



U.S. Department of Energy
Office of River Protection

P.O. Box 450, MSIN H6-60
Richland, Washington 99352

SEP 20 2007

07-TOD-098

Mr. John C. Fulton, President
and Chief Executive Officer
CH2M HILL Hanford Group, Inc.
Richland, Washington 99354

Dear Mr. Fulton:

CONTRACT NO. DE-AC27-99RL14047 – U.S. DEPARTMENT OF ENERGY, OFFICE
OF RIVER PROTECTION (ORP) TANK FARM PROJECT MONTHLY REPORT FOR
AUGUST 2007

The ORP Tank Farm Project Facility Representatives (FR) and Technical Staff conducted evaluations of the Tank Farm and 222-S Laboratory operations and activities during August 2007. The attached report documents the results of the evaluations. The FRs focused their August reviews on Conduct of Operations and Radiological Work Practices. Some improvement was noted in both areas, however additional emphasis and management attention is warranted to ensure that improvements continue. The FRs did observe direct involvement by the Radiological Control First Line Supervisors in immediately correcting deficient radiological work practices in the field.

If you have any questions, please contact me, or you may contact Mr. Mark C. Brown, Director, Tank Farm Operations Division, (509) 373-9150.

Sincerely,

A handwritten signature in black ink, appearing to read "DLNoyes".

Delmar L. Noyes,
Acting Assistant Manager Tank Farms

TOD:MCB

Attachment

cc: See Page 2

Mr. John. C. Fulton
07-TOD-098

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SEP 20 2007

cc w/attach:

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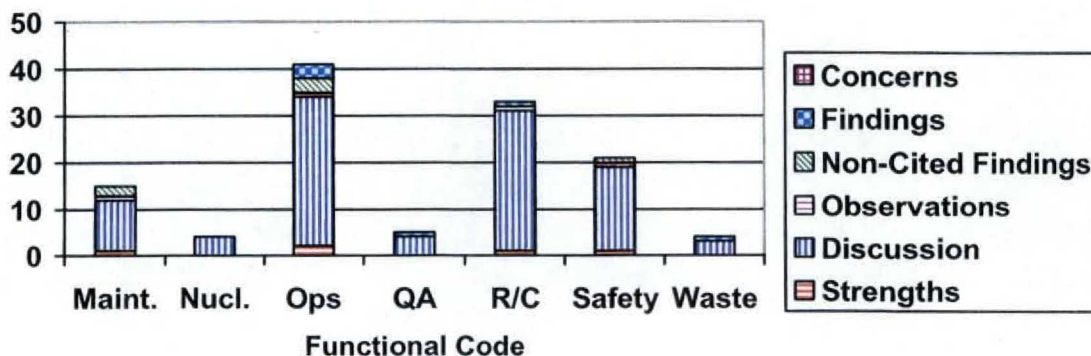
Office of River Protection

Tank Farm Project Monthly Report for August 2007

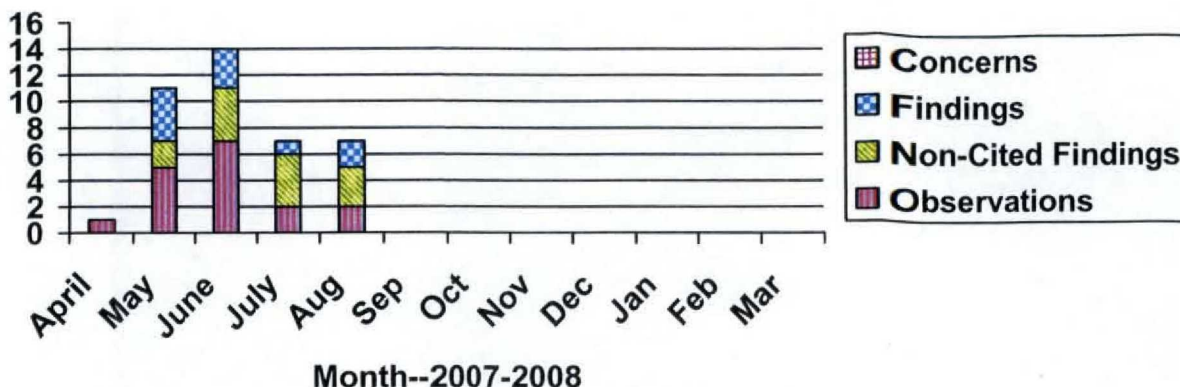
I. Introduction/Summary

During the month of August 2007, the U.S. Department of Energy (DOE), Office of River Protection (ORP) Facility Representatives (FRs) and technical staff reviewed maintenance and operations at the TF and 222-S Laboratory. For this reporting period, 52 entries were made in the Operational Awareness (OA) database. The graph below groups the entries by functional area; since some entries cover more than one functional area they may be represented in the graph more than once. The area with the most OA entries is in the Operations functional area, which is consistent with activities at the TFs and 222-S Laboratory. Two Strengths, two Findings, three Non-Cited Findings and two Observations were noted during the month (detailed in Section V of this report). Some improvement was noted in radiological control work practices and in Conduct of Operations. Continued contractor senior management involvement is needed to enforce expectations in the field in both areas of Conduct of Operations and radiological control work practices. Of particular note was the consistent direct involvement of radiological control first line supervisors in enforcing management expectations in the field and providing real-time feedback to workers.

Number of OA Entries by Category



Number of Deficiencies by Type



II. Analysis and Discussion

In August 2007 the ORP FRs and technical staff performed 44 surveillances in areas that included Conduct of Operations, Radiological Control Practices, Operations, Maintenance, Nuclear Safety, Integrated Safety Management, Training, and Industrial Safety. The FRs conducted field oversight and program reviews during the month. Some of the more complex or hazardous field activities observed included:

- Recovery actions for the condensate spill near C-204;
- S-102 Dilution Hose Removal mockups and evaluated mockup;
- S-102 High Contamination Area (HCA)/High Radiation Area (HRA) entries;
- 242-A Evaporator campaign operations;
- Inspection and re-inspection of the C-200 condensate drain line packaging;
- Field work for valve closure in the S-102 retrieval system;
- Integrated Dryer Melt Testing for the Demonstration Bulk Vitrification System Project;
- CH2M HILL Hanford Group, Inc. (CH2M HILL) response to On-Site Fire; and
- C-104 ventilation hatchway removal.

S-102 Recovery Oversight:

ORP has issued an S-102 Recovery Oversight Plan. This plan breaks oversight into three distinct areas: field recovery, engineering/safety basis, and event investigation. Field oversight in August has focused on:

- Spill area perimeter surveys;
- HCA/HRA dose rate and contamination area surveys;
- Industrial safety;

- Lockout/Tagout implementation;
- Industrial Hygiene (IH);
- Team Planning Meetings;
- Mockup preparation; and
- Evaluated mockup of the dilution hose removal.

Engineering/Safety Basis oversight during the month of August has focused on Potential Inadequacy in the Safety Analysis (PISA) evaluations, Unreviewed Safety Question Determinations (USQD), technical evaluations, hazard and safety analyses, TF Hazard Database, and occurrence reports. Specific documents reviewed included:

- TE-07-009, *Technical Evaluation for the C-109 and AN-106 Transfer Pumps*;
- TE-07-012, *C-109 Retrieval System Technical Evaluation for Pressurized Solids*;
- Occurrence Report EM-RP—CHG-TANKFARM-2007-0009, *Tank 241-S-102 Waste Spill*;
- Occurrence Report EM-RP—CHG-TANKFARM-2007-00010, *Tank 241-S-102 Dilution System Design Represents a Technical Safety Requirements Violation*;
- Occurrence Report EM-RP—CHG-TANKFARM-2007-00011, *Postulated Waste Leak Accident Scenario Resulting from Pressurizing/Channeling is Not Considered in the Safety Basis*;
- Progressive Cavity Pump Review Comment Record (RCR);
- RPP-17965, *Safety Evaluation of the Single-Shell Tanks Modified Sluicing Waste Transfer System*;
- RPP-15188, *Hazard Evaluation Database Report*;
- TF Safety Basis Clarification Request, Log No. 2004-4177;
- CH2M HILL PISA Worksheet S-102 dilution system design; and
- CH2M HILL PISA Worksheet for the postulated waste leak resulting from pressurizing/channeling within waste tank solids.

S-102 Event investigation oversight during the month of August has focused on the following:

- Spill event investigation and fact-finding meeting;
- Response actions investigation and fact-finding meeting;
- Health Effects Group investigation;
- U.S. Environmental Protection Agency investigation and documentation review;
- ORP independent investigation team assistance and documentation review; and
- Type A Investigation Team interviews and support.

III. Occurrences and Injuries

During the month of August 2007 there was one lost work day case. On August 2, 2007, while performing normal job duties, cutting floor tiles, an employee felt abdominal pain. Employee was treated at AdvanceMed Hanford and initially returned to work with no restrictions. Due to continuing medical treatment and days away from work, the case has been reclassified to Recordable Lost Workdays. The contractor conducted an ergonomic evaluation of the work

activity and implemented corrective measures. The previous recordable and lost work day injury occurred on April 3, 2007.

There was one occurrence report issued during the month of August 2007:

Postulated Waste Leak Accident Scenario Resulting from Pressurizing/Channeling is not considered in the Safety Basis (EM-RP--CHG-TANKFARM-2007-0011):

On August 23, 2007, this contractor issued this occurrence report as a result of a review of past 241-S-102 waste retrieval operations. It was noted that on several occasions waste disturbances from the dilution water flow and air sparging were seen at distances of up to approximately 10 feet from the pump column. This provides evidence that there is sufficient waste solids strength to channel pressurized fluid away from the point where the pressurized fluid is introduced. Based on new information from observations of past 241-S-102 waste retrieval operations, the following waste leak accident scenario is postulated:

1. A pressurized source of fluid (e.g., waste, water, air, nitrogen) is introduced below the solids surface in a waste tank. Examples include waste transfer discharge lines, waste transfer suction lines (if connected to a positive displacement waste transfer pump that can be operated in reverse), high pressure mixers, dilution water lines, water lances, air lift circulators, weight factor dip tubes, etc.
2. The waste solids (i.e., settled solids) have sufficient strength to channel the pressurized fluid.
3. The pressurized fluid, including entrained waste, is released from the tank through other equipment that has an open path from the waste solids to outside the tank or associated tank structures. Examples include the 241-S-102 sparge line, self-lancing thermocouple trees, transfer pump columns, transfer pump dilution lines, transfer pump sparge lines, core sampling drill strings, failed liquid observation wells, dip-tubes, etc.

The postulated waste leak accident scenario resulting from pressurizing/channeling is not considered in the safety basis. In addition, it is qualitatively judged that this waste leak accident scenario has the potential for significant impact to workers, the public, or the environment. Thus this new information constitutes a potential inadequacy in the PISA. As a result, this event was categorized as a 3B(2) SC-3.

IV. Monthly Focus Review for August: Conduct of Operations and Radiological Control Practices

In July 2007 ORP FRs observed a negative performance trend in radiological work practices and in Conduct of Operations. As a result, increased emphasis was placed on oversight in these areas in August 2007. Result: Some improvement was noted in radiological control work practices and in Conduct of Operations. Continued contractor senior management involvement is needed to enforce expectations in the field in both areas of Conduct of Operations and radiological control work practices. Of particular note was the consistent direct involvement of radiological

control first line supervisors in enforcing management expectations in the field and providing real-time feedback to workers.

During the month of August, the FRs conducted numerous surveillances of the Tank Farm Contractor (TFC) Conduct of Operations and Radiological Control Practices. The FRs used a performance-based approach to assess procedural compliance, work planning, adequacy of field work, feedback, and training.

Scope:

The FRs performed the numerous activities, as outlined below, to evaluate the performance of Conduct of Operations and Radiological Control Practices.

- The FRs reviewed the following procedures/documents:
 - TF Conduct of Operations Manual, *Communications*;
 - TFC-OPS-OPER-C-31, *Communications Guidelines*;
 - TFC-OPS-MAINT-C-01, Rev. M-4, *Tank Farm Contractor Work Control*;
 - TFC-OPS-OPER-C-14, Rev. C, *Event Investigation Process*;
 - TFC-ESHQ-S-STD-19, Rev. A-2, *Safety Showers and Eyewash Stations*;
 - TO-420-905, *Perform S-102 Waste Retrieval Pumping*;
 - TO-020-420, *Clean, Level Indicating Transmitter Tapes, Plummets and Displacers*;
 - HNF-5183, *Tank Farms Radiological Control Manual*;
 - TE-07-009, *Technical Evaluation for the C-109 and AN-106 Transfer Pumps*;
 - TE-07-012, *C-109 Retrieval System Technical Evaluation for Pressurized Solids*; and
 - ARP-221, *A-Farm Alarm Response*.

- The FRs observed field work activities including:
 - Inspection of the C-200 condensate drain pipe packaging;
 - Inspection of the C-200 condensate drain pipe packaging after the wrapping was repaired;
 - S-102 Dilution Hose Removal mockups (numerous occasions) and evaluated mockup;
 - Participated in the Type A investigation;
 - Observed S-102 HCA/HRA entry (numerous occasions);
 - Observed C-109 Retrieval System Leak Detector Functional Test;
 - Inspected the status of CR-Vault construction activities;
 - Observed the Integrated Dryer Melt Test (IDMT) at the Horn Rapids Test Facility (numerous occasions);
 - Post-IDMT activities;
 - 242-A Evaporator campaign operations (numerous occasions);
 - Field work for valve closure in the S-102 retrieval system;
 - CH2M HILL response to On-Site Fire;

- C-104 ventilation hatchway removal;
- C-104 ventilation construction activities;
- AW-102 ENRAF Flush; and
- U-Farm Vadose Zone Sampling.

Results:

Conduct of Operations:

Several areas related to Conduct of Operations have been reviewed during the field observations conducted in August. Specific areas in which weaknesses were detected were:

1. Inadequacies Associated with the C-200 Condensate Drain Line Radioactive Material Packaging (Operations Turnover, Communications).

Discussion: Poor Conduct of Operations was demonstrated by inadequate turnover and communication by not showing or providing the Field Work Supervisor (FWS) photos of the discrepancies noted by the FR. Additionally, management's expectations were not adequately communicated to ensure that the identified discrepancies were resolved. This is even more significant in light of the fact that numerous perforations were found that had not been corrected during the first attempt.

2. Inadequacies of the C-200 Critique (Investigation of Abnormal Events, Procedure Content and Use).

Discussion: Procedural non-compliances of TFC-OPS-OPER-C-14 were noted during the critique.

3. Operational Weaknesses noted during ENRAF Flushes (Communications, Control of Equipment and Equipment Status).

Discussion: Inadequate communications were responsible for excessive water leakage at the hose connection at the ENRAF. Additionally, a premature failure of the totalizer resulted in only 41 of the 50 gallons used for the flush. This was not communicated to the FWS and the field personnel decided that 41 gallons was adequate. There was also no post-job review to discuss the work performance and why it deviated from what was expected.

4. Situational Awareness during ENRAF Flush (Shift Routines and Operating Practices).

Discussion: During an AW TF entry, only one of five workers reviewed the posted survey map before entering the farm. This demonstrates complacency in the awareness of TF status.

5. 242-A Portable Eyewash Station was not operable prior to slurry sampling (Control of Equipment and System Status).

Discussion: This represents a non-compliance with the expectations set forth in TFC-ESHQ-S-STD-19 for operability of safety showers and eye wash stations.

6. Low voltage power not removed during troubleshooting in leak detector functional test (Control of Equipment and System Status).

Discussion: Poor Conduct of Operations was demonstrated when the electrician failed to remove power from a panel prior to reconnecting a current source. The electrician failed to exercise proper control of equipment during the correction.

7. Inadequacies noted in alarm status maintenance and in procedural controls for alarm response (Procedure Content and Use).

Discussion: One example of poor Conduct of Operations is demonstrated for the AN-107C leak detection pit high level alarm. The log sheet is pre-printed with a statement that the alarm is "intermittent" and that the Shift Manager has been notified. This removes the burden for following up on the alarm. The *AN-107C leak detection pit high level alarm* was cleared on the panel, but never cleared on the log sheet.

Radiological Control Work Practices:

Radiological control work practices were observed for work activities and operations during the month of August. Observed field operations and activities included:

- Inspection of the C-200 condensate drain pipe packaging;
- Inspection of the C-200 condensate drain pipe packaging after the wrapping was repaired;
- S-102 Dilution Hose Removal mockups (numerous occasions) and evaluated mockup;
- Observed S-102 HCA/HRA entry (numerous occasions);
- Field work for valve closure in the S-102 retrieval system;
- C-104 ventilation hatchway removal; and
- C-104 ventilation construction activities.

The following radiological control work practice deficiencies were noted in August:

- Rapid rate of frisking in the concrete enclosure while exiting the S-102 HCA/HRA. This has been observed on several occasions.
- Reaching into the HCA/HRA boundary while applying fixative.
- Positive/negative face seal checks are frequently not performed while donning a face mask.
- One individual did not don a hood prior to entering the Contamination Area (CA). This person was part of the undress team for the S-102 HCA/HRA entry. The individual was required to go back to the change trailer to get a hood. This problem could have been avoided if team members exercised more team work by checking each other during the dressing process.
- Several Self-Contained Breathing Apparatus bottles were passed from the change trailer Radiological Buffer Area (RBA) to the Radioactive Material Area (RMA) without frisking the bottles prior to moving them across the boundary.
- One individual touched his face with his hands while inside the CA (not the HCA/HRA) at the S-102 spill area. The person was prompted by CH2M HILL personnel to have an

Health Physic Technician perform a face frisk to make sure there was no personnel contamination.

- One individual did not have the single set of Personnel Protective Equipment (PPE) (booties) taped up appropriately. This could have been eliminated by using a buddy system while dressing in PPE.
- During the S-102 evaluated mockup, more care should be given to making sure that people in plastic PPE do not tear the plastic. The need for a buddy system was particularly evident when one individual was sitting on an old water supply line and the pants of his plastic PPE were pressing against the sharp metal edge of a support.

Some improvement has been noted in radiological control work practices within the month of August. Most of the improvements were noted during S-102 HCA/HRA entries. Specific examples of improvements noted include:

- The process for dressing and undressing for the individuals wearing a double set of PPE is markedly improved. This was achieved by standardizing the removal sequence and undergoing several practice sessions. The level of attention-to-detail in the removal process is also improved by sensitizing personnel to the potential spread of contamination while undressing.
- A training session for installation of glove bags, J-Seals and Umbilical cuts was beneficial for communicating the expectations and standardizing the tasks when making a specific seal or taping a glove bag to a flat surface.
- 3-way communications during S-102 HCA/HRA entries has improved although weaknesses continue with making sure that repeat-backs are accurate. Supervision has done an excellent job at reinforcing the expectations of 3-way communications, when appropriate, by correcting personnel when errors occur.
- Maintaining radiological zone control within change trailers has frequently been problematic. In preparation for the Evaluated Mockup for the S-102 Dilution Hose Removal, one of the lead HPTs did a superb job at reminding people of radiological zone barriers and making sure that when a zone was violated (e.g. passing from the change trailer RBA into the RMA without performing a hand/foot frisk, or passing from the TF CA into the change trailer RBA) appropriate radiological checks were completed to ensure no contamination spread.
- The same lead HPT also played an important role by assisting and coaching personnel in the dressing of PPE in the change trailer. This was particularly important for the S-102 mockup in that plastic PPE were being used.
- The sensitivity to dust control has improved.

Strengths:

Management Demonstrated Effective ISMS During S-102 HCA/HRA Entry. (Frink, August 15, 2007.)

Strong Support from the CH2M HILL Technical Representative at the Emergency Operations Center (EOC). (Trenchard, August 17, 2007.)

Findings:

Critique of C-200 Condensate Spill Event was not Adequate. (Yasek, August 22, 2007.)

Radioactive Material Packaging of Removed Sections of C-200 Condensate Drain Lines was Found to be Inadequate . (Frink, August 23, 2007.)

Non-Cited Findings:

ORP FR Found a 242-A Portable Eyewash Unit that was not Operable Prior to a Slurry Sampling Job. (Williamson, August 14, 2007.)

Operational Weaknesses Noted during ENRAF Flushes. (Ciola/Trenchard, August 23, 2007.)

Inadequacies Noted in Alarm Status Maintenance and in Procedural Controls for Alarm Response. (Ciola/Williamson, August 28, 2007.)

Observations:

Situational Awareness During ENRAF Flush. (Trenchard, August 23, 2007.)

Low Voltage Power not Removed During Troubleshooting in Leak Detector Functional Test. (Yasek, August 29, 2007.)

Conclusion:

As previously stated, some improvement was noted in August 2007 in radiological control work practices and in Conduct of Operations. Two areas of Conduct of Operations appear to be the most deficient: *Communications* and *Control of Equipment and System Status*. Continued contractor senior management involvement is needed to enforce expectations in the field in both areas of Conduct of Operations and radiological control work practices. As a result of the observed need for continued improvement in both areas, the FR monthly focus areas for the month of September 2007 will be Conduct of Operations and Radiological Control Practices.

V. Strengths and Deficiencies

Strengths:

Management Demonstrated Effective Integrated Safety Management System During S-102 HCA/HRA Entry. (Frink, August 15, 2007.)

Equipment problems (radiological control lapel air samplers) delayed S-102 HCA/HRA entry and resulted in one HPT being in a double set of anti-C's for a prolonged period of time. An HPT was involved with checking the Lock and Tag and while she was doing this, the malfunction of 2 lapel air samplers (in the change trailer) was noted. Upon completion of her task, she came back to the change trailer and waited in the double set of Anti-Cs with hood and

mask on until everyone else was ready. The FR discussed concerns for the HPT's safety with the Senior Supervisory Watch and the RadCon Supervisor; they were very much aware of the issue and they shared the same concerns. At no time was the IH work/rest regimen violated. The HPT was frequently asked if she was ok and acknowledged that she was fine. She was monitored closely by management and the FR. Her attitude was exceptional throughout the long morning. Management did an excellent job of making sure that she was safe.

Strong Support from the CH2M HILL Technical Representative at the Emergency Operations Center (EOC). (Trenchard, August 17, 2007.)

During a Site-Wide Emergency Exercise at a non-TF Facility (August 16, 2007), the CH2M HILL Technical Representative provided the on-call ORP FR with detailed status. She discussed the scenario and the potential impacts to TF personnel and facilities with the FR. Her evaluation and notification were thorough and well conducted. This strong performance was repeated later in the day during an Alert Level Emergency for a large fire on the Hanford Site. Again, the CH2M HILL Technical Representative provided the FR with information about the overall event, potential impacts to TF personnel and facilities, and the details of the actions being taken by TF personnel on-site. She also informed the FR of the ORP personnel who were present in the Emergency Operations Center and their planned reliefs which aided in the FRs notification process.

Findings:

Critique of C-200 Condensate Spill Event was not Adequate. (Yasek, August 22, 2007.)

Requirement: TFC-OPS-OPER-C-14, Rev C, Event Investigation Process, implements the event investigation process to ensure significant issues are aggressively pursued and documented. Requirements for conducting Event Investigation Critique Meetings is defined in this procedure.

Discussion:

On August 21, 2007, approximately one cup of contaminated liquid was spilled to the ground inside C Farm adjacent to 241-C-204. A critique was held the following day to determine the facts of the event. This critique did not meet several requirements for Critique Meetings as specified in TFC-OPS-OPER-C-14, Rev C, Event Investigation Process. The C-204 Leak Critique did not address the following requirements of this procedure:

- The scope/purpose of the critique were not clearly stated. TFC-OPS-OPER-C-14, Revision C, section 4.2 (8) states that the critique meeting is only for fact finding and prescribes a set format to ensure this objective is met. This format was not used.
- No individual was assigned to take meeting minutes. The meeting facilitator apparently was taking meeting notes, but a separate person should have been assigned so that the facilitator could concentrate on conducting the meeting.
- The critique agenda did not follow the format described in TFC-OPS-OPER-C-14, Revision C, section 4.2 (10).

- The critique meeting objectives were not reviewed with critique team members to ensure that critique objectives were met. It was noted by the FRs that the objectives were not well defined to begin with.

Additionally, the conduct of the meeting would have been improved substantially through the following inclusions:

- Photographs of the event scene would have aided greatly in recreating the event and clarifying facts. Only one photograph was used in the critique and it was not distributed to all participants; the only graphic was a whiteboard drawing of the event scene and equipment.
- A printed depiction of the timeline for all to see (either overhead or handouts) rather than just reading off the timeline to the participants.
- A printed list of critique objectives to use to perform the critique and to review at the conclusion to ensure that the objectives had in fact been met.

At the conclusion of the critique meeting, it was not clear to the FRs in attendance that all the facts relevant to the event were available to determine follow-on actions or additional investigation. Follow-up investigations by the FRs in the field at C Farm revealed that there were multiple perforations of sleeving around equipment that had been handled during the same timeframe as the piping that had leaked. This implied that there was a reasonable chance that similar perforations to the sleeving around the leaking pipe could have occurred. Perforation of sleeving was brought up at the critique, but lightly touched on, with no additional investigation deemed necessary. Such perforation is a potential cause for the leakage and warrants followup investigation to determine if it was a contributing factor to the leak.

Radioactive Material Packaging of Removed Sections of C-200 Condensate Drain Lines was Found to be Inadequate . (Frink, August 23, 2007).

Requirement:

HNF-5183 (Tank Farms Radiological Control Manual), Revision 1, Section 413, line item 3 states, "Radioactive material with removable or potentially removable contamination levels in excess of 100 times Table 2-2 values should have additional packaging controls such as double-wrapping or the use of plastic bags inside containers."

Discussion:

On August 21, 2007, approximately one cup of contaminated liquid was spilled to the ground inside C-Farm adjacent to 241-C-204. The spill emanated from liquid that was trapped in one of the wrapped condensate drain lines that were removed per work package CLO-WO-07-0057. On August 23, 2007, the C-Farm FR and the ORP Director of TF Operations inspected the wrapping on the remaining two sections of piping. The wrapping of both pipe sections was found to have numerous perforations. This information was communicated to CH2M HILL management. Later the same day, the Closure Operations Shift Manager informed the FR that the perforations had been corrected with the use of tape.

On August 27, 2007, the FR entered C-Farm and reviewed the workmanship for applying tape to the perforations. Although a substantial amount of tape had been applied to seal some perforations, the FR found numerous perforations that had not been sealed. Most notably, the largest perforation that was noted on the August 23, 2007, inspection had not been corrected.

The presence of perforations in the wrappings represents a non-compliance with the above-cited requirement.

Non-Cited Findings:

Non-Cited Finding: ORP Facility Representative Found a 242-A Portable Eyewash Unit that was not Operable Prior to a Slurry Sampling Job. (Williamson, August 14, 2007.)

A FR found that a portable eyewash/drench hose unit was not pressurized just prior to the slurry sampling crew entering the CA at the 242-A Evaporator on 8-14-2007. This portable unit was being used in place of a permanent safety shower that was inoperable at the time due to an electrical safety issue. Procedure TFC-ESHQ-S-STD-19, REV A-2, *Safety Showers and Eyewash Stations*, requires that employees and supervisors ensure operability of safety showers and eyewash stations when working in an area that involves a significant potential for hazardous materials to splash onto the skin or into the eyes. Once the FR identified the problem, the portable unit was exchanged for an operable one prior to entry into the CA.

Non-Cited Finding: Operational Weaknesses Noted During ENRAF Flushes. (Ciola/Trenchard, August 23, 2007.)

ENRAF Flush procedure TO-020-420 Revision G-0 provides instructions for flushing FICs, Manual Tapes, and ENRAFs. Several areas for improvement were noted on recent AW-102 ENRAF Flushes:

- Poor Communications were noted during the August 20, 2007, AW-102 ENRAF Flush. The pump truck was parked in an area that afforded the shortest hose length to the ENRAF. However, in this position, a motor control center impeded visual contact between the pump operator (outside the TF fence line) and the operators stationed at the ENRAF (within the TF fence line). Once the water supply pump was started, the hose connection at the ENRAF leaked excessively, and operators at the ENRAF were not able to quickly contact the pump operator to stop the flow. An observer notified the pump operator to stop the flow.
- During the August 23, 2007, pre-job brief, the expectation was clearly to flush the ENRAF with 50 gallons of hot water. During the flush, the water meter stopped moving after 41 gallons had been flushed. It was not clear why this happened. The FWS was not at the work site and was not informed; instead, members of the work crew decided that this volume was adequate and disconnected the flush equipment. While 41 gallons was recorded in the procedure, there was no determination whether this was a failure or inaccuracy of the water meter. There was no post-job to discuss the work performance and why it deviated from what was expected.

- A review of completed procedures for five additional AW-102 ENRAF Flushes revealed problems on two additional flushes:
 1. For the July 17, 2007, flush, step 4.3.4 was not filled out correctly. There is a space to enter the planned flush volume and whether it will be cold or hot water. In this case, a check mark was made instead of entering the number of gallons to be flushed.
 2. For the August 13, 2007, flush, an entry was made in step 4.3.4 specifying that the flush volume was to be less than or equal to 50 gallons. On Data Sheet 1, 100 gallons was entered as the approximate amount of water required and then 60 gallons was added. This is in excess of the 50 gallons planned for in step 4.3.4.

Non-Cited Finding: Inadequacies Noted in Alarm Status Maintenance and in Procedural Controls for Alarm Response. (Ciola/Williamson August 28, 2007.)

When reviewing the “241 AN Facility Alarm Status Data Sheet” (log sheet), the alarm response procedure for a *high level leak detector pit* alarm (ARP-221) refers to an out of service alarm (annulus CAM alarm) as one of the alarms that should be investigated and reported to the Shift Manger. The same condition was found at AW and SY Farms. At AN Farm, all seven of the annulus CAM alarms were locked in. The annulus CAM alarms at all of the TFs are all listed as out of service in the Shift Manager turnover sheet.

For the *AN-107C leak detection pit high level alarm*, the log sheet is pre-printed with a statement that the alarm is “intermittent” and that the Shift Manager has been notified. This seems to remove the burden for following up on the alarm. The *AN-107C leak detection pit high level alarm* was cleared on the panel, but never cleared on the log sheet.

The “alarm title” column indicates status vs. title for *AN-105 Alarm 9* and *AN-101 Alarm 9* entries. The log sheet also logs ongoing alarm conditions that are to be investigated or disabled per work packages dating as far back as 2002. Examples are the log sheet entry for *ANN-101A Alarm 3*, which states that work will be performed to permanently disable the alarm. It is dated October 11, 2003. The log sheet for *AN-101 Alarm 9* states that troubleshooting will be performed on the *Service Water Building Hi Rad alarm*. This entry is dated October 30, 2002.

Observations:

Situational awareness During ENRAF flush. (Trenchard, August 23, 2007.)

During AW TF entry to perform an ENRAF Flush on August 23, 2007, only one of five workers (the HPT) reviewed the posted survey map before entering the farm.

Low Voltage Power not Removed During Troubleshooting in Leak Detector Functional Test. (Yasek, August 29 2007.)

During performance of a functional test of the leak detectors at C-109, the electrician was setting a current supply (Fluke meter) to the low voltage system to simulate pump flows greater than 50 gpm. When initially set, the indicated pump flows did not repond to application of meter current. The electrician realized that they had incorrectly connected the current supply and made a correction without removing power to the panel. When the current supply is initially connected, power to panel is removed for equipment protection (the panel is low voltage, 24 volts, so there is no lock and tag or personnel safety issue). A good work practice would have been to remove power while the correction was being made. This was also noted by the FWS and debriefed during the post-job debrief.

VI. Closed Findings: None