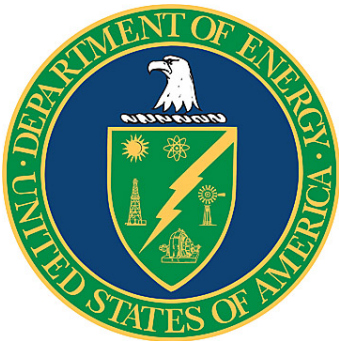


# Honeywell Federal Manufacturing and Technologies/New Mexico

**Report from the Department of Energy  
Voluntary Protection Program  
Onsite Review  
December 5-9, 2011**



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. This program closely parallels the Occupational Safety and Health Administration (OSHA) VPP. Since its creation by OSHA in 1982, and implementation by DOE in 1994, VPP 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 (HSS) assumed responsibility for DOE-VPP in October 2006. HSS is expanding complex-wide contractor participation and coordinating DOE-VPP efforts with other Department functions and initiatives, such as Enforcement, Oversight, and the Integrated Safety Management System.

DOE-VPP outlines areas where DOE contractors and subcontractors can surpass compliance with DOE orders and OSHA standards. The program encourages a *stretch for excellence* through systematic approaches, which emphasize creative solutions through cooperative efforts by managers, employees, and DOE.

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 available to all contractors in the DOE complex and encompasses production facilities, laboratories, and various subcontractors and support organizations.

DOE contractors are not required to apply for participation in DOE-VPP. In keeping with OSHA and DOE-VPP philosophy, *participation is strictly voluntary*. Additionally, any participant may withdraw from the program at any time. DOE-VPP consists of three programs with names and functions similar to those in OSHA's VPP: Star, Merit, and Demonstration. The Star program is the core of DOE-VPP. This program is aimed at truly outstanding protectors of employee safety and health. The Merit program is a steppingstone for participants that have good safety and health programs, but need time and DOE guidance to achieve true Star status. The Demonstration program, expected to be used rarely, allows DOE to recognize achievements in unusual situations about which DOE needs to learn more before determining approval requirements for the Merit or Star program.

By approving an applicant for participation in DOE-VPP, DOE recognizes that the applicant exceeds the basic elements of ongoing, systematic protection of employees at the site. The symbols of this recognition provided by DOE are certificates of approval and the right to use flags showing the program in which the site is participating. The participant may also choose to use the DOE-VPP logo on letterhead or on award items for employee incentive programs.

This report summarizes the results from the evaluation of the Honeywell Federal Manufacturing & Technologies/New Mexico Operations during the period of December 5-9, 2011, and provides the Chief Health, Safety and Security Officer with the necessary information to make the final decision regarding its participation in DOE-VPP.

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## ABBREVIATIONS AND ACRONYMS

AFB	Air Force Base
BSAFE	Behavioral-Based Safety for Everyone
BLS	Bureau of Labor Statistics
CI	Continuous Improvement
DART	Days Away, Restricted, or Transferred
DOE	U.S. Department of Energy
ELMS	Electronic Learning Management System
ESS	Engagement Simulation System
FM&T	Federal Manufacturing and Technologies
HOS	Honeywell Operating System
HS&E	Health, Safety and Environmental
HSS	Office of Health, Safety and Security
JHA	Job Hazard Analysis
KCP	Kansas City Plant
NAICS	North American Industry Classification System
NM	New Mexico
OSHA	Occupational Safety and Health Administration
OST	Office of Secure Transportation
PHA	Preliminary Hazard Analysis
PID	Production Identification Document
PM	Preventive Maintenance
PPE	Personal Protective Equipment
SHINE	Safety and Housekeeping Implementation Needs Everyone
SNL	Sandia National Laboratories
Team	DOE Office of Health, Safety and Security VPP Team
TRC	Total Recordable Case
VPP	Voluntary Protection Program

## EXECUTIVE SUMMARY

Honeywell Federal Manufacturing and Technologies (FM&T) is a large nationally based company, which serves as a management and operating contractor for the Kansas City Plant (KCP), a major Department of Energy (DOE) facility in Kansas City, Missouri. A division of FM&T/KCP, FM&T/New Mexico (NM) supports the DOE/National Nuclear Security Administration in its mission to support the Office of Secure Transportation and various National Laboratories (Sandia National Laboratories, Lawrence Livermore National Laboratory, and Los Alamos National Laboratory) by designing; manufacturing; and procuring electronic, electromechanical, and mechanical equipment under a prime contract between Honeywell and DOE.

FM&T/NM submitted its application to the DOE Voluntary Protection Program (VPP) in September 2003. An initial certification onsite review of FM&T/NM was conducted from July 12-15, 2004. The review team concluded that the contractor did not fully meet the requirements for DOE-VPP Star status in the Management Leadership and Employee Involvement tenets. As such, FM&T/NM was granted Merit status. A subsequent review was conducted in December 2004 by the DOE/Kansas City Site Office. Based upon recommendation from that review, FM&T/NM was certified as a DOE-VPP Star site in April 2005 and recertified as a Star site in 2008.

Continuation of Star status in DOE-VPP requires an onsite review by the DOE Office of Health, Safety and Security VPP Team (Team) every 3 years. The Team conducted its review during December 5-9, 2011, to determine whether FM&T/NM was continuing to perform at a level deserving DOE-VPP Star recognition. The purpose of this report is to document the results of the Team's review and to provide the Chief Health, Safety and Security Officer with the necessary information to make the final decision about its status as a DOE-VPP participant.

Based upon discussions and interviews with more than 50 (approximately 30 percent) workers, supervisors, and managers, as well as extensive observation of work activities at facilities in Albuquerque and review of records, the Team determined that FM&T/NM has maintained an emphasis on safety excellence and achieved an exemplary degree of teamwork that puts safety ahead of production. Accordingly, and having observed firsthand that FM&T/NM continues to fully meet all the tenets of DOE-VPP, the Team recommends that FM&T/NM continue to participate in DOE-VPP at the Star level.

The standard for Star status is not perfection, but rather in addition to an excellent safety record, managers and workers are dedicated to and effectively pursuing continuous improvement and excellence in safety performance. Consistent with that goal, the Team identified a number of opportunities for improvement. These opportunities reflect those areas where FM&T/NM can further improve its performance (see Table 1). While no formal action plan is required to address those opportunities, FM&T/NM is expected to consider and specifically address them in its annual status reports.

**TABLE 1**  
**OPPORTUNITIES FOR IMPROVEMENT**

<b>Opportunity for Improvement</b>	<b>Page</b>
FM&T/NM should evaluate using Human Performance Improvement as a tool for safety improvements.	4
FM&T/NM should evaluate its Hazard Analysis Process to ensure a comprehensive hazard <i>analysis</i> is documented.	11
FM&T/NM should reevaluate the PID process to ensure critical hazard controls are included in the work instructions provided to the worker rather than relying on the expert-based process demonstrated during the review.	11
FM&T/NM should develop an improved firing platform for the Browning 50-caliber M2 machinegun to provide a stable firing platform and improved safety for test fire operations.	14
FM&T/NM should update the Hazard Survey to accurately reflect the site description and hazards associated with FM&T/NM facilities.	15

## I. INTRODUCTION

The Department of Energy (DOE) Voluntary Protection Program (VPP) onsite review of the Honeywell Federal Manufacturing and Technologies (FM&T)/New Mexico (NM) was conducted from December 5-9, 2011. A division of the Honeywell FM&T/Kansas City Plant (KCP), FM&T/NM is located on and near Kirtland Air Force Base (AFB) in Albuquerque, New Mexico. DOE direction to, and oversight of, FM&T/NM is provided by the DOE Kansas City Site Office.

The primary mission of FM&T/NM is to support the DOE/National Nuclear Security Administration in its mission to support the Office of Secure Transportation (OST) and various National Laboratories (Sandia National Laboratories (SNL), Lawrence Livermore National Laboratory, and Los Alamos National Laboratory) by designing; manufacturing; and procuring electronic, electromechanical, and mechanical equipment under a prime contract between Honeywell and DOE.

FM&T/NM performs work at several facilities in the Albuquerque area, either on, or adjacent to, Kirtland AFB. The NC-135 site on Kirtland AFB is used for small electrical/electronic shops, and administrative and office space. The Craddock Facilities (located off Kirtland AFB) are comprised of three separate buildings. Craddock A is a high bay facility recently reconfigured for OST trailer repair and refurbishment. Craddock B is currently undergoing upgrades and improvements supporting the trailer modification efforts. Craddock C is the relocated fabrication shop, which performs machining, sheet metal fabrication, and welding operations. The Air Park Facility is used for learning technologies development, including computer-based training and knowledge preservation work. Additionally, FM&T/NM supports OST at several small sites within, or near, SNL by repairing and preparing OST vehicles for use on the road; providing engineering and manufacturing support to OST to modify escort vehicles, tractors, trailers, and special vehicles; performing vehicle maintenance; providing training aids; and maintaining an armory of blank-firing weapons for Engagement Simulation Systems (ESS) training use.

Recertification in DOE-VPP requires an onsite review by the Office of Health, Safety and Security (HSS) VPP team (Team) to determine whether the contractor is still performing at a level deserving DOE-VPP recognition. The Team evaluated FM&T/NM safety programs against the provisions of DOE-VPP. During the site visit, the Team observed work activities, attended work planning and safety committee meetings, evaluated relevant safety documents and procedures, and conducted interviews to assess the strength and effectiveness of FM&T/NM health and safety programs.

The Team had contact with more than 50 (approximately 30 percent) associates, managers, and supervisors, either formally or during observation of field activities. The facilities that comprise FM&T/NM are generally low hazard with no radiological or bulk chemical activities. The principal hazards that exist at the facilities are common to general industry and include fire, electrical, production, development and nonproduction chemicals, explosives, and natural phenomena. Work observed included machining, fabrication, and vehicle/component assembly.

**II. INJURY INCIDENCE/LOST WORKDAYS CASE RATE**

<b>Table 2.1 Injury Incidence/Lost Workdays Case Rate (FM&amp;T/NM)</b>					
Calendar Year	Hours Worked	Total Recordable Cases (TRC)	TRC Rate	Days Away, Restricted, or Transferred (DART) Cases	DART Case Rate
2008	469,769	4	1.7	3	1.3
2009	425,242	4	1.9	1	0.5
2010	375,240	0	0	0	0
3-Year Average	1,270,251	2.6	1.2	1.3	0.6
Bureau of Labor Statistics (BLS-2010) average for NAICS* Code # 334412			2.3		1.2
<b>Table 2.2 Injury Incidence/Lost Workdays Case Rate (Subcontractor)</b>					
Calendar Year	Hours Worked	TRC	TRC Rate	DART Cases	DART Case Rate
2008	21,516	0	0.00	0	0.00
2009	19,844	0	0.00	0	0.00
2010	24,584	1	8.12	0	0.00
3-Year Average	65,944	0.3	2.7	0	0.00
Bureau of Labor Statistics (BLS-2010) average for NAICS Code # 334412			2.3		1.2

\* North American Industry Classification System

***TRC Incidence Rates, including subcontractors: 1.34***

***DART Case Rates, including subcontractors: 0.6***

**Conclusion**

A review of the accident and injury statistics over the past 3 years revealed that rates at FM&T/NM, including subcontractors, is approximately 40 percent below the industry average. FM&T/NM has not had a recordable case in the past 29 months. Based upon discussions with workers and managers, associates are not hesitant to report injuries, including first-aid events. FM&T/NM's accident and injury rates meet the expectations for a DOE-VPP Star participant.



### III. MANAGEMENT LEADERSHIP

Management leadership is a key element of obtaining and sustaining an effective safety culture. The contractor must demonstrate senior-level management 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: (1) clearly communicated policies and goals; (2) clear definition and appropriate assignment of responsibility and authority; (3) adequate resources; (4) accountability for both managers and workers; and (5) managers must be visible, accessible, and credible to employees.

After the 2008 VPP recertification review, FM&T began an initiative to realign all functions and business processes at FM&T/NM with FM&T/KCP to streamline processes and realize corporate organizational efficiencies. That initiative included organizational realignment with local managers reporting to a KCP manager. The realignment was successfully completed in 2009 with no issues identified. Over the past several years, Honeywell, the corporate parent of FM&T/NM, has been developing a framework for work management. Known as the Honeywell Operating System (HOS), this process stresses organizational readiness, baselining and planning, learning through observation, work process improvements, and pursuit of excellence. Key components of HOS are management visibility, accountability, management involvement, empowered resources, and communication. The corporate initiative and components integrate with the tenets of DOE-VPP extremely well. FM&T/NM began shifting to HOS in 2011. Further discussion on HOS integration and successes are described in the Employee Involvement section.

The Team observed a strong management commitment at FM&T/NM. This strong commitment to safety excellence and continuous improvement is evident throughout the organization from the Director and management team to the newest member of the workforce. The FM&T/NM workforce has been empowered by the management team to own the safety program, provide input for improvements, and to pursue excellence. Managers have committed the resources and act on employee input as a matter of priority. A strong incentive and award program, managed from FM&T/KCP, is in place that encourages participation at all levels. The commitment of FM&T/NM managers, coupled with HOS changes in corporate philosophy, are complementing each other to produce an exceptional working environment.

FM&T/NM is led by a Director who is ultimately responsible and accountable for creating safety and health programs that ensure compliance and promote excellence. As observed in the 2008 VPP recertification review, delegation of responsibility and accountability for safety and health protection is documented for each component of the organization in the Health, Safety and Environmental (HS&E) Management Plan. The HS&E Management Plan outlines general responsibilities for safety and health.

In 2008, the HS&E organization was responsible for establishing and maintaining HS&E programs that ensure compliance with DOE Orders and Federal, State, and local regulations. This arrangement is still in place today. The HS&E staff functions as the technical resource and

oversight group for safety and health. FM&T/NM health and safety program requirements are communicated to associates in the HS&E Process Descriptions and Work Instructions. These documents identify compliance requirements, work controls, and responsibilities for associates and managers to work safely and to effectively implement and maintain program requirements. Identified deficiencies or noncompliant safety and health items are assigned to the responsible organization for corrective action.

FM&T/NM managers allocate the resources necessary to operate and maintain viable safety and health programs. In addition to the staff assigned to the HS&E organization, additional expertise from FM&T/KCP and local contractors is available. FM&T/KCP safety professionals frequently visit FM&T/NM or coordinate via phone calls to assist with compliance, safety, or implementation issues. The FM&T/KCP accident review team reviews injury and illness evaluations with FM&T/NM's involvement. As the corporate parent for both FM&T/NM and FM&T/KCP, Honeywell is increasing the frequency of corporate audits. These corporate safety reviews provide subject matter experts to review focus areas and to elevate safety expectations from the corporate perspective.

In 2001, FM&T/NM implemented a behavior-based safety program called Behavioral-Based Safety for Everyone (BSAFE). Managers implemented this program because results of accident investigation and awareness campaigns, while effective, had not achieved desired results to drive down incident rates, which in 2001 were above industry average. BSAFE has become the core tool in FM&T/NM's efforts to proactively and continually improve safety performance. The Director of FM&T/NM is an active proponent of BSAFE. Not only does he encourage its use, he performs BSAFE observations. On numerous occasions subordinates have performed BSAFE observations of the Director. BSAFE has been a significant contributor to the overall improvement in incident rates since its inception. Incident rates are now well below industry average. Since the 2008 review, BSAFE has replaced the random observation process used previously with a work group focused approach. According to managers and employees, the realignment of BSAFE to work groups has improved the process and quality of observations.

From 2008 to 2009, there were several instances of injuries occurring during material movement. The Director championed a campaign to identify and address these types of injuries that led to a significant reduction in TRC rates in 2010. As part of that campaign, the Director initiated a safety standdown to reinforce employees' awareness of hazards in the workplace.

The workforce at FM&T/NM has reached the maturity level where additions to the safety toolbox could be considered. As such, FM&T should especially consider using Human Performance Improvement as the next major improvement initiative in safety.

<p><b>Opportunity for Improvement:</b> FM&amp;T/NM should evaluate using Human Performance Improvement as a tool for safety improvements.</p>
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## **Conclusion**

FM&T/NM managers continue to effectively support and lead the workforce in improving the safety culture. The management team leads by example and is directly involved with the safe operation of the facility on a daily basis. The HOS establishes a solid corporate framework, coupled with onsite and matrixed safety support, and provides FM&T/NM the resources to implement a solid safety program. Managers are clearly committed to the continuous improvement and excellence expected for DOE-VPP participation at the Star level.

#### 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 involvement is a major pillar of a strong safety culture. Employee participation is in addition to the right of an individual to notify appropriate managers of hazardous conditions and practices. Managers and employees must work together to establish an environment of trust where employees understand that their participation is crucial and welcome. Managers must be proactive in recognizing, encouraging, facilitating, and rewarding workers for their participation and contribution. Both employees and managers must communicate effectively and participate collaboratively in open forums to discuss continuing improvements to recognize and resolve issues and to learn from their experiences.

After the 2008 VPP review, FM&T/NM experienced a significant reduction in workscope, resulting in a subsequent reduction in the workforce. Many of the employees that were the heart of the safety culture that was established and allowed to flourish are no longer at FM&T/NM.

As discussed in the Management Leadership section, material movement injuries were occurring during the 2008 and 2009 timeframe. The reengagement of employees to focus on material movement hazards and revitalize employee ownership with management support contributed significantly to the successful injury rate improvements realized in 2010. FM&T/NM has emerged stronger as a result of that rebuilding effort. Coupled with the efforts to implement HOS, employees at FM&T/NM are building a very strong safety program that seeks excellence.

One of the cornerstones of the HOS effort is communication, particularly in three tiers of daily meetings. The Tier 1 meetings are held at the work locations. Tier 2 meetings include the section manager and the first line supervisors. Finally, Tier 3 meetings include the Director and section managers. The Team observed the Tier 1 and Tier 2 meetings during this assessment of FM&T/NM.

Every day before work starts in every work group location, the Tier 1 meeting addresses the following questions:

- Are there any safety/security issues, concerns, or messages that need to be communicated today?
- Are there any safety interventions to report?
- Are there any significant quality issues?
- Are there any potential misses to current delivery requirements?
- What is each operator's primary job assignment, what is the due date or expected output for the operations you are currently working on, and when will they be completed?
- Are there any issues preventing you from performing your job today?
- Is there any equipment going down in the next 7 days for planned maintenance that may impact production, and when will it be available for production?
- Are there any equipment problems that resulted in unplanned downtime? If so, what was the impact to production?

- Are there any new Continuous Improvement (CI) opportunities identified or change in status of open CIs?
- Is any help needed to close open CIs? and
- Are all cell metrics being reviewed at least once per week in the daily meeting?

The Tier 2 meeting also addresses the same questions. This process has significantly improved transfer of information up and down the management chain. There is active engagement by workers and managers during these daily meetings. If an issue cannot be addressed at one level, it is quickly elevated such that resources can be allocated and corrective actions implemented. Discussions with managers and associates indicate that this ability to communicate effectively has significantly reinforced the partnership between the workforce and managers.

The Team observed associates proactively involved in every aspect of the safety program. As in 2008, when asked who owns safety at FM&T/NM, employees still answered “we all do.” Associates interviewed by the Team indicated they are responsible for their own safety even though they are comfortable knowing their coworkers are looking out for their safety as well. All interviewed workers understand their right to stop work if they see an unsafe activity or simply need clarification on a process or procedure. They feel no fear of retribution and know that stop work is the management expectation if something does not appear safe.

The process observed in 2008 to recognize associates for safe behaviors and recommendations that improve safety in the workplace continues to effectively promote positive involvement by associates. A formal online recognition system is in place to acknowledge associates’ involvement in safety initiatives. Persons “doing the right thing” can be rewarded with special recognition awards or may be recognized through one of the various types of available media (newsletter, closed-circuit television, etc.). Salaried associates must be provided feedback concerning their compliance with, and commitment to, safety and health rules as part of the annual performance management process. Finally, all associates are eligible to receive any of a number of substantial awards under the FM&T/NM Organization Rewards and Recognition Program.

FM&T/NM associates are actively engaged in improving the safety program and work environments. The FM&T/NM VPP Steering Committee engages employees in safety contests to increase awareness. Examples include safety crossword puzzles with the theme of “Polish to Sustain” completed in October, and the new puzzle that ended on December 2, 2011 was a safety word search. Winners are presented small prizes at the Tier 1 meetings and entered into the grand prize drawing. The increase in the Associate’s participation is, according to the VPP Steering Committee chair, due to the grand prizes (tool kits and duffle bags) that would be presented to two quarterly winners in the forthcoming quarter.

Although the VPP Steering Committee is functioning very well, the charter has not been revised to reflect changes in how that committee functions. One of the changes in the new charter will be the elimination of the Occupational Safety Advocate concept, which is no longer used. The previous committee chairperson retired in July 2011, and the new chairperson is aware of, and committed to, updating the charter. The charter specifies that the committee will consist of

five FM&T/NM employees that will serve a term of 18 months or longer. Rotation of VPP members will be staggered beginning at 15 months and no more than half of the committee should rotate at one time. Discussions with the new chairperson indicate that for the foreseeable future the committee will continue to function along these guidelines.

In 2008, 100 percent of the employees at FM&T/NM participated in the BSAFE program, which for the time being is separate from VPP. All FM&T/NM employees interviewed by the Team still support the program. According to the BSAFE chairperson, from January 2011 to December 2011, there were approximately 700 BSAFE observations performed by approximately 170 employees at FM&T/NM. Associates are also actively involved in conducting workplace inspections with managers. This program, called Safety and Housekeeping Implementation Needs Everyone (SHINE), includes regular workplace walkdowns that, when coupled with HOS housekeeping values, has created workplaces that are clean, neat, and free of clutter. Equipment and material are stored in an easily retrievable system. All associates, managers, and supervisors have the opportunity to participate in BSAFE observations once they receive the required training and in SHINE walkdowns. Associates indicated that they are comfortable observing and being observed by their coworkers. This comfort level was also reinforced by the Director's comments to the Team.

In one example of employee involvement leading to improvement, some trailer refurbishment work required the exterior skin of the trailer to be removed and caulk sealant manually scraped from the skin edges. In the past, this has proven to be a time-consuming effort typically taking up to 4 1/2 hours to prepare each trailer skin. Based on a worker's suggestion, a new chemical stripper was evaluated for its effectiveness in reducing the time to remove the caulk. The chemical was effective at removing the silicone caulk and the work iteration was reduced from 4 1/2 hours to only 30 minutes as a result of the worker's suggestion. Based on interviews, the chemical was vetted for acceptance into the chemical management program. Personal Protective Equipment (PPE) requirements for the chemical were typical of other chemicals utilized (i.e., neoprene gloves, safety glasses with side shields, etc.).

Another Honeywell corporate initiative was to challenge divisions to demonstrate continuous improvement by cost reductions within those divisions each year. As part of an awareness campaign to recognize employees that submitted good ideas, a continuous improvement board was developed and installed in the fabrication shop. An improvement idea was posted on the board by the welders to improve the work process involved in welding the trailer metal skin to port attachments. The workers were concerned that welding the thicker material port to the thin trailer skin material was causing work delays due to the tendency of the thinner material to warp during the process. The welders worked with engineering support staff to develop a process that reduced warping and reduced overall worktime for the task. The resulting solution was a twopiece, specially designed template that when used during the welding process, absorbed and uniformly distributed the welding process heat, thereby reducing warps. This improvement directly reduced the time spent by workers "reworking the material" to correct for material warping; and as a result, made the work process safer and faster.

A variety of communication efforts are still used to support employee involvement. Examples of these efforts include posters, health/safety bulletins, e-mail notices, newsletters (Porcelain Press),

and distribution of safety theme calendars to all hands. Associates manage the Ask Wally Reporting System, a Web-based feedback program, which enables associates to voice concerns about safety and health issues. This complements the Near-Miss Reporting System, another online feedback system, which encourages associates to report behaviors or events that could have resulted in an injury. The Team reviewed both of these databases and noted that these are excellent tools, which are easy to use and continue to provide all associates near-realtime status updates.

## **Conclusion**

Safety is deeply rooted in FM&T/NM employees. Management and the corporate HOS philosophy have clearly empowered employees to take ownership of their workplace and provided them with opportunities to fully participate in its pursuit of safety excellence. Many practices, such as BSAFE, SHINE safety walkdowns, and KCP and HOS safety focus assessments, are promoting workplace safety. FM&T/NM meets the requirements of the Employee Involvement tenet of DOE-VPP at the Star level.

## 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 mitigating measures during work planning to anticipate and minimize the impact of such hazards.

The Team observed performance of work tasks and reviewed the processes that define the work scope and identify and analyze the hazards. At FM&T/NM, typical hazards are ergonomic hazards from repetitive manufacturing of electrical components, vehicle electrical hazards, machine shop and metal fabrication hazards, welding hazards, painting hazards, environmental hazards, and other standard industrial hazards. Most hazards are low-level, and there are limited, potential low-level radiological issues encountered by the workforce. As noted in the 2008 review, housekeeping throughout all of the facilities that were visited was outstanding.

FM&T/NM continues to use a documented process to evaluate new or significantly modified equipment, materials, and processes for potential hazards prior to use. A Preliminary Hazard Analysis (PHA) is performed when there is a physical change in work location for the performance of work or a major change in the work being performed in a particular location. A Beneficial Occupancy Inspection is performed by HS&E disciplines for HS&E concerns prior to releasing the facility to its new occupant. The HS&E organization performs a Hazardous Material Review before new chemicals are requested or introduced into FM&T/NM operated facilities. If new chemicals arrive at the facility prior to review, they are stored in a cabinet appropriate for that material until the review is performed and material released for use.

A Job Hazard Analysis (JHA) is documented for most work at FM&T/NM. The JHA document addresses job steps, hazards, and procedures/safety controls. JHAs reviewed in 2008 did not capture the logic linkage between the hazard and the controls. FM&T/NM did not make any changes to the JHA as a result of the 2008 review. Discussions with FM&T/NM during this current assessment led to a better understanding by FM&T/NM of the benefits of documenting the analysis, but the fundamental opportunity for improvement remains and the improvement opportunity below is retained.

In some cases, analysis of hazards has not addressed the full scope of potential exposures. For example, FM&T/NM uses a chain box spray booth at the Craddock location. This spray booth, a small enclosure used for painting small to medium sized components, was experiencing lower than expected airflow. The safety group contracted with their industrial hygiene vendor to evaluate the situation. Measurements were taken to ensure workers in the spray booth are not being exposed to volatile organic compounds or paint particulates, but FM&T/NM has not



evaluated the potential exposure to a worker who is colocated 5 feet from the entrance to the booth and is not wearing PPE.

**Opportunity for Improvement:** FM&T/NM should evaluate its Hazard Analysis Process to ensure a comprehensive hazard *analysis* is documented.

FM&T/NM uses the Production Identification Document (PID) as a work order document that defines the work to be performed, the hierarchy of approval highlighting concerns, and tracking employee use and costing. The PID for work involving lead at Craddock C did not include reference to the “chemical plans for carcinogens JHA” (which includes the controls for proper lead handling) or list the special controls for handling and disposal of the material in the environmental waste stream. Interviews demonstrated the workers were well informed by their supervisor and safety staff regarding how to conduct the work and properly dispose of the waste; however, this information was not formally captured in the work control process. The JHA for the chemical plan for carcinogens is a well-written document that captures analysis and control selection. It was the supervisor's expectation that the JHA for handling lead would have been specified in the PID. However, a review of four separate work packages involving the handling of, and working with lead, failed to include the JHA reference.

**Opportunity for Improvement:** FM&T/NM should reevaluate the PID process to ensure critical hazard controls are included in the work instructions provided to the worker rather than relying on the expert-based process demonstrated during the review.

Trend analysis is used to identify safety and health program deficiencies and to facilitate development of HS&E objectives. Trend analysis is conducted on available HS&E data, including first aid and Occupational Safety and Health Administration (OSHA) recordable injuries/illnesses and audit findings (noncompliance). FM&T/NM performs tracking and trending across a spectrum of areas in addition to TRC and DART case rates. The list below provides examples of its tracking and trending efforts:

- TRC and DART case rates;
- Near-miss reporting;
- Facility issues and improvements;
- Environmental issues;
- On-time corrective action closure;
- Self-assessment tool;
- Annual risk assessment;
- Environmental self-assessment program; and
- At-risk behaviors.

As identified in 2008, FM&T/NM personnel are required to immediately report occupational injuries/illnesses and/or property/vehicle damage incidents to their managers and HS&E. Accident investigations are still conducted and documented in accordance with the risk-based approach defined in the Accident Investigation Program in the Command Media procedure. The accident/incident investigation program establishes the requirements and methodology for the

investigation of near-miss incidents/HS&E concerns, first-aid injuries/illnesses, OSHA recordable injuries/illnesses, and property and vehicle damage incidents at FM&T/NM. All incidents that are OSHA recordable, or which might have some cause needing systemic correction, are reported to FM&T/KCP. All accidents/injuries and the required investigations are reviewed weekly by the Safety Process Steering Committee.

## **Conclusion**

FM&T/NM facilities contain a variety of hazards that are well understood by a mature workforce. The PHA process is applied and understood by the workers. Occupancy and hazardous material evaluations are being performed in accordance with documented process descriptions. Most of the workforce has been at FM&T/NM for some time and have acquired hazard knowledge through experience. By establishing an expectation to document the hazards analysis, FM&T/NM will improve the retention of corporate knowledge and provide a basis for training new employees on hazards and controls. FM&T/NM continues to improve and meets the requirements of the DOE-VPP Worksite Analysis tenet.

## 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, or PPE). Equipment maintenance 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. These rules and procedures must also be followed by everyone in the workplace to prevent, control the frequency of, and reduce the severity of, mishaps.

Where hazards cannot be eliminated, they are mitigated through the appropriate use of controls in a hierarchical approach: first, by elimination of the hazard if possible; then by engineered controls; and, finally, by using administrative controls and/or use of PPE.

Engineered controls are strongly evident in the Craddock facilities. FM&T/NM acquired two new facilities adjacent to the location of the previous Craddock facility. They are now designated Craddock A, B, and C. All the Craddock facilities have had their shops upgraded since the previous review to include new filtration ventilation systems. The vehicle paint booth, which was previously located on Kirtland AFB, has been relocated to Craddock A in support of the trailer refurbishment activities. The welding ventilation system that demonstrated several operational issues in the 2008 review has been removed and replaced. FM&T/NM has also adopted the 2008 review recommendation to require annual inspection tags be affixed to inspected ventilation equipment so workers can easily confirm the operational status of the equipment they are going to be using.

As part of its workscope, FM&T/NM supports multiple Federal Agencies with the design, maintenance, and modification of their ESS weapons. ESS weapons are specially modified weapons designed to fire only blank rounds for the purpose of training. ESS weapons are also specifically modified to ensure incompatibility with live ammunition rounds. FM&T/NM employs multiple controls in its ESS weapons that include: live round inhibitors, which are used to physically prevent live rounds from operating within the modified weapons; magazine blocks, which are ammunition magazines with custom notch cuts that prevent live rounds from seating properly in the magazines; and chamber porting, which provides for safe release of propellant gases in the event of a live-round activation within the weapon.

During the review, the Team observed the test firing of two ESS weapons performed by the FM&T/NM armorers. The test firing included the 50-caliber Barrett and the Browning 50-caliber M2 machinegun. During the test fires, notifications to Kirtland AFB, the Federal Aviation Administration, and FM&T/NM personnel were made. Ear plugs, in conjunction with ear muffs, were used throughout the testing. The Browning M2 machinegun is a recent acquisition to the FM&T/NM armory. One concern raised from the observation of the test firing was that the firing platform for the Browning M2 machinegun was inadequate. The table used to support the M2 and its tripod was unstable and required two people to hold the tripod while firing. FM&T/NM should work in conjunction with its fabrication shop to develop an appropriate stable firing platform for future test firing of this weapon. Discussions with the FM&T/NM armorers after the test firing demonstrated that an improved firing platform would be

beneficial. Several firing platform design options were discussed, and the Team is confident that a new firing platform could readily be designed by FM&T/NM.

**Opportunity for Improvement:** FM&T/NM should develop an improved firing platform for the Browning 50-caliber M2 machinegun to provide a stable firing platform and improved safety for test fire operations.

Administrative controls are also evident and effective within the Craddock facilities. Team observations of the three Craddock facilities identified improved postings and an effective use of communication tools, such as centrally located performance metric charts, BSAFE and VPP activities updates, issues boards, and continuous improvement ideas boards. The various communication boards are routinely updated so that anyone accessing the facility is immediately apprised of the current status of any of those functions.

The Team reviewed several work control documents (work instructions) for trailer refurbishment activities. The work instructions included step-by-step instructions with quality assurance signatures required and specific hazards or controls specified in warning boxes within the work instructions at the point the control is necessary. If special torqueing or calibration is required, the equipment used for that step is identified by its equipment tag and documented in the work instruction. Worker input to improve the work steps in the work instructions has been active (see discussion in Employee Involvement section) and supported by managers.

Managers in Craddock C and HS&E personnel are in the process of developing preuse checklists that will be posted on all machines located in the fabrication shop. The preuse checklists will ensure operators have the specific controls for proper preuse inspection of the machines visible at the machines prior to beginning operations rather than relying on the worker's recollection of JHA-specified requirements for safe operation of the equipment.

The FM&T/NM preventive maintenance (PM) program continues to use a computerized maintenance management system, *Maximo*, for tracking preventive and corrective maintenance. Low-level PM activities are handled by FM&T/NM. Higher-level or specialized PM activities are performed by subcontracted vendors. In some cases, individual departments may be managing their PM program through subcontracts with vendors, and those preventive maintenance actions are not tracked or maintained in the *Maximo* system. At the time of the review, no deficiencies in this area were identified, but the potential exists for the subcontracted vendor-performed PM actions to be missed without a formal tracking system. FM&T/NM should evaluate and confirm, on a periodic basis, that the individual departments responsible for conducting their own PM through subcontracts are satisfying those PM requirements.

The maintenance organizations have a strong communication link with the safety group and have no problems initiating safety pauses if potential hazards are identified. For example, a water leak in one of the facility bathrooms required a partial demolition before repairs could be performed. The FM&T/NM maintenance group consulted the Allied Signal asbestos characterization report, which was performed in December 1996. The report was created by Allied Signal to analyze and locate any asbestos containing materials in the NC-135 area. The report identified that the

tiles in that location did include asbestos material. Based on that information, the maintenance group worked with the HS&E organization to establish appropriate controls for handling and disposal of the asbestos-containing material.

The HS&E organization provides an emergency management program consistent with the hazard level of the facility. The program was developed based upon the results of the FM&T/NM Hazard Survey, which was last updated in December 2009. The Hazard Survey is an examination of the features, processes, and characteristics of the facilities to identify potential emergency events and conditions, and their potential impacts. Due to the addition of Craddock B and C and its increased role in refurbishing the OST trailer systems, the 2009 FM&T Hazard Survey needs to be updated to analyze and ensure the emergency preparedness program adequately envelopes any potential new emergency preparedness concerns related to those facilities.

**Opportunity for Improvement:** FM&T/NM should update the Hazard Survey to accurately reflect the site description and hazards associated with the FM&T/NM facilities.

FM&T/NM conducts emergency management and evacuation training for new associates with an annual refresher. The focus of the training is a review of the emergency management program, emergency evacuation procedures, and associates' responsibilities during an emergency. FM&T/NM conducts evacuation drills to reinforce emergency management/evacuation training and identify areas for improvement and documents lessons learned from all drills.

FM&T/NM contracts with a local care provider, Concentra, for services to evaluate and treat occupational injuries and illnesses, conduct initial and recurring medical surveillance and monitoring, and provide preventative and wellness programs to help associates achieve and maintain the best possible general state of health.

In addition to the Occupational Medicine program, FM&T/NM provides its employees with a wellness program sponsored by the Honeywell corporate. Honeywell's Health Resources program is a comprehensive suite of healthcare decision support tools and resources available to FM&T/NM employees. Health Resources is a packaged wellness program provided through the care provider, Care Allies. The foundation of the wellness program is in the availability of professional health advocates who describe the healthcare options and best practices for wellness to the FM&T/NM employees.

Recently, Honeywell corporate expanded its health resource program to take a more direct approach to wellness and preventive healthcare to improve employees' quality of life. Employees are offered a \$250 reduction in the medical plan contributions by participating in a health assessment. The health assessment includes two parts: a health screening to obtain information, such as blood pressure, cholesterol, height and weight; and an online questionnaire. Based on the results of individual health assessments, professional health advocates will contact FM&T/NM employees and recommend specific short- and long-term ways to improve their health and well-being. Employee involvement and participation in the wellness program and the health assessment is purely voluntary.

## **Conclusion**

Hazards at FM&T/NM are well controlled. FM&T/NM employs an appropriate range of engineered controls, administrative controls, and PPE to minimize its workers' exposure to hazards. Workers clearly demonstrated an ability to conduct work safely and had an effective awareness of hazards. FM&T/NM meets the expectations of a Star participant in Hazard Prevention and Control.

## VII. SAFETY AND HEALTH TRAINING

Managers, supervisors, and employees must know and understand the policies, rules, and procedures established to prevent exposure to hazards. Training for health and safety must ensure that responsibilities are understood, personnel recognize hazards they may encounter, and they are capable of acting in accordance with managers' expectations and approved procedures.

FM&T/NM provides a variety of training opportunities for its associates. HS&E training continues to be delivered through several different formats, including formal classroom and computer-based instruction, as well as informal means (i.e., on-the-job training, safety shares, newsletters, such as the *Porcelain Press*), and required and suggested videos and safety meetings.

Managers and associates receive training commensurate to their level of responsibility. Training is provided onsite by HS&E staff or by subcontracted trainers. HS&E training is driven by programmatic requirements, such as regulations, DOE Orders, and corporate initiatives. Orientation training for new associates is extensive and includes all general HS&E training that is necessary for the individual to safely perform his/her job assignment. On-the-job training concerning risks specific to the job takes place at the departmental level. This training is performed prior to the associate being exposed to a specific hazard. Before associates are transferred to new assignments with different training requirements, they must receive the pertinent training prior to assuming their new responsibilities. The new line manager is responsible for ensuring training requirements are met.

Training requirements for each associate have been identified and documented in the organization-wide database, the Electronic Learning Management System (ELMS). Course attendance is also documented in ELMS. This is done both manually by designated training representatives, who administer the training database, and automatically when associates log on to online computer-based training. The database can be accessed for checking course enrollment, viewing training records, identifying training requirements, and running training reports. The ELMS database allows managers to check if required training has been completed. The Team discussed the current training resources and processes with FM&T/NM training specialists and managers. At the completion of this review, the Team verified that FM&T/NM had a 98 percent training completion rate for its associates.

FM&T/NM managers share the responsibility with their associates to understand the potential hazards related to an activity and how to mitigate those hazards. Qualification and training requirements are established for each manager and documented in the ELMS database. Managers receive much of the same HS&E training as do the associates. If there is a recognized need for training that goes beyond the boundaries of the course for associates, managers receive an expanded version of the course. Managers become familiar with the specific hazards of a job by being directly involved in the planning of tasks and work instructions, by assisting in the development and updates of JHAs, and by performing departmental self-assessments.

One of the key training responsibilities for managers is ensuring that their direct reports are thoroughly familiar with the applicable sections of the Emergency Plan. This includes, but is not

limited to, knowledge concerning emergency notifications, evacuation and inside sheltering routes, and the telephone numbers to call for reporting of emergency situations.

## **Conclusion**

The Team found that safety and health training continues to be effective at FM&T/NM. Workers are very proud of their worksite and indicated that the HS&E training, as well as the genuine commitment of all associates at FM&T/NM to improve safety performance has made a positive impact on their safety at work, at home, and in the community. FM&T/NM meets the DOE-VPP requirements of the Safety and Health Training tenet for participation at the Star level.



## **VIII. CONCLUSIONS**

FM&T/NM managers effectively support and lead the workforce in improving the safety culture, and are clearly committed to the continuous improvement and excellence in safety and health. Employee involvement in the safety and health program is embraced by the workforce. The workforce is mature and actively engaged in keeping its fellow workers safe. FM&T/NM clearly demonstrated its commitment to worker safety with the use of engineered controls in the shop areas. A well-established training and qualification program ensures workers are appropriately trained to recognize hazards and protect themselves and coworkers

The Team recommends that FM&T/NM continue to participate in DOE-VPP at the Star level.

**APPENDIX A****Onsite VPP Assessment Team Roster****Management**

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