



U.S. Department of Energy
Office of River Protection

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

AUG 23 2007

07-TOD-082

Mr. J. C. Fulton, President
and Chief Executive Officer
CH2M HILL Hanford Group, Inc.
2440 Stevens Center Place
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 JULY 2007

The ORP Tank Farm Project Facility Representatives and Technical Staff conducted evaluations of the Tank Farm and 222-S Laboratory operations and activities during July 2007. The attached report documents the results of the evaluations.

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

Sincerely,

A handwritten signature in black ink, appearing to read "D. L. Noyes".

Delmar L. Noyes,
Acting Assistant Manager Tank Farms

TOD:MCB

Attachment

cc: See Page 2

Mr. J. C. Fulton
07-TOD-082

-2-

AUG 20 2007

cc w/attach:

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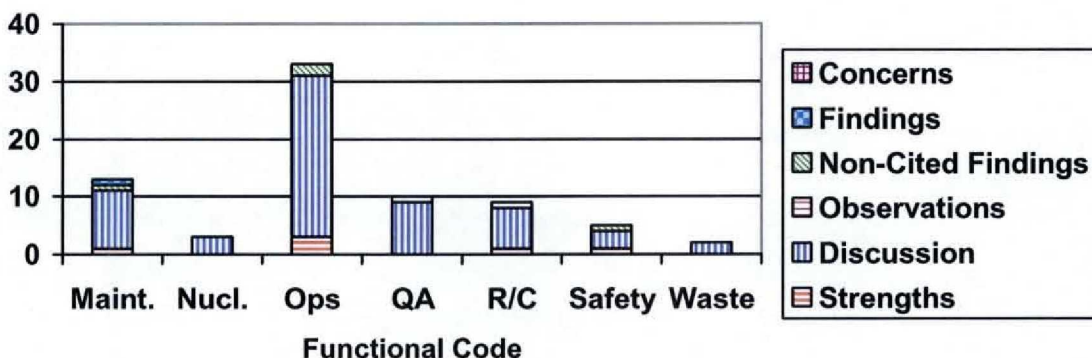
Office of River Protection

Tank Farm Project Monthly Report For July 2007

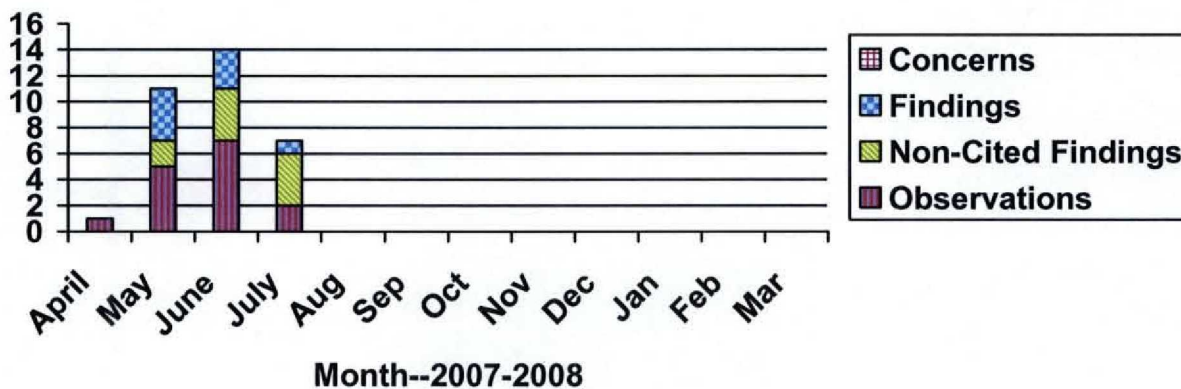
I. Introduction/Summary

During the month of July 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 Tank Farms and 222-S Laboratory. For this reporting period, 72 entries were made into 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 Tank Farms and 222-S Laboratory. Six Strengths, one Finding, four Non-Cited Findings, and two Observations were noted during the month (detailed in Section V of this report).

Number of OA Entries by Category



Number of Deficiencies by Type



II. Analysis and Discussion

In July 2007 the ORP FRs and technical staff performed surveillances in 24 areas that included operations, maintenance, nuclear safety, integrated safety management, construction safety, quality assurance and radiological protection. The FRs conducted field oversight and program reviews during the month. Some of the complex or hazardous field activities observed included:

- Preparations for, and conduct of, waste transfer from AP-104 to AW-102—complex hazardous;
- Preparations for, and observation of, waste transfer from 219-S to SY-101—hazardous;
- Seepex pump removal and installation at Tank S-102—complex/hazardous;
- C-109 retrieval operations—hazardous;
- Operation of the 242-A Evaporator—complex/hazardous;
- S-102 retrieval—complex/hazardous;
- Response to S-102 spill event—hazardous.

S-102 Spill Event

FRs provided response and oversight of the S-102 spill and associated response activities, including response to the Incident Command Post (ICP) and numerous discussions with the Tank Farm Contractor (TFC) on protective actions, reportability, significance categorization, notifications, radiological postings, determination of failure mechanism, etc. No emergency action levels were reached and consequently no emergency was declared, although the ICP was manned and the Emergency Operations Center in the Federal Building to a limited extent. Response actions by the TFC were considered to be appropriate, but reviews and investigations are still ongoing.

The spill is currently believed to have been caused by the backflow of tank waste into the raw water dilution piping, directly connected to the S-102 retrieval pump suction. During reverse pump operation to clear the pump of waste, the pump suction became plugged with waste and was pressurized, resulting in the backflow of waste into the dilution line, pressurizing the dilution hose, and rupturing the dilution hose on top of the tank. Engineering design and safety analysis personnel failed to adequately analyze this accident scenario and to properly apply existing controls in the Documented Safety Analysis and Technical Safety Requirements to preclude this failure mechanism and resultant spill. This postulated failure mechanism had not been verified by the end of the reporting period. The FRs also engaged in oversight of ongoing recovery actions including evaluation of radiological surveys, postings and practices.

The ORP has developed and implemented an S-102 Spill Recovery Oversight Plan. This review plan describes how ORP will evaluate contractor event investigations, causal analyses, recovery work activities (contaminated equipment and soil removal, and decontamination activities), Engineering and Safety Analysis, Conduct of Operations, Radiological Controls and Industrial Safety. ORP FRs and technical staff will be involved in the review. Results of the review will be provided to the contractor on a regular basis through established mechanisms. Upon completion of the aforementioned investigation and recovery activities, a final report will be issued to formally document the results of the evaluation (estimated to be completed in October 2007).

Corrective Action Management

A review of the Problem Evaluation Request (PER) and corrective action management processes was conducted this month to evaluate the process for correcting the adverse conditions identified in the FR Weekly Reports and Occurrence Reports. Corrective actions for FRs identified issues and Occurrence Reports for the time period of June 30, 2006 through June 30, 2007, were evaluated.

The disposition of 71 PERs covering both FR issues and Occurrence Reports were reviewed to determine if the actions on the PER addressed the identified cause and corrected the problem. Each PER was reviewed to determine if: the identified issue was entered into the PER system; the appropriate problem analysis method was used to identify the problem cause; corrective actions were developed, documented, approved, implemented and tracked to validate completion; and the closure records provide documented evidence of corrective action completion.

The review found two issues with only one of the 71 PERs evaluated. CH2M-PER-2007-0616 was generated based on a Finding in weaknesses in Operator Aid Audits. The two outstanding issues are:

1. Procedure TFC-OPS-OPER-C-41 requires revision and has a completion date of July 23, 2007. This action was not complete nor was an extension requested at the conclusion of the assessment. The actionee is working with his management to resolve this issue.
2. CH2M-PER-2007-0616 resulted in the generation of CH2M-PER-2007-0564. This PER requires disconnecting an obsolete siren and the associated switch at Tank Monitoring and Control System (TMACS). This PER action has been extended to October 30, 2007, because supporting documentation from the vendor is not available and new Engineering drawings must be created.

Overall the FRs found that contractor personnel regularly coordinated PER closure of FR identified issues with the initiating FR. In using established problem identification and corrective action management processes, TFC demonstrated that deficiencies were adequately captured and that corrective actions were appropriate and effective.

Identified Trends in Radiological Practices and Conduct of Operations

Indications of a degradation in radiological practices and Conduct of Operations have been observed recently that, if left uncorrected, could develop into a potential concern. For example, during ongoing recovery actions from the S-102 spill event, the following deficiencies in radiological practices were observed:

- Inadequate three-way communication when communicating dose readings from within the High Radiation Area(HRA)/High Contamination Area (HCA) while wearing Self-Contained Breathing Apparatus (SCBA);
- Lack of frisking SCBA face piece prior to donning when entering/exiting HCA;

- General lack of frisking SCBA face piece prior to donning in Contamination Area;
- Personnel frisk for alpha contamination inappropriately rapid;
- Personnel checking pocket dosimeters with insufficient frequency;
- Passing items over boundaries out of HCAs/CAs with out frisking;
- Less than adequate radiological zone control.

The following Conduct of Operations deficiencies have been observed over the last couple of months:

- Front-end loader ran over a TMACS junction box in C-Farm;
- Numerous errors in C-109 retrieval startup documents such as checklists/datasheets;
- 242-A evaporator material balance discrepancy calculations;
- Hose-in-Hose Transfer Line inspections not completed;
- S-102 valve misalignment;
- Equipment Discrepancy List errors at 242-A evaporator;
- AN-B multiple personnel contamination event;
- S-Farm contamination event (cutting pipe rack);
- Lack of admin lock on AN-101 transfer pump;
- Improper application of a lock and tag at AP valve pit.

Improvements are warranted in these areas, especially in light of continued recovery actions that must be accomplished for the S-102 spill in order to resume retrieval. Therefore, the FR monthly focus areas for the months of August and September will be conduct of operations and radiological controls.

III. Occurrences and Injuries

During the month of July 2007 there were no recordable injuries and no injuries that resulted in days away from work. The last recordable and lost work day injury occurred on April 3, 2007, when a CH2M HILL Hanford Group, Inc (CH2M HILL) employee was rolling up cable on a reel and felt pain in their lower back. The employee received initial and follow-up treatment and was on home rest. The contractor conducted an ergonomic evaluation of the work activity and implemented corrective measures.

There were four occurrence reports issued during the month of July 2007.

- On July 25, 2007, a material receipt inspection found two 4" flanged gate valves displaying characteristics of being refurbished. The valve bodies, including the yoke nuts, stud threads, and lubrication fittings had been repainted. Additionally, the manufacturer's tag on the valve was badly mangled. These valves were purchased for Waste Feed Operations (WFO) in support of repairing the 241-AY-102 waste tank cooling tower glycol pump. This was categorized as a Group 4C (2), SC-4 event.
- On July 25, 2007, a Fluor Federal Services heavy equipment operator, while spreading gravel in the vicinity of waste tank 241-C-104, backed a front loader into a TMACS junction box. As a precaution, danger tape was placed around the damaged junction box.

There were no injuries as a result of this event. A fact finding was scheduled for the following day, from which this was categorized as a Group 10(2), SC-4 event.

- On July 27, 2007, at 2:40 a.m. (all times are approximate), WFO Shift Manager (SM) was notified of unexpected high radiation readings around the S-102 transfer pump area and personnel had exited the S-Complex. While performing a routine pump shutdown survey of S-102 to SY-102 waste transfer route, a Health Physics Technician (HPT) identified radiation levels of 200 to 250 mR/hr 8 to 15 feet from the east side of the S-102 transfer pump box. There were no active leak detectors and the material balance discrepancy was within procedure limits. The WFO SM immediately restricted access to S-Complex stationing personnel at SX, S, and SY change trailers to prevent entry into the area. The on-call Closure Operations (CO) Radiological Control (RadCon) Manager and S-102 Operations Director were contacted. At 4:00 a.m., the CO RadCon Manager and S-102 Operations Director arrived onsite and began planning the entry into S-Farm to perform investigative surveys. Radiation surveys performed around the S-Complex perimeter fence line commenced. Perimeter surveys of the S-Complex fence line were less than 0.5 mrem/hr. At 6:55 a.m., visual inspections to determine conditions around the S-102 pump using Tank Farm cameras and binoculars were completed and no observable abnormalities were found. At 8:30 a.m., the entry team (2 HPTs and 1 Nuclear Chemical Operator [NCO]) assembled and pre-entry brief commenced. At 9:45 a.m., the entry team was authorized to access S-Complex to determine the source of increased radiation levels. The entry team began tracing the transfer route from Tank SY-102 to S-102. As the team approached the S-102 pump pit, radiation levels began to increase. At 10:07 a.m., the entry team evacuated S-Complex after observing a dark oily stain approximately 16 feet in diameter around the S-102 pump pit. Initial radiation readings reported were 25 R/hr (window open) and 5 R/hr (window closed) one foot from the liquid. The S-102 Operations Director placed personnel in take cover in the SY Change Trailer and MO-027 and notified the WFO SM. At 10:10 a.m., the WFO SM dispatched a Field Operations Specialist to the SY Change Trailer. At 10:30 a.m., the WFO SM dialed 911 to initiate protective actions in the 200 West Area and activated the ICP in the 200 East Area. However, no emergency action levels were reached for declaration of an emergency. Perimeter surveys and air sampling were completed with no contamination detected at the facility boundary. Spill area was stabilized with two coats of fixative and a HRA and HCA boundary established around the spill location. This event was categorized as a Group 5A (1), SC-2 event. It was also categorized as a Group 10 (4) event.
- On July 27, 2007, during reverse rotation of the positive displacement (progressive cavity) pump installed in Tank S-102, a release of waste occurred outside of the designed transfer system confinement boundary. Visual observation of the leak site and review of the radiological data indicate that the likely waste release point was from the dilution water supply line. The dilution line ultimately leads to the pump suction. The proposed mechanism is plugging of the pump suction area while the pump was run in reverse (the pump's suction becomes the pump's discharge when run in reverse) causing sufficient pressurization of the dilution line to overcome the hydraulic lift to the top of the tank and rupture the dilution line. Back flow of waste into the dilution line of the S-102 progressive cavity pump was not considered in the safety basis. Dilution lines in the

normal suction of a waste transfer pump that can be pressurized by running the pump in reverse (assuming a plugged pump suction) have not been evaluated relative to the hazard of concern for back flow of waste into a non-waste transfer system. This represents a hazardous condition not considered in the safety basis that has the potential for significant impact to workers, the public, or the environment, and thus is a Potential Inadequacy in the Safety Analysis (PISA). This event was categorized as a Group 3B (2), SC-3 event.

IV. Monthly Focused Review for July: Feedback and Improvement

During the month of July the ORP FRs conducted an assessment of the TFC feedback and improvement process. The FRs used a performance based approach to assess procedural guidance, work planning sessions, work performed in the field, post-job reviews, event investigations, and lessons learned processes.

Scope:

The FRs performed the following activities to evaluate feedback and improvement using FR Surveillance Guide ISM 20-6, *Post Work Feedback and Improvement*:

- The FRs reviewed the following procedures:
 - TFC-OPS-MAINT-C-01, Rev M-2, *Tank Farm Contractor Work Control*;
 - TFC-ESHQ-RP_RWP-C-03, *As Low As Reasonably Achievable (ALARA) Work Planning*.
- The FRs observed field work activities including;
 - S-102 Quarterly Leak Detection Functional Test;
 - C-109 retrieval operations;
 - S-102 retrieval operations;
 - 242-A Evaporator campaign operations;
 - Field activities at U Farm vadose zone investigations site;
 - Team planning meeting and mockup training for AP-104 pit job;
 - Inspection of the AMEC Earth and Environmental, Inc. test site;
 - Post-job ALARA review meeting for five Closure Operation work packages;
 - In-Process ALARA Review for contamination event at AN-B valve pit;
 - Pre-job briefing and transfer operations for the 219-S to SY-102 transfer;
 - Pre-job and subsequent S-102 camera repair per CLO-WO-06-001796;
 - Observed inspection and addition of pump spacer to the new Seepex pump for S-102;
 - Observed the post-job briefing for the 1F Hot Cell replacement at 222-S;
 - Observed and evaluated C-104 construction activities;
 - Observed the Operational Acceptance Testing of the new AN Farm primary exhauster.

- The FRs reviewed the following Post-Job ALARA Reviews (PJAR) from the PJAR database:
 - PJAR-07-011 – Remove Saltwell Screen from C-109;
 - PJAR-07-009 – Remove Temperature Probe from C-109;
 - PJAR-07-005 – Remove and Reinstall Hose In Hose Transfer Line from SY-A to the PPP;
 - PJAR-06-049 – Install New Jumper at 244-S Filter Pit;
 - PJAR-06-043 – Prep and Paint SY-B Valve Pit.

In July the FRs also attended an in-process ALARA review associated with AN-B valve pit contaminations and were also involved in fact finding meetings for the C-Farm Front-End Loader TMACS box incident, the S-102 electrical incident, and two fact finding meetings for the S-102 waste transfer accident, as well as the 222-S Laboratory Radioactive Waste Container Handling Accident Drill. Various Joint Review Group (JRG) meetings were observed and proposed safety basis amendments were also reviewed during the month of July.

Results:

The TFC's work control procedure TFC-OPS-MAINT-C-01, Rev. M-2, *Tank Farm Contractor Work Control*, defines work management from the initiation of a work request through work order closeout. It requires that, for a complex work package, an intermediate post-job review be conducted at the end of the shift or the end of the day before personnel leave. There are six questions contained in the procedure for conduct of post-job reviews that revolve around lessons learned during the job. They focus on successes and shortcomings in performance of a particular job that would facilitate improvement the next time it is conducted. These questions have been formalized onto a checklist that the Field Work Supervisor (FWS) uses to document post job-reviews conducted and they become part of the work record. Procedure TFC-ESHQ-RP_RWP-C-03, *ALARA Work Planning*, also contains requirements for conducting in-process and post-job ALARA reviews to determine if any improvements can be made in the area of dose reduction the next time a particular job is conducted.

FR observations of work performed, post job reviews (including in process and post-job ALARA reviews) and documentation of post job reviews found that the process described in the TFC's procedures is being inconsistently followed. In-process ALARA reviews are considered to be a strength and post job ALARA reviews appear to be accomplished on a regular basis. However, evidence was lacking in 20 of 24 work packages reviewed for conduct of post-job reviews required by the work control procedure. Only four work packages reviewed had documentation of completed post-job reviews in their work records. None of the packages reviewed showed evidence of the feedback and lessons learned from a post-job review in the CHAMPS work record as required by the work control procedure. The procedure requires the FWS to enter this information into the CHAMPS work record, but some FWSs do not have access to CHAMPS. High risk jobs appeared to consistently have intermediate post-job reviews accomplished and formal post-job reviews at the end of the job. Little or no evidence exists however for post-job reviews at the completion of intermediate/standard or low risk/minor jobs, even though these are required by the work control procedure.

Another aspect of feedback and improvement is the TFC's Lessons Learned program. The TFC is considered to have a robust Lessons Learned program. Planners interviewed indicated that PERs, the Lessons Learned database, Event Investigation Reports, and PJARs are used as feedback/lessons learned input for new work instructions. They also consult work records in CHAMPS for feedback/lessons learned from previous, similar work packages. Random samples of ALARA Management Worksheets, from which Radiological Work Permits are derived, showed that lessons learned information from previous jobs or incidents was utilized in every case. Evidence of lessons learned being incorporated into work packages was also seen during attendance at JRG meetings, such as the 244-CR Vault demolition work. Questioning attitudes and good feedback to the work planners by JRG members was also displayed. Critiques and fact-findings are conducted regularly for various adverse events to determine what happened and any lessons learned that can be applied in the future. Another example of incorporation of lessons learned is the modifications and improvements that were made to the new S-102 Seepex pump as a result of problems that were identified in the old one that failed.

Analytical Technical Services, including the 222-S Laboratory, has gone almost two years without a lost workday case, and is on track to meet its ALARA goals for 2007.

Weekly reports from the covered period reported five Strengths, one Observation, one Finding and three Non-Cited Findings related to feedback and improvement as shown below. *Other issues identified during the month that dealt with other issues (not directly related to feedback and improvement) are not included below.* Details of the Strengths and Deficiencies can be found in Section V of this report.

Strengths:

- **On two occasions CH2M HILL has chosen to take a conservative approach that is beyond the minimum requirements of TFC-ESHQ-RP_RWP-C-03, ALARA Work Planning.** (Frink, July 3, 2007)
- **Evaporator Staff Demonstrate Excellent Control Room Conduct of Operations.** (Blanchard, July 8, 2007)
- **In-Process ALARA Review Demonstrates Effective Integrated Safety Management System (ISMS) Performance.** (Frink, July 19, 2007)
- **Exceptional Communications Observed during the July 25, 2007, 222 S Laboratory Radioactive Waste Container Handling Accident Drill.** (Blanchard, July 25, 2007)
- **Personnel response to vapors encountered while performing work in U Farm were timely and effective in protecting workers from potential exposure.** (Yasek, July 25, 2007)

Findings:

- **Post-Job Review Completion Inadequate.** (Frink, July 30, 2007)

Non-Cited Findings:

- **Calculation Error in “242-A Evaporator Material Balance Calculation Sheet”.** (Frink, July 14, 2007)
- **242-A A-1 and A-2 Equipment Deficiency Lists (EDL) Not Maintained Up-To-Date.** (Frink, July 18, 2007)
- **Posting around Vapor Control Zones in SX Farm was deficient.** (Yasek July 26, 2007)

Observations:

- **Equipment in the 200-E transfer pump laydown yard is degrading from exposure to the environment.** (Sorensen July 25, 2007)

Conclusion:

The FR focus area review of July 2007 found that the TFC’s feedback and improvement process is adequately implemented, with one notable exception. Post-job briefings do focus on the successes and areas for improvement during a particular job to facilitate a continual improvement in the work planning, control and execution process, and are being consistently conducted for high risk/complex work. However, they are not being conducted as specified in the TFC’s work control procedure. It appears that a graded approach is warranted for application of post-job reviews at the completion of work packages based on the complexity/risk, and documentation of post-job reviews in the package work record should suffice without the need to enter it into the CHAMPS work record. In-process ALARA reviews are considered to be a strength, and the TFC’s Lessons Learned program is maturing and a valuable part of the feedback and improvement process.

V. Strengths and Deficiencies

Strengths:

On two occasions CH2M HILL has chosen to take a conservative approach that is beyond the minimum requirements of TFC-ESHQ-RP_RWP-C-03, *ALARA Work Planning*. (Frink, July 3, 2007)

Work packages CLO-WO-07-0728 (C-104 Foam Removal) and CLO-WO-07-0730 (C-104 Condenser Hatchway Pit Survey and Video) are medium radiological risk. TFC-ESHQ-RP_RWP-C-03 requires that an ALARA Joint Review Group (AJRG) meeting be held to evaluate the hazard controls for high radiological risk work; this level of rigor is not required by TFC-ESHQ-RP_RWP-C-03 and typically is not applied to medium radiological risk work. During the AJRG meeting for CLO-WO-07-0730, the feedback from the Chairman was particularly beneficial and this resulted in a re-evaluation of the Industrial Hygiene (IH) controls and radiological controls. This feedback and the benefit gained would not have been realized if an AJRG meeting had not been convened.

Evaporator Staff Demonstrate Excellent Control Room Conduct of Operations (Blanchard, July 8, 2007))

On July 8, 2007, the 242-A evaporator control room staff demonstrated professional and knowledgeable recoveries to two operational malfunctions. At 12:15 p.m. the 10 lb. steam system's pressure became erratic and shutdown the evaporator. The control room staff notified Johnson Control Inc (JCI). JCI fixed the steam pressure quickly and the evaporator was restarted. At approximately 4:30 p.m. a control room NCO observed that TI-DHS-3 temperature trend was increasing and notified the 242-A SM. At 6:07 pm the evaporator shutdown due to TI-DHS-3 malfunctioning. The control room staff again performed all required actions in a controlled manner per the procedure.

That evening the FR observed that the 242-A SM and NCOs demonstrated a questioning attitude when preparing to perform the process condensate sampling. Both the 242-A SM and NCOs reviewed Procedure TO-630-020, *Sample Process Condensate from TK-C-100*, and Procedure TO-630-080, *Operate 242-A RC-3 Sampling System*, and questioned the adequacy of the Procedure TO-630-020. The 242-A SM contacted the 242-A Senior Technical Advisor (STA) to confirm Procedure TO-630-020 was not adequate for use, and then appropriately utilized Procedure TO-630-080. If the 242-A control room staff would not have recognized Procedure TO-630-020 omitted required packaging and transportation requirements the samples would have been rejected at the laboratories. The cost impact, if incorrectly performed, would have been approximately \$300.00 (for replacement sample bottles). These actions demonstrated that 242-A control room staff were well versed in the requirements for environmental sampling and maintained a questioning attitude.

In-Process ALARA Review Demonstrates Effective ISMS Performance. (Frink, July 19, 2007)

On July 19, 2007, CH2M HILL CO convened an In-Process ALARA Review for the AN-B Valve Pit Contamination Event (non-reportable) of July 18, 2007. Although this work was within WFO facilities, CO personnel were assigned this scope of work. All relevant personnel attended and interaction between participants was good. Feedback from workers was frank, direct and well-received. Open communication was a strong point of this meeting and was better than others the FR had observed. A path forward was not achieved in this meeting, nor was it expected, as senior contractor management must weigh-in and determine the near-term path forward.

A particular strong point of this meeting was the attendance of key WFO personnel. Although not associated with the event, one WFO Field Crew Manager, one WFO FWS, the WFO Planning Manager and one WFO planner attended this meeting. This is important since the need to cross-communicate and absorb lessons learned is critical to improved performance.

Exceptional Communications Observed during the July 25, 2007, 222 S Laboratory Radioactive Waste Container Handling Accident Drill. (Blanchard, July 25, 2007)

The FR observed exceptional communications during the subject drill. The Building Emergency Director (BED) made clear distinct announcements over the Public Address System (PAX).

Communications were effective, efficient, and productive between the Hanford Fire Department Incident Commander, BED, and facility emergency response organization personnel located at the event scene. Specifically, radiological units (e.g., mr/hr) were used to communicate radiation dose rates and 3-way communication was used when assessing victim and responder conditions. Additionally, the ICP's time-line and status board captured the appropriate event information and was clearly written. One Radiological Control Technician identified that he had specified the wrong radiological units and quickly corrected them. Radio communications were effective and the appropriate number of channels were used to allow open and continuous communications.

Personnel response to vapors encountered while performing work in U Farm were timely and effective in protecting workers from potential exposure. (Yasek, July 25, 2007)

On July 25, 2007, drillers were performing direct push sampling activities near U-105 when one driller and one HPT noted odors in excess of what they normally encountered in the farm (at the time, they had been working inside the farm on a regular basis for longer than one month). There was an IH Technician (IHT) present setting up a wet bulb globe temperature thermometer. When the odors were noted, all personnel exited the Tank Farm and the IHT checked the condition of the workers and asked if they wanted to go to Advance Med Hanford (AMH). They declined. The IHT also requested equipment to take an air sample and took a sample at the location where odors were noted when the equipment arrived at U Farm. The CO SM was notified immediately by the FWS and both individuals talked directly to SM who also questioned them to determine if they were experiencing any health effects of the exposure and asked them if they wanted to go to AMH (both declined). The SM then entered Annual Operating Plan (AOP)-15 and controlled access to U Farm. When the air sample results were determined to be not above background, AOP-15 was exited and access to U Farm restored. In all, the response to the potential exposure demonstrated that the appropriate actions were performed quickly and were protective of personnel.

The job to free the seized AP-104 transfer pump was well-planned. (Sorensen, July 25, 2007)

The FR observed the Technical Program Manager (TPM) for the job that would attempt to free the seized AP-104 transfer pump. A large team of individuals was assembled including the planner, two rad planners, a HPT, the FWS, operators, millwrights, riggers, the Senior Supervisory Watch, etc. These personnel were actively involved and engaged in the planning process, providing feedback where appropriate. This type of job had been accomplished before and had been successful at freeing the pump, so that experience was utilized during the meeting. A mockup was also conducted on a spare pump motor in the laydown yard which was key in determining the detail of the work to do and how it should be done. The draft work instruction that had been generated during the TPM was modified appropriately as a result of the mockup. The crew accomplished the work in a timely manner and was successful at freeing the pump as evidenced by its successful starting and running the next day.

Findings:

Post-Job Review Completion Inadequate. (Frink, July 30, 2007)

Requirement: TFC-OPS-MAINT-C-01, Rev. M-4, *Tank Farm Contractor Work Control*, Section 4.8.1, line 1 requires, "When the job in the field is complete, perform post-job review and sign work complete in CHAMPS within five working days, and document feedback and lessons learned in the CHAMPS work record."

Discussion:

24 completed work packages were randomly selected to verify post-job review completion. Only 4 of the work packages selected showed evidence that a post-job review was completed. These were documented in the River Protection Project Work Record. None of the packages reviewed showed evidence of the feedback and lessons learned from a post-job review in the "CHAMPS work record".

The packages that were reviewed included the following:

CLO-WO-06-000323, CLO-WO-06-000478, CLO-WO-06-001018, CLO-WO-06-001826, CLO-WO-06-001978, CLO-WO-07-0418, CLO-WO-07-0519, CLO-WO-07-0526, CLO-WO-07-0673, CLO-WO-07-0715, CLO-WO-07-0898, CLO-WO-07-0995, WFO-WO-05-002469, WFO-WO-05-003199, WFO-WO-06-000531, WFO-WO-06-001989, WFO-WO-06-002223, WFO-WO-06-002476, WFO-WO-07-0498, WFO-WO-07-1004, WFO-WO-07-1011, WFO-WO-07-1112, WFO-WO-07-1192, WFO-WO-07-1596.

Non-Cited Finding: Calculation error in "242-A Evaporator Material Balance Calculation Sheet". (Frink, July 14, 2007)

FR reviewed "Manual Evaporator Material Balance Calculation Sheet," (TO-600-100, Attachment 2) dated July 10, 2007. The summation of data for Total Accumulation (ACC) was found to be incorrect. The individual who performed the calculation inadvertently added a value instead of subtracting a value. The calculated Material Balance Discrepancy (MBD) was -253.53 gallons. The revised MBD was -9.53 gallons. The revised MBD was improved and well within the allowed uncertainty (+/- 5000 gallons).

This was discussed with the SM who verified the calculation error. The SM then reviewed the "Manual Evaporator Material Balance Calculation Sheets," for July 4, 2007 through July 9, 2007. Two additional calculation errors were found. This non-cited Finding has been documented in CH2M-PER-2007-1206.

Non-Cited Finding: 242-A A-1 and A-2 Equipment Deficiency Lists (EDL) Not Maintained Up-To-Date. (Frink, July 18, 2007)

On July 18, 2007, a review of the 242-A A-1 and A-2 Board Operator EDLs indicated that they have not been kept up-to-date to reflect changed facility status. 57% of the entries were found to be incorrect and included the following:

A-1 Board Operator Equipment Deficiency List (3 of 8 entries required updates):

WFO-05-3066 has been cancelled; the EDL was not updated to reflect changed status;

PER-2005-3246 correlates to WFO-WO-05-000410 and has been cancelled; the EDL was not updated to reflect changed status;

WFO-WR-06-000164 refers to PER-2006-0979. This PER was closed as a transient usage factor and referenced work package WFO-WO-06-001001 which has since been cancelled; the EDL was not updated to reflect changed status.

A-2 Board Operator Equipment Deficiency List (13 of 20 entries required updates)

WFO-06-0008 is a verbal work order. If this work is still valid, this should have been carried over to the new minor work order package WFO-WO-07-0008;

EE-03-1808 is closed; the EDL was not updated to reflect changed status;

EE-04-1476 is closed; the EDL was not updated to reflect changed status;

WFO-05-0851 is closed; the EDL was not updated to reflect changed status;

WFO-05-0590 has been canceled; the EDL was not updated to reflect changed status;

WFO-05-0434 is closed; the EDL was not updated to reflect changed status;

WFO-06-1987 was changed to be worked under WFO-WO-06-002449 and has since been closed; the EDL was not updated to reflect changed status;

WFO-06-1613 is closed; the EDL was not updated to reflect changed status;

WFO-06-1858 has been cancelled and combined into WFO-WO-06-001701. The EDL was not updated to reflect the validated package;

WFO-WR-07-0028 has been validated as WFO-WO-07-1020. The EDL was not updated to reflect the validated work package number;

3 recent entries dated between July 12, 2007 and July 15, 2007, have been completed. The EDL was not updated to reflect the changed status.

Conversation with the 242-A Facility Manager and FR verification indicate that both EDLs have since been updated.

Non-Cited Finding: Posting around Vapor Control Zones in SX Farm was deficient.
(Yasek, July 26, 2007)

On July 26, 2007, the FR walked down SX Farm prior to its closure for quarterly access. It was noted that several Vapor Control Zones were not posted in accordance with the requirements specified in TFC-ESHQ-S-STD-18, Rev B, to prevent personnel from entering them. Specifically, at SX-101, a wire chain at the entrance to the Vapor Control Zone (VCZ) was dangling open and not in place; at SX-110 and SX-111, the barriers were arranged such that if personnel were to approach from the direction of the change trailer (a normal access route) they would not encounter any barriers or signs prior to entering the VCZ; at SX-109 and SX-112, there were no VCZ signs posted on the east side of the VCZ, which is the normal access direction. These discrepancies were debriefed to the CO SM for correction.

Non-Cited Finding: Poor Housekeeping in the 222-S Laboratory 1E1 and 1E2 Hot Cells.
(Blanchard, July 31, 2007)

On July 31, 2007, the 222-S FR observed that the 1E1 and 1E2 hot cells were cluttered with debris. In the 1E1 hot cell the drain strainer was located next to the drain bowl. Without this strainer in place, debris had an unobstructed path to clog the drain. The 1E1 hot cell is on restricted access and no activities are currently authorized in this area. The 1E2 hot cell's two drain bowls were intentionally plugged but would allow debris to accumulate in the bowl and when the plug was removed debris could drop into the drain. Over the past several months, CH2M HILL craft have been replacing a section of clogged drain line in the 1F hot cell. The FR observed that the debris in the 1E1 and 1E2 hot cells was the same type that clogged the 1F hot cell. Additionally, Procedure ATS-MP-1032, *222-S Laboratory Quality Assurance Plan*, Section 11.1.5, *Housekeeping*, required that employees were responsible for maintaining their work area in a neat and orderly manner. Contrary to this requirement and lessons learned from the 1F hot cell the 1E1 and 1E2 hot cells housekeeping was poor and the significant quantity of debris could lead to another clogged drain line. On August 1, 2007, the 222-S FR observed that the 1E1 hot cell had been cleaned and the Analytical Process Development Manager explained 1E2 would be cleaned out as soon as the restrictions were lifted. Additionally, Analytical Process Development Manager explained that engineering would be tasked to design and develop a plug that did not allow waste to accumulate in the bowl.

Observations:

Equipment in the 200-E transfer pump laydown yard is degrading from exposure to the environment. (Sorensen, July 25, 2007)

While observing the mockup of the AN-104 transfer pump motor work at the 200-E laydown yard, the FR toured the other long length equipment in the laydown yard. It was evident that significant degradation has occurred to much of the equipment stored there due to exposure to the open environment. Some of the pump motors had plastic wrapped around them, most of which is badly decomposed. Others have no protection at all. At least one pump has writing on

it that indicates it is already failed. Even the AP-104 transfer pump replacement motor, while it passed its megger test satisfactorily, was rusted and showed signs of significant degradation such that it is being sent to an offsite vendor for refurbishment prior to installation. Another replacement motor for AP-104 was identified there but it failed its megger test. This laydown yard is managed by Fluor Hanford for the TFC, and while they apparently do periodic preventative maintenance of the equipment stored there, little is done to actually protect the equipment. The FR assumes that this equipment was purchased with the intent of using it one day, and more robust measures and precautions should be instituted to protect it for future use.

Incorrect Units Identified on Some 222-S Laboratory Air Sampler Rotometers. (Blanchard July 31, 2007)

On July 31, 2007, the 222-S FR was observing biweekly air sample exchange performed by a 222-S HPT. In the past the rotometers displayed in Standard Cubic Feet per Hour (SCFH) but were currently being changed to read in Standard Cubic Feet per Minute (SCFM). This change required that new scales be placed on the face of the unit which included the units (SCFM). However, one past rotometer with a SCFH scale had the units taped (sticker) over and SCFM hand written in.

On August 1, 2007, the 222-S FR, Analytical Technical Services (ATS) Radiological Control Director, and ATS Radiological Control Senior Technical Advisor (STA) inspected approximately 60 of the 78 rotometers used in the 222-S Laboratory. There were 6 rotometers observed with SCFH scales having a SCFM sticker placed over the SCFH. During the inspection the ATS Radiological Control Director and ATS (STA) removed the stickers as they were identified. Further review determined that no data associated with the air sampling program was compromised because of the six incorrect stickers. However, the ATS Radiological Control Director explained that the incorrect unit stickers should have been identified during rotometer calibration and the biweekly air sample exchange. The ATS Radiological Control Director explained that the ATS Engineering Manager and ATS Maintenance Manager were briefed on the issue and corrective actions were being implemented.

VI. Closed Findings:

Inadequate Implementation of Vehicle Barrier Controls. (Sorensen/Williamson May 8, 2006)

In response to this Finding, one of the PERs that the TFC initiated was PER 2006-1050, designated as a significant PER, and it described six different corrective actions associated with this issue. The FR verified closure of each of these actions. Some of the actions had been verified previously by observing conditions in the field or by reviewing amendments to safety basis documents. A safety basis amendment was recently issued that removed references to vehicle barriers from AC 5.11 and removed vehicle barriers from the list of safety significant structures, systems and components. Vehicle barriers are now part of a Safety Management Program. These actions were the direct result of this Finding. PER 2006-1050 was closed on March 13, 2007. This Finding is now considered closed.

Omission Identified with the Chemical Inventory Tracking System. (Blanchard
February 7, 2007)

The contractor revised Procedure LO-150-063 to track chemicals to and between facilities rather than specific location. The law states that the tracking should be to a facility, not necessarily a specific building, room, or storage shelf that was required in Procedure LO-150-063 prior to its revision. This Finding is closed.