



Fluor Federal Services Richland, Washington

**Report from the Department of Energy
Voluntary Protection Program
Onsite Review
June 16-27, 2008**



U.S. Department of Energy
Office of Health, Safety and Security
Office of Health and Safety
Office of Worker Safety and Health Assistance
Washington, DC 20585

Foreword

The Department of Energy (DOE) recognizes that true excellence can be encouraged and guided but not standardized. For this reason, on January 26, 1994, the Department initiated the DOE Voluntary Protection Program (VPP) to encourage and recognize excellence in occupational safety and health protection. DOE-VPP closely parallels the Occupational Safety and Health Administration (OSHA) VPP, which was established by OSHA in 1982 and has demonstrated that cooperative action among Government, industry, and labor can achieve excellence in worker safety and health. The Office of Health, Safety and Security assumed responsibility for DOE-VPP in October 2006 and has been working since that time to reinvigorate the program and increase emphasis on performance-based inspections as the basis for certification and recertification.

DOE-VPP outlines areas where DOE contractors and subcontractors can comply with DOE orders and OSHA standards while also “stretching for excellence.” DOE-VPP emphasizes systematic and creative approaches involving cooperative efforts of everyone in the contractor or subcontractor workforce at DOE sites, including contractor managers and workers.

Requirements for DOE-VPP participation are based on comprehensive management systems with employees actively involved in assessing, preventing, and controlling the potential health and safety hazards at their sites. DOE-VPP is designed to apply to all contractors in the DOE complex and encompasses production facilities, research and development operations, construction, and various subcontractors and support organizations.

DOE contractors are not required to apply for participation in DOE-VPP. In keeping with OSHA’s VPP philosophy, participation is strictly voluntary. Additionally, participants may withdraw from the program at any time.

DOE-VPP consists of three programs, which are based on, and similar to, those in OSHA’s VPP. These programs are Star, Merit, and Demonstration. The Star program is the core of DOE-VPP, and its achievement indicates truly outstanding protectors of employee safety and health. The Merit program is a steppingstone for contractors and subcontractors that have good safety and health programs, but need time and DOE guidance to achieve Star status. The Demonstration program is expected to be used rarely; it exists to allow DOE to recognize achievements in unusual situations about which DOE needs to learn more before determining approval requirements for the Star program.

By approving an applicant for participation in DOE-VPP, DOE recognizes that the applicant meets, at a minimum, the basic elements of ongoing, systematic protection of employees at the site. The symbols of this recognition are DOE-provided certificates of approval and the right to fly VPP flags (e.g., VPP Star flag for sites with Star status). The participant may also choose to use DOE-VPP logo on letterhead or on award items for employee incentive programs. Further, each approved site will have a designated DOE staff person to handle information and assistance requests from DOE contractors, and DOE will work cooperatively with the contractors to resolve health and safety problems.

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ABBREVIATIONS AND ACRONYMS

AJHA	Automated Job Hazard Analysis
AMH	Advance Med Hanford
C.F.R.	Code of Federal Regulations
CH2M-Hill	CH2M-Hill Hanford Group
CH2-PRC	CH2 Plateau Remediation Company
DART	Days Away, Restricted, or Transferred
DOE	Department of Energy
EAP	Employee Assistance Program
EJTA	Employee Job Task Analyses
ES&H	Environment, Safety and Health
ESH&Q	Environment, Safety, Health and Quality
FH	Fluor Hanford
FGG	Fluor Government Group
FFS	Fluor Federal Services
HAMMER	Hazardous Materials Management and Emergency Response
HPI	Human Performance Improvement
HSS	Office of Health, Safety and Security
IH	Industrial Hygiene
JSA	Job Safety Analysis
MSC	Maintenance and Support Contract
MSDS	Material Safety Data Sheet
NAICS	North American Industry Classification System
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PHMC	Project Hanford Management Contract
PPE	Personal Protective Equipment
ROC	Regional Office Complex
RPP	River Protection Project
Team	HSS DOE-VPP Team
TRC	Total Recordable Case
VPP	Voluntary Protection Program
VPPPA	Voluntary Protection Program Participants' Association
WRPS	Washington River Protection Solutions, LLC

EXECUTIVE SUMMARY

The Department of Energy (DOE) Voluntary Protection Program (VPP) onsite review of Fluor Federal Services (FFS) in Richland, Washington, was conducted June 16-27, 2008. FFS conducts design/architecture/engineering, procurement, self-perform construction, and construction management (subcontractor) activities at the 560-square-mile Hanford Site. FFS performs work for both Fluor Hanford (FH), the prime contractor on the Project Hanford Management Contract, and CH2M-Hill Hanford Group, the prime contractor for the River Protection Project. Personnel are located in workshops and trailers at the Hanford Site and in the Regional Office Complex in Richland. FFS employs approximately 750 people (621 noncraft, 128 craft). Of those, 428 were classified as “long-term affiliates” to FH. As such, they received daily direction from FH, not FFS. Craft personnel consisted of building trades people (electricians, pipefitters, carpenters, ironworkers, sheet-metal workers, heavy equipment operators, painters, and laborers) and are represented by the Building Trades Council. Noncraft employees include a full range of engineering and administrative support staff.

FFS entered DOE-VPP at the Star level in June 2001 and was recertified in September 2005. This marks FFS' second recertification, and this report documents the result of the onsite assessment.

Based upon contact with approximately 100 personnel, observation of construction activities, and inspection of work areas, the Office of Health, Safety and Security DOE-VPP Team (Team) determined that FFS has maintained excellent safety performance. Consequently, the Team is recommending that FFS continue as a participant in DOE-VPP at the Star level.

Consistent with the standard for Star status that managers and workers are dedicated to and effectively pursuing excellence in safety performance, the Team identified a number of opportunities for improvement. Listed in Table 1, these opportunities for improvement require no formal corrective action plan, but should be considered and addressed by FFS in conjunction with its ongoing efforts for continuous improvement.

TABLE 1
OPPORTUNITIES FOR IMPROVEMENT

Opportunity for Improvement	Page
FFS should provide reinforcement to encourage the ROC Steering Committee to become more active and to encourage constituents to participate (e.g., become active committee members, participate in VPPPA conferences) and develop a safety improvement plan with measureable/attainable objectives to meet the FFS safety goal of zero injuries.	5
FFS should find ways to encourage workers to be more critical of their own workspace and identify and correct hazards that have become routinely accepted.	7
FFS should ensure hazards analyses are clearly documented in JSAs, AJHAs, and baseline exposure assessments, including assumptions inherent in the analysis and justification of the adequacy of the selected controls, particularly for chemical hazards.	10
FFS should consider the use of 15-minute flush eyewash stations in shop areas where other chemicals (noncorrosive) may be used, particularly when the MSDS recommends a 15-minute flush.	11
FFS should consider updating the employee concerns program and ensure that employees are aware of its function and capabilities.	11
FFS should provide clear guidance and expectations to define the term "Rest," such as removal of respirators and availability of air-conditioned space.	13
FFS should find new means to identify and prevent worker complacency with existing requirements.	14
FFS should actively promote availability of EAPs during periods of contract transition, expected force reductions, and other stressful times for the workforce.	15
FFS should evaluate the need to increase IH staffing to support activities, such as baseline assessments, employee monitoring, material substitutions, and hearing conservation surveys.	16
FFS should ensure that monthly inspections of emergency exit lights, exit signs, and annual 90-minute, drain-down tests of those devices are performed.	16

I. INTRODUCTION

The Department of Energy (DOE) Voluntary Protection Program (VPP) onsite review of Fluor Federal Services (FFS) in Richland, Washington, was conducted June 16-27, 2008.

FFS, (as an element of the Fluor Government Group (FGG)), conducts design/architecture/engineering, procurement, self-perform construction, and construction management (subcontractor) activities at the 560-square-mile Hanford Site. FFS performs work for both Fluor Hanford (FH), the prime contractor on the Project Hanford Management Contract (PHMC), and CH2M-Hill Hanford Group (CH2M-Hill), the prime contractor for the River Protection Project (RPP). Personnel are located in workshops and trailers at the Hanford Site and in the Regional Office Complex (ROC) in Richland. FFS employs approximately 750 people (621 noncraft, 128 craft). Of those, 428 were classified as “long-term affiliates” to FH. As such, they received daily direction from FH, not FFS. Craft personnel consisted of building trades people (electricians, pipefitters, carpenters, ironworkers, sheet-metal workers, heavy equipment operators, painters, and laborers) and are represented by the Building Trades Council. Noncraft employees include a full range of engineering and administrative support staff.

On June 19, 2008, DOE announced that CH2 Plateau Remediation Company (CH2-PRC) would be replacing FH as the prime contractor for the Plateau Remediation Contract at the Hanford site. FFS is a designated subcontractor for CH2-PRC; although, as of this assessment, the actual level of effort by FFS had not been determined. The transition period began July 1, 2008, and should be completed by September 30, 2008. Similarly, CH2M-Hill was being replaced on RPP by Washington River Protection Solutions, LLC (WRPS). It had not yet been determined how FFS employees were going to be affected by both of these transitions.

FFS was granted DOE-VPP Star status in June 2001 and recertified as a DOE-VPP Star site in September 2005.

Continuation in DOE-VPP requires an onsite review by the Office of Health, Safety and Security (HSS) DOE-VPP team (Team) to determine whether the applicant is performing at a level deserving DOE-VPP Star recognition. The Team evaluated FFS’ safety programs against the provisions of DOE-VPP. During the site visit, the Team observed activities, performed field walk-downs, evaluated relevant safety documents and procedures, and conducted interviews to assess the strength and effectiveness of FFS health and safety programs.

During the onsite assessment, the Team had contact with approximately 100 different individuals. Assessment activities included observation and inspection of shop and office areas, walk-down of work areas in both the 200 East and 200 West Areas, including work in the Hanford Tank Farms, observation of critiques, pre-job briefings, work planning meetings, and safety committee meetings. The hazards encountered by workers include the full range of construction hazards complicated by the potential radiological and chemical hazards present at the Hanford site.

II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE

The Team conducted a review of the Occupational Safety and Health Administration (OSHA) 300 logs. The tables below summarize OSHA reportable data for FFS. FFS does not employ any subcontractors.

**FLUOR FEDERAL SERVICES
INJURY INCIDENCE / LOST WORKDAYS CASE RATE**

Injury Incidence / Lost Workdays Case Rate (Nonaffiliated Personnel Only)					
Calendar Year	Hours Worked	Total Recordable Cases	Total Recordable Case (TRC) Incidence Rate	DART* Cases	DART* Case Rate
2005	811,016	7	1.73	0	0.00
2006	632,332	2	0.63	2	0.63
2007	402,694	1	0.50	0	0.00
3-Year Total	1,846,042	10	1.08	2	0.22
Injury Incidence / Lost Workdays Case Rate (All FFS Personnel)					
Calendar Year	Hours Worked	Total Recordable Cases	Total Recordable Case Incidence Rate	DART Cases	DART Case Rate
2005	1,638,923	12	1.46	5	0.61
2006	1,638,917	6	0.73	4	0.49
2007	1,476,914	2	0.27	0	0.00
3 Years	4,754,754	20	0.84	9	0.38
Bureau of Labor Statistics (BLS-2005) Average for North American Industry Classification System (NAICS) Code 237 (Heavy Construction)			TRC Rate 5.3	Total DART Case Rate 3.0	

*Days Away, Restricted, or Transferred

Conclusions. Since FFS employees affiliated with other companies (primarily FH) receive their daily direction from non-FFS personnel, and nominally work under non-FFS health and safety systems, the comparison statistic for purposes of DOE-VPP recertification is the nonaffiliated personnel. For the nonaffiliated workers, the rates are far below NAICS averages. The TRC rate for 2007 was less than 10 percent of the national average, and there were no DART cases. When the statistics for the affiliated work are included, which includes the bulk of the heavy construction activities, both TRC and DART rates are still significantly below the national average. In either case, the statistics demonstrate safety performance that is significantly better than the comparison industry.

III. MANAGEMENT LEADERSHIP

Management leadership is a key element of obtaining and sustaining an effective safety culture. The contractor must demonstrate senior-level managers' commitment to occupational safety and health, in general, and to meeting the requirements of DOE-VPP. Management systems for comprehensive planning must address health and safety requirements and initiatives. As with any other management system, authority and responsibility for employee health and safety must be integrated with the management system of the organization and must involve employees at all levels of the organization. Elements of that management system must include clearly communicated policies and goals that are measurable and attainable, clear definition and appropriate assignment of responsibility and authority, adequate resources, and accountability for both managers and workers. Finally, managers must be visible, accessible, and credible to employees.

FFS managers have clearly established a policy that safety is an expectation and a prerequisite for every task. In addition to a signed commitment to the FFS Occupational Safety and Health Program, FFS has established a policy of "We can always restart work – we cannot eliminate an accident after it has happened." This policy is visible on bulletin boards, newsletters, and presentations and was repeatedly heard from managers and workers alike.

FFS has a stated goal of "Zero" accidents and injuries. In addition, Fluor Corporate has challenged all the Fluor subsidiaries to meet the corporate goals for TRC rate (.65) and DART (.15). FFS has not established any other objectives or milestones to support reaching those goals. Objectives have been established within the construction organization through the Safety Improvement Plans, but there has not been an equivalent Safety Improvement Plan developed outside the construction organization. Further, the Safety Improvement Plans focused primarily on ensuring compliance with existing requirements. FFS could benefit from identifying more specific safety and health improvement initiatives, such as a worker wellness program and establishing means to measure participation in those initiatives. Goals for participation could then be established that would demonstrate increasing participation by workers.

Safety and health are factored into the basic business of FFS. As a construction and engineering services provider, FFS includes safety and health considerations into estimates and proposals for work. Estimators use established factors based on the expected hazards and controls for jobs to increase estimates as necessary to ensure safety and health resources are available to complete the project. Once the estimates are finalized and projects are accepted, the costs for safety and health are monitored. FFS could obtain valuable information on project performance by specifically tracking project costs for safety and health and comparing those costs with the original estimates, as well as ensuring that resources estimated for safety and health performance are not diverted unnecessarily to other project costs.

FFS has established an extensive set of safety practices that comprise the Industrial Safety and Health Program Manual. The manual includes a Worker's Bill of Rights, the Master Safety Rules, and the FFS Safety and Health Policy Statement, all of which are posted on information bulletin boards in FFS-controlled spaces. In addition, that manual contains a comprehensive set of practices covering a broad range of topics. Those practices clearly delineate responsibilities

for workers, supervisors, managers, and subject matter experts. In some cases, as discussed later, these practices may not be sufficiently followed. For example, Practice 134 653 3000, "Industrial Hygiene Program Requirements," implements an Industrial Hygiene and Hazardous Materials Evaluation Form, S-NW-377, which documents a detailed exposure assessment for hazardous material usage. This form was not being used for chemical hazard analysis (see Section V. Worksite Analysis).

Mechanisms exist to hold workers and managers accountable for safety. Annual performance evaluations (for nonbargaining unit personnel) include performance elements for safety. In addition, there is a range of recognition and awards that managers use to reward employees for exemplary performance, including safety.

Managers are clearly committed to safety, but the safety program would benefit from increased manager visibility. The senior manager positions within FFS are filled by people who are detailed from FGG. In some cases, their duties to FFS make up only a small percentage of their time. For example, the Director of Environment, Safety, Health and Quality is only able to spend approximately 20 percent of the available time working on FFS-related tasks. The overall manager for FFS, while committed to VPP efforts, spends even less time with FFS. Consequently, their opportunities to influence and encourage, as well as their visibility to the workforce, are very limited. Middle managers and supervisors are very visible to the workers. An open-door policy for all managers was evident, and workers expressed confidence that they could approach their managers with any safety issues.

Senior managers have not been significantly involved in helping the health and safety committees in performing the annual safety and health program evaluation or developing safety and health improvement plans. The Construction PRIDE committee and the subordinate steering committees developed Safety Improvement Plans for 2008, but the ROC Health and Safety Committee did not. As a result, managers have missed an excellent opportunity to encourage those committees to extend their focus from safety compliance to safety excellence. Increased senior management support and participation could also lead to greater participation on those committees and greater recognition for the committee efforts.

Conclusions

FFS is currently exhibiting good safety performance from a statistical perspective, and workers consistently believed this is the safest place they have ever worked. Managers are clearly committed to workers accomplishing the mission safely. The means to achieve that goal have focused primarily on compliance with standards and regulations. Managers have not effectively challenged themselves or their workforce to go beyond compliance and truly focus on excellence. Managers should find means to challenge themselves and their workers to make FFS the safest place it can be.

IV. EMPLOYEE INVOLVEMENT

Employees at all levels must continue to be involved in the structure and operation of the safety and health program and in decisions that affect employee health and safety. Employee participation is in addition to the individual right to notify appropriate managers of hazardous conditions and practices. Field observations and interviews indicate that FFS workers remain committed to their personal safety, as well as the safety of their coworkers and plant visitors.

The FFS Safety and Health Program provides opportunities for employees at all levels to be involved in the structure and operation of the safety program and in decisions that affect employee health and safety. Evidence of participation was noted during field walk-downs, observations of work in progress, and during interviews conducted with employees at all levels. Field observations and interviews indicate that FFS workers remain committed to their personal safety, as well as the safety of their coworkers.

FFS has two distinct committees that include worker safety and health. The first is the PRIDE Committee that covers all FFS construction activities on the Hanford site. The PRIDE Committee serves as the joint Labor-Management Safety Committee, as required, of construction contractors in the VPP process. Geographically based Steering Teams are local safety committees comprised of labor and management representatives. Two members (one labor and one manager) of each Steering Committee combine to make up the PRIDE Committee. The second committee is the ROC Health and Safety Committee. That committee is organized by floor, and there is one floor monitor and one alternate on each of the six floors. The floor monitors are voluntary positions, and they serve as the representatives for the Health and Safety Committee.

The PRIDE and Steering Committees are functioning at a high level. Employees are actively involved and membership is cycled so that the number of workers participating is maximized. Participation in and knowledge of the ROC Committee could be improved. Unlike the PRIDE Committee, there has been little turnover of ROC Committee membership over the past several years. The chairperson has had that role for 5 years. The members of the ROC Committee are clearly dedicated to ensuring FFS provides a safe place to work. They have identified safety improvements and addressed safety concerns. Since the ROC Committee represents a large community of office workers generally performing low-risk tasks, the challenge lies in motivating those workers to participate in safety activities and identify opportunities to pursue safety excellence. For the past 3 years, the ROC Committee has not identified a specific Safety Improvement Plan. FFS has a procedure (practice) that delineates ROC responsibilities, but the committee members did not think that procedure applied to workers in ROC.

Opportunity For Improvement – FFS should provide reinforcement to encourage the ROC Steering Committee to become more active and to encourage constituents to participate (e.g., become active committee members, participate in the Voluntary Protection Program Participants' Association (VPPPA) conferences) and develop a Safety Improvement Plan with measureable/attainable objectives to meet the FFS safety goal of zero injuries.

Employee involvement was also noted in other programs and activities. Employees are actively involved in Job Safety Analysis (JSA), Baseline Analysis, Field Safety and Housekeeping Walk-downs, Craft Incentive Programs, VPPA Conferences, Safety Meetings, Pre-job and Post-Job Briefings, and Post Incident Investigations. For example, during this assessment an FFS employee received radiological contamination on his work boot while performing a task in the 200-East Tank Farm. He quickly identified the hazard (potentially contaminated water), appropriately warned others in the area, and took actions to prevent further spread of contamination. After the incident, the employee was cleared through medical and returned to the area to attend the incident critique. During the critique, input from affected and associated workers was encouraged, and they actively participated and contributed to the process. The critique concluded without any assignment of blame to the worker for the incident. Managers rewarded the contaminated worker for exemplary actions taken to minimize the event by preventing the spread of contamination.

The work described above was being conducted in preparation for contract transition from CH2M-Hill to WRPS as the tank farm contractor. Jumpers used in valve boxes at the tank farm were being placed in storage bins to protect them, as well as prevent spread of contamination during the transition process. The Team was impressed with concern demonstrated by the workers to ensure that workers for the new contractor would not face additional hazards or difficulty in unpacking and retrieving the jumpers from the boxes. This concern indicates a culture that holds true value for safety over other peripheral issues and concerns.

Workers are routinely involved in the work planning process. Workers have input into the pre-planning, the Automated Job Hazard Analysis (AJHA) or JSA, tool selection, and process improvement. For example, workers at the 200 East Tank farms have developed specialized long-reach tools to facilitate the cleanout of tank and pump pits. The long-reach tools aid workers in performing the work while maintaining exposure to radiological hazards As Low As Reasonably Achievable. Using the tools, the work is completed in less time and maximizes the distance from the hazard source. Long-reach tools also reduce the risk of injury via improved ergonomics resulting in less strain on the worker. All the tools are subjected to engineering and ergonomics review prior to use.

Interview responses indicate that employees at all levels believe a positive and safe work environment exists at FFS. Many stated that FFS was the safest construction job that they had ever worked. In addition to soliciting worker identification of hazards, FFS has a "scored" self-inspection program for shop areas. The scored inspection process is a good mechanism to encourage self-inspections, but additional effort may be needed to ensure hazards are identified and appropriately controlled in the shop areas. Observations by the Team identified a number of hazards that could have been previously addressed. The shop areas used by FFS construction forces were mostly comprised of older wooden structures or small trailers modified to accommodate space for craft inventory and fabrication work. During the site visit, it was observed that some of the areas had deficient lighting, exit signs, landings next to doors, or questionable electrical capacity. FFS should look for additional opportunities to eliminate/mitigate those hazards and to raise the level of hazard awareness for all workers. Raising the hazard awareness level of the workers will also challenge workers to meet the expectation to make FFS the safest place it can be.

Opportunity For Improvement – FFS should find ways to encourage workers to be more critical of their own workspace and identify and correct hazards that have become routinely accepted.

Most workers also stated that they felt very comfortable raising safety and health concerns to their supervisors and managers. Employees also indicated that they participate in the resolution of concerns they raise. Interviewed employees regarded communications as generally effective. Workers were candid and showed no fear of reprisal in talking with the Team during interviews. All employees indicated that they understood their rights and responsibilities and are very knowledgeable about their responsibilities regarding safety and health. Employees also indicated that they were responsible for their own safety.

Employees were also noted to foster a culture where they proactively “look-out” for their coworkers’ safety; this was particularly effective within the construction work crews. For example, while working in conditions where heat stress was a hazard due to temperature and working conditions, a trained worker is assigned to monitor the heat index with a wet bulb globe thermometer. Temperatures are monitored and recorded on an hourly basis, and work/rest routines are implemented to reduce risk to the worker. It is noteworthy that FFS has chosen to require work/rest routines where many other sites use this program as a guide only.

Workers within the crews are also trained to issue respirators. This practice requires the issuer to determine the qualification of the worker and issue the correct respirator and cartridges in accordance with the technical work document. This activity was observed on several occasions, and the conduct of the operations was exemplary. Another example of workers holding each other accountable and taking ownership of their safety program was noted when workers were observed not wearing the required personal protective equipment (PPE); i.e., safety glasses, hardhats, and safety shoes. Their coworkers reminded them of PPE requirements and the at-risk behavior was immediately corrected.

The Team observed or was briefed on a number of safety improvements that resulted from employee concerns or suggestions. For example, traffic concerns at ROC were addressed by adding speed bumps and warning signs to reduce the risk of traffic incidents, drains were installed in the elevated walkover and stairs to eliminate water accumulation and ice, and new-hire general orientation was improved to include safety expectations.

Another notable improvement involves the maintenance of Employee Job Task Analyses (EJTA). Whereas in the past, EJTA's were reviewed by foremen; employees are now involved with their own periodic EJTA review. Transcription or other errors are corrected, and interactions between employees and supervisors are enhanced.

Conclusions

Overall, the Team concluded that FFS employees are actively involved in promoting safety and improving the safety culture at FFS. Workers are committed to accomplishing their mission safely. The workforce believes FFS is a safe place to work and that their managers and supervisors share the commitment to safety. The construction workforce was noted as being active and engaged in the program and is making valuable contributions to enhance the work processes. FFS can benefit from additional employee involvement by encouraging workers to go above and beyond compliance and look for new methods to raise safety awareness. Workers in ROC especially need to be encouraged to get involved with safety improvement initiatives and promotions.

V. WORKSITE ANALYSIS

Management of health and safety programs must begin with a thorough understanding of all hazards that might be encountered during the course of work and the ability to recognize and correct new hazards. There must be a systematic approach to identifying and analyzing all hazards encountered during the course of work, and the results of the analysis must be used in subsequent work planning efforts. Effective safety programs also integrate feedback from workers regarding additional hazards that are encountered and include a system to ensure that new or newly recognized hazards are properly addressed. Successful worksite analysis also involves implementing preventive and/or mitigative measures during work planning to anticipate and minimize the impact of such hazards.

There are two processes that FFS uses to evaluate work at the Hanford site. The first process is JSA, which is used to evaluate work in shop areas or at construction sites outside existing facilities. The second process is Construction AJHA, which is used to analyze work performed in an existing facility. Initially developed by FH, AJHA has been modified by FFS to more effectively identify hazards and controls for a construction environment. AJHA documents are typically more detailed than JSA. The Team reviewed several AJHA packages and observed the development of an AJHA for an upcoming project at the Canister Storage Building.

Both processes are clearly accepted and used by the craft, supervisors, and supported vigorously by the management team. The workforce was observed participating in the development of both types of documents.

Both processes effectively identify hazards and controls. Job site surveys are conducted prior to the start of work to identify hazards or safety issues. Based on these surveys, JSA or AJHA can be effectively constructed to address hazards that require controls or adjust the scope of work or the sequence of work to eliminate hazards. JSAs and AJHAs reviewed by the Team indicated that analysis of identified hazards was not effectively included in the final document. Information included in JSA and AJHA was not sufficient to demonstrate that selected controls were adequate for anticipated hazards. This was mostly identified in the evaluation of chemical hazards. For hazardous chemicals, FFS has a form that can be used for this purpose, *Industrial Hygiene and Hazardous Materials Evaluation, S-NW-377*. This form includes evaluation of the quantity and location of the chemical, how the chemical will be used, identification of any applicable exposure limits, subsequent justification of controls, and a determination of any sampling that may be required during the work. The Team did not see the form being used, and it was not included in any of the hazard analyses reviewed. JSAs and AJHAs reviewed did not contain documented analysis that evaluated the hazards, such that a peer professional, a worker, or a field work supervisor could understand why the control set was selected or assumptions that were made as part of the analysis. The range of chemical hazards identified during this assessment included a variety of hazardous chemicals, particularly organic solvents and adhesives that would be used during the course of construction activities, such as acetone, xylene, toluene, and methyl ethyl ketone.

The Team reviewed the baseline exposure assessments performed by the construction forces on the Central Plateau and noted a difference between the two different areas. The documentation

and focus of assessments differed relative to which area was performing the baseline assessment. The 200 East area utilized a simple checklist type process to document hazards with very little description. The 200 West construction forces provided a more narrative description. Typically, both covered the chemical inventories, physical setting, location, and date the exposure assessment was performed. Both baselines provided a limited amount of analysis relative to potential exposures, but lacked the detail necessary to perform an adequate analysis and implement effective controls. Additionally, baseline documentation was absent from some of the shops, office areas, and storage areas.

Opportunity For Improvement – FFS should ensure hazards analyses are clearly documented in JSAs, AJHAs, and baseline exposure assessments, including assumptions inherent in the analysis and justification of the adequacy of the selected controls, particularly for chemical hazards.

Workers and managers perform monthly health and safety walk-downs. Additional walk-downs are performed by resident safety personnel, craft, and front-line supervision on a regular basis as often as weekly for some areas. There is some discontinuity on the frequency and breadth of mandated monthly inspections, especially at the 200 West construction shops. Conditions were observed by the Team that should have been identified during walk-downs. For example, the Team observed old shop tools that were not adequately guarded. The Team also observed postings on a fence requiring that safety glasses be worn when inside the fence. This posting was old, and FFS personnel reported that the requirement for safety glasses had been removed from that area, yet the postings had not been removed. In some shops, Material Safety Data Sheets (MSDS) were being kept in the shop that did not match the chemical that was being used, and the chemical inventories were not up to date.

The FFS safety organization is tracking and trending information garnered from safety walk-downs, monthly safety meetings, first aid cases, and employee surveys. Currently, it appears that two areas where people have the greatest potential for injury are during walking and engaging in shop activities. Trending also indicates that employees are concerned about available resources and housekeeping in work areas. FFS personnel are receiving Human Performance Improvement (HPI) training, primarily through FH or Hanford General Employee Training. As FFS personnel become proficient in HPI techniques, they may be able to develop better leading indicators of safety performance than the current indicators, which tend to be more lagging.

All employees interviewed in the shop complex were knowledgeable of routine hazards within their work area and how to use chemicals and tools. They clearly were able to identify precautions, such as ventilation when using certain chemicals within the shop complex, use of hearing protection, or the use of safety glasses. In some shops, signs clearly indicated the requirement for hearing protection and safety eyewear when machinery was in use. Several instances were observed by Team members when visiting these areas as the workers stopped and assured visitors were properly protected. In other shops, the requirements for safety glasses and hearing protection were not clearly posted.

FFS requires that each shop maintain a chemical inventory sheet. When the need arises for a new chemical, there is a process that must be followed prior to receipt of the new chemical. The

approval process includes a review by safety professionals and an evaluation of less hazardous substitutes. Eyewash stations are provided in the shops along with first aid kits. The eyewash stations have 5-minute bottles to rinse a person's eyes should a foreign substance get into the eyes. It was discovered in some MSDS documents that the manufacturer recommended at least a 15-minute flush should the product get into the eyes. FFS only provides a 15-minute flush capability when the chemical of concern is specifically identified as a "corrosive." Although this interpretation is consistent with title 29, Code of Federal Regulations (C.F.R.), part 1910.151, FFS should consider other OSHA eyewash requirements for operations involving dipping and coating, carcinogens, and sensitizers. As a means of promoting excellence beyond compliance, FFS should consider the use of 15-minute flush eyewash stations in shop areas where hazardous chemicals other than corrosives may be used.

Opportunity For Improvement – FFS should consider the use of 15-minute flush eyewash stations in shop areas where other chemicals (noncorrosive) may be used, particularly when the MSDS recommends a 15-minute flush.

Interviews with construction employees and field work supervisors indicated that there is a free-flowing exchange of information between the workforce and managers. Most workers indicated that the preferred route of exchange was verbal. Typically, all personnel interviewed indicated satisfaction with responses to concerns, and there was no indication of issues. There are numerous instances of construction forces being rewarded for identifying improvements and safety issues. For example, employees have been rewarded with gift cards for questioning the lift plan for C-104 jet heel pump, safe coordination of a new hire, building glove bags for field use, providing job experience during work planning, questioning whether any analysis was performed for the C-104 jet heel pump, excellent work in glove bags, and finding a problem with a work platform.

The Team reviewed the employee concerns program, both at ROC and within construction forces. The forms provided for employees to identify written concerns were out of date in that the contact person listed no longer managed the program. Responsibility for the program had shifted at least twice since the forms had been updated. Although no employees expressed any hesitancy to report concerns verbally to their supervisors and managers, should an employee choose to use the written program for a legitimate concern, it is not certain if the concern would be addressed. FFS needs to ensure that the employee concerns program is maintained and managed up to date with correct contact information.

Opportunity For Improvement – FFS should consider updating the employee concerns program and ensure that employees are aware of its function and capabilities.

Accidents and upsets are investigated in accordance with FH written process for accident investigation and causal analysis if the incident occurs on a PHMC project. Similarly, if the incident occurs on work for RPP, the CH2M-Hill investigation process is used. In both cases, results are available to all employees, and corrective actions are tracked to completion.

Conclusion

Hazards are clearly identified through a multitude of inspection and assessment processes conducted at construction sites and shops. Workers clearly understand the use of AJHA and JSA and use these tools effectively. There are several areas where FFS could benefit from a more rigorous analysis process, particularly in the analysis of chemical hazards and baseline hazard and exposure assessments. Additional attention to detail on safety inspections and walk-downs will help FFS identify and eliminate some residual hazards that have become part of the accepted everyday risk.

VI. HAZARD PREVENTION AND CONTROL

Once hazards have been identified and analyzed, they must be eliminated (by substitution or changing work methods) or addressed by the implementation of effective controls (engineered controls, administrative controls, and/or PPE). Equipment maintenance, PPE, processes to ensure compliance with requirements, and emergency preparedness must also be implemented where necessary. Safety rules and work procedures must be developed, communicated, and understood by supervisors and employees and followed by everyone in the workplace to prevent mishaps or control their frequency and/or severity.

The means for eliminating or controlling hazards is accomplished by using the Hierarchy of Controls (Substitution, Engineering, Administrative and, lastly, PPE). Several observations identified the use of higher level controls in lieu of PPE at the job site, such as use of specialty tools developed by the craft (which are documented in a logbook with associated calculations to justify their use and application), use of the dual track remote unit to accelerate sludge movement in the tank farms, substitution of epoxy-based coatings with water-based coatings where practical, use of portable vacuum systems while welding stainless steel, use of wind breaks for radiation control, and shade for heat stress relief. While evidence of positive engineered controls were observed in field work activities, a consistent level of diligence was not evident in the established shop areas where routine tasks are performed. Some areas of concern were noted during walk-downs and indicated that additional controls are needed to address hazards, including inadequate guarding on shop machinery and room heater fan blades and additional flash screens needed for welding locations to prevent nonionizing eye injury to colocated workers. Administrative controls consisted of signs, warning labels, and other special instructions (e.g., vehicle 360-degree walkaround). In most cases, administrative controls were followed, but the Team did observe some cases of incorrect or missing postings for eye and hearing protection or hardhats.

Administrative controls have been developed to address heat stress. Wet bulb globe temperatures are monitored and recorded on an hourly basis and work/rest routines are implemented to reduce risk to the worker. These work/rest routines are documented and are mandatory. During an evolution at the tank farm, there was some confusion as to the meaning of “Rest” in the work/rest cycle. The definition of “Rest” in the work/rest cycle is not consistently interpreted across the project. Some believed that stopping work and seeking shade satisfied the rest requirement, and some believed rest required the removal of respirators, drinking water, and providing air-conditioning. The lack of a standardized interpretation of “Rest” could lead to inadequate identification of hazard controls. FFS has additional administrative controls in place, including a management directive to treat all workers as “not acclimatized” when evaluating heat stress hazards and controls. By selecting “not acclimatized,” selected controls are more conservative and provide additional protection. Also, “Mockups” are used for work classified as “High Risk.” High-risk jobs are those that have a high potential for radiological consequences.

Opportunity For Improvement - FFS should provide clear guidance and expectations to define the term, “Rest,” such as removal of respirators and availability of air-conditioned space.

During the site visit, it was apparent that the use of PPE was understood and utilized by the workforce. PPE was emphasized at every pre-job briefing, and the opportunity for questions or suggestions was always offered. On several occasions, employees were observed reminding coworkers of the need for particular PPE, such as safety glasses and hardhats while in shop areas. PPE is provided to employees and, when specialized protection is determined to be required, the management system supports the acquisition of required PPE. Although worker input is solicited when selecting PPE to be used, Safety and Health Professionals exercise additional control by reviewing and approving the purchase prior to use. Safety equipment is selected based on the hazard involved and is inspected prior to use. Defective PPE is segregated from use and discarded. During a work evolution on the tank farm, respirators were issued to workers in preparation for the assigned task. The issuer inspected the respirators prior to issuance and was diligent in his review. Respirators were discarded if they were not in sealed shipping bags and were also negative/positive pressure tested by the user prior to use.

Walk-downs and procedure reviews also identified some conditions or areas where controls in place did not comply with established FFS practices or regulations. For example, the Team observed areas where barricades were either absent or not installed per the approved FFS practice. Nonradiological boundaries and work area control barricades were observed established with yellow or red (orange) rope without discretion. Per FFS procedure, yellow is assigned to material storage, while red is reserved for hazard identification and requires permission to enter from the owner. In another example, it was not apparent that an adequate number of areas had been provided to allow workers to shelter when required. "Take Shelter" areas should be evaluated to ensure that sufficient space is available for the expected population and duration should there be a need to shelter. Some shop areas were observed to have incorporated eating areas within the shops. Microwave ovens, coffeepots, and refrigerators were installed. This practice conflicts with FFS practice, which requires eating areas to be separate from construction and maintenance areas. A significant number of unlighted exit signs (that did not appear to be Underwriters Laboratories listed) were observed in shop and office areas. Illumination is required by National Fire Protection Association (NFPA) 101, The Life Safety Code. In one case not observed by the Team, but reported to the Team by FFS, the failure of personnel to perform an appropriate 360-degree walkaround a vehicle and subsequent inattention by two spotters resulted in a near-miss when a strap connected to a crane became caught on a tank riser during movement of the crane.

Opportunity For Improvement - FFS should find new means to identify and prevent worker complacency with existing requirements.

FH radiation protection program supports FFS construction activities. Whether in a remote location or in a facility, FFS construction forces rely on FH-trained radiation protection specialists to assist and support their activities. During the Team visit, no issues with the radiation protection program application or implementation were noted.

Advance Med Hanford (AMH) provides all medical services for FFS work at the Hanford Site, including acting as the medical director, providing medical surveillance, maintaining medical records, providing medical evaluation, and other medical-related activities.

The Site EJTA defines medical surveillance requirements for workers. The industrial hygienist implements the EJTA program, and an annual assessment of EJTA is conducted by Safety as part of the Safety Improvement Plan. Job activities requiring medical surveillance are scheduled for evaluation by AMH, which uses EJTA information to guide medical surveillance and monitoring. Use of EJTA is a key way that FFS coordinates with AMH medical monitoring and surveillance.

Workers with potential exposure or minor injury/illness are evaluated by AMH. Emergency medical response service is provided by the Hanford Fire Department, and serious cases can be transported directly to the local hospital.

Field workers are provided with first aid, cardiopulmonary resuscitation, and Automated External Defibrillator training when it is required by their job. Training is also made available to personnel on a voluntary basis. First aid kits are provided in shop facilities and at job locations. First aid kits are inspected on a weekly basis in FH areas and on a monthly basis in FFS areas according to governing procedures and work practices. A review of FFS practices identified that first aid kit inspections do not require the inspector to open the kit if the seal is in place. First aid kits can contain products that have expiration dates. This issue was self-identified by an FFS worker; however, the inspection procedure has not been changed to ensure that out-of-date stock is purged from first aid kits.

FFS workers have access to Fluor Employee Assistance Programs (EAP) and Work Life Services. Through these programs, employees have access to assistance for depression, anxiety, stress, substance abuse, relationship problems, workplace conflicts, parenting, family issues, living with chronic conditions, and childcare and eldercare support. As previously discussed in the Introduction, the effect of transition from FH and CH2M-Hill Hanford to CH2-PRC and WRPS on the workforce structure had not yet been determined. This situation can lead to significant stress on workers. EAPs are often well suited to helping workers deal with these stresses. FFS does include information about EAP in annual employee training. FFS could gain additional benefit by promoting EAP to workers during the transition period and ensuring they are aware of its availability.

Opportunity For Improvement - FFS should actively promote availability of EAPs during periods of contract transition, expected force reductions, and other stressful times for the workforce.

Site emergency preparedness activities are the primary driver for alarm testing and emergency drills. Site-wide alarm tests are conducted regularly, and each site area typically has two drills each year. Drills may include evacuation, take cover, or personal injury scenarios. During a pre-job meeting, Emergency Preparedness for a remote location was discussed. The site was located away from a facility and did not afford the workers the normal structure for take cover.

The workforce was instructed to take cover in the nearest occupied facility, which in this case involved an approximately ¼-mile drive to reach a suitable location. There was an issue with evacuating these employees since transportation had not been provided as required in JSA. The Construction forces acquired a vehicle to fulfill the need to support remote location work.

FFS has safety professionals on staff (or access to FH) who provide expertise in industrial safety, industrial hygiene (IH), radiation protection, and fire protection, as well as certified safety professionals. Qualified and trained craftsmen also assist with electrical hazards, hoisting and rigging issues, and mechanical construction and maintenance activities. While safety professionals are available, there is a concern that IH may not be staffed to a level necessary to support FFS activities (specifically, baseline hazard analyses, which have been identified as needing improvement). FFS has recently lost the service of one certified industrial hygienist, which has contributed to the lack of detailed hazard analysis.

Opportunity For Improvement – FFS should evaluate the need to increase IH staffing to support activities, such as baseline assessments, employee monitoring, material substitutions, and hearing conservation surveys.

In the context of facility preventive maintenance, FFS does not regularly perform that type of activity. The FFS construction forces do, however, perform preventive maintenance in accordance to manufacturer's recommendation on equipment in its possession under its operational purview. Periodic inspection includes Ground Fault Circuit Interrupters, ladders, rigging, fall protection, and power tools utilized by craft personnel. While FFS performs monthly inspections of emergency exit lights and exit signs, no record could be produced to indicate that yearly 90-minute, drain-down tests of those devices had been performed in accordance with NFPA 101.

Opportunity For Improvement – FFS should ensure that monthly inspections of emergency exit lights, exit signs, and annual 90-minute, drain-down tests of those devices are performed.

Conclusions

FFS has implemented a robust hazard prevention and control program. A process is in place to identify hazards and determine effective controls to protect the worker. The workforce and management are committed to a positive safety culture at work. As discussed in the worker involvement section, the workforce is clearly engaged in identifying and controlling hazards. With the exception of IH, professional staffing is adequate to support project initiatives. To further improve the process, FFS should look for opportunities to take advantage of material substitution and engineered controls, particularly in shop and material storage areas.

VII. SAFETY AND HEALTH TRAINING

Training is necessary to implement managers' commitment to prevent exposure to hazards. Managers, supervisors, and employees must know and understand the policies, rules, and procedures established to prevent exposure to hazards. Managers, supervisors, and employees must understand their safety and health responsibilities and know how to effectively carry them out.

FFS assures that employees are adequately informed about their rights and responsibilities for safe working conditions through a combination of formal and informal training. Construction managers and supervisors are required to have an orientation to the safety and health program (a 6-8 hour course), "safety leadership" training, as well as project-and location-specific training, including field work supervisor training. First-line supervisors (foremen) are required to have the same training as those they "directly" supervise (the one-over-one approach). Formal training is provided through unions, Hazardous Materials Management and Emergency Response (HAMMER), and Fluor safety professionals. Informal training includes pre-job planning sessions, pre-job briefings, safety meetings, post-job critiques, and facility walk-down inspections. Fluor safety and health professionals have also provided informal training for topics such as heat stress and hearing protection. FFS pairs new craftsmen with experienced craftsmen to provide for mentoring and on-the-job training.

Interviews with senior managers demonstrated they clearly understood their safety and health responsibilities. They are knowledgeable of hazards their workers encounter and the controls necessary to accomplish the work safely and use that knowledge to educate their workforce. This was demonstrated anecdotally by reports of a construction manager who appropriately addressed a concern about static electricity buildup in aerial lifts when operating on tile or linoleum floors. The manager was able to explain the buildup process, as well as the use of a grounding chain on the lift in contact with the floor, to dissipate the static buildup.

During the site visit, supervisors and front-line supervisors were observed correcting employee behaviors that were inconsistent with postings and requirements. The Team reviewed a work package that was being completed for a specific facility. In the work package, there was a sheet for each employee that documented their training and due dates for retraining. All supervisors and employees interviewed had completed the required training to perform their job functions.

Those FFS Safety and Health programs that are required by title 10, C.F.R., part 851, to include training requirements were reviewed for compliance, including Hazardous Waste Operations and Emergency Response; PPE General Requirements; Respiratory Protection; Confined Space; Powered Industrial Trucks (Hoisting & Rigging); Cutting and Welding (Control of Hot Work); Electrical Safety Training; Carcinogenic Metals; Bloodborne Pathogens; and Hazard Communication. No deficiencies were noted. The respiratory protection training provided by HAMMER is exemplary and would serve as an excellent role model for the rest of the Complex.

Each work group has a Position Task Code that specifies the training course they are required to complete. This training is referred to as core training. Managers and supervisors determine any additional training based on the task assignment (for example, if a worker is assigned to issue

respirators or work in a confined space, the worker must have required training to perform that task). Activity-specific training requirements are annotated on JSAs. A review of training records in the ITEM database (tracking/reporting training database) for workers performing work on the tank farm revealed no significant training delinquencies for the work group. Additional controls also ensure that workers are qualified before they are allowed to perform work by the Access Control Entry System, which electronically checks qualifications/training prior to allowing access to radiological controlled areas.

Conclusions

The training program for FFS is comprehensive, and robust controls/practices are in place to ensure that training is maintained current. Formal training is successfully supplemented by experienced workers willing to mentor new employees. Safety professionals are also proactive in providing additional education to the workforce where needed. FFS is meeting VPP expectations to provide adequate safety training to FFS workers.

VIII. CONCLUSIONS

FFS has demonstrated exemplary safety performance over the past 3 years. The accident and injury rates show a downward trend and are a small fraction of the comparison industry rates. Employees performing in the most hazardous work are actively participating in the FFS Safety Program. For the construction trades, even the workers that are performing work for FH or CH2M-Hill continue to actively participate in FFS PRIDE committee and Steering committees. Participation by workers in the lower hazard office environments should be further encouraged. FFS faces some challenges through the contract transition period. In particular, FFS workers and managers should challenge themselves more in pursuing safety excellence. Rather than accepting FFS as “the safest place I’ve ever worked,” workers and managers alike should focus on making FFS “the safest place it can be.”

As a result of this assessment, the Team recommends that FFS continues participation in DOE-VPP at the Star level. FFS should consider the Opportunities for Improvement identified in this report and address them as necessary in its next annual self-assessment.

Appendix A

Onsite VPP Audit Team Roster

Management

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