Independent Oversight Follow-Up Review of Worker Vapor Exposures and Occupational Medicine Program at the

Hanford Site

June 2005

Office of Independent Oversight and Performance Assurance
Office of Security and Safety Performance Assurance
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Abbreviations Used in This Report

AMH	AdvanceMed Hanford
BNI	Bechtel National, Incorporated
CAIRS	Computerized Accident/Incident Reporting System
CATS	Corrective Action Tracking System
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EM	DOE Office of Environmental Management
ES&H	Environment, Safety, and Health
ES&Q	ORP Office of Environmental Safety and Quality
FY	Fiscal Year
GAP	Government Accountability Project
JHA	Job Hazards Analysis
MSDS	Material Safety Data Sheet
OA	Office of Independent Oversight and Performance Assurance
OEL	Occupational Exposure Limit
ORP	Office of River Protection
OSHA	Occupational Safety and Health Administration
PER	Problem Evaluation Request
PPE	Personal Protective Equipment
RL	Richland Operations Office
SCBA	Self-Contained Breathing Apparatus
SWE	Safe Work Environment
VOC	Volatile Organic Compound

OVERSIGHT

Executive Summary

The U.S. Department of Energy (DOE) Office of Independent Oversight and Performance Assurance (OA) conducted a follow-up review in May-June 2005 of its 2004 investigation of allegations of deficiencies in worker protection and medical practices at the DOE Hanford Site. The purpose of this OA follow-up review was to assess the status of the corrective actions for selected findings identified by OA during its 2004 investigation. OA reports to the Director of the Office of Security and Safety Performance Assurance, who reports directly to the Secretary of Energy.

The follow-up review examined corrective actions taken by: (1) the Office of River Protection (ORP) and the Tank Farms contractor, CH2M HILL, for vapor exposure findings; and (2) the Richland Operations Office (RL) and the medical program contractor, AdvanceMed Hanford (AMH), for medical program findings. In each of these areas, OA's objective is to provide constructive feedback to ORP, RL, CH2M HILL, and AMH. OA focused on providing a set of specific recommendations for enhancing current site programs and initiatives and/or addressing specific weaknesses in the approach to managing the corrective actions for the identified findings.

After the 2004 OA investigation, ORP and CH2M HILL instituted a number of corrective measures, most notably the extensive use of supplied air respirators for workers in a position to be exposed to tank vapors. These measures are still being applied and are still appropriate to ensure that workers are protected from tank vapor exposures; ORP and CH2M HILL plan to maintain these measures until the hazards are fully characterized and controls are reassessed. They have made significant progress in addressing the vapor issue. Their strategic approaches and programs are generally well designed, are of high technical quality, and are appropriate to establish a longer-term protection strategy. ORP and CH2M HILL also have made improvements in work planning and control and in their injury and illness investigation and reporting processes that appropriately address the OA findings. ORP and CH2M HILL have completed the actions committed to in the approved corrective action plan, and they plan to evaluate the effectiveness of all the corrective actions before November 2005.

Although CH2M HILL has implemented or is in the process of implementing improvement actions in all areas where OA had previously identified findings, some additional actions are needed. For example, through field observations, the OA team found that the recent enhancements associated with work planning and control had not been effectively implemented at the working level. The OA team also determined that much work remains to address the underlying issues of the 2004 investigation findings. As a result of observations during this follow-up visit, the OA team recommends that ORP and CH2M HILL keep the findings of the 2004 investigation open until the effectiveness of the corrective actions has been verified.

ORP and CH2M HILL have devoted significant management attention and resources to the corrective action process, and RL has enhanced its oversight of the medical contractor. CH2M HILL recognizes that much work remains to be accomplished, particularly in the industrial hygiene area, to address the complex and technically challenging aspects of tank characterization, exposure assessment strategies, and monitoring program design (including the need to develop operational exposure limits, monitoring equipment and methods, and protection strategies for a wide range of chemicals) before reducing the personnel protection requirements. Even though CH2M HILL had identified many of these actions, the OA team found, as ORP did in its most recent evaluation of the CH2M HILL industrial hygiene program, that CH2M HILL has not developed a detailed plan and associated schedule for these actions, and that these actions have not been entered into a formal tracking system. While the new CH2M HILL Program Plan fills the need for a comprehensive strategic plan for addressing vapor issues, it lacks sufficient detail and controls to ensure timely and effective implementation of

the many ongoing efforts. Continued ORP and CH2M HILL attention is needed to ensure that a comprehensive plan and schedule are developed to include and track these actions.

In the medical area, RL and AMH have adequately addressed the two medical-related findings from the 2004 investigation. Their corrective action plan was adequate and has been effectively implemented. The transition to a new contractor was timely and effective, and the new contractor is making improvements in a number of areas, such as establishing the risk communicator position. RL has been actively involved in the program enhancement and has provided effective oversight. Continued RL and AMH management attention is warranted in some areas, including risk communication and collection and analysis of historical and medical surveillance information. In addition, RL management attention is needed to ensure that RL applies sufficient medical expertise in its oversight efforts and addresses the current weaknesses in its Performance Evaluation Plan for the medical contractor.

This OA review did not result in any new findings. Recommendations for continued improvement and enhancements to ongoing initiatives are provided in this report.

1.0 Introduction

The U.S. Department of Energy (DOE) Office of Independent Oversight and Performance Assurance (OA) conducted a review in May-June 2005 to follow up on its earlier investigation of selected aspects of worker safety and health systems at the DOE Hanford Site. OA reports to the Director of the Office of Security and Safety Performance Assurance, who reports directly to the Secretary of Energy. OA performed the original investigation in February-April 2004 at the direction of the Secretary of Energy to evaluate allegations of deficient safety and medical practices.

The purpose of this OA follow-up review was to assess the status of corrective actions for selected findings identified by OA during the 2004 investigation in two areas:

- Corrective actions taken by the Office of River Protection (ORP) and the Tank Farms contractor (CH2M HILL) for safety (vapor exposure) findings.

- Corrective actions taken by the Richland Operations Office (RL) and the medical program contractor, AdvanceMed Hanford (AMH), for medical program findings.

In each of these areas, OA's objective is to provide constructive feedback to ORP, RL, CH2M HILL, and AMH. As discussed in this report, the follow-up review did not identify any further deficiencies that are outside the scope of the findings identified in the original investigation report, and the site organizations either have adequately addressed the previous findings or have ongoing programs in place that are generally appropriate to address the previous findings. Consequently, OA focused on providing a set of specific recommendations for enhancing the current site programs and initiatives and/or addressing specific weaknesses in the approach to managing these corrective actions.

The original investigation identified 18 findings. Thirteen of these findings addressed CH2M HILL's approach to vapor protection, one addressed ORP's oversight of the vapor issue, and two addressed the medical program and RL's oversight of the medical program. The other two findings addressed injury/illness investigation and reporting by other site organizations; these findings have been addressed through other DOE Headquarters initiatives and were not included in this review. In addition, three of the thirteen findings applicable to CH2M HILL dealt with engineered systems and were not explicitly addressed during this review. OA's preliminary review of the three engineered system findings indicated that the related corrective actions generally address the actions that need to be performed; however, ORP and CH2M HILL are still assessing the application of engineered systems in the overall protection strategy, so a review by OA is not yet appropriate.

Hanford Tank Farms

The Hanford Site, located in southeastern Washington state, incorporates a number of Tank Farms that store and process highly radioactive and hazardous waste. The Hanford Site Tank Farms include 177 large underground tanks, all of which are aging, and some of which are deteriorating. Some of these tanks are of a single-shell design that provides less assurance of containment than the newer double-shell design. Tank Farm activities involve various potential hazards that need to be effectively controlled: exposure to external radiation, radiological contamination, hazardous chemicals, and various physical hazards associated with facility operations. Of particular relevance to this investigation is that the materials in the tanks generate various gases, such as hydrogen, and vapors that contain ammonia and various volatile organic compounds (VOCs). These gases and vapors can escape the tanks through normal venting and other leak paths. Some of the vapors produce unpleasant odors and can cause such reactions as coughing and skin irritation; at higher concentrations, some of the vapors could be hazardous to human health.

The DOE Office of Environmental Management (EM) is the lead program secretarial office for the Hanford Site. As such, it has overall Headquarters responsibility for most activities at

the site. At the site level, line management responsibility for the Tank Farms falls under the Manager of ORP, which manages the prime contract for the Tank Farms – CH2M HILL – and one other ORP prime contract – Bechtel National, Incorporated (BNI). ORP was established as a separate organization reporting to EM in 1998 in an effort to increase accountability for the success of the tank waste remediation efforts and to streamline the management structure and the decision-making process.

Medical Program

The Hanford Site has an occupational medicine program that serves all Hanford Site contractors except BNI (which was authorized by DOE to subcontract its own occupational medical provider). The occupational medicine program performs the various functions required by DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*. For example, the occupational medicine program provides medical treatment, performs required examinations, maintains medical records for Hanford Site workers, and has responsibility for performing occupational medicine services and for tracking and coordinating medical issues, including trending health issues for all site contractors.

At the direction of EM, RL manages various sitewide programs at the Hanford Site, including the site occupational medicine contract. Since the 2004 OA investigation, the site occupational medicine program has transitioned to a new contractor. AMH was awarded the medical program contract in June 2004 and assumed responsibilities for operation of the Hanford Site occupational medicine program, which encompasses all site workers (including Tank Farm workers) except BNI.

Allegations

In September 2003, the Government Accountability Project (GAP) issued a report entitled "Knowing Endangerment," which alleged that deficiencies in worker protection at the Hanford Tank Farms had led to worker vapor exposures and illnesses. Specifically, GAP alleged that workers were sick and injured after being exposed to vapors from high-level nuclear waste tanks and other toxic and carcinogenic substances. The GAP report and subsequent GAP statements also alleged that there were instances of improper medical record keeping (including falsifying records and collusion to undermine worker compensation claims) and improper reporting of injuries and illnesses.

OA Investigation in 2004

The 2004 OA investigation focused on the adequacy of Tank Farm safety and health programs in areas relevant to the allegations, such as industrial hygiene, work planning, and engineering controls. OA also reviewed the Hanford Site medical program and injury and illness reporting practices. In addition, OA evaluated relevant safety management systems, such as contractor feedback and improvement systems and DOE line management oversight. In a separate effort, the DOE Office of the Inspector General investigated the allegations regarding potential violation of laws.

OA's 2004 review of worker vapor exposures concluded that there have been no known cases of workers being exposed to chemical vapors at the Hanford Site Tank Farm in excess of regulatory limits, and available sampling data indicated that worker exposures were low. However, the Tank Farm's personal sampling data was too limited to conclude that no worker has had any exposure that exceeded regulatory thresholds for any chemical to which workers might be exposed. In addition, weaknesses were identified in the Tank Farm industrial hygiene program, hazard analysis and controls, engineered controls, communications, contractor feedback systems, and DOE oversight. During the investigation, ORP and CH2M HILL took appropriate actions to mitigate worker risks until the hazards could be better characterized and began to evaluate longer-term solutions.

In reviewing the occupational medicine program in 2004, OA concluded that the allegations concerning the falsification of workers' medical records and the inappropriate medical treatment were not substantiated. The occupational medicine program maintains detailed patient records and no major problems in occupational medicine were identified, although a few improvements were warranted in some medical contractor administrative processes and in RL's coordination of the interfaces between site contractors. In the area of injury and illness investigation and reporting, OA's review of a sample of reports from the Tank Farm contractor and four other Hanford contractors showed that most injury and illness events were appropriately categorized and no egregious examples of misreporting were identified, although a few cases were not clearly addressed in the regulation and the decisions to treat

them as non-recordable were questionable in a few cases.

Following the OA investigation, the Secretary of Energy directed EM to develop and implement corrective action plans to comprehensively and effectively address the resultant findings and recommendations. In response, ORP and C2M HILL developed a corrective action plan for the vapor exposure findings, and RL developed a corrective action plan for the findings related to the medical program and sitewide injury and illness reporting. OA's review of the initial corrective actions plans indicated that many of the identified corrective actions could be accomplished in a short time but that some would entail large, multi-year efforts.

Organization of This Report

Sections 2 and 3 of this report provide OA's assessment of the corrective actions for vapor exposures and the medical program, respectively. Appendix A provides supplemental information, including team composition.

2.0 Assessment of Corrective Actions for ORP and CH2M HILL

The 2004 OA investigation identified a number of weaknesses in the CH2M HILL programs for defining, monitoring, and controlling the hazards associated with workers' exposure to vapors from waste storage tanks. During that investigation, ORP and CH2M HILL determined that the corrective actions for the identified weaknesses would require a long-term project to characterize the tanks and vapors, determine the potential health risks to workers, and establish an effective system of workplace monitoring and controls. In light of the uncertainties, ORP and CH2M HILL then decided to take the conservative step of requiring Tank Farm workers to use supplied air—such as self contained breathing apparatus (SCBA) or portable supplied air systems—for any work activities in areas where vapors could be present. OA concluded that the extensive use of supplied air was an appropriate measure to protect the workers from tank vapors while hazards are being analyzed and engineering controls are being developed.

At the time of this 2005 follow-up review, extensive SCBA usage was still being required. As long as this measure remains in effect and effectively implemented, the risk of workers' exposure to vapors is adequately controlled. However, ORP and CH2M HILL recognize that use of SCBA for essentially all work activities at the Tank Farms is not the optimal long-term solution. The SCBA air tanks are heavy and awkward to wear, and they reduce workers' field of vision and ability to communicate. These factors could lead to other (non-vapor) types of health hazards, such as heat stress, falls, and muscle strains, and may contribute to injuries; a study by CH2M HILL attributed 57 injuries to SCBA use for the 14-month period ending May 2005. While OA did not independently evaluate injury trends, SCBA use involves potential safety hazards that warrant consideration. In addition, the SCBAs reduce worker efficiency, and some workers complain about the inconvenience and discomfort (e.g., heat and dry air).

The overall ORP/CH2M HILL approach is to work toward a sufficient understanding of the vapors, the release conditions and dispersal patterns of the vapors, and their health effects to determine the best combination of engineered controls, personal protective equipment (PPE), and administrative controls. ORP and CH2M HILL believe that the use of SCBAs can be substantially reduced through some combination of engineering controls (e.g., extended stacks, ventilation systems), administrative controls (e.g., designated areas or activities with controls that are graded according to the potential for exposure), air monitoring, and various types of respiratory protection. According to the conceptual strategy, the type of respiratory protection required would vary based on the potential for exposure and the types of vapors anticipated (ranging from none for areas with very low vapor exposure potential, to air-purifying respirators for areas with low risk from airborne contaminants, to SCBAs for areas with significant potential for vapor exposure). As discussed in Section 2.1, CH2M HILL has made progress in characterizing the tank vapors, developing procedures, and sampling the workplace air, but continuing efforts remain to develop the specific protection strategies approaches and fill in the knowledge gaps; for example, some occupational exposure limits (OELs) need to be determined, and sampling methods need to be developed.

OA's review of the vapor exposure findings and associated corrective actions taken by ORP and CH2M HILL addressed five categories of findings: vapor exposure characterization and the associated industrial hygiene program controls, work planning and control, CH2M HILL injury and illness reporting, the CH2M HILL corrective action management process, and ORP oversight of the vapor exposure findings. The effectiveness of the corrective actions must be considered both in the context of the current conditions (extensive SCBA use) and the anticipated future conditions (additional engineering controls, with SCBAs used only for selected activities).

2.1 Industrial Hygiene Programs

2.1.1 Summary of 2004 Results

The 2004 investigation concluded that there were no known instances of exposures above regulatory limits, but the longstanding deficiencies in the characterization of the Tank Farm vapors and industrial hygiene program were such that the site could not adequately ensure that all exposures have been below regulatory limits. The 2004 OA investigation identified five findings for CH2M HILL related to the industrial hygiene program. These findings were in the areas of: (1) vapor characterization, (2) exposure assessment program, (3) industrial hygiene instrumentation, (4) industrial hygiene training and qualifications, and (5) respiratory protection.

2.1.2 Site Corrective Actions

CH2M HILL's current corrective action (i.e., extensive SCBA usage) is still being implemented to protect workers from vapor exposures while long-term solutions are under development. In addition, CH2M HILL has a number of ongoing projects to address the vapor protection issues, which are in various stages of development and implementation. Corrective actions relevant to the five industrial hygiene findings are presented below. CH2M HILL has closed the identified corrective actions for the five OA industrial hygiene findings, ORP has verified the corrective actions, and an effectiveness review is scheduled. (However, see Sections 2.4 and 2.5 for discussion of some concerns involving premature closure of corrective actions.)

2.1.3 OA Assessment

The OA team interviewed industrial hygiene and engineering staff, reviewed reports and corrective action closure documents, and observed a few selected field work activities. The following paragraphs provide an evaluation of the status of the corrective actions with respect to these findings and associated issues.

Tank Vapor Characterization

The OA concerns with respect to the lack of tank vapor characterization are captured principally in Finding #C-1 of the 2004 investigation, which states that "CH2M HILL tank vapor characterization is not sufficient to support industrial hygiene exposure assessment and respiratory protection programs." CH2M HILL identified 15 corrective actions associated with this finding. All of these corrective actions have been closed by CH2M HILL, most before 2005. Collectively, the 15 corrective actions address most of the concerns identified by the 2004 OA investigation.

Significant accomplishments with respect to vapor characterization have been achieved since April 2004. Several actions are noteworthy, such as the establishment of a panel of nationally recognized toxicological experts to review the "chemicals of potential concern" list and develop additional OELs for over 1400 tank chemicals for which OELs do not presently exist. Another CH2M HILL accomplishment is the issuance of several technical reports on tank vapor characterization, such as the *Industrial Hygiene Chemical Vapor Technical Basis* report and other reports on vapor chemistry and headspace mechanics.

As part of their extent-of-condition review, CH2M HILL, to their credit, included additional necessary corrective actions that were not identified in the 2004 OA investigation report. For example, one of the corrective actions requires evaluation of the 242-A Evaporator as a potential vapor source, although the OA report did not explicitly address the 242-A Evaporator. In addition, CH2M HILL has aggressively sought to analyze the potential hazard in the tank vapor spaces resulting from a number of potential chemical hazards.

Tank vapor characterization is a complex and challenging activity, and CH2M HILL is applying significant scientific expertise to assess the technical challenges and uncertainties. As examples of uncertainties that were identified since the 2004 OA investigation, CH2M HILL identified 30 to 40 new chemicals that are now being evaluated in the vapor headspaces, encountered some cases of higher chemical concentrations than those observed in the 1990s, and experienced infrequent short-term concentrations of VOCs exceeding the 200 ppm saturation limit of some detection instruments placed on single-shell tank breather filters.

In a few cases, the corrective actions for this finding were either missed or incomplete. One of the concerns identified by the OA investigation team was the lack of a process for analyzing and estimating sampling errors. This concern was identified in two corrective actions associated with headspace sampling and direct reading instruments. For example, although methods have been established for estimating error, these methods have not been implemented in field

procedures. In addition, some of the corrective actions for this finding resulted in the issuance of technical reports that identified additional recommendations. Some of these recommendations have not been incorporated into any follow-on corrective actions to ensure effective evaluation and/or implementation.

While the corrective actions for this finding have been closed by CH2M HILL (but not by ORP in the Corrective Action Tracking System, or CATS), considerable work with respect to vapor characterization remains before the OA finding can be resolved. CH2M HILL has scheduled additional vapor characterization activities to continue through 2007. The determination of OELs and development of sampling and analysis protocols to implement the OELs is ongoing and may not be completed until later this year. Although tank headspaces for 30 additional tanks have been sampled for vapors through the Vapors Solutions Project since April 2004, the number of samples for most tanks is limited, and the results do not reflect the variety of work activities in the Tank Farms. Furthermore, at present, there is no headspace vapor characterization for 30 single-shell tanks. Because of the complexity of vapors in the tank headspaces, it is difficult to predict a time in the future when headspace vapors will be "fully characterized." However, upon completion of each future sampling campaign, such as the initial sampling campaign for the A-prefix Tank Farms scheduled for May 2006, sufficient vapor characterization should be available for these tanks to support industrial hygiene exposure assessment programs. At that time, modifications to the current protection strategy (e.g., relaxing current supplied air respiratory protection requirements for selected work activities) can be assessed.

Exposure Assessment Program

The OA concerns with respect to the CH2M HILL exposure assessment program are encompassed in Finding #C-2 of the 2004 investigation, which states that "Compliance with Occupational Safety and Health Administration (OSHA) and DOE exposure limits for chemical vapors cannot be sufficiently demonstrated due to weaknesses in the CH2M HILL exposure assessment program." CH2M HILL identified nine corrective actions associated with this finding, all of which have been closed. The CH2M HILL corrective actions for this finding were wide-ranging and included the development of an exposure assessment strategy, development and issuance of industrial hygiene procedures, and development of industrial hygiene technician training and industrial hygiene instrument training. Corrective actions associated with the exposure assessment program are addressed in this section, and the following sections address corrective actions associated with industrial hygiene instrumentation (and associated procedures) and training.

A number of accomplishments with respect to the development of the CH2M HILL exposure assessment program are evident since the issuance of the 2004 OA investigation report. A robust *Exposure Assessment Strategy* document was issued and continues to be refined. The strategy provides a detailed description of the exposure assessment process envisioned for the Tank Farms, including roles and responsibilities (including the role of occupational medicine), establishes the basis for OELs and personal monitoring, and addresses other hazards indirectly associated with the tank vapors, such as physical, biological, and ergonomic hazards. During March 2005, the Tank Farm Industrial Hygiene Database was issued for use by the industrial hygiene staff. It provides a comprehensive exposure data record-keeping and analysis tool that will allow Tank Farm industrial hygienists and the AMH medical staff easy access to personal sampling data and direct reading instrument records for workers' breathing zones, as well as tank ventilation system chemical sampling data. The database also catalogs direct reading instrument data records, provides instrument range and calibration data, and is directly linked to a variety of chemical information. The database addresses a number of the 2004 OA concerns about poor instrument record-keeping practices and CH2M HILL's previous inability to provide a timely, consistent, and accurate catalog and analysis of tank ventilation and personal exposure records. Another noteworthy accomplishment is the significant increase in the amount of sampling of tank ventilation vapors and sampling for worker exposures. During the past 14 months, several hundred such samples have been collected and analyzed.

As with tank vapor characterization, much remains to be completed with respect to the implementation and refinement of the exposure assessment strategy. CH2M HILL plans to continue breathing zone sampling for workers and sampling of vapor sources. Historical exposure data will continue to be verified and entered into the new Tank Farm Industrial Hygiene Database. The exposure assessment strategy has not been fully implemented in the field, and the strategy is in some cases inconsistent with current work practices. Because workers are currently using supplied air, there

has been limited effort to integrate the exposure assessment strategy with current work activities. For example, one work package observed by the OA team included outdated action limits of 2 ppm VOCs and 25 ppm ammonia, and void limits (i.e., a limit at which an evacuation is required) of 25 ppm VOCs and 300 ppm ammonia. These limits do not reflect either the current knowledge of the tank vapors or the fact that workers are using supplied air; instead, these limits are associated with the air monitoring zones and limited respiratory protection that existed prior to the 2004 OA investigation. Based on this observation by the OA team, CH2M HILL has recently issued guidance concerning action and void limits when workers are in supplied-air respirators. However, CH2M HILL has not yet entered in their corrective action tracking system the actions necessary to assure timely implementation of the exposure assessment strategy.

During the past few months, the CH2M HILL Industrial Hygiene Department has drafted a vapor permit that should provide a useful work control tool for translating requirements from the technical basis documents to vapor controls that can be implemented in the field. However, the vapor permit is a new concept that has not been finalized, procedures have yet to be drafted, the process has not been incorporated in the CH2M HILL work control process, and the industrial hygiene staff and CH2M HILL workforce have not been trained concerning its use.

Before the exposure assessment strategy can be implemented in the field, OELs for chemicals in the headspace and sampling and analysis protocols must be completed, the appropriate field instrumentation must be readily available, work control processes must be adjusted, and workers and industrial hygiene technicians must be appropriately trained. The ongoing A-Prefix Tank sampling campaign, which is scheduled for completion in the autumn of 2005, appears to be the initial opportunity to implement these actions.

Industrial Hygiene Instrumentation

The OA concerns with respect to industrial hygiene instrumentation are encompassed by Finding #C-3 of the 2004 investigation, which states that "Chemical vapor exposure data obtained by CH2M HILL through the use of field instrumentation, particularly direct reading instruments, is in some cases unreliable and may not accurately reflect exposures of workers to some chemical vapors being released from the tanks." There are four corrective actions that are unique to Finding #C-3, as well as four corrective actions from Finding #C-2 that also apply to industrial hygiene instrumentation. All of the corrective actions are identified by CH2M HILL as being closed.

A number of significant accomplishments have been realized in the area of industrial hygiene instrumentation since the 2004 OA investigation. For example, as previously mentioned, the Tank Farm Industrial Hygiene Database provides a useful tool for collecting field data from direct reading instruments. In addition, the database provides a way to record instrument calibration data, and if an instrument has exceeded the calibration period a warning is provided to the technician. The database also requires a supervisory and management review of all data recorded by the industrial hygiene technician before the data record can be completed. The Tank Farm Industrial Hygiene Database, when fully implemented, is an appropriate mechanism for addressing a number of concerns about instrumentation data records previously identified by the OA team. Another recent accomplishment has been the identification, acquisition, and field testing of additional industrial hygiene instrumentation consistent with the monitoring and sampling strategy. A significant investment has recently been made in personal sampling equipment, direct reading instruments for nitrous oxides and ammonia, and data loggers that can continuously monitor and record VOC levels associated with single-shell tank breather filters and stack effluents. Prior to the 2004 OA investigation, there were few industrial hygiene instrument procedures, and technicians relied on their interpretation of various instrument vendor manuals. However, during the past year, 18 new procedures have been completed, and 3 additional instrument procedures are in development.

Although there has been significant progress in the area of industrial hygiene instrumentation, considerable effort remains. For example, a number of instrument procedures have been completed, but few of these procedures have been issued or implemented in the field since much of the technician training has yet to be conducted (see the following section). In some cases, the direct reading instrument required for detecting a primary chemical contaminant in the work space has not been field-prototyped or issued to technicians for use in the field (e.g., mercury detection), or the instruments are in short supply (e.g., nitrous oxide detection). Because the Tank Farm Industrial Hygiene Database was only made available for field use in March 2005, training and implementation issues will continue to require management attention in the upcoming months. Furthermore, much of the historical instrument data requires a quality review before

inclusion in the Tank Farm Industrial Hygiene Database.

Industrial Hygiene Training and Qualifications

The OA concerns with respect to training and qualification of industrial hygiene technicians, particularly with respect to exposure monitoring and sampling, and the use of direct reading instruments, are encompassed in Finding #C-4 of the 2004 investigation, which states that "Limitations in the current CH2M HILL industrial hygiene technician training and qualification program, and the lack of instrument procedures, do not ensure consistency or proficiency when conducting vapor exposure and monitoring activities." CH2M HILL identified three corrective actions associated with this finding, two of which were addressed in Findings #C-2 and #C-3 and are discussed above. All of these corrective actions have been closed by CH2M HILL.

Although CH2M HILL had implemented an industrial hygiene technician qualification program prior to the 2004 OA investigation, training and qualification activities were often informal and inconsistent, and implementation varied considerably among industrial hygienists who were assigned responsibility for this program. However, since the 2004 investigation, the industrial hygiene training and qualification program has been completely revised, formalized, and restructured to be consistent with the exposure assessment strategy. The current industrial hygiene training consists of 40 hours of classroom instruction in industrial hygiene fundamentals, and additional training and qualification in two areas: industrial hygiene fundamentals and industrial hygiene instrumentation. CH2M HILL has required all technicians, including lead technicians, to qualify or requalify in the new program. Currently, over 90 percent of the industrial hygiene technicians have completed the fundamentals classroom and qualification requirements. Based on OA field observations and interviews with industrial hygiene technicians, the level of knowledge concerning industrial hygiene fundamentals and instrumentation has improved considerably. Another improvement is the recent development of a qualification program for Tank Farm staff industrial hygienists, consisting of required reading, continuing education, and practical field exercises.

However, considerable training remains to be completed on a number of the instruments used by the technicians. At present, training has been conducted on only two instruments: the ITX Multi-Gas monitor (currently used for ammonia monitoring) and the ppbRAE VOC monitor. Training has yet to be conducted on multi-gas monitors, mercury analyzers, another commonly used ammonia monitor, Gillian low flow samplers, industrial hygiene pumps, noise survey and dosimeters, and heat stress monitors. Industrial hygiene management anticipates that this training can be completed before the end of calendar year 2005. A policy was established in March 2005 for modified qualification or "grandfathering" of technicians who had previous experience with some instruments, but had not completed their instrument qualifications in accordance with the new qualification program. In addition, of the seven industrial hygienists who are required to qualify based on the new requirements, only two have completed all of their qualification requirements.

Respiratory Protection

The OA concerns with respect to the CH2M HILL respiratory protection program in the areas of respiratory protection procedures, respirator cartridge selection, and issuance of voluntary respirators are encompassed in Finding #C-5 of the 2004 investigation, which states that "The CH2M HILL respiratory protection program has not facilitated the voluntary use of respirators, ensured that respirator issuers are trained, or adequately demonstrated that workers are protected from the variety of chemical contaminants in tank vapors." CH2M HILL identified four corrective actions, three focusing on additional training for respirator issuers and one focusing on revising the respiratory protection procedure to address the voluntary issuance of respirators. Corrective actions included a training needs analysis, which was conducted by the respiratory protection core team (consisting of respirator issuers, industrial hygienists, training personnel, and the respiratory protection program administrators). The needs analysis concluded that respirator issuers should receive additional training on evaluating, maintaining, and issuing respirators. Changes to the respiratory protection procedure may streamline the process for voluntary issuance of respirators and adequately address OA's previous concern that the process was so cumbersome that workers were reluctant to request a respirator. Respiratory protection procedures were further revised to more clearly define responsibilities within the various impacted organizations, thereby addressing another concern from the 2004 investigation. Several additional

corrective actions were identified by CH2M HILL with respect to the development of a respiratory issuers forum, issuance of a charter for this group, scheduling and conduct of meetings, and the development and issuance of a qualification card for mask issuers. All of these corrective actions have been closed by CH2M HILL.

The corrective actions for the voluntary issuance of respirators are appropriate and appear to have been satisfactorily completed, pending an effectiveness review to be performed by CH2M HILL. Corrective actions have also been identified and completed to ensure that the respiratory protection that is issued, including filter cartridges, is consistent with the chemical contaminants in tank vapors. CH2M HILL currently requires the use of supplied air for all work conducted within the Tank Farms. CH2M HILL has also developed a path forward for chemical vapor protective equipment decisions that, if carried to completion, provides an appropriate mechanism for ensuring the appropriate selection of respiratory protection, consistent with the vapor hazard.

Although progress has been achieved in resolving respiratory protection concerns raised during the 2004 OA investigation, some issues remain. For example, respirator issuers have received some training, but a qualification process for respirator issuers has yet to be formalized; additionally, there is not yet a formal charter for the new respirator issuers group. The respiratory protection procedure identifies some responsibilities of the respiratory protection core team but does not fully address the corrective action. Furthermore, until the completion of the CH2M HILL effectiveness review, there is limited evidence that the changes to the respiratory protection program have been effective.

Summary

Since the 2004 OA investigation, CH2M HILL has achieved significant progress in each of the areas of industrial hygiene concern identified by the 2004 OA investigation team. Several of the corrective actions have resulted in noteworthy accomplishments, such as the *Industrial Hygiene Chemical Vapor Technical Basis* document and the Tank Farm Industrial Hygiene Database. In a number of cases, CH2M HILL has initiated additional corrective actions to address root causes and extent-of-condition concerns related to the CH2M HILL industrial hygiene program. CH2M HILL has spent and continues to expend significant resources in addressing tank vapor issues by developing and implementing a comprehensive plan, which was not evident during the 2004 investigation. Industrial hygiene technical basis documents and procedures have been developed, the industrial hygiene staff has increased, and additional industrial hygiene instrumentation and training programs have increased the capability and credibility of the industrial hygiene program.

Significant work remains in the characterization of tank vapors and worker exposures, as well as the control of vapors to minimize exposures. The path forward for the industrial hygiene program, as described in several CH2M HILL documents, appears appropriate. As discussed in Sections 2.4 and 2.5, the corrective actions for the findings from the 2004 OA investigation associated with the CH2M HILL industrial hygiene program have been closed. However, additional actions, ongoing or planned, that are needed to resolve the underlying causes of the findings are not tracked in a formal issues management system. Also, the new industrial hygiene technical basis documents, permits, training, and instrumentation have not been adequately integrated with work planning and work controls at the Tank Farms. Because CH2M HILL implementation schedules lack sufficient focus on work control integration, the necessary industrial hygiene controls (i.e., work documents, procedures, monitoring, vapor permits, sampling, and training) may not be in place to support the A-Prefix sampling campaign scheduled for later this year.

2.1.4 Recommendations for Continued Improvement

The following recommendations address ongoing initiatives/enhancements to the current industrial hygiene initiatives:

1. Continue the development and enhancement of the industrial hygiene program in the following areas:

   - Continue to aggressively sample, analyze, and characterize vapor sources (e.g., breather filters and stacks) and tank headspaces. Provide a method for estimating sampling and instrument errors in field procedures, and include error estimates within the data compiled in the Tank Farm Industrial Hygiene Database.

   - Continue to evaluate, field test, and issue new industrial hygiene instrumentation, particularly for direct reading of mercury vapors and data

logging of VOCs as required to support ongoing work activities.

- Complete the development and issuance of industrial hygiene procedures.
- Develop and implement qualification standards for respirator issuers.
- Complete the industrial hygiene instrument technician training and qualification. Expand the current industrial hygiene technician training and qualification to include additional training on tank vapors and scenarios relating to industrial hygiene support of work activities (i.e., interpretation of action limits). Complete the training and qualification of Tank Farm industrial hygienists.
- Perform effectiveness reviews upon completion and implementation of significant industrial hygiene program milestones.

2. Ensure that the exposure assessment strategy is integrated into work control practices and documents, and maintain consistency between industrial hygiene technical basis documents and work practices. Complete the development, issuance, integration, and training for the vapor permit process (or a comparable process).

2.2 Work Planning and Control

2.2.1 Summary of 2004 Results

The 2004 OA investigation concluded that implementation of work planning and safety controls was not sufficiently rigorous. Consequently, in some cases, workers were not aware of appropriate controls or did not appropriately implement the specified controls while performing work. The investigation report identified three findings for CH2M HILL in the work planning and control areas of: (1) insufficient rigor in hazard analysis processes, (2) insufficient identification and communication of hazards and controls to workers through work packages, and (3) insufficient rigor and specificity in the processes for implementing hazard controls.

2.2.2 Site Corrective Actions

CH2M HILL conducted two assessments in response to the 2004 OA findings related to work planning and control at the Tank Farms. These assessments included an *Independent Assessment of ALARA, Radiological Work Planning, and Work Execution Process*, performed by the CH2M HILL independent assessment group, and a *Mission Control Management Assessment of Work Planning*, which examined the identification, analysis, and flowdown of hazards to workers in the work planning process. These assessments included an extent-of-condition review, determined that the weaknesses were programmatic in nature, and identified a need for improvement in the hazards analysis process. Specific corrective actions relevant to the three findings are presented below. CH2M HILL has closed the identified corrective actions for the three OA work planning and control findings, ORP has verified the corrective actions, and an effectiveness review is scheduled. (However, see Sections 2.4 and 2.5 for discussion of some concerns about the closure of corrective actions.)

2.2.3 OA Assessment

OA reviewed the CH2M HILL assessments, hazards analysis procedures, selected work packages, and related records. OA also interviewed selected Tank Farm managers and workers and observed selected work activities.

Hazards Analysis

CH2M HILL took appropriate corrective actions to address the OA finding about insufficient rigor in hazards analysis processes. CH2M HILL established a task team, consisting of representatives from the appropriate line and safety organizations, that developed an integrated strategy for hazard identification, analysis, and flowdown of controls into the work planning process and made specific recommendations for improving procedures and training. Expectations for work planners (e.g., a program to ensure that planners periodically observe work and identify improvements in work instructions or hazard controls) were also developed. Work planning qualification cards were modified to reflect clear emphasis on work scope task breakdown, and work planners have been required to requalify on modified qualification cards.

Communication of Hazards to Workers

CH2M HILL actions were also appropriate to address the OA finding about insufficient identification and communication of hazards and controls to workers through work packages. Many of the actions for addressing the hazards analysis deficiency (discussed above) were also part of the integrated approach to flow down controls to the work activity level. Additionally, the work control procedure was modified to clarify the roles of the job hazards analysis (JHA), radiation work permit, and work instructions in the work planning process. These revisions emphasize the use of work instructions to control work and identify hazard controls at the work activity level. Training plans were developed for each procedure revision and appropriately addressed all affected personnel. Requisite training was developed, scheduled, and tracked to completion, and updates to qualification cards were required.

Implementation of Controls

The corrective actions discussed above also addressed the OA finding about insufficient rigor and specificity in the processes for implementing hazard controls. In addition, CH2M HILL evaluated communication processes for abnormal events (such as vapor releases) and concluded that no changes to procedures were indicated. CH2M HILL also conducted briefings for CH2M HILL and construction subcontractor radiological workers on recent issues and performance expectations in an effort to improve implementation of controls. These briefings addressed appropriate topics, such as conduct of operations, enhancements to the Management Observation Program, definition and implementation of work scopes and controls, observation of field activities, hazard identification and mitigation, post-job analysis, procedure compliance, and conservative decision making.

OA's review of a sampling of work packages and field work observations showed that CH2M HILL has increased rigor in the work planning process and improved JHA documentation (with some exceptions, noted below). Personal protective equipment (primarily use of SCBAs) was used extensively to prevent vapor exposures. Workers demonstrated proficiency in the donning, use, and doffing of respiratory protection and were able to complete observed tasks without any vapor-related (or SCBA use-related) incidents or injuries. However, OA identified a few deficiencies in work packages and implementation of controls, as discussed in the following paragraphs.

The work package for removal of the three valve pit covers for 241 AP 08A did not reflect the current industrial hygiene technical basis, and the industrial hygiene action levels and void limits (i.e., stop-work criteria) in the work package were not consistent with the use of SCBAs or based on recent tank characterization data or exposure monitoring data. For example, Steps 2.7 and 3.11 of the work package included industrial hygiene action levels that are based on the use of air purifying respirators, not SCBAs, even though SCBAs have been in use for over a year. According to the work package, if the specified action levels of 2 ppm VOCs and 25 ppm ammonia are exceeded, then supplied air is required and the breathing zone must be monitored. However, workers are already on supplied air (i.e., SCBAs), and the technician had no plans to monitor the breathing zone of workers based on exceeding these action levels, because the workers are already in SCBAs. The action levels and void limits specified in the work package (for example, 2 ppm for VOCs) do not have a documented basis in the *Industrial Hygiene Exposure Assessment Strategy*, which the work package indicates is the source of the limits. Although a number of new technical documents and exposure assessment programs have been developed as a result of the 2004 OA investigation, many of these programs are new, are not fully developed, and have yet to be implemented and integrated into the work control processes at the Tank Farms. A work package that contains requirements that are no longer applicable and are not expected to be followed may confuse workers and create a work environment where procedure non-compliance is tolerated.

The work package for the C farm 241-C-103 application of fixative to the tank vault had some deficiencies. The JHA was revised (to address the new chemical fixative to be used) between the time the crew was dispatched to the job site and the actual start of work, necessitating an additional briefing and worker sign-in on the new JHA. The JHA referred to the material safety data sheet (MSDS) for the fixative media for potential hazards and controls associated with the use of the material; this MSDS was not part of the work package, but was available at the job site. The JHA could have provided the relevant information so that workers would not have to search for the MSDS. No workers were observed requesting or reviewing the MSDS during the job. The work package and JHA contained good linkage between work tasks, potential hazards, and required controls; however, the JHA did not include potential hazards related to the use of sharps,

(i.e., razor knives used to remove tape and large scissors used to cut pump line), and controls, such as cut-resistant gloves, were not considered. Additionally, although workers were required to don PPE (i.e., silver shield gloves) for protection against potential mercury hazards in tank wastes, the permeation times were not kept for the individual (health physics technician) with the greatest potential to come in contact with these materials, to limit the individual's potential for absorption. Finally, CH2M HILL field work supervisors and workers assume that mercury is present only if radiological contamination is present, but there is no documented technical basis for this assumption. This observation is similar to industrial hygiene findings from the 2004 OA investigation regarding the technical basis for vapors and the various tank constituents.

Some aspects of work planning and work conduct for the replacement of an inlet high efficiency particulate air filter at SX Tank Farm did not follow PPE requirements, as prescribed by the procedure for protection against mercury. Furthermore, tools and supplies required for conducting this work were not readily available at the work location. The pre-job briefing and the work package procedure for the SX Tank Farm inlet filter replacement appropriately addressed the required PPE for worker protection against potential contact with mercury-bearing wastes (primarily contaminated liquids). Because these (or similar) filters had been replaced previously, workers and planners knew that free standing liquids could be encountered, typically from less than a quart to as much as five gallons of water potentially containing mercury. During the observed evolution, more than four gallons of liquid spilled from the filter and filter housing; some was captured by the pre-staged plastic bag, and some missed the bag and spilled onto the concrete pad beneath the filter. Three of the five individuals conducting the filter replacement had donned PPE to protect against potential mercury contamination: one individual wore silver shield gloves, sleeves, and apron, and two others wore sleeves and gloves. This PPE was worn over the PPE required by the radiation work permit (coveralls, booties, latex gloves, etc.). The two additional workers initially wore only the PPE designed to protect against radiation. Once the cover to the filter housing was breached, water started to seep between the bag and outer surfaces and leak to the ground, where the two individuals who did not wear PPE for mercury helped collect the water (mopping up by hand), reattach the bag to the filter housing, and remove the filter wipe around the gasket material. They did not don silver shield gloves before this activity, though they did subsequently don gloves or sleeves. Additionally, although the potential contact time was monitored for the primary individuals (i.e., 15-minute duration for glove effectiveness), no such control was placed on these two workers. This lack of appropriate controls may or may not be attributed to the assumed correlation between mercury and radioactive materials described above.

Some aspects of the readiness to perform work for the replacement of the same air filter at SX Tank Farm also had shortcomings in implementation. For example, the equipment pre-staged for the work activity did not include the needed tools, resulting in the workers beating a pry bar on a wing nut used to tighten down a filter housing cover for approximately 15 minutes, until a field supervisor directed a worker to get the needed channel lock pliers from elsewhere in the Tank Farm. This delay caused unnecessary consumption of the work crew's SCBA air supply. Additionally, the plastic bags used to capture the liquids and dispose of the filter were not large enough to readily contain a water-laden filter, so additional liquid was lost when the attempt to place the filter punctured the bag. Furthermore, the absorbent material placed in the waste bag was not sufficient to entrain all the liquids, leading to additional cleanup after the bag puncture.

CH2M HILL recognizes that continued attention is needed in work planning and control, particularly in implementation of controls at the work activity level. A recent ORP assessment stated that "benefits of corrective action implementation were beginning to be realized" and that "a year or more of continued deliberate management attention will likely be required to assure sustained improvement and culture change." As discussed in Sections 2.4 and 2.5, a review of the implementation of the corrective actions is essential to verify their effectiveness before closure.

Summary

CH2M HILL actions to enhance hazards analysis processes and communication of hazards and controls to workers have been generally adequate. Improvements are evident in work packages, and CH2M HILL has devoted significant attention to communicating expectations to workers and enhancing implementation of controls at the work activity level. However, the observed deficiencies in implementation of controls indicate a need for additional improvement in a number of areas, including readiness to perform work, ensuring that information contained in work packages is current and complete, and communication

of abnormal events and the need to stop work when unexpected conditions are encountered. Continued and increased attention is needed to assess and verify performance effectiveness in this area.

2.2.4 Recommendations for Continued Improvement

The following recommendation addresses ongoing initiatives/enhancements to the current work planning and control initiatives:

3. Continue and enhance efforts to improve work planning and control processes, with particular emphasis on implementation of controls at the work activity level in the following areas:

    - Ensure readiness to perform work, current and complete information in work packages, and communication of processes for unusual events and the need to stop work when unexpected conditions are encountered.

    - Substantially increase observation of work activities in the planned effectiveness review, and perform regular assessments of work planning and control at the work activity level.

2.3 CH2M HILL Injury and Illness Reporting

2.3.1 Summary of 2004 Findings

The 2004 OA investigation concluded that CH2M HILL injury and illness evaluation and reporting processes were generally adequate, and there were no indications of significant or pervasive underreporting of injuries and illnesses. However, the finding in this area noted that injury and illness cases were not always properly classified and reported and also identified weaknesses in the CH2M HILL records keeping systems, which are needed to support injury and illness reporting requirements.

2.3.2 Site Corrective Actions

To address this finding, CH2M HILL took a number of corrective actions, including revising their record keeping procedure to include more specific expectations and establishing a process for regular audits of the case files. CH2M HILL also hired a second records specialist and provided training to the records specialists on OSHA injury and illness record keeping requirements. In coordination with the medical contractor, CH2M HILL established regular interfaces between records specialists (case managers) and medical program personnel. CH2M HILL also audited case files generated during the past two years to determine whether cases had been properly classified and whether OSHA record keeping requirements were met; deficiencies identified during the audit were corrected. In addition to CH2M HILL actions, the Headquarters Office of Environment, Safety and Health changed applicable requirements so that injury and illness data is now reported electronically and provided training to DOE and contractor injury and illness record keeping specialists.

2.3.3 OA Assessment

The OA team reviewed the revised procedures and training records, and interviewed one records specialist (the second was on leave) and various CH2M HILL managers. OA also reviewed a sample of case files (28 files from the past two years) to determine effectiveness of CH2M HILL actions.

OA found that the CH2M HILL corrective actions have been appropriate and effectively implemented. The revised procedures are adequate, and training records verify that training was performed. The Headquarters actions to require electronic reporting have resulted in more efficient reporting processes and more timely records.

The 28 case files reviewed by OA indicated that CH2M HILL personnel have a good understanding of OSHA record keeping. All 28 files contained the records required by CH2M HILL procedure: a problem evaluation request (PER) if generated, record of visit, event report, Computerized Accident/Incident Reporting System (CAIRS) report if reportable, and a case manager's report. All were correctly classified for reporting pursuant to OSHA 29 CFR 1904 criteria. CAIRS reports were issued for each recordable injury and illness.

Further refinements are needed in the interface between CH2M HILL and AMH, the medical program contractor. In four case files, the CH2M HILL case manager's report indicated that the employee's personal physician had prescribed medicine, but AMH's updated record of visit did not indicate that prescription medication was provided. In these four cases, the case managers had been able to find the information about

prescriptions by informal means and include it in the file; however, the information should have been systematically provided by AMH through an updated record of visit because accurate information about prescription medicine is needed to make correct decisions about reportability. Such information could have been omitted from the record of visit for various reasons—for example, employees not following procedures for reporting to AMH before returning to work, or AMH not properly reporting information about medicine prescribed by a non-AMH physician. As discussed in Section 3.1, AMH managers indicated that this potential interface concern will be addressed with CH2M HILL.

Summary

CH2M HILL has adequately addressed the weaknesses in injury and illness reporting noted in 2004. To further refine the process, CH2M HILL should continue to follow up with AMH to ensure that complete information about medicine prescribed by employees' personal physicians is reliably included in the case files to support reportability decisions.

2.4 CH2M HILL Corrective Action Management

2.4.1 Summary of 2004 Findings

The 2004 OA investigation concluded that CH2M HILL had made some improvements but that there were weaknesses in the CH2M HILL corrective action management process and in other aspects of feedback and improvement systems (assessments, issues management, lessons learned, and employee concerns programs). The finding in this area (Finding #C-13) indicated that the corrective action program had not always been effective in defining and investigating issues related to Tank Farm vapor releases and exposure incidents or in establishing actions that effectively prevented recurrence of personnel vapor exposures.

2.4.2 Site Corrective Actions

CH2M HILL actions specifically to address Finding #C-13 included revising procedures to require more thorough review of future vapor exposures and previously-issued vapor exposure PERs to identify lessons learned. CH2M HILL has also used its PER process to manage corrective actions for the other 12 findings from the 2004 OA investigation that were directed toward CH2M HILL. ORP and CH2M HILL developed a corrective action plan that defined specific actions to be completed for each of these findings. CH2M HILL reported that it had completed all of the requisite actions and had closed all 13 of the findings within its PER tracking system; the last finding was closed in March 2005. In its fiscal year (FY) 2005 annual assessment of the CH2M HILL industrial hygiene program, ORP verified that CH2M HILL had completed the corrective actions committed to in the corrective action plan, based on reviewing a sample of these corrective actions. The OA team found that ORP had updated CATS to reflect this verification. ORP plans to conduct an effectiveness review by November 2005.

2.4.3 OA Assessment

OA reviewed the specific actions identified in the corrective action plan for the 2004 finding that dealt with corrective action management (Finding #C-13), as well as the application of the CH2M HILL corrective action management process to the other 12 CH2M HILL findings from the 2004 investigation. OA also examined the broader set of actions that CH2M HILL is undertaking to address the vapor issue, including efforts by CH2M HILL to improve communications and trust between management and workers, such as an initiative by CH2M HILL to create a safe work environment (SWE). OA reviewed the corrective action plan and closure packages, toured facilities, watched selected work activities, and examined selected documents (e.g., operating procedures, air monitoring records, and training records) to assess the completed actions.

CH2M HILL has devoted significant management attention to the application of the PER process to the 13 findings. Each finding was reviewed to determine the extent of condition and causal factors, and all corrective actions were reviewed by a Corrective Action Review Board before the PER was closed. CH2M HILL's review of the problems and corrective actions included steps that were more rigorous than the minimum requirements of the PER process for most of these findings.

The PER process is generally adequate for managing corrective actions. In some cases, the process was effective in identifying and tracking the execution of an appropriate set of corrective actions

that corrected the identified problem and eliminated underlying causes. For example, the actions in response to the injury and illness finding and the vacuum breaker finding were effective. For the most part, CH2M HILL effectively implemented the closure process and verified that actions were complete.

In some cases, however, the actions identified in the PER process were limited to identifying a path forward or establishing an action plan, and did not include plan implementation. Thus, the actions were completed and the PERs were closed before the planned improvements were made and the underlying causes of the problems were corrected. For example, OA Findings #C-1 through #C-5 identified the need for better vapor characterization, exposure assessment, and monitoring. Progress has been made in each of these areas, but much work remains to be done to reduce the dependence on supplied air respirators.

Some of the PERs that were written to address OA investigation findings were closed because the corrective action specified in the PER had been completed; however, the underlying causes of the finding remain to be corrected. CH2M HILL has identified the actions needed to address these causes, but the actions are not identified in a formal corrective action tracking system. For example, PERs for the following tasks, which were part of the response to the 2004 OA findings, were closed even though corrective actions were continuing and are not formally tracked through PERs:

- A PER for the task, *"Align the IH [industrial hygiene] vapor monitoring program to the documented technical basis,"* was closed, even though the monitoring procedures were not up to date with vapor characterization studies and the procedures and training for use of some industrial hygiene instrumentation were incomplete.

- A PER for the task, *"Establish an exposure assessment strategy that incorporates the IH [industrial hygiene] vapor monitoring technical basis,"* was closed based on development of a documented exposure assessment strategy, but the strategy was not fully implemented in the field.

- A PER for the task, *"Establish a formal IH [industrial hygiene] Instrument Program to ensure a systematic and methodical approach to instrument selection, use, calibration, and maintenance,"* was closed, even though development of an instrument control process was incomplete, some instrumentation has yet to be selected (e.g., field instruments for mercury detection) and training of industrial hygiene technicians is incomplete.

The corrective actions have continued after closure of these PERs, but these ongoing actions are not always tracked in PERs (or another corrective action management process). Application of the PER process to planned tank vapor actions is important to ensure timely and effective completion. The current CH2M HILL PER process does not contain definitive closure criteria and thus does not preclude closure based solely on development of a path forward.

CH2M HILL recently issued a management plan, *Program Plan for Resolution of Tank Farm Vapor Issues*, that provides a comprehensive strategic plan for addressing vapor issues. This plan lays out a logical approach for controlling Tank Farm vapors that is consistent with the DOE safety management policy. If effectively implemented, the plan would address concerns previously identified by OA and could reduce the dependence on supplied air respirators. However, the plan lacks sufficient detail to ensure timely and effective implementation of the many ongoing improvement initiatives. Because specific tasks are not well defined, the responsibilities for accomplishing these tasks are not clearly defined; milestones and completion dates are not established; and several planned activities are not included in a referenced Vapor Solutions Matrix (which is described as a tool for identifying, tracking, and ensuring the effectiveness of corrective actions).

Without a project management approach, there is a potential to miss actions or encounter delays because requisite interfaces are not managed. For example, research projects are under way to develop new monitoring methods for some chemicals; implementing these methods will require a number of further actions (e.g., equipment procurement, technician training, and procedure development). Also, a number of organizations (line, industrial hygiene, engineering, and various laboratories and subcontractors) have responsibilities for implementing ongoing action items, but there is no clear process for ensuring that all of these organizations coordinate their effort, apply the necessary resources, and meet established milestones. In addition, if priorities and funding change, these items may not be completed, because they are not in a formal tracking system. A project management approach will

facilitate risk-based application of resources and will provide a formal process for balancing priorities.

At the end of the onsite portion of this OA investigation, CH2M HILL indicated that they plan to implement a project management approach. CH2M HILL has identified a senior manager to manage the project, has identified key tasks, and is working on a project plan and milestones.

ORP and CH2M HILL plan to perform an effectiveness review by November 2005; this timing meets the requirement to conduct the review within six months of closing the PERs, consistent with DOE Order 414.1B, *Quality Assurance*. However, many important actions will not be completed by then, notably characterization of tank vapor. While a review in November 2005 could verify some actions, it would not provide for full verification that the corrective actions have adequately addressed the findings.

OA confirmed that the corrective actions specified in the PER and associated Electronic Suspense Tracking and Routing System (ESTAR) items for the corrective action management finding (Finding #C-13) were satisfactorily completed. However, the analysis of this finding did not identify the past failure to adequately address workers' concerns as a causal factor, even though workers had been raising concerns about vapor exposures for several years before appropriate actions were initiated. A Lessons Learned Bulletin, issued in 2004 as part of the corrective action for this finding, appropriately recommends better communication between management and workers, with a focus on how management can better provide information to workers. However, the Bulletin does not address how management can be more responsive to worker concerns. Discussions with workers during this follow-up review, and interviews conducted during the recent ORP review of the CH2M HILL industrial hygiene program, indicated a continuing belief by some workers that CH2M HILL management has not adequately addressed their concerns.

Recently, CH2M HILL has taken additional steps to communicate with workers and to respond to worker concerns and feedback, with the goal of improving worker confidence in the monitoring and control of vapor exposures. CH2M HILL recently initiated the SWE program, which is an approach commonly used in the commercial nuclear industry to encourage workers to raise concerns to management. The program includes mechanisms for workers to raise concerns without fear of reprisal and ensuring that managers are responsive to these concerns. A baseline survey conducted last year indicates a need for improvement in this area, and management is placing priority on implementation of this approach. Expectations have been conveyed through policy statements, procedures, and all-hands meetings and have been incorporated into performance standards and disciplinary procedures. Managers have been trained, and workers have been engaged. Although the SWE is in the early stages, the SWE approach is promising and has the potential to enhance communications, worker confidence, and activity-level feedback about potential vapor exposures.

Summary

CH2M HILL has devoted significant management attention and resources to resolution of the findings identified in the 2004 OA investigation. Most of the actions specified in the corrective action plan for the 2004 OA investigation have been completed and have been verified complete by CH2M HILL and ORP. However, much work remains to address the underlying issues that resulted in the original findings, and these actions should be rigorously tracked in a formal corrective action management system. CH2M HILL's new program plan fulfills the need for a comprehensive strategic plan for addressing vapor issues but requires additional detail and controls to ensure timely and effective implementation of the many ongoing efforts.

2.4.4 Recommendations for Continued Improvement

The following recommendation addresses ongoing CH2M HILL initiatives/enhancements to the current corrective action management control initiatives:

4. CH2M HILL should strengthen the management of corrective actions associated with worker vapor exposures:

    - Revise the *Program Plan for Resolution of Tank Farm Vapor Issues* to incorporate a project management approach for assigning tasks, establishing milestones, and setting due dates for accomplishing program objectives. The program plan should be supported with clear responsibilities and lines of authority and should identify the estimated funding and resources needed to complete the identified tasks.

- Reopen PERs, or establish new PERs, for OA findings with continuing corrective action and improvement initiatives. Use the PER process to track and manage these items until an alternative system, such as the project management system discussed above, is available for management of these items.

- Include closure criteria in the PER procedure to ensure that planned corrective actions fully address stated problems.

- Coordinate with ORP to schedule effectiveness reviews after corrective actions are fully implemented and sufficiently mature to allow for an adequate review and verification that the underlying issues for findings have been addressed. Multi-phased reviews should be considered as a mechanism for timely review of actions as they are completed.

2.5 ORP Line Management Oversight

2.5.1 Summary of 2004 Findings

The 2004 investigation concluded that ORP had performed a number of appropriate reactive reviews and interim actions to obtain industrial hygiene support from other DOE organizations. However, the 2004 OA finding on ORP oversight (Finding #C-14) indicated that ORP had not adequately addressed weaknesses in its oversight of the CH2M HILL industrial hygiene program and had not ensured timely corrective actions for identified issues. In addition, the investigation concluded that ORP did not have sufficient industrial hygiene expertise to adequately perform its line management oversight responsibilities and had not devoted sufficient attention and resources to performing effective line management oversight of the industrial hygiene program, issues, and ongoing corrective actions at the Tank Farm.

2.5.2 Site Corrective Action

During the past year, ORP has provided industrial hygiene training to the technical staff as part of a 40-hour OSHA course and augmented its staff with contracted certified industrial hygienists. Training was also provided on injury and illness record keeping and reporting. Two additional Facility Representatives were assigned to oversee Tank Farm activities. Programmatic assessments by technical specialists have focused on Tank Farm environment, safety, and health (ES&H). ORP also developed and implemented a corrective action plan to address the OA investigation findings as required by DOE Order 470.2B, *Independent Oversight and Performance Assurance Program*, and DOE Order 414.1B, *Quality Assurance*.

2.5.3 OA Assessment

To assess enhancements in ORP oversight, OA reviewed training materials, staffing, various procedures, selected assessment reports (industrial hygiene and injury and illness assessments), and records (e.g., quarterly reports, training records). OA also interviewed ORP managers and selected staff.

The actions taken by ORP are appropriate and strengthen ORP oversight of vapor exposure issues. The industrial hygiene training and contracted industrial hygienists, and the return of a Federal industrial hygienist to the ORP staff, have provided ORP with adequate capabilities to oversee industrial hygiene issues.

The Facility Representative activities have been strengthened by the additional staff assignments. ORP now has ten Facility Representatives assigned to the Tank Farms, eight fully qualified and two trainees. The Tank Farm Project Group Facility Representatives provide daily oversight of Tank Farm activities by observing and assessing such activities as field work, job planning, post-job review meetings, training, and oral board exams. Facility Representatives are expected to spend 60 percent of their time in the field and 40 percent observing Tank Farm activities, and to document their activities in weekly and quarterly reports.

ORP management discusses the results of operational awareness activities with CH2M HILL management on a monthly basis and formally reports results to CH2M HILL management in quarterly reports. Deficiencies requiring corrective action are documented by CH2M HILL as PERs, which are referenced in weekly and quarterly reports. A review of the four most recent quarterly reports, supporting weekly reports, and related assessments indicates that Facility Representatives and technical staff are effectively performing their line oversight responsibilities. The reports include assessment of Tank Farm work controls and management of vapor exposure issues. ORP's conclusions were based on observations

of work activities, when appropriate, and substantive problems were entered into the PER process for management of corrective actions.

However, corrective actions have not always been fully effective, as evidenced by the fact that some weaknesses previously identified by ORP were also observed during this OA follow-up review. For example, ORP identified PERs that were closed before corrective actions were complete and identified the need for vapor project efforts "to be managed to predetermined objectives or coordinated toward proper respiratory protection" (see Section 2.4).

Technical specialists from the ORP Office of Environmental Safety and Quality (ES&Q) also assess Tank Farm activities. Results of these assessments are communicated to CH2M HILL in formal assessment reports, and corrective actions are tracked in CATS. ORP discusses assessment results and the status of corrective actions (including corrective actions associated with OA findings) with CH2M HILL management during weekly meetings. ES&Q has scheduled and performed assessments of CH2M HILL Tank Farm activities in a variety of programmatic areas. Ten assessments have been completed, and four others are scheduled for FY 2005.

OA's review of the ORP assessment of injury and illness record keeping determined that the scope and criteria were appropriate and that the conclusions were well supported. The results of the assessment indicate that corrective actions taken by CH2M HILL in response to its earlier self-assessment were effective. The results of the ORP assessment were consistent with the results of this OA follow-up review (see Section 2.3).

ORP recently performed a comprehensive review of the CH2M HILL industrial hygiene program, *Review of the CH2M Hill Hanford Group, Inc. (CH2M HILL) Industrial Hygiene (IH) Program, April, 2005*. The report for this review concludes that the industrial hygiene program complies with regulatory requirements and is effectively implemented, but the basis for these conclusions is not clear in some cases. For example, the report states that the contractor can achieve full implementation of its industrial hygiene program goals by April 2006. This statement was based upon the fact that issues to be resolved were identified and findings for resolution had been provided; however, the contractor does not have a comprehensive project plan in place to achieve the defined goals by that date. Also, the report does not provide clear conclusions about some important aspects of the program, such as the quality of the new industrial hygiene technical basis document, the ability to monitor chemicals of potential concern, or the effectiveness of CH2M HILL's management of vapor issues.

ORP has had a contractor perform three reviews of integrated safety management for Tank Farm activities since the 2004 OA investigation of vapor exposures. The OA team reviewed the most recent of these reports, *Post-Implementation Portion of the Integrated Safety Management (ISM) Improvement Validation at the Hanford Tank Farm, Final Report, March, 2005*, and determined that the review was well planned, team members were well qualified, conclusions were well supported, and the review appropriately included observation of work activities. The contractor's report identified needs for improvement in determining the readiness to proceed with work so that proper personnel equipment resources are available and in upgrading the issues management program with respect to closure effectiveness, timeliness, and feedback. However, because the report identified no findings, no formal corrective action was required. Corrective action appears to have been warranted because similar problems were observed by OA during this follow-up review.

ORP has held the Tank Farm contractor financially accountable for ES&H performance. For example, ORP withheld fee from the contractor last August when ES&H performance expectations were not met. In addition, ORP established financial incentives last year to encourage the implementation of engineered controls (stack extensions) and headspace vapor sampling. CH2M HILL met the performance criteria (e.g., extending the stacks and collecting samples) and was awarded the incentive fee.

ORP has been actively monitoring CH2M HILL efforts to address the 13 OA findings that were applicable to CH2M HILL. ORP reviewed the CH2M HILL corrective action plan submitted to DOE Headquarters, and also has monitored CH2M HILL's implementation of the corrective action plan through oversight of work activities and weekly status meetings with CH2M HILL management. To meet the requirement for an effectiveness review for the 2004 OA investigation findings, ORP has directed that CH2M HILL perform such a review, and ORP intends to participate in and assess the CH2M HILL efforts. ORP has verified completion of CH2M HILL corrective actions based on an assessment of a sample of these actions and has updated CATS to reflect this verification.

Although ORP personnel indicated that they intend to close the 13 CH2M HILL findings in CATS, it is premature to do so for some of the findings (#C-1 through #C-5) for the reasons discussed in Section 2.1 and 2.4. In addition, OA's review of one work activity indicates that additional assessment of work planning and control should be considered before the CH2M HILL actions in the work planning area are closed. Further, the effectiveness review is scheduled for a time period in which many of the most important actions in the areas of tank characterization and industrial hygiene will not be complete, as discussed in Sections 2.1 and 2.4, and thus their effectiveness cannot be adequately verified.

Summary

ORP has strengthened its oversight of the Tank Farm contractor since the 2004 OA investigation. Oversight by Facility Representatives has been strengthened by increased staffing, and the technical staff has been augmented by contracted industrial hygienists. Increased priority has been placed on assessment of ES&H programs, and assessments have been conducted in most areas where the OA investigation identified problems. Continuing attention is needed to ensure the quality of such products as the industrial hygiene technical basis document and tank vapor characterization results and to ensure that the Tank Farm contractor establishes an effective process for corrective action management. ORP should ensure that findings from the 2004 OA investigation are not closed until their effectiveness has been adequately evaluated and verified.

2.5.4 Recommendations for Continued Improvement

The following recommendation addresses ongoing ORP initiatives/enhancements to the current corrective action management control initiatives:

5. Strengthen the ORP management of CH2M HILL corrective actions associated with worker vapor exposures:

   - Review and approve the CH2M HILL program plan, after it is revised to incorporate a project management approach, to ensure that implementation of this plan will fully resolve OA findings and adequately manage other improvement initiatives.

   - Provide line management oversight to ensure that CH2M HILL uses its PER process, or an alternative management system (such as the program plan discussed above), to track and manage corrective actions and improvement initiatives associated with each OA finding.

   - Continue to assess the technical adequacy of corrective actions taken by CH2M HILL, including tank vapor characterization studies and the industrial hygiene program technical basis document.

3.0 Assessment of Corrective Actions for RL and AMH

For the medical program findings, OA focused on the corrective actions taken by RL and AMH to enhance the medical program contractor's administrative processes and the actions taken by RL to enhance the interfaces between the medical program and the site operating contractors (including CH2M HILL). OA also examined RL's line management oversight of the medical program, with emphasis on RL's oversight of the transition of the medical program from the previous contractor to AMH; this transition occurred at about the same time as the 2004 OA investigation report was released by the Secretary of Energy and provided to EM and RL.

3.1 Contractor Administrative Processes

3.1.1 Summary of 2004 Findings

The 2004 OA investigation determined that the previous contractor's clinical protocols were consistent with standard occupational medical practices. However, weaknesses were identified in the previous contractor's administrative protocols in the areas of internal communications, use of the results of patient surveys to drive improvements, and completeness of records of visits provided to other site contractors (which contributed to a few instances of incorrect recording of injuries).

3.1.2 Site Corrective Actions

RL took actions with the previous contractor to address the identified weaknesses in the records of visits, including revising the protocol to provide more specificity on work restrictions and prescriptions of pharmaceuticals. The revised protocol was carried through to the new medical contractor. RL also took actions to ensure that the new contractor was aware of and had plans to address the weaknesses in internal communications and use of patient surveys. These RL actions included a review of AMH procedures and survey practices. In addition, RL had previously taken action to clarify expectations in the scope of work and contractual provisions for the contract award. AMH has submitted revised procedures and survey instruments in accordance with the corrective action plan provisions. AMH has also established a "risk communicator" position, which is filled by a licensed physician, to enhance communications.

3.1.3 OA Assessment

OA reviewed selected AMH procedures and processes relevant to the identified deficiencies, as well as RL corrective action plans and assessments. OA also interviewed RL and AMH personnel with medical program responsibilities.

The RL corrective action plan for the finding in this area identifies appropriate actions and has been adequately implemented. RL has been effective in ensuring that AMH was aware of and effectively addressed weaknesses in the previous contractor's administrative protocols. Training on the AMH corporation policies is in process.

OA's review indicated that the AMH procedures are appropriately rigorous and detailed and address the identified concerns about records of visits, internal communications, and use of survey results. During the transition period, AMH adequately addressed a number of challenges associated with establishing new office/clinical space and transferring custody of DOE equipment and records. AMH has also converted previous contractor files to electronic files/databases that are searchable and is now assessing how to best use the data to perform trend analysis. Further, AMH is planning to use patient and customer (contractor) survey information to make improvements in specific contractor interfaces and has subcontracted with an external organization to perform regular, independent patient/customer surveys.

As discussed in Section 2.3, AMH needs to continue to clarify its process for records of visits

to ensure that prescription medications, when prescribed by an employee's personal physician, are included on record-of-visit forms, which are provided to the contractor case manager to enable proper decisions about OSHA recordability. AMH managers indicated that they would work with CH2M HILL to make the needed changes to the record-of-visit process and forms.

OA's review indicates that establishing the risk communicator position has been effective in addressing the significant challenges with communicating medical risk information to the workforce. The AMH risk communicator and other AMH personnel staff are now actively participating in the CH2M HILL health effects committee, vapor solutions team, mercury surveillance forums, and several other informational meetings initiated by CH2M HILL to enhance communication with the Tank Farm employees. Independent interviews with several Tank Farm workers indicated that AMH has been helpful in establishing a positive communication process at various forums and informational meetings.

However, much work remains in communicating information about health risks to the workforce and addressing concerns on the part of some Hanford Site workers. In addition, although some progress has been made, AMH is only in the early stages of developing a strategy for collecting and analyzing the various sources of historical health-effects data and using clinical information to provide trend analysis of medical surveillance data.

Summary

RL and AMH actions have adequately addressed the finding in the area of medical contractor processes (e.g., internal communications, use of surveys, expectations for record-of-visit forms). However, continued efforts are needed in communications and in using health-effects data.

3.1.4 Recommendations for Continued Improvement

The following recommendation addresses ongoing initiatives/enhancements to the current medical provider administrative process program initiatives:

6. AMH should accelerate their efforts in the areas of risk communication (among site management and the site worker population), collection and analysis of historical Tank Farm health-effects data, and trending and analysis of medical surveillance data, and should ensure that record-of-visit processes and forms are revised to reflect information about medicines prescribed by non-AMH physicians.

3.2 Interfaces Between the Medical Program and Site Operating Contractors

3.2.1 Summary of 2004 Findings

The 2004 OA investigation determined that RL had not adequately coordinated with other site organizations to ensure that adequate interface agreements were in place between the occupational medical program contractor and site operating contractors. The insufficient interfaces contributed to instances where health-related information was not adequately exchanged to ensure that medical program requirements were met and that site safety coordinators could accurately determine whether an event is OSHA-reportable.

3.2.2 Site Corrective Actions

RL took actions to complete formal interface agreements and enhance communications among the various organizations, such as regular meetings between RL and AMH to exchange information and discuss issues. RL and AMH have also worked with the various site contractors to promote consistency in handling, storage, and retention of medical records.

3.2.3 OA Assessment and Summary

OA reviewed interface agreements and records of meetings that were relevant to the identified deficiencies. OA also interviewed RL and AMH personnel with responsibilities for interfacing with other Hanford Site organizations.

The RL corrective action plan for the finding in this area identifies appropriate actions and has been adequately implemented. The interface agreements are in place and provide appropriate information about expectations and roles and responsibilities for the various organizations. OA's review indicates that communications have improved and that AMH is working to further enhance site contractor communication and interfaces. Overall, RL has adequately addressed the finding in this area.

3.3 RL Line Management Oversight of the Corrective Action Process

3.3.1 OA Assessment

RL has appropriately closed the two medical program-related findings from the 2004 OA investigation. RL ensured that the corrective action plans for these findings were adequate and that milestones were met (a few justifiable delays were encountered and were accepted by management). RL also performed appropriate assessments to verify the completion of the corrective actions for the medical findings. RL plans to perform effectiveness reviews of AMH's new and ongoing programs and initiatives after sufficient time has passed to evaluate performance data.

RL has also been generally effective in overseeing the transition from the previous contractor to AMH. RL has been actively involved in the AMH efforts during the transition period and has provided appropriate assistance in addressing transition issues.

RL has established a strategic approach and schedule for performing regular assessments of medical program contractor performance. Specifically, the U.S. Public Health Service has been contracted to help perform quarterly reviews of various aspects of medical contractor performance, including reviews that provide information for the annual contractor performance evaluation. In addition, RL has required AMH to coordinate with an accreditation agency (AMH selected the Accreditation Association for Ambulatory Health Care) to perform accreditation reviews of the medical program starting in December 2005.

Although RL actions to oversee the corrective actions and medical program issues have generally been appropriate, OA identified two areas that warrant additional management consideration. First, RL has limited expertise in the occupational medicine and industrial hygiene disciplines. Some of the recent successes and enhancements in managing the medical contract can be attributed to the current contract administrator, who was appointed in June 2004 (about the time the OA investigation report was issued) and has some medical background. However, this individual is retiring soon and his designated replacement has minimal expertise in occupational medicine. RL needs to ensure that its contract administrator develops a sufficient understanding of requirements and responsibilities of DOE occupational medical service providers, the medical interface with industrial hygiene programs, and the complex interfaces among the various Hanford Site organizations; such understanding is essential to meet medical program requirements and the specific provisions of such DOE programs as the chronic beryllium disease prevention program, protective force medical and fitness requirements, and the human reliability program. In addition, medical expertise is needed to effectively assess the performance of the medical program contractor.

Second, the RL Performance Evaluation Plan for the AMH medical program contract has not been finalized, even though the first annual evaluation (covering the first contract year) is scheduled for September 2005. The criteria in the draft plan are limited in scope and do not adequately address important aspects of a quality occupational medical program, such as case management, medical record charting, and use of relevant occupational health data (e.g., industrial hygiene, MSDSs, and health physics). Further, these criteria do not provide sufficient specificity in the expectations for strategic planning or work site visits. A review of established occupational medicine program criteria (e.g., criteria promulgated by the Accreditation Association for Ambulatory Health Care) could provide insights on the general structure and form of criteria for evaluating the quality of an occupational medicine program.

Summary

RL actions to close the two OA medical program-related findings from the 2004 report and oversee the contract transition have been effective, and their oversight of the medical program has improved. Additional attention is warranted in the areas of RL's medical expertise and performance evaluation criteria for the medical contract.

3.3.2 Recommendations for Continued Improvement

The following recommendation addresses ongoing initiatives/enhancements to current RL line management oversight of medical program initiatives:

7. Continue to strengthen line management oversight initiatives in the following areas:

- Continue to use external expertise, such as the U.S. Public Health Service, to support the RL contract administrator and to perform assessments of the occupational medical program at the Hanford Site.

- Continue to improve the Performance Evaluation Plan criteria for evaluating occupational medical program contractor performance, including substantive criteria for occupational medicine, strategic planning, and work site visits, and finalize the Plan in a timely manner.

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APPENDIX A
SUPPLEMENTAL INFORMATION

A.1 Dates of Review

Onsite Data Collection	May 31 - June 9, 2005
Report Validation and Closeout	June 22 - 24, 2005

A.2 Review Team Composition

A.2.1 Management

Glenn S. Podonsky, Director, Office of Security and Safety Performance Assurance
Michael A. Kilpatrick, Director, Office of Independent Oversight and Performance Assurance
Patricia Worthington, Director, Office of Environment, Safety and Health Evaluations
Thomas Staker, Deputy Director, Office of Environment, Safety and Health Evaluations

A.2.2 Quality Review Board

Michael Kilpatrick	Patricia Worthington
Dean Hickman	Robert Nelson

A.2.3 Review Team

Patricia Worthington (Team Leader)

Marvin Mielke	Al Gibson
Joe Lischinsky	Jim Lockridge

A.2.4 Administrative Support

Tom Davis

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