U.S. Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

NOV 01 2006

06-ESQ-150

Mr. M. S. Spears, President
and Chief Manager
CH2M HILL Hanford Group, Inc.
2440 Stevens Center Place
Richland, Washington 99354

Dear Mr. Spears:

CONTRACT NO. DE-AC27-99RL14047 – ASSESSMENT REPORT A-06-ESQ-TANKFARM-009 – ENTRY CONTROL PROGRAM, SEPTEMBER 25 THROUGH 29, 2006

This letter forwards the results (Attachment) of the U.S. Department of Energy, Office of River Protection assessment performed from September 25 through 29, 2006, to evaluate the CH2M HILL Hanford Group, Inc. (CH2M HILL) Entry Control Program (the Program).

The assessor determined the Program met regulatory and contract requirements, and functioned effectively to control access to radiological areas as by 10 CFR 835, Sections 501 and 502.

There were no Findings and two Observations for Program improvement: There was no Backup Company Technical Authority -- Access Control Entry System (ACES) & Entry Control listed on the CH2M HILL web site, and requalification training in entry control computer software, ACES, was not formally delivered to Health Physics Technicians. Responses to Observations are not required.

If you have any questions, please contact me, or your staff may call Robert C. Barr, Director, Office of Environmental Safety and Quality, (509) 376-7851.

Sincerely,

T. Zack Smith, Assistant Manager
for Tank Farms Project

ESQ:LRM

Attachment

cc: See page 2

Attachment
06-ESQ-150
A-06-ESQ-TANKFARM-009

U.S. DEPARTMENT OF ENERGY
Office of River Protection
Environmental Safety and Quality

ASSESSMENT:	Entry Control Program
REPORT:	A-06-ESQ-TANKFARM-009
FACILITY:	CH2M HILL Hanford Group, Inc. Tank Farms
LOCATION:	Hanford Site
DATES:	September 25 through 29, 2006
ASSESSOR:	Larry R. McKay
APPROVED BY:	Patrick P. Carier, Team Lead Verification and Confirmation

Executive Summary

The U.S. Department of Energy, Office of River Protection evaluated the CH2M HILL Hanford Group, Inc. (CH2M HILL) Entry Control Program from September 25 through 29, 2006.

The assessor concluded the CH2M HILL Entry Control Program met regulatory and contract requirements. A computer-based system, Access Control Entry System (ACES), provided a reliable and sound platform. There were no Findings and two Observations provided as opportunities for Program improvement:

- No Backup Company Technical Authority (CTA) – ACES & Entry Control was listed on the CH2M HILL web site.

  The assessor recommended CH2M HILL appoint a Backup CTA from one of the current Points-of-Contact (POC) and Backup POCs and list the Backup CTA on the company web site.

- CH2M HILL did not provide formal requalification training during biennial Health Physics Technician (HPT) Requalification Training.

  The assessor recommended CH2M HILL re-evaluate the need for formal requalification in entry control during the biennial HPT requalification ("cycle training").

No response is required for these Observations.

Assessment details are described in this report and in Assessment Note A-06-ESQ-TANKFARM-009-01.

Table of Contents

List of Acronyms

ACES	Access Control Entry System
ATS	Analytical Technical Services
CH2M HILL	CH2M HILL Hanford Group, Inc.
CO	Closure Operations
CTA	Company Technical Authority
DOE	U.S. Department of Energy
FHI	Fluor Hanford, Inc.
HPT	Health Physics Technician
HRA	High Radiation Area
PER	Problem Evaluation Request
POC	Point-of-Contact
RadCon	Radiological Control
RGD	Radiation-Generating Device
RWP	Radiological Work Permit
WFO	Waste Feed Operations

Radiological Control (RadCon) Assessment
Entry Control Program

Scope

The U.S. Department of Energy (DOE), Office of River Protection evaluated the CH2M HILL Hanford Group, Inc. (CH2M HILL) Entry Control Program from September 25 through 29, 2006.

The assessor evaluated procedures against regulatory requirements and guidance; examined records; reviewed Health Physics Technician (HPT) requalification training in entry control; interviewed staff members responsible for implementing the Program or knowledgeable of it; and conducted field inspections to evaluate applied Program controls.

Details

The DOE specified entry control requirements in Sections 501 and 502 of 10 CFR 835, "Occupational Radiation Protection," January 1, 1999. The DOE published Program Guide G 441.1-5, "Radiation-Generating Devices Guide", Section 4.3.1 Shielding, Controls, & Safety Devices, April 15, 1999, to provide guidance for Radiation-Generating Devices (RGD).

The following CH2M HILL procedure governed the Program:

- TFC-ESHQ-RP-ADM-C-15, "Entry and Exit Controls," Revision D-2, March 14, 2006;

- TFC-ESHQ-RP-MON-C-11, "High Radiation Areas Physical Access Controls," Revision A-5, January 12, 2006;

- TFC-ESHQ-RP-RWP-C04, "Radiological Work Permits," Revision D-10, August 16, 2006; and

- TFC-ESHQ-RP-STD-04, "Controlling Radiation Generating Devices," Revision A-1, December 1, 2005.

The assessor interviewed the following CH2M HILL and Pacific Northwest National Laboratory staff responsible for implementing the Program or knowledgeable of the Program:

CH2M HILL RadCon Program
RadCon Program Director
Company Technical Authority (CTA) – Access Control Entry System (ACES) & Entry Control
Analytical Technical Services (ATS) RadCon Director
Closure Operations (CO) Sr. Technical Advisor (for CO RadCon Director)
Waste Feed Operations (WFO) RadCon Director
ATS First-Line Supervisor, Facility Point-of-Contact (POC) – ACES & Entry Control
CO Sr. Technical Advisor, Facility POC – ACES & Entry Control
CO First-Line Supervisor
WFO First-Line Supervisor (2)

Fluor Hanford, Inc. (FHI)
Instructor (HPT Requalification)
Technical Support Staff Member (ACES)

Lockheed Martin Services, Inc.
Sr. Software Engineer

In addition, the assessor conducted multiple field inspections to evaluate applied controls.

Assessment Note A-06-ESQ-TANKFARM-009-01 contains interview, records review and field inspection details.

Results

The Entry Control Program relied on the ACES computer program. All ACES operators were qualified HPTs. Workers presented themselves to ACES operators and gave them Radiological Work Permit (RWP) and role information (e.g., Role AE1 is All Employee Unescorted). The operator entered the information into the ACES computer. If access was granted, a green monitor screen appeared; otherwise, a red screen appeared.

All 13 interviewees stated that ACES was a very reliable computer-based system for implementing entry control. They consistently stated the major weakness in ACES was its heavy dependence on user input (RWP number and role).

Several interviewees pointed out ACES is an Oracle-based system over 10 years old and that technical support was being phased out for that operating platform. They proposed the transition of ACES to a web-based system at an estimated cost of from $100,000 to $120,000. According to the interviewees, FHI is the only other Hanford contractor using ACES. They are currently unwilling to share this cost; CH2M HILL would have to bear the entire cost of the ACES transition.

The assessor interviewed the principal FHI instructor responsible for the HPT requalification program (“cycle training”) and found it contained no formal requalification for HPTs in entry control computer software (ACES).

The assessor reviewed the Problem Evaluation Requests (PER) associated with entry control and determined that four of the five dealt with human errors, confirming interviewees contentions that the main shortcoming of the ACES system was that it was heavily dependent on worker action. The fifth PER documented the complaint by one worker that ACES precluded his/her entry into a radiological area for lack of required training. This PER showed that ACES performed exactly as it was designed: to prevent access to workers if the required qualifications were not satisfied.

Some of the PERs documented the phenomenon of "role shopping" where the workers stated one role to the ACES operator and, if ACES denied access, the worker offered up another role in the hope of gaining access. Recently, CH2M HILL RadCon staff has reduced the numbers of roles and has stated a future objective of eliminating worker-provided roles altogether.

The assessor reviewed the RGDs in ATS (other Projects have no RGDs) and found they do not create High Radiation Areas (HRA) in operation. As a result, the assessor did not consider RGDs further in this assessment.

The field Observations revealed that ACES operators are well trained and follow the procedural requirements. Posted requirements for entry into CH2M HILL-controlled radiological areas were compliant with 10 CFR 835, "CH2M HILL Radiation Protection Program," and "Tank Farms Radiological Control Manual" requirements. The assessor examined approximately 100 radiological postings and determined that 10 CFR 835-required entry requirements appeared on all signs.

Access to HRAs was effectively controlled with a lock-and-key system. Key control in the 242-A Evaporator and ATS facilities was excellent: keys to HRAs were kept in a single lock box, and the key to the lock box stringently controlled.

The assessor identified no Findings and two Observations for Program improvement, as described below.

<u>Observation (Area for Program Improvement) - - No Backup CTA – ACES & Entry Control was listed on the CH2M HILL web site.</u>

CH2M HILL has appointed a primary CTA as well as POCs and Backup POCs for each of the three Projects (ATS, CO, and WFO). No Backup CTA has been appointed. The assessor recommended CH2M HILL appoint a Backup CTA from one of the current POCs or Backup POCs and list the Backup CTA on the company web site.

<u>Observation (Area for Program Improvement) - CH2M HILL did not provide formal requalification training during biennial HPT Requalification Training.</u>

Interviews with the CTA – ACES & Entry Control, RadCon Directors and RadCon First-Line Supervisors revealed HPTs were initially qualified in entry control (completed a "qual card"). The current biennial HPT requalification program did not contain a training module on entry control computer software (ACES); any retraining was done in the form

of “ad hoc” training sessions if ACES or the Entry Control Program changed. The assessor recommended that CH2M HILL consider implementing formal requalification in entry control because the Program was so heavily dependent on operator action, and all ACES operators were qualified HPTs.

Conclusions:

The assessor concluded the CH2M HILL Entry Control Program met regulatory and contract requirements; ACES provided a reliable computer-based platform for a sound entry control program; the biggest ACES weakness was heavy dependence on user action; and access to HRAs was effectively controlled.

There were no Findings and two Observations for program improvement:

- No Backup CTA was listed on the CH2M HILL Web Page “CH2M HILL Radiological Control Company Technical Authorities and Facility Points of Contact,” September 21, 2006; and

- HPTs did not undergo formal requalification training in entry control during the biennial “cycle training.”

The CH2M HILL CTA – ACES & Entry Control agreed with the Observations.

Open Items

None

Closed Items

None

Discussed Items

None

Signature

_____

Larry R. McKay, Assessor Date

Assessment Note A-06-ESQ-TANKFARM-009-01

Assessor: **Larry R. McKay**

Dates of Assessment: **September 25 through 29, 2006**

Areas/Items Assessed: **CH2M HILL Entry Control Program**

A U.S. Department of Energy (DOE), Office of River Protection assessor evaluated the CH2M HILL Hanford Group, Inc. (CH2M HILL) Entry Control Program against established requirements and guidance from September 25 through 29, 2006.

Assessment Report A-06-ESQ-TANKFARM-008 contains the assessment results. This assessment note captures details of personnel interviews, documents reviewed and field observations.

Personnel Interviewed:

CH2M HILL Radiological Control Program
E. J. Adams, RadCon Program Director
C. K. Bean, Waste Feed Operations (WFO) RadCon Director
P. B. Brannan, Analytical Technical Services (ATS) RadCon Director
R. L. Brown, Closure Operations (CO) Sr. Technical Advisor, Facility Point of Contact – ACES & Entry Control
E. Carreras, WFO First-Line Supervisor
J. E. Crockett, ATS First-Line Supervisor, Facility Point of Contact – ACES & Entry Control
K. W. Gray, CO Sr. Technical Advisor (for M. S. McGrory, CO RadCon Director)
L. M. Livesey, Company Technical Authority (CTA) – ACES & Entry Control
S. H. Livesey, CO First-Line Supervisor
D. W. Pattee, WFO First-Line Supervisor

Fluor Hanford, Inc. (FHI)
B. L. Killand, Instructor (Health Physics Technician Requalification)
J. B. Stamper, Technical Support (ACES)

Lockheed Martin Services, Inc. (LMSI)
M. M. Hammond, Sr. Software Engineer

Documents Reviewed:

10 CFR 835, "Occupational Radiation Protection," Section 501 and 502, Entry Control Program, January 1, 1999

ATS-LO-040-101, "ATS 222-S Complex Building Inspection," Rev. Y-0, April 13, 2006

ATS-310, "222-S Laboratory Key Control," Section 2.2, Rev. 12, August 22, 2005

S-W050, "222-S Radiological Control Scheduled Radiation Survey Task Description," Rev. 7, May 1, 2003

"CH2M HILL Radiological Control Company Technical Authorities and Facility Points of Contact," September 21, 2006 (on CH2M HILL web site)

HNF-5193, "Tank Farms Radiological Control Manual," Rev. 1, Part 3 Entry and Exit Requirements, Articles 330-338, February 28, 2005

HNF-MP-5194, "CH2M HILL Hanford Group, Inc. Radiation Protection Program," Rev. 4, Change 1, Requirements 102-121

DOE G 441.1-5, "Radiation-Generating Devices Guide", Section 4.3.1 Shielding, Controls, & Safety Devices, April 15, 1999.

DOE-STD-1098-99, *Radiological Control*, Part 3, Entry and Exit Provisions, Articles 331-338, July 1999

TFC-ESHQ-RP_ADMIN-C-15, "Entry and Exit Controls," Rev. D-2, March 14, 2006.

TFC-ESHQ-RP_MON-C-11, "High Radiation Areas Physical Access Controls," Rev. A-5, January 12, 2006.

TFC-ESHQ-RP_RWP-C04, "Radiological Work Permits," Rev. D-10, August 16, 2006.

TFC-ESHQ-RP-STD-04, "Controlling Radiation Generating Devices," Rev. A-1, December 1, 2005

Problem Evaluation Reports (PERs):

- PER 2006-0736, "Worker rejected in ACES"
- PER 2006-0852, "Stop work on all ACES entries for all roles except WW1 and WW2"
- PER 2006-1255, "Employee granted ACES access without all required training"
- PER 2006-1382, "Correct RWP not used when using the ACES system for Green Hut"
- PER 2006-1699, "Qualified radioactive source user entered in ACES under incorrect RWP"

"WFO High/Very High Radiation Area Inventory List" for week ending October 1, 2006

"Tank Farm Contractor Radiological Survey Report," 242-A Condenser Room, Exhauster Area and RMAs, RSR WTO-004619, September 28, 2006

"Analytical Technical Services Radiation Generating Devices," P. B. Brannan, 7S600-PBB-05-037, November 28, 2005

"Request for Permission to Start Up Hand-Held X-Ray Fluorescence Spectrometer in 222-S Room B1B," R. W. Warrant, 7S110-RWW-05-033, August 23, 2005

"Identification of Authorized Radiation Generating Devices (RGD) Operators," C. M. Seidel, 7S110-CMS-06-071, June 1, 2006

Field Observations:

Attachments 1 and 2 contain details of field observations made as part of this assessment.

Approved By: _____ **Date: _____**
Larry R. McKay, Assessor

Assessment Note A-06-ESQ-TANKFARM-009-01

Attachment 1

Field Observation (Entry Control Assessment)

Description: Challenge of Access Entry Control System (ACES)
Worker: Edward Carreras, WFO First-Line Manager
Date: September 28, 2006
Time: 9:00 AM

Ed and I selected Radiological Work Permit (RWP) TF-001, Rev. 37, and Role 242A-40 for an alleged tour of the 242-A Evaporator. The ACES operator was Health Physics Technician Bill L. Brazelton.

Ed read and signed the form attesting he had read TF-001, Rev. 37 and gave his payroll number to Bill. Bill asked him for role information, which Ed gave him (242A-40). Bill entered the information into the desktop computer and got two "red flags" (actually red screens) notifying him that Ed lacked the following training to access the 242-A Evaporator:

- 40-hour HAZWOPER
- Field experience accompanying 40-hour HAZWOPER
- 242-A Facility Emergency Hazards Identification Checklist (FEHIC)

Bill entered my payroll, RWP and Role information (TF-001, 242A-40), found I was authorized to enter (green computer monitor screens) and printed out the "brick" – a self-adhesive label authorizing my entry. I actually needed to ACE in, for an inspection of 242-A High Radiation Areas later in the morning.

I asked Bill to "give us a break" and authorize Ed to enter the 242-A Evaporator with me, so we could both tour the evaporator. He immediately refused and continued to refuse despite repeated pleas.

Ed asked Bill if his 24-hour HAZWOPER would suffice and was told it would not, that only 40-hour HAZWOPER was acceptable.

Conclusion: The ACES Operator successfully passed the ACES challenge (to allow access to an individual without all the required training) and the ACES system correctly rejected his access attempt.

Assessment Note A-06-ESQ-TANKFARM-009-01

Attachment 2

Field Observation (Entry Control Assessment)

Description: Tour of 242-A Evaporator High Radiation Areas
Escort: Jeff A. Stewart, Health Physicist
Date: September 28, 2006
Time: 9:30 AM

Examined K-1 Building Exhauster, East Filter Bank – posted High Radiation Area (HRA), High Contamination Area (HCA) & Airborne Radioactivity Area (ARA). Chain runs through handles to filter housings; key resides in 242-A Evaporator Control Room (inside "242-A Lock and Tag & High-Rad Lockbox." Only the Shift Manager has the key to the lockbox.

Examined Airlock door to Evaporator Room, posted HCA. When open, leads to door with HRA posting and locked door.

Examined Sample Cabinet in Pump Storage Room, posted as HRA.

Note: The roll-up door area (SW corner of the 242-A Evaporator) is no longer posted as an HRA, but as a Contamination Area (CA)/Radiation Area (RA).

Examined approximately 10 Radioactive Material Area (RMA), Radiological Buffer Area (RBA), CA, RA and HRA postings – all were compliant with 10 CFR 835 Sec. 501 & 502.

HRA keys are kept locally in 242-A Evaporator, but not by the HP (see above).

Conclusion: All HRAs were compliant with posting, physical access controls, barriers and requirements for entry stipulations of 10 CFR 835.