs to pull the string on worker involvement prior to the AJHA.

AJHA on HA-46 glovebox D&D, which included removal of a tank under the glovebox.

The questions on chemicals covered what chemicals were going to be brought in. Where does the process identify chemical hazards of the system?

Deficiencies will be documented in the surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

Rpt #: 36143
Date Entered: 03/07/2011

PFP

Date Observed: 03/07/2011
Hours in Field: 8 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning at PFP

Summary:

The surveillance team observed an HRB, run by the D&D manager, for remove PRF Room 60 Mercury Lines and an AJHA for HA-46 Process Cell (Room 232A) Isolation. The HRB meeting was with the HRB chair, the two proposed field work supervisors and planner. This process did not included workers. One of the to dos was to identify containers and verify chemical compatability.

The planner at the AJHA very quickly read through the work package, then went through the list of hazards in the AJHA. At this meeting, the team decided which checks to mark yes, no, or question. The industrial hygeinist was not at the meeting. The meeting ended with a list of to dos.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

Rpt #: 36121
Date Entered: 03/04/2011

PFP

Date Observed: 03/03/2011
Hours in Field:

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning, PFP

Summary:

Performed an interview of a field work supervisor for Transfer Lines work. The FWS demonstrated the work planning and use of engineered controls for this package.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

Rpt #: 36115
Date Entered: 03/04/2011

PFP

Date Observed: 03/01/2011
Hours in Field: 8.5 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning PFP

Summary:

1. Attended a post job review that was called due to an intake (potential uptake) of plutonium that occurred on Sunday. Again, the post job format was not very suitable for determining what happened. A formal causal analysis was planned, personnel from the causal analysis group attended the post job. The RCT covering the job was not in the post job (not available). Management indicated the RCT would be interviewed separately.

The individuals in the meeting identified how the RCT found some contamination in a couple of areas and had the workers cover the areas (up to 1800 in a 8" x 8" cable box).

The team went through the post job review check list.

At the point of completion of the post job, the project was not able to identify what went wrong. RL will continue to investigate.

2. Continued with the interview of CHP responsible for air sampling program and dosimetry. Some deficiencies in the air monitoring program (compliance with 40-DAC-hr per year regulatory requirement) and dosimetry program (correct dosimetry for work) were identified. These deficiencies will be documented in the surveillance report.

OpAware: Project/Issue Detail**Plutonium Finishing Plant Project****Brenda Pangborn****PFP**

Rpt #:	Date Entered:	Date Observed:	Hours in Field:
36113	03/04/2011	02/28/2011	7 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning Surveillance, PFP

Summary:

The surveillance team continued interviews, including the PFP health physicist over the air monitoring and dosimetry programs, and HAMTEC safety representative.

Attended a "Post Job" review of exceeding CA levels during movement of glove box pieces to another room and placing them in waste boxes. The post job format did not appear to work well for understanding what happened during the work to result in a spread of contamination and exceeding CA levels. The FWS "lead" the post job. Instead of individuals identifying the sequence of events, the FWS summarized what happened. The communications appeared stifled.

Hair spray was used to reduce contamination levels to below the levels for a HCA. Communications on what activities were going to be done was LTA to predict the generation of HCA levels. "Turn" vice "Flip over" was the action communicated. The need to flip over the piece multiple times (while in the waste box) is thought to be a reason the individual got HCA levels of contamination on their PPE. RCTs indicated, had they known, what was going to be done, they would have told them to have additional PPE [example of RCTs specifying PPE in the field, due to generic format of requirements in the RWP].

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35980

02/24/2011

02/24/2011

7 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning at PFP

Summary:

The surveillance team interviewed the last line work planner, interviewed two lead radiological control technicians and interviewed the field work supervisor for the chop shop.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35948

02/24/2011

02/23/2011

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological work planning surveillance

Summary:

The surveillance team continued the interviews with the line planners. During the interview, the discussion of changes to the procedure revealed the planner may or may not get contacted for a direct change to the procedure. The planners indicated the DA made the decision whether the direct change required radiation protection concurrence. This indicates the need to add the DA to the interview list.

The team started the interviews of the lead RCTs.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35919

02/22/2011

02/22/2011

8.5 hrs

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning surveillance

Summary:

The surveillance team began interviews with the line work planners. One interview was cancelled due to the worker being unavailable (out sick). Four planners were interviewed. Similar to the radiological control side, a significant turnover of planners was reported.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35918

02/22/2011

02/17/2011

5 hr

Entry Type: Routine Oversight

Include in CIR: No

Title:

PFP Radiological Work Planning surveillance

Summary:

The surveillance team continued with interviews. The facility worked only a half day. Interviews were performed with the PFP ESH manager, the Work Control Program Manager, and the corporate radiological controls mentor.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

PFP

Rpt #:

Date Entered:

Date Observed:

Hours in Field:

35827

02/16/2011

02/16/2011

5 hr

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning at PFP

Summary:

The surveillance team observed the RCT POD and continued with the interview process. Interviews of radiological control supervisors were performed.

The interviews confirmed there were too few radiological control supervisors for the amount of work performed. Currently there are 5 supervisors, but with all of the administrative supervisory work, including HR type work, only two, sometimes three, supervisors are available for being in the field at any time. There are 101 RCTs being supervised by 5 RCT supervisors. The PFP management knows they are short RCT supervisors, and have two openings, in addition to the radiological control manager position. Some RCT supervisors indicated even with hiring of two more supervisors, there will be a shortage. 50% of the 101 RCTs were called "junior" by the RCT supervisors, indicating there were limitations on what work they could perform alone. RCT supervisors indicated they depend on the lead RCTs [for maintaining radiological safety in the field].

The experience levels varied among the RCTs interviewed. Several have a year or less experience in a plutonium facility.

Deficiencies will be documented in the surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

Rpt #:

35811

Date Entered:

02/15/2011

PFP

Date Observed:

02/15/2011

Hours in Field:

10

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological work planning PFP

Summary:

The surveillance team continued with interviews of the radiological control organization. The last of the three radiological work planners was interviewed. Additionally, the RWP preparer and one radiological control supervisor was interviewed.

The surveillance team also attended the morning RCT Plan of the day, a work planning meeting for a job that involved a change to the original work package, and a post job review for a work activity that exceeded the RWP limit and work was not stopped.

Deficiencies identified will be incorporated into the surveillance report.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

Rpt #:

35789

Date Entered:

02/14/2011

PFP

Date Observed:

02/14/2011

Hours in Field:

9

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning at PFP - Process Audit

Summary:

The surveillance team began the interviews at PFP. Two radiological work planners/radiological engineers were interviewed.

One radiological work planner interviewed was recently hired and has been there only three weeks. While the individual has many years of experience in the nuclear field, he has had limited experience with D&D of plutonium facilities. The individual did have a few years experience at PFP many years ago, prior to the D&D phase of work, and thus has more knowledge of the systems.

The second work planner was hired into PFP 3 1/2 months ago. This person has less than 5 years experience total nuclear experience, and had no prior experience with a plutonium facility. The planner did recently get his CHP

certification.

The third radiological work planner will be interviewed tomorrow.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

Rpt #:

35754

Date Entered:

02/11/2011

PFP

Date Observed:

02/11/2011

Hours in Field:

5 hr

Entry Type: Routine Oversight

Include in CIR: No

Title:

Radiological Work Planning Surveillance at PFP - Meeting with ESH Mgr and FR

Summary:

The surveillance team met with the PFP ESH manager to kick off the RL surveillance of radiological work planning at PFP. An overview of the surveillance methodology (process audit) was discussed. Team logistics were covered. The team worked with the facility representatives for selection of PERT teams to include in the review and to have frank discussions on the work planning at PFP pertinent to the review.

OpAware: Project/Issue Detail

Plutonium Finishing Plant Project

Brenda Pangborn

Rpt #:

35469

Date Entered:

01/28/2011

PFP

Date Observed:

01/28/2011

Hours in Field:

Entry Type: Routine Oversight

Include in CIR: No

Title:

No evidence exists that PFP radiological control organization performed an airborne radioactivity estimate for cutting PFP gloveboxes with a circular saw

Summary:

After a high airborne radioactivity level was identified during cutting of a glovebox in room 172 at PFP, the surveillant requested a copy of the contractors work planning documents, including the airborne radioactivity estimates performed that demonstrated the adequacy of the respiratory protection for the planned activity. The high airborne radioactivity level resulted in two workers receiving more than 1 DAC-hr with respiratory protection worn.

The contractor radiological control manager, on discussing the request with the project, determined no airborne radioactivity calculation was performed. The airborne hazard from using the circular saw on the glovebox, was not estimated during the work planning process to verify the controls were adequate for the activity.

This deficiency will be incorporated into a surveillance report on radiological work planning.

Issue Type: Finding

Significance Level: 4

Statement:

PPF did not adequately analyze the radiological hazards associated with use of a circular saw to size reduce a contaminated glove box which resulted in airborne radioactivity levels that exceeded the respiratory protection factor of the airline respirator. Investigation revealed a programmatic deficiency in hazards analysis existed.

Discussion:

As discussed in concern S-11-SED-CHPRC-PPF-002-C01 above, radiological work planning needs to understand the hazards associated with the system, work operations and location in order to determine appropriate controls to mitigate the hazards. Multiple examples exist where the hazards were not appropriately analyzed, resulting in airborne radioactivity generation that exceeded the applicable protection factor for the respiratory protection worn:

- The hazard associated with using a circular saw to cut a highly internally contaminated glove box was not analyzed, resulting in very high airborne radioactivity that exceeded the respiratory protection factor for airline respirators.

The work in room 172 of PFP involved cutting up highly internally contaminated glove boxes for disposal. The room is referred to as the chop shop. On December 29, 2010, while cutting pieces off the back (exposing the internals) of Glove box 139-3-4, with a circular saw, the airborne radioactivity levels exceeded the respiratory protection factor for the airline respirator. The maximum lapel reading was 0.71 DAC-hr. see OA 35012.

The surveillant requested the FR obtain airborne calculations for the work activity from the contractor.

On January 25, 2011, workers again used a circular saw to size reduce a glove box. The airborne radioactivity levels "jumped". The highest DAC-hr value on workers lapel air sampler was 17000 DAC-hr, 1.7 DAC-hr after adjusting for the protection factor of the airline respirator (10,000). Assuming the jump in airborne radioactivity occurred over a five minute period, the airborne radioactivity level generated by the circular saw was more than 200,000 DAC.

The surveillance team again requested the work planning documentation that would indicate the project had evaluated the airborne radioactivity hazard associated with use of the circular saw. The contractor could not provide any.

- Investigation revealed PFP radiological work planners routinely did not perform airborne radioactivity estimates to ensure appropriate controls were selected for the work activity.

Interviews with the radiological work planners at PFP revealed the facility did not evaluate the potential airborne radioactivity levels for use of the circular saw on contaminated glove boxes. In fact, the radiological work planners indicated they had not ever performed airborne radioactivity estimates for work at PFP. The surveillance team reviewed the work planning records for several work packages confirming there were no records of the analysis of the airborne radioactivity hazards for the work reviewed.

A significant contributing factor to this programmatic deficiency is the lack of training and lack of procedures provided by CHPRC that would show the radiological work planner how to analyze the airborne radioactivity hazard, to ensure adequate engineered controls and/or respiratory protection (see findings XXXXXXXX). In this case, no respiratory protection had a protection factor high enough for the work. The analysis of the airborne hazard would have demonstrated the need to incorporate engineered controls.

To control worker exposures to airborne radioactivity, the project incorporated air monitoring void limits. While this process is more of an emergency response, and has minimized the potential dose consequences to the workers to date, it does not control the generation of airborne radioactivity or prevent airborne that exceeds the respiratory protection factor of equipment worn, and creates a highly inefficient work process.

Requirements:

10 CFR 835.501(b) specifies "The degree of control shall be commensurate with existing and potential radiological hazards within the area."

10 CFR 835.501(d) specifies "Written authorizations shall be required to control entry and perform work within radiological areas. These authorizations shall specify radiation protection measures commensurate with the existing and potential hazards."

835.1102 (b) specifies "Any area in which contamination levels exceed the values specified in appendix D of this part shall be controlled in a manner commensurate with the physical and chemical characteristics of the contaminant, radionuclides present, and the fixed and removable surface contamination levels."

DEAR 970.5223-1, Integration of environment, safety, and health into work planning and execution, paragraph (b)

specifies "... The contractor shall, in the performance of work, ensure that... (5) Before work is performed, the associated hazards are evaluated..."

Funct. Area:	Trend Code:	ISMS Funct.:	Causal Code:	
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