Burns & McDonnell - Facility Engineering Services, LLC
National Security Campus
Kansas City, Missouri
Voluntary Protection Program Assessment
September 14-17, 2015

Background

Burns & McDonnell - Facility Engineering Services, LLC (FES), is a subsidiary of Burns & McDonnell Engineering Company. FES is physically located in the National Security Campus with Honeywell Federal Manufacturing & Technologies, LLC (Honeywell FM&T) and the National Nuclear Security Administration's (NNSA) Kansas City Field Office (KCFO). There are approximately 20 FES employees with about 10 personnel from Burns & McDonnell Engineering that support FES. FES supports the old Bannister Complex with 3-4 staff, with the remainder working at the National Security Campus. FES entered the Department of Energy's (DOE) Voluntary Protection Program (VPP) in 2006, and was recertified as a Star participant in 2008 and in 2012.

FES provides utility system management, engineering/design support and construction oversight to Honeywell FM&T plant management operations. FES employees perform their primary job functions in offices; however, there are times when they may be required to enter the plant and evaluate plant areas. Potential hazards for FES employees include physical hazards common to general industry, fires, electrical shocks, exposure to chemicals, and natural phenomena. Additionally, FES employees are not part of a collective bargaining organization.

Honeywell FM&T assembles and manufactures components for National defense systems, primarily nonnuclear components for the NNSA's nuclear weapons program. Operations directly involving radioactive materials or explosives normally associated with nuclear weapons do not occur at the National Security Campus nor does Honeywell FM&T store any special nuclear material.

After the 2012 recertification, FES supported Honeywell FM&T's relocation from the Bannister Complex to the new National Security Campus. That relocation effort began in January 2013 and finished in July 2014.

A review of the past 3 years did not identify any external reviews of FES (DOE Oversight/ Defense Nuclear Facilities Safety Board (DNFSB), etc.)). The Office of Environment, Health, Safety and Security (AU) DOE-VPP Team (Team) did not identify any Occurrence Reports related to FES since 2011. FES has not had a recordable injury in the past 11 years and has not had a lost workday case in 13 years. In 2013, FES received a Legacy of Stars award for outstanding injury prevention, outreach, and mentoring.

Continued participation in DOE-VPP requires a triennial onsite review by the Office of Worker Safety and Health Assistance (AU-12) to verify the safety programs, evaluate the participants' improvements from the last certification, and assure that FES continues to meet DOE-VPP requirements as specified in the DOE-VPP Manual. Because of the small size of FES, the Team consisted of two AU-12 personnel who interviewed all FES personnel, assessed FES project

work areas, and evaluated FES work control processes from September 14-17, 2015. This report documents the results of that review, and provides the Associate Under Secretary for Environment, Health, Safety and Security with the Team's recommendation for FES to continue participation in DOE-VPP at the Star level.

Results

In the 2012 assessment, the Team determined that FES was implementing a sound and effective worker safety and health program. Employees, supervisors, and managers had formed a relationship built on trust, communication, and professional respect in their support to Honeywell FM&T. Managers actively encouraged employees to participate in the safety initiatives, submit improvement ideas, and be vigilant for safety improvements. FES employees repeatedly demonstrated their concern for safety by submitting safety ideas. FES employees assisted Honeywell FM&T with hazard analysis and control selection on a daily basis. Safety training for all personnel was appropriate, and ensured they were prepared to recognize and control the hazards they faced in daily activities.

A similar corporate culture exists in 2015, with managers closely engaged with the small workforce. The move from the Bannister Complex to the new National Security Campus completed in July 2014, has significantly helped FES managers increase their visibility. FES is located in a block of cubicles within the National Security Campus. This proximity and open office area promotes face-to-face communication between employees and managers, and gives employees the opportunity to speak directly to the small management team.

In addition to the move, FES initiated GEMBA (derived from the Japanese term for real workplace) walks as a means of more effectively engaging employees. The GEMBA walk is a concept originated by Toyota Motor Corporation and adopted by lean management systems, and is simply the act of a manager going to the workplace to understand the processes and issues experienced by workers, and identify wasteful activities. FES has adopted the term "GEMBA walks" for its regular worksite inspections. A team consisting of managers and VPP steering committee members performs monthly walks with the responsible project manager or utility system engineer, and reports any identified issues. In July and August 2014, FES performed a series of ergonomic assessments on all FES workstations as GEMBA walks. These walk around inspections are a good means to identify issues, but FES should revisit the use of the term GEMBA. In order to achieve the full benefit of the GEMBA approach, FES should ensure it trains managers and employees alike in the expectations for a true GEMBA walk, and refocus the GEMBA walks on understanding the work at the worksite, not simply as another worksite inspection opportunity.

Opportunity for Improvement: FES should ensure it trains managers and employees alike in the expectations for a true GEMBA walk, and refocus the GEMBA walks on understanding the work at the worksite, not simply as another worksite inspection opportunity.

Because FES is a small company deeply integrated into the Honeywell FM&T system, it was not uncommon for managers and workers alike to refer to the collective "we" during discussion with the Team. FES uses Honeywell FM&T systems to plan and manage work by subcontractors. FES works very closely with Honeywell FM&T personnel to determine project requirements,

budgets, schedules, and perform oversight of construction subcontractors. This integrated organization promotes effective communication and ownership, but it also makes it difficult for FES to maintain a separate corporate identity. FES does conduct corporate activities, such as promotional activities and recognition drawings. FES workers and managers display a strong sense of ownership for all activities in which they are involved, and FES has its own reward and recognition processes. For example, FES expects workers to perform and document "Safety Interventions." These interventions document an observation of a safety issue or condition that the worker identified. The documentation may be an e-mail or other written communication. FES conducts regular monthly drawings for prizes (such as auto safety kits, flashlights, tools, and weather stations) from submitted safety interventions.

After the 2012 assessment, the FES VPP lead left the company, and FES recognized that it had become dependent on a single person for managing its VPP efforts. At that point, FES solicited for volunteers to refresh the VPP steering committee, and regain momentum for the FES safety program. Half (12) of the FES staff volunteered to serve on the committee. The committee consists of eight volunteers. Two management champions support the committee.

Since early 2015, the committee has focused heavily on meeting the expectations for recertification. It has established a series of monthly safety topics focused on specific safety topics, such as fire safety, driving safety, and heat stress. FES provides monthly safety topics to all personnel via e-mail along with relevant discussions. Safety posters within the FES area reinforce the monthly topics. FES should consider expanding these safety topics. Expanded topics could include more theoretical approaches to safety, such as behavioral elements of safety, human performance improvement, and safety culture principles. These topics should include specific activities personnel can engage in to reinforce the subject matter. FES can also link these activities to reward and recognition programs, providing a small token or reward to workers completing the activity. Such a process would improve worker familiarity with the topic (learn by doing), and provide more effective retention of the information.

Opportunity for Improvement: FES should consider expanding safety topics to include more theoretical approaches to safety, such as behavioral elements of safety, human performance improvement, safety culture principles, or other such topics, and include specific activities for workers that reinforce the safety subject matter.

FES relies on the VPP steering committee to perform its annual self-assessment. FES provides this report to DOE annually, and typically focuses on FES accomplishments through the calendar year. The report identifies safety and health goals for the coming year, but these goals are not specific, and often focus on "maintaining" rather than improving. In order to support a posture of continuous improvement, FES should become more self-critical in its annual assessment, and focus on specific, measurable, achievable, relevant, time-framed (SMART) goals. FES should use those goals as a means of identifying leading indicators of safety issues and drive further improvement.

Opportunity for Improvement: FES should become more self-critical in its annual assessment, focus on SMART goals, and use those goals to develop leading indicators of safety issues and drive further improvement.

Because FES is such a small company, the Team interviewed all employees and managers during the assessment. During those interviews, all the employees identified the importance of safety in the workplace. Most employees identified examples where the safety emphasis at work led them to modify personal behaviors at home. All the employees felt empowered and comfortable to raise safety issues, stop work, and report injuries. Most employees gave examples of safety interventions they had performed in the past year. Employees can be involved in multiple safety activities, from participating on the VPP Steering Committee or one of several subcommittees, conducting safety interventions, presenting safety focus topics, or observing subcontractor construction activities. In addition to the FES VPP Steering committee, FES also has a representative on the Honeywell FM&T's "Safety 4 All" committee.

FES personnel often described the safety intervention process to identify and correct unsafe activities or conditions. However, none of the FES personnel identified using a safety intervention to recognize or reward safe activities or improved conditions. FES should consider revising its safety interventions to include an element that recognizes and rewards positive behaviors and conditions. Other DOE-VPP sites have demonstrated that this practice encourages safety communication between workers, and increases participation in safety observation efforts.

Opportunity for Improvement: FES should consider revising its safety interventions to include an element that recognizes and rewards positive behaviors and conditions.

Many FES personnel are engaged in activities related to construction project management. In that role, FES personnel observe subcontractor personnel, and have the opportunity to intervene and prevent unsafe practices. To better prepare FES personnel to perform these duties, FES should consider sponsoring its construction managers to pursue the Board of Certified Safety Professionals' Safety Trained Supervisor for Construction (STSC) certification. The STSC is intended for construction supervisors, managers, superintendents, forepersons, crew chiefs, and craftspeople who have responsibilities to maintain safe conditions and practices on construction job sites. These individuals may not have safety as a primary duty, but their knowledge of safety standards and practices ensure safer worksites. This program would help FES construction managers better understand the standards and requirements for construction safety, and apply those standards and requirements during the course of their normal duties.

Opportunity for Improvement: FES should consider sponsoring its construction managers to pursue the Board of Certified Safety Professionals' STSC certification.

As part of transferring workers from the old Bannister complex to the new National Security Campus, FES performed ergonomic evaluations of all FES workstations. A safety and health professional from Burns & McDonnell (FES' parent company) conducted the evaluations by observing workers for a period of time. The evaluator made recommendations to the employee based on those observations and in some cases recommended additional or different equipment for the workstations. FES continues to perform ergonomic evaluations for new employees. FES currently plans to perform ergonomic reviews every 2 years. As a means of preventing the workstations from drifting away from the optimal setup, FES should consider posting a picture and checklist of the preferred setup at each workstation. This would mirror a Honeywell

FM&T's practice at the National Security Campus, where Honeywell FM&T posts a picture of conference rooms or offices at the exit of the space with a headline "Return to Standard."

FES provided a presentation to the Team on electrical arc-flash hazards and how it is controlling potential exposure to electrical arc-flash hazards. Early on during the move process to the National Security Campus, FES recognized that in some cases, the as-built configuration of the plant electrical system did not match the design drawings. This was particularly evident in fuses installed for equipment power supplies. The design drawings called for a specific type of fast blowing fuse that would limit the arc-flash potential. As-built conditions did not have the correct fuse, increasing the potential arc-flash hazard and negating the labeled arc-flash hazard on installed equipment. As a result, for any electrical construction work, FES is now checking the as-built condition, recalculating the arc-flash potential of equipment, and posting new arc-flash labels. FES is updating the drawings for the electrical system, and establishing configuration control for those systems. This project will take several years before all the equipment will have the new arc-flash labels with the correct arc-flash data. Until then, the subcommittee requires workers to wear Category 2 personal protective equipment (PPE) for work inside the arc-flash boundary of any unreviewed equipment.

Although FES is aware of the electrical configuration issues, and recognizes that arc-flash labels in the National Security Campus may not be accurate, FES presented an example work control document to the Team. Although the example was for a work package in the Bannister facility, subject matter experts continue to include in the control section the statement "read the arc-flash labels" for work in the National Security Campus. Rather than telling the workers to identify the arc-flash hazard and control at the time of work, FES should ensure the electrical subject matter expert (SME) or engineer walk-down the work area during the work planning process, determine if the arc-flash label is correct, and then specify the controls in the work documents. This would prevent an otherwise knowledgeable worker from making an erroneous determination of the arc-flash protection requirements.

Opportunity for Improvement: FES should ensure the electrical subject matter expert (SME) or engineer walkdown the work area, determine if the arc-flash label is correct, and then specify the controls in the work documents.

In the industrial areas, FES contributes to the Honeywell FM&T's "Management of Change" process. This process evaluates how new projects, or changes to existing operations, may impact existing operations or conditions. These may include changes to: chemicals, equipment, processes, new business, work for others, or facilities. A preliminary hazard analysis (PHA) tool identifies the potential effect of the change to the safety and health of workers, or the impact to the environment, and involves the Honeywell FM&T's health, safety and environment (HS&E) staff. HS&E Process Description (PD) 5.12, *Enterprise Content Management,* describes the use of the PHA. FES SMEs contribute to the PHA hazard analysis and control selection for fire safety and exhaust ventilation. For example, an FES fire protection engineer evaluated dust generated from a plastic model pulverizing unit used to declassify plastic parts prior to disposal before installing the unit in the National Security Campus. The engineer determined the dust could present an explosion hazard, and identified additional fire suppression systems for the process equipment. FES also supports management of exhaust ventilation systems from process equipment. The National Security Campus design includes a manifold exhaust ventilation

system that requires careful management and balancing to ensure appropriate exhaust flows from all protected areas. FES analyzes the materials listed on the PHA and the associated processes, and works with Honeywell FM&T's industrial hygienists to determine the appropriate exhaust ventilation flows. Additional controls include automatic shut-off switches on equipment if there is inadequate exhaust. FES helps Honeywell FM&T ensure the "Management of Change" and PHA provide a reliable process to identify hazards and establish controls.

During employee interviews, most employees identified their personal injury threshold below which they saw no value in reporting (such as minor cuts, bruises, etc.). Individuals have personal definitions of minor and major injuries. They did not recognize that minor injuries and close calls are opportunities to correct a hazardous situation before a serious injury occurs. By encouraging workers to freely report all injuries, FES is more likely to identify and mitigate previously unrecognized hazards. To encourage reporting of all injuries, FES should work with employees to help employees understand the value of reporting all minor injuries or close calls.

Opportunity for Improvement: FES should work with employees to help employees understand the value of reporting all minor injuries or close calls.

FES employees have access to a variety of health and wellness improvement programs. FES employees can participate in the Burns & McDonnell Healthyroads® wellness incentive program. By completing a biometric screening, a personal health assessment, and several activities from a list, workers can receive a $60 discount on monthly medical insurance. An additional $20 insurance discount is available for nontobacco users. Workers can use the Burns & McDonnell Health Center to receive acute/urgent care, annual physicals, allergy shots, and many other medical services. Honeywell FM&T and Burns & McDonnell both maintain fitness centers that FES employees can use. These centers offer a variety of equipment and exercise classes. FES does not keep track of the number of workers taking advantage of these programs, but should consider this number as a potential leading safety indicator.

Training for FES employees emphasizes safety programs and provides knowledge to FES workers as they develop work control documents and review the work of contractors and subcontractors. FES workers may receive training in many safety related subjects including: Occupational Safety and Health Administration's (OSHA) 10-hour general industry training, OSHA two-hour refresher training every 5 years, confined space, fall protection, Hazardous Waste Operations and Emergency Response (HAZWOPER), PPE, chemical training, and others. In 2015, the training monitor started tracking all FES training on a spreadsheet to capture the training status.

Additional training occurs at the Burns & McDonnell world headquarters facility. The Burns & McDonnell facility has a confined space mockup trainer to provide practical, hands-on training. Although the Team was not able to visit the mockup, FES stated the facility is a welcomed resource.

During interviews, most workers acknowledged they were not familiar with Integrated Safety Management (ISM), but were familiar with the process of defining the scope of work, analyzing hazards, developing controls, performing the work, and providing feedback and improvement. FES procedures do not reference the ISM guiding principles or core functions, and the relationship between ISM and VPP. FES should consider including training on ISM in

connection with its safety program and help workers better understand the underpinnings of an effective safety and health management system.

Opportunity for Improvement: FES should consider including training on ISM in connection with its safety program and help workers better understand the underpinnings of an effective safety and health management system.

Conclusions

FES is a small, tightly knit organization that is integrated into the National Security Campus. It strives to ensure Honeywell FM&T can safely and effectively perform work, and prevent unnecessary risks within the National Security Campus. Although the FES VPP effort had stalled after the 2012 assessment, FES recognized the issue and revitalized its VPP steering committee. FES has a long history of working safely, and routinely encourages its workforce to observe and intervene in potentially unsafe acts or conditions. FES has several opportunities to stretch its safety efforts beyond just looking for unsafe acts or conditions, and reenergize its pursuit of safety excellence. The Team recommends that FES continue to participate in DOE-VPP as a Star participant.

Table 1
INJURY INCIDENCE/LOST WORKDAYS CASE RATE

Table 1.1 Injury Incidence/Lost Workdays Case Rate (FES)					
Calendar Year	Hours Worked	Total Recordable Case (TRC)	TRC Rate	Days Away, Restricted or Transferred (DART) Cases	DART Case Rate
2011	81,221	0	0	0	0
2012	87,724	0	0	0	0
2013	110,326	0	0	0	0
2014	81,633	0	0	0	0
Last 3-Year Total	279,683	0	0	0	0
Bureau of Labor Statistics (BLS-2013) average for NAICS* Code # 54133 (Engineering Services)			0.7		0.3

*North American Industry Classification System

TRC Rate, including subcontractors: 0
DART case rate, including subcontractors: 0