

Cambridge Center for Behavioral Studies Safety Accreditation Site Visit Report

To:

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working at:

**Marathon Petroleum Co. LLC
Illinois Refining Division
Robinson, IL**



From:

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Cambridge Center for Behavioral Studies Safety Accreditation Site Visit Report

Site: BRAND ENERGY SERVICES at
Marathon Petroleum Company, Illinois Refining Division
100 Marathon Avenue
Robinson, IL 62454

Date of Visit: August 20-24, 2012

Reviewers: Mark Alavosius, PhD (Chairperson of Team) & Tim Ludwig, PhD
Commission on Behavioral Safety, Cambridge Center for Behavioral
Studies

Overview: The Marathon Petroleum Company, Illinois Refining Division, (hereafter IRD) uses a behavioral safety process as part of a comprehensive safety program at the Robinson IL refinery. The Marathon IRD workforce initiated this process in 1996 and it has earned accreditation and re-accreditation by the CCBS since 2005. The IRD program also extends to multiple contractors who have adopted the PBBS process with their workforces operating in the refinery. During the week of 8/20/12-8/24/12 the CCBS review team examined ten (10) PBBS processes within the IRD. These included the Marathon refinery PBBS system and its extension into nine (9) contractors. **The BRAND ENERGY SERVICES accreditation review was included in this comprehensive site review.**

An important feature of the IRD PBBS process is shared elements of the system used by all parties: all participating units seeking CCBS accreditation during this review use a similar observation card, all observers are encouraged to make observations on any workers within the refinery (not just employees in their business unit), and all data stream to a central data base allowing examination of interlocking elements of the IRD workforce and contractors. The CCBS review team interviewed managers and workers from all ten units applying for accreditation (Marathon IRD & one contractor applied for re-accreditation) and critically assessed the elements of the PBBS system and its coordination during five (5) days on site. The review team scheduled focused interviews with managers of each unit's PBBS team and randomly selected workers to assess implementation of the PBBS system. The CCBS team examined outcomes achieved by each unit applying for accreditation as presented in their application to the CCBS. In many cases additional analyses were generated during the site review and these are added to the applications. Since all unit's behavioral observation data are streamed through a central data-base, Tim Meier, CAP Coordinator (CAP = Contractor Advisory Panel) was present during portions of all the interviews to query the data-base and provide reports as requested by the CCBS reviewers. These queries often revealed how the various contractors and Marathon IRD personnel observed each other within the refinery operations. Thus input on each company seeking accreditation was gathered both during the focused interviews of each applicant's personnel and in the review of other applicant's observation data.

It is noteworthy that our program reviews revealed the operation of the PBBS CAP (contractor advisory panel) that coordinates the PBBS program elements across 19 contractors (nine of which applied for CCBS accreditation during this review). This system appears essential for the continued development of the contractor workforce.

Schedule of Events

Date/Time	Item	Location
8/20/2012 6:00am-7:00	Kick-Off: The IRD PBBS Leadership Team: Refinery GM, PBBS CAP Coordinator, Managers/Leaders from all Sites	Training Building Main Conference rm
7:00am-Noon	Marathon IRD PBBS system. Interview PBBS Coordinator (Dan Dix) & randomly selected workers	Training Building Conference room
Noon -4:30	Lytle Electric Co PBBS system. Interview PBBS Coordinator (Eric Biernbaum) & randomly selected workers	Training Building Conference Room
8/21/2012 7:00am-Noon	SENCO Construction Co PBBS system. Interview Resa Shaner & Chad Brown, co-owners, Curt Reimer, Safety Superintendent & randomly selected workers	Training Building Conference Room
Noon-4:30	Freitag-Weinhardt, Inc. PBBS system. Interview John Marts & Paul Maxwell, randomly selected workers	Training Building Conference Room
8/22/12 7:00am – 11am	Stewart Security Patrol, Inc. PBBS system. Interview Owners, Debbie Parker, PBBS coordinator, visit security video surveillance center & observe personnel	Training Building Conference Room; site visit to video surveillance post
11:00am-2pm	Gribbins Insulation Co. PBBS system. Interview Trevor Atherton, PBBS Coordinator and randomly selected workers	Training Building Conference Room
2pm-4:30pm	Bay Industrial Safety Services PBBS System. Interview Monica Piper, BBS Coordinator, XXXX Office Manager, and randomly selected workers	Training Building Conference Room
8/23/12 7am - noon	White Construction, Inc. PBBS system. Interview Nick Martin, PBBS coordinator and randomly selected workers	Training Building Conference Room
Noon-4pm	Brand Energy & Infrastructure Services, Inc. PBBS system. Interview Aaron Ikemire, PBBS Coordinator and randomly selected workers	Training Building Conference Room
8/24/2012 7:00am -noon	SDR Coatings, Co. PBBS program. Interview Tanner Holt and randomly selected workers	Training Building Conference Room
1:00-2:30	Closing Meeting: The MPC IRD Leadership Team. GM, ES Mgr., Managers/Leaders from all Sites.	IRD Admin Building Main conference room

Summary

BRAND ENERGY SERVICES at Marathon Petroleum Company, Illinois Refinery Division Accreditation Report

The CCBS review team reviewed on-site operations to validate data and confirm that program descriptions as reported in the application are accurate. We find that the BES program operates as described. Further, the program meets the 3 basic criteria of the Commission on Behavioral Applications for PBBS Accreditation: 1) it is a behavioral program, 2) the PBBS program has had a visible impact on safety performance, and 3) the program has produced sustained positive performance over 3 or more years.

History: In 2005 the Marathon IRD earned accreditation from the CCBS for their PBBS process. One of the CCBS recommendations from that accreditation was to involve the contractor workforce in PBBS at the refinery. IRD invited their contractor community to participate in their process. Brand Scaffold Rental & Erection, at the time now Brand Energy Services (BES), accepted the IRD's invitation and began adopting their PBBS process.

In April of 2006 the IRD started a steering committee made up of one representative from each company, interested in committing to the PBBS process, currently working at the IRD. BES responded along with ten other companies by signing a written commitment to the IRD's process. In the agreement BES agreed to continue to receive PBBS training at the IRD's expense for the first year, then take on half of the cost the second year, and finally train their own employees at the expense of BES by the end of the third year. From the eleven contract companies a steering committee was formed. The committee was called the Contractor Advisory Panel (CAP) and was made up of one IRD employee and one representative from each contract company. BES, wanting the process to remain employee driven, chose a journeyman carpenter to represent the company and serve on the panel.

Once the CAP representative was in place BES then formed its own PBBS steering committee. The committee would be chaired by the CAP representative and consist of the site superintendent, the general foreman, one foreman, one carpenter, and the site safety representative. The responsibilities of the committee are as follows:

- Listen to and address the concerns of the work force
- Gauge the interest as well as the involvement of BES employees
- Gather and track the data collected through the observation process
- Analyze said data using it to prevent future accidents

Committee responsibilities are not limited to the above mentioned tasks. The structure of the steering committee has changed as well. The committee is now comprised of the BBS Facilitator and eight hourly employees who have been voted onto the committee by their peers.

Evidence observed during the 2012 accreditation visit indicates that Brand Energy Services is executing the procedures described in their application for accreditation. Outcome data are extensive, verifiable and current and indicate a safety process that has resulted in sustained control of at risk behaviors and a low rate of incidents. The management systems (e.g., data collection, data entry, analysis, reporting) and training are responsive to the safety needs of the workforce and evidence of employee input into the system is abundant. The PBBS process is part of a comprehensive safety program that manages the safety of refinery employees and integrates well with the operations by other contractor workforces in the Robinson refinery. We did not examine Brand Energy Services' operations on other job sites external to the 900 acre refinery site as this accreditation application extends only to their work at the IRD refinery.

The refinery is a large installation and employees work across the environment. BES erects and dismantles scaffolds used to maintain, construct and service the refinery. Their scaffolds are used by many other personnel and extend throughout the operational areas. Thus the BES workers may encounter numerous hazards and engage in numerous at risk behaviors in a far-ranging operation. They identify their top injury potentials as

- Falls
- Falling objects

- Material handling exposures
- Pinch points
- Chemical contact
- and exposures to weather conditions

In addition to Aaron Ikemire, we spoke with several workers about the PBBS system to gauge its reach. The following were notable:

- Their employees engage in extensive manual labor and the work requires physical fitness, agility and team-work in a rapidly changing work environment.
- Workers are familiar with the PBBS system of observation and feedback and how it is implemented.
- Employee recruitment and training systems appear adequate to sustain worker participation in the PBBS system as turnover occurs within the workforce.
- The PBBS operations by BES employees and other contractors and their safety systems are coordinated in an effective manner via CAP.
 - Clear communications among the managers of Marathon's IRD safety program and contractors are evident as they share data and refinements during formal (BBS CAP meetings) and informal channels.
- Workers have used the PBBS process to identify hazards and arrange solutions:
 - Tattered nomex, for example, was replaced via this PBBS problem-solving
 - A written 'best-practices' statement was created to define decision-making when adverse weather reduced scaffold safety.

The PBBS program is well supported by management systems and integrated with routine operations. They have a working and coordinated effort to sustain critical safety practices across their workforce with the capacity to scale in response to fluctuations in the size of their workforce. At the time of this review, 84 workers were onsite; at times this expands to 250 workers. They have a sound observation system which tracks important behaviors, they complete observations, timely feedback is delivered to those observed, they seem to emphasize positive communications and use of reinforcement to increase sharing information, at-risk behaviors are identified and actions taken to identify barriers to safety, safe behaviors are reinforced, the data are entered in a timely way into an excellent data-base, and they generate useful and timely reports.

The incidence rates of critical safety events indicate an effective safety system that demonstrates sustained effectiveness (see their application for extensive data illustrating results). Since 2006 they report 1 recordable injury (in 2011 a worker's chin was lacerated). This was their first recordable in more than 1,300,000 work hours. Their OSHA recordable rate is significantly below the BLS data for general industry.

Strengths:

- BES employees use a well-established behavioral observation protocol to monitor safety practices. With this they provide feedback to one another to maintain safety and correct at-risk variability. Observations focus on important risks in the

refinery environment. Evidence shows that observations are conducted by personnel on the ground. This delays feedback but feedback meetings are being conducted during breaks when circumstances are safer. Employees report that at-risk behaviors are addressed more immediately when observed. There are specific measurable goals for employee participation and data are current revealing how collect observations. Employees interviewed were knowledgeable of the observation cards.

- Every Friday BES commits 2 steering team members to walk around and observe workers throughout the facility. These observations are often made on other contractors. BES are particularly expert at fall protection and these observations likely aid others' to adhere to safety at height.
- Observation data are examined systematically and feedback loops distribute reports to key audiences for these data.
- Employees interviewed were well versed in how to do the process. Evidence of integration with other safety management systems was apparent. Training in the process is ongoing and extensive. Participation in the observation process is tracked and efforts are made to increase participation and improve the quality of observations. We saw no evidence of incentives used in a way that might suppress reporting.
- According to statements in interviews, employees offer suggestions for improvements and control of hazards during feedback interactions (e.g, seeking new Nomex, seeking a written protocol for stopping work in adverse conditions). These are communicated to supervisors and management for corrective action. Examination of the comments on observation forms confirmed this.
- The observation data are entered in an excellent data-base for tracking progress. Data are entered in a timely fashion enabling rapid analysis and reporting.
- Aaron Ikemire is the current PBBS manager for BES employees. He is fluent with procedures, reports, and the PBBS technology. It was evident Aaron is a visible and attentive manager and enjoys the support of employees and management.
- There are considerations to integrate the PBBS system with Process Safety. Erecting scaffolds presents a vantage point of the refinery (scaffolds go up and down, 6 feet, 1 inch at a time) and the BES work crew might detect signals of process variation. This topic (PBBS – PSM integration) was addressed by numerous contractors during assessment of their systems.

Concern:

LIFE CRITICAL SAFETY RULES

- Life Critical Safety Rules were instituted 2 years ago from a corporate initiative and focus on behaviors that could result in a fatality. If there is a violation then employee must stop employee and get supervisor. The justice system then gets put into place and the employee may be disciplined. Supervisors can be disciplined for not following up.

While this policy is adopted in many companies and is well intentioned, it represents a threat to BBS that relies on coaching and positive reinforcement to change behavior. We were pleased to learn that BBS observations were considered an exemption to the policy. When employees doing a BBS observation see a LCSR violated they must stop it and correct it. If the employee doesn't change then the BBS process stops and a supervisor is retrieved. Employees are told/trained that BBS cannot be used to hide behind violations and it doesn't happen very often. Fall protection is most likely to be a violation and that seems to be an education issue where BBS helps. Fall protection is crucial in scaffold work as much work is at height. All BBS personnel are exempt from LCSR actions. However, other safety officers, who are often also the BBS safety coordinators, are put in a dual role with the responsibility to enforce LCSRs while at the same time promoting BBS. Supervisors and managers also do BBS observations and, therefore, are also put in this dual role. This represents a threat to the trust that employees put in BBS.

- During the Shaw project several workers (not BES) were viewed engaging in at-risk practices and the safety observer elected to define this as a 'life-critical' event and initiated disciplinary action. The event (working at height without adequate fall protection) was generally seen by workers as an at-risk behavior that could have been addressed via the PBBS system. In other words, the workers could have been apprised of their behavior and coached to use fall protection. This constructive feedback was not provided via a PBBS observation; rather disciplinary action ensued which is reported to have reduced use of the PBBS observation system. Implementation data from some contractors confirm a decrease in observations concomitant with this event. The incident suggests that the critical aspects of the PBBS system (observation & feedback) are susceptible to interference from safety policies implemented during special projects that overlap PBBS operations.

INCENTIVES

- Large contractor projects (e.g., the recent Shaw project) may provide incentives to employees for meeting task deadlines. Employees working onsite on other projects are not included. The potential exists that this uneven contingency may lead to morale problems within contractors as some workers do similar work but not under similar bonus conditions. This can undermine behavioral observations across work teams performing on separate projects.

LOW OBSERVATION RATE OF 'AT-RISK' BEHAVIOR

- Analysis of the BBS data shows that the majority of items on the card are rated as safe in any given time frame. This suggests that the BBS program is losing its ability to identify areas of risk from its observation card. Safe behaviors are the only ones listed. Identifying safe behaviors are good because they give workers opportunities to reinforce their peers. This reinforcement then leads to greater prevalence of safe behaviors. However, the lack of at-risk behaviors coming out of the BBS program is a concern.

Future Challenges:

- On the observation cards, one barrier is listed as "personal choice" under "causes" on the checklist. This label is frequently used to attribute cause to the at-risk behavior. However, such a label may be too easy to choose as a cause and does not help identify environmental changes that should occur to reduce the at-risk behaviors (e.g., decreasing response costs, peer pressure, or confusing procedures).
- Economic challenges appear mounting to threaten sustaining PBBS operation as pay cuts are rumored to be coming to the contractors and this may undermine commitment to the PBBS operations.
- Brand has an incentive program with a drawing for prizes to increase observations by workers. Workers observing must therefore identify themselves on the observation cards. There is a concern about putting the observers name on the card because if the person observes an at-risk act and the observed individual gets hurt doing that at-risk act... then it is possible that the observer can be held liable for the injury because it is assumed that the observer didn't do enough to correct the behavior. The incentive programs may be putting some individuals in uncomfortable situations.

Recommendations:

- The PBBS program is a properly designed, well-run behavior-based safety system. Impressive improvements in safety behavior and corresponding decrease in injuries and illnesses are noted in comparison to pre-PBBS data. **It is highly recommended that the current operations be supported so that they continue. The contractor PBBS processes including BES are integrated with the Marathon Petroleum Company IRD safety program and these linkages should continue.**
 - **Provide BES and other contractors access to the Marathon intranet system so that video streams and data access are available to contractor safety teams.**
- **Design for employee leadership of safety teams (e.g., Area Safety Coordinators) by having them routinely summarize and report PBBS observations and comments from their work team at tool-box meetings or other on-the-job meetings.** This will further emphasize and reinforce employee ownership of the program and will help generate higher quality (more detail &

constructive suggestions) during implementation of the PBBS process. We recommend Aaron transfer more PBBS oversight functions to his team members.

- **Consider fading incentives for conducting observations.** Incentives might apply to other behaviors like recommending safety improvements/innovations during which disclosing the identity of the contributor is harmless.
- **Alterations to the Contractor PBBS systems (new target behaviors, extension to craft work) should be done in consultation with the BBS CAP team so that integration does not complicate existent behavioral data systems at the refinery.** Contractor employees can and do provide valuable input to the Marathon safety program and contribute in important ways to sustaining the safety of the entire Marathon IRD workforce. They serve as a source of innovation improving the current system.
- **Review the PBBS card and drop the behaviors that consistently remain above 99% safe.** Alternatively, the behavioral categories may be fine-tuned to identify risks better. New cards and brief training will increase the use of the card (less “memorization”) and may indeed increase at-risk behavior identification. Task-specific cards could be used for hazardous work that would benefit from more targeted observations. It may be wise, however, to revisit the full card during turnarounds when transient and new employees may need coaching in these behaviors.
- The BES PBBS observations may offer an additional organized method to detect variation in the refinery related to process safety management (PSM). Their eyes are on various features of the refinery especially during turnarounds. **We recommend consideration of adding a section to the PBBS SHORT SHOT form for employees to record any unusual variations (etc. leaks, spills, corrosion, vibration, etc.) as a way to collect such observations.** We temper this recommendation with the advice that this be done in collaboration of the BBS CAP team and the engineers responsible for PSM as the logistics for collecting and analyzing such data may complicate existent systems.
- **Drop “Personal Choice” as a barrier on the observation form. Adopt an ABC Analysis Root Cause Analysis methodology to apply to the review of high at-risk behaviors in an attempt to go beyond “awareness” solutions toward more permanent environmental solutions.** . With ‘personal choice’ being noted so frequently (~ 60% of barriers are listed as this), the BBS program is missing out on the opportunity to identify the real root causes of the at-risk behaviors within the work process, environment, supervisory methods, tool/equipment availability, or other stimuli and consequences.
 - For example, parking vehicles and materials at a distance from a construction site requires workers to manually haul scaffolds and gear to the site and increases risk for exertion injuries. Barriers to this include arranging permissions to drive vehicles closer (e.g., sniffing the air, vehicle inspections, etc.). The behavior of carrying extra

distances can be as a function of administrative barriers and not 'personal choice'. Noting the functional barriers might prompt action (like the Adverse Weather Best Practice) to alleviate real barriers.

- **Reduce the tendency for workers to blame themselves for at-risk behavior.** Nearly every person interviewed during our review of all 10 PBBS programs described at-risk behavior as "wrong". This, along with the Personal Choice barrier can create an unintended "blame the worker" mindset. This may make the workers hesitant to list risk on their cards. Training should emphasize that *behavior is neutral* and there is no "wrong". Instead, the worker is concerned for the other worker enough to point out the risk.
- BBS operations are challenging to develop, implement, and manage. The BES team and the PBBS CAP group impressed us with their expertise, enthusiasm, and effectiveness. **We recommend that Brand Energy Services extend their PBBS system to their other operations outside the refinery as the program is clearly effective in improving safety practices.** The many effective elements of the PBBS process provide a well-tested and working foundation for this extension.

Conclusion:

It was a pleasure to view the performance of the Brand Energy Services team. This group impressed us with their enthusiastic adoption of the PBBS system (personnel outside of BES also noted this). Our observations confirm that the BES system is effectively managing critical behavior by refinery workers and contractors and helping sustain the outstanding safety record at this refinery. The site visit indicates that they are indeed running an effective PBBS process and developing it carefully. Our recommendation to the CCBS is for accreditation of the Brand Energy Services PBBS program in Robinson, IL. This recommendation was (approved unanimously on September XXXXX). The Cambridge Center for Behavioral Studies accredits the BES PBBS program at the Marathon IRD refinery in Robinson, IL for three years (September 2012 – October 2015)

Respectfully Submitted,

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