



U.S. Department of Energy
Office of River Protection

P.O. Box 450
Richland, Washington 99352

NOV 26 2003

03-ESQ-080

Mr. E. S. Aromi, President
and General Manager
CH2M HILL Hanford Group, Inc.
Richland, Washington 99352

Dear Mr. Aromi:

CONTRACT NO. DE-AC27-99RL14047 – REPORT OF ASSESSMENT OF CH2M HILL HANFORD GROUP, INC., (CH2M HILL) INDUSTRIAL HYGIENE (IH) PROGRAM, A-03-ESQ-TANKFARM-007


This letter provides the results of the U.S. Department of Energy, Office of River Protection assessment of the CH2M HILL IH Program, which was conducted during the week of October 20, 2003.

This assessment concluded CH2M HILL management oversight of its IH Program requires strengthening. Our team found that most oversight of the IH Program was through external review. CH2M HILL Management and self-assessments were infrequent. CH2M HILL recently had conducted a number of comprehensive evaluations of various aspects of its IH Program.

Collectively, these CH2M HILL initiated assessments have identified a number of deficiencies or areas requiring strengthening. We also found that you have established an aggressive schedule to implement the necessary corrective actions. CH2M HILL senior staff should closely monitor the progress of your corrective actions and strengthen your management oversight of the IH Program.

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,


Roy J. Schepens
Manager

ESQ:RCB

Attachment

Attachment
03-ESQ-080
A-03-ESQ-TANKFARM-007

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

ASSESSMENT: TANK FARM CONTRACTOR INDUSTRIAL HYGIENE PROGRAM

REPORT: A-03-ESQ-TANKFARM-007

FACILITY: CH2M HILL Hanford Group, Inc.

LOCATION: P.O. Box 1500, H6-63
Richland, Washington 99352

DATES: October 20 – 23, 2003

ASSESSORS: D. H. Brown, Lead Assessor
J. Eizaguirre, Certified Industrial Hygienist

APPROVED BY: P. P. Carrier, Team Lead
Quality and Industrial Safety

Executive Summary

From October 20 – 23, 2003, the U.S. Department of Energy, Office of River Protection (ORP) assessed the CH2M HILL Hanford Group, Inc. (CH2M HILL) industrial hygiene (IH) program. The assessment team found that in a recent assessment, CH2M HILL had identified a number of weaknesses requiring correction. The DOE assessment team identified no other program weaknesses.

Strengths:

The CH2M HILL IH program is staffed with competent, motivated personnel.

CH2M HILL management recognizes its IH program weaknesses, as a result of recently performing a number of thorough assessments, and has implemented an ambitious plan to correct the weaknesses.

CH2M HILL employees have not been exposed to airborne contaminants above Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits or the Threshold Limit Values specified by the American Council of Government Industrial Hygienists (ACGIH).

Weaknesses:

CH2M HILL management oversight of the industrial hygiene program has not been fully effective. The oversight program has not been conducted such that programmatic weaknesses have been promptly identified and corrected.

CH2M HILL does not in all cases have sufficient records to irrefutably prove workers have not exceeded legal exposure requirements, principally because the supporting data primarily came from area sampling, rather than personal sampling from the workers' breathing zone.

The CH2M HILL IH program did not comply fully with DOE O 440.1A, *Worker Protection Management*. CH2M HILL management recognized the issue and was moving aggressively to resolve it. In the view of the assessment team, the most significant areas of noncompliance with DOE O 440.1A were as follows:

- There were credibility problems with data quality of survey records. Data recording practices were prone to error and some databases did not facilitate sorting data in a way that would support construction of individual exposure histories.
- Sampling strategies did not adequately provide for sampling from the individual workers' breathing zones. Because of this and the data quality issue discussed above, CH2M HILL would have trouble providing defensible exposure records, vital records as described in 36 CFR 1236, for individuals.

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- The IH program did not have a comprehensive set of technical and administrative procedures necessary to consistently and effectively execute the IH program.
- Communications between workers and management requires strengthening to assure workers fully understand tank farm vapor hazards.
- The qualification program for IH personnel does not provide for adequate training, continuing education, and requalification.

Assessment of the CH2M Hill Industrial Hygiene (IH) Program

1.0 Introduction

From October 20 – 23, 2003, the U.S. Department of Energy (DOE), Office of River Protection (ORP) assessed the CH2M HILL Hanford Group, Inc. (CH2M HILL) IH program. The ORP Quality Assurance lead and the Richland Operations Office Industrial Hygiene lead (a certified industrial hygienist) performed the assessment.

2.0 Assessment Results

Oversight and Assessment

The DOE assessment team found that the Tank Farms contractor, CH2M HILL, had not implemented an effective long-term management assessment program for its Industrial Hygiene Program. The team also found, due to insufficient management involvement, some recommendations from previous external reviews had not been effectively implemented. However, recently CH2M HILL had conducted a number of assessments to identify and correct weaknesses in its IH program. Also, at the time of this assessment, CH2M HILL had either implemented or was in the process of developing corrective actions for the weaknesses that had been identified.

The DOE team reviewed the recent CH2M HILL assessments, some of which were in draft, and concluded those assessments were thorough and probing. A summary of three of the reviews and some of their significant findings or observations included the following:

- DuPont Safety Resources of Newark, DE, compared CH2M HILL industrial hygiene practices with those of the petro-chemical industry and found the following:
 1. CH2M HILL IH practices were generally consistent with the petro-chemical industry.
 2. CH2M HILL IH should expand personal monitoring, as too much reliance was being placed on area monitoring as a means for establishing a formal record of chemical exposure for individuals.
- A CH2M HILL independent assessment compared field activities with requirements and found in some instances exposure assessment strategies that relied on area monitoring were not appropriate for the types of activities being performed. In addition, 29 CFR 1910.1020, which is a contract requirement, requires personnel exposures be measured and exposure records maintained.

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CH2M HILL assessors also identified IH training weakness that required implementation of corrective actions.

- Intertox, Inc., who reviewed previous assessments and effectiveness of corrective actions, found in its independent assessment that some recommendations from 1990 evaluations had not been addressed. They additionally found a few recommendations made in CY 2000 and CY 2001 that also had not been implemented. Some of these recommendations correspond to actions CH2M HILL is taking currently to resolve concerns with the IH program.

Management Priorities

Environment, Safety, and Health (ES&H) management recognized the need to aggressively correct weaknesses with the CH2M HILL IH program. They provided the assessment team with the following list of priorities:

1. Build a hierarchy of IH administrative and technical procedures. (There were few existing administrative procedures and technical procedures.)
2. Improve instrumentation. (This included providing remote monitoring technology for areas where tank vapors had recurred.)
3. Improve the IH survey data database. (Deficiencies in the current database led to problems with data quality.)
4. Improve chemical training material for workers.
5. Improve communications on industrial hazards with the workforce.
6. Improve the respirator program.
7. Upgrade training and qualification for IH personnel.

CH2M HILL management provided the assessment team with a schedule, approved by management, for correcting these weaknesses. The DOE assessment team considered the above priorities and schedule appropriate.

In addition to the above priorities, CH2M HILL plans to provide specific engineering controls in the tank farms to address employee uncertainties about tank odors and vapors. These controls include sealing leak paths for fugitive emissions and raising ventilation exhaust riser heights for passively ventilated single shell tanks. At the time of this assessment, all the identified vapor leak paths of the single shell tanks had been sealed and work was in progress to raise the height of some ventilation risers. CH2M HILL also was evaluating additional methods to reduce exposures to chemical to concentrations well below regulatory limits.

Procedures

The DOE assessment team found CH2M HILL lacked a comprehensive set of technical and administrative procedures to govern IH work. As an alternative to detailed technical procedures, CH2M Hill IH technicians were performing work in accordance with sampling plans, which were prepared by industrial hygienists. Team review of some of the sampling plans found the plans did not include all of the necessary detail to ensure a record of exposure had been established for each homogeneous exposure group for each work activity. The sampling plans often were tailored to specific jobs and relied heavily on the judgment of the industrial hygienist. As a result, two sampling plans for similar work might differ considerably. This contrasted with CH2M HILL radiological control processes where two different radiological control technicians could be expected to perform similar work in a consistent manner. It also contrasted with many companies in the petro-chemical industry where IH personnel could be expected to perform work consistently.

The DOE assessors found, and CH2M HILL managers agreed, procedure HNF-IP-0842, Vol. 9, Section 4.4, *Industrial Hygiene Personal Monitoring Program Plan*, Rev. 0d, which establishes the overall sampling strategy, was outdated because of changes to tank contents. The procedure also was not considered relevant to the day-to-day IH practices in the Tank Farms. It is imperative this procedure be current because it provides direction on the frequency, location, and type of personal monitoring data to collect.

CH2M HILL managers agreed with the DOE team that the current procedures were insufficient to guide IH work activities and plan to develop a comprehensive set of technical procedures. A CH2M HILL manager had been assigned full-time to coordinate development of the necessary procedures.

Conformance with DOE Requirements

The assessment team compared the requirements for industrial hygiene in DOE O 440.1A, *Worker Protection Management*, as specified in HNF-SD-MP-SRID-001, Rev 3, *Standards and Requirements Identification Documents (S/RID)*. The DOE requirements are specified in DOE O 440.1A, Attachment 2, *Contractor Requirements Document*, Section 18, *Industrial Hygiene*. With the exception of the nonconformances described below, which CH2M Hill had self-identified through assessments, the DOE assessment team found CH2M HILL was in compliance with the requirements of DOE O 440.1A. For each case of nonconformance, CH2M HILL management was in the process of bringing its IH program into conformance.

Requirement	Issue
9.b – Assess worker exposure ... Documentation shall ... identify workers monitored or represented by monitoring...	CH2M HILL had used area monitoring with relatively little personal monitoring. Exposure records were tied to work packages, not workers. This process did not support construction of exposure records for individual workers and was inadequate for establishing statistical exposure records for homogeneous exposure groups. These are vital records as described in 36 CFR 1236. Also, the footnote on Table 1 of 29 CFR 1910.1000 requires exposure monitoring be based on measurements taken in workers' breathing zones. ¹ The S/RID identified 29 CFR 1910.1000 as a source requirement.
18.c – [Industrial hygiene programs shall include] periodic resurveys and/or exposure monitoring as appropriate.	Same as 9.b
18.d – [Industrial hygiene programs shall include] documented exposure assessment...	CH2M HILL identified data quality issues with area survey results. Using this data it would be difficult to reliably establish exposure histories for individuals. Also, databases used to store the data did not effectively permit the data retrieval required to establish exposure histories.
18.e – [Industrial hygiene programs shall include] specification of appropriate engineering... protective control methods to limit hazardous exposures...	Until recently, CH2M HILL had not implemented a series of recommendations to provide engineering controls to protect workers. These include raising ventilation riser heights and sealing leak paths for fugitive emissions.
18.f – [Industrial hygiene programs shall include] worker education, training, and involvement.	CH2M HILL did not consistently communicate to workers the risk from vapors in a manner to develop trust in CH2M HILL worker protection processes.
18.k – [Industrial hygiene programs shall include] professionally and technically qualified industrial hygienists to manage and implement the industrial hygiene program.	CH2M HILL did not promptly fill key IH management positions vacated during reorganizations.

¹ This does not mean that all workers require personal monitoring in the way that all workers require personal radiological dosimetry. However, worker exposure records must be constructed from sampling data obtained from workers' breathing zones. Area sampling is beneficial, but is not a substitute for personal (breathing zone) sampling. A variety of strategies are available to satisfy this requirement, but the approach taken by CH2M HILL did not facilitate construction of legally defensible exposure records.

Field Activity

On October 23, 2003, the assessors observed performance of duties by IH technicians and industrial hygienists. They saw evidence corroborating the need for the changes identified in CH2M HILL's assessments.

For example, the assessment team witnessed a relatively confrontational exchange between a worker, an IH technician, and an industrial hygienist that demonstrated the need to improve communications with workers. The confrontation resulted from the worker not being informed of the purpose of a passive, organic vapor-sampling badge she was required to wear.

The DOE assessors also observed that personal sampling equipment was not always worn properly. The assessors noted personal sampling badges were hung from neck lanyards at mid-chest level (similar to radiological dosimetry) and did not appear to be within the area defined as the breathing zone. In one case, a worker placed his neck lanyard and personal sampling badges on a desk while he continued to work nearby, defeating the purpose of wearing a personal sampling device. This observation confirmed that without uniform instructions, such as specifying the necessary placement of personal sampling devices on employees, devices may be improperly placed or used. The CH2M HILL priorities and corrective action plan address problems such as these.

Training of IH Personnel

The DOE assessors identified that CH2M HILL did not effectively transition to an effective IH training program from the former tank farm contractor, Westinghouse Hanford Company. CH2M HILL did not effectively implement all previous training requirements. In CY 2001, CH2M HILL formalized its training and qualification process and issued new qualification cards; however, these qualification cards had deficiencies. For example, IH technicians were required only to demonstrate proficiency with sampling equipment one time. The qualification had no provision for acquiring proficiency on new or revised equipment. Additionally, the CH2M HILL IH training lacked adequate requirements for qualification training, continuing education, and requalification. CH2M HILL management stated it intended to correct this problem as one of its priorities.

3.0 Conclusions

Strengths

The CH2M HILL IH program is staffed with competent, motivated personnel.

CH2M HILL management recognizes its IH program weaknesses and has implemented an ambitious plan to correct the weaknesses.

CH2M HILL employees have not been exposed to airborne contaminants above Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits or the Threshold Limit Values specified by the American Council of Government Industrial Hygienists (ACGIH).

Weaknesses

CH2M HILL management oversight of the industrial hygiene program has not been fully effective. The oversight program has not been conducted such that programmatic weaknesses have been promptly identified and corrected.

CH2M HILL does not have sufficient records, in all cases, to irrefutably prove workers have not exceeded legal exposure requirements, principally because the supporting data primarily came from area sampling rather than personal sampling from the workers' breathing zone.

In limited areas the CH2M HILL IH program does not comply fully with DOE O 440.1A, *Worker Protection Management*. CH2M HILL management recognized this and is moving aggressively to come in compliance. The most significant of these noncompliances are as follows:

- There were credibility problems with data quality of survey records. Data recording practices were prone to error, and some databases did not facilitate sorting data in a way that would support construction of individual exposure histories.
- Sampling strategies did not adequately provide for sampling from the individual workers' breathing zones. Because of this and the data quality issue discussed above, CH2M HILL would have trouble providing defensible exposure records, vital records as described in 36 CFR 1236, for individuals.
- The IH program did not have a comprehensive set of technical and administrative procedures necessary to consistently and effectively execute the IH program.
- Communications between workers and management requires strengthening to assure tank farm workers fully understand tank farm vapor hazards.
- The qualification program for IH personnel does not provide for adequate training, continuing education, and requalification.

E-STARS™ Report
Task Detail Report
11/26/2003 1027

TASK INFORMATION			
Task#	ORP-ESQ-2003-0080		
Subject	CONCUR 03-ESQ-080 Assessment Report A-03-ESQ-TANKFARM-007		
Parent Task#		Status	CLOSED
Reference		Due	
Originator	Hopkins, Dianne	Priority	None
Originator Phone	(509) 376-4132	Category	None
Origination Date	11/19/2003 1616	Generic1	
Remote Task#		Generic2	
Deliverable	None	Generic3	
Class	None	View Permissions	Normal
Instructions	bcc: MGR RDG FILE Judy O'Connor, OPA J. Swailes, AMTF D. Brown, ESQ		
ROUTING LISTS			
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ATTACHMENTS			
Attachments	<ol style="list-style-type: none"> 1. 03-ESQ-080 Assessment -007 letter.doc 2. 03-ESQ-080 Assessment -007 Report.doc 		
COMMENTS			
Poster	Hopkins, Dianne (Hopkins, Dianne) - 11/26/2003 1011		
	CLOSED		
	Swailles concurred 11/28/03		
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	<i>No Due Date History</i>		
SUB TASK HISTORY			
	<i>No Subtasks</i>		

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E-STARS™ Report
Task Detail Report
11/19/2003 0433

TASK INFORMATION			
Task#	ORP-ESQ-2003-0080		
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Reference		Due	
Originator	Hopkins, Dianne	Priority	None
Originator Phone	(509) 376-4132	Category	None
Origination Date	11/19/2003 1616	Generic1	
Remote Task#		Generic2	
Deliverable	None	Generic3	
Class	None	View Permissions	Normal
Instructions	bcc: MGR RDG FILE Judy O'Connor, OPA J. Swalles, AMTF D. Brown, ESQ		
ROUTING LISTS			
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	<ul style="list-style-type: none"> ● Barr, Robert C - Review - Awaiting Response <i>Bob</i> ● Swalles, John H - Review - Awaiting Response <i>John 28 Nov 03</i> ● Schepens, Roy J - Approve - Awaiting Response <i>RJ 11/26/03</i> 		
ATTACHMENTS			
Attachments	<ol style="list-style-type: none"> 03-ESQ-080 Assessment -007 letter.doc 03-ESQ-080 Assessment -007 Report.doc 		
COMMENTS			
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SUB TASK HISTORY			
<i>No Subtasks</i>			

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