

## Cambridge Center for Behavior Studies Safety Accreditation Site Visit Report

Site: Marathon Petroleum Company LLC  
Illinois Refinery Division  
100 Marathon Avenue  
Robinson, IL 62454

Date of Visit: November 7, 2008 (8am – 4:30pm)

Auditor: Mark Alavosius, Ph.D.

### Schedule of Events:

8:00 am - 11:30 am	Audit programs, review statistics, view training materials field observations,
11:30 am - 12:30 pm	Working lunch (on-site) with two BBSCAP contractors
12:30 pm - 1:30 pm	Audit programs, statistics, field observations, etc.
1:30 pm - 2:30 pm	Private meeting with John Swearingen
2:30 pm - 3:15 pm	Gather ideas for close-out meeting
3:15 pm - 4:30 pm	Close-out meeting

### Summary:

IRD Marathon has an impressive BBS program. The evidence that I saw indicates that they are executing the procedures described in their re-application. The enthusiasm of Tim Meier, Mike Bachelor, Von Meeks, Gail Sandiford, Kathleen Isom, and others for the program is readily seen. I toured the refinery and spent some time looking at their management procedures for the BBS process. The refinery is a blend of new and older technologies & has some design features that are inherently dangerous given the combination of new and antiquated equipment. Their BBS process is well supported by management systems and integrated with routine operations. I met with some of the sub-contractors who are actively engaged with the Marathon system. All in all...it looks like a coherent and coordinated effort. They have a good observation system, they take lots of observations, the data are entered in a timely way into an excellent Access data-base, and they generate useful and timely reports.

### Strengths:

- Employees and contractors use a behavioral observation protocol to monitor safety practices. With this they provide feedback to maintain safety and correct at-risk variability. Observations focus on important risks.
- The BBS process is well designed and managed. Evidence of integration with other management systems was apparent.

- The contractors share the BBS system with Marathon Oil personnel which is a laudable accomplishment.
- During feedback interactions, observed employees offer suggestions for improvements and control of hazards. These suggestions are communicated to supervisors and managers for corrective action. This feedback loop was evident during my visit.
- The observation data are entered in an excellent data-base for tracking progress. Data seemed to be entered in a timely fashion enabling rapid analysis and reporting.
- The BBS managers for employees and contractors coordinate their efforts and share data. Both were fluent with procedures, reports, and the technology. It was evident that they enjoy the cooperation of employees and management.
- The BBS managers were able to quickly locate requested documents, data, training materials and other materials. It is evident that they are maintaining close contact with their data and personnel.
- The safety (BBS) oversight procedures seem planned and routine such that follow-up actions are coordinated within and across work units.
- There is a variety of promotional items (caps, t-shirts, logos, etc.) that promote the BBS process and appear to be effective in maintaining enthusiasm for the program.
- Small incentives (cash for gasoline) are awarded to employees who complete prescribed numbers of observations. This appears to be a positive and appropriate use of reinforcements to maintain the integrity of the system. Incentives were not used in a way that might suppress reporting of injuries or hazards.
- They are video-taping various operations and these are used to assist in hazard identification. This appeared to be a particularly effective method for assessing behaviors that put people at risk.
- I met with John Swearingen, General Manager of the facility. He impressed me as genuinely committed to running a safe operation. Our discussion was about the recent fatality, their response, and future directions. It appears the death occurred when an employee continued to work in a pit as his warning alarm sounded. People who responded did so appropriately and adhered with safety procedures. The person who died was a relatively new employee. Swearingen was troubled that a worker would ignore a warning signal and remain in a dangerous area. Our discussion was about factors that might lead to this level of risk-taking, and the training challenges that this event signals. The investigation and follow-up to this incident, including lone-worker observations, appears to have been thorough and appropriate.

## Future Challenges:

- The average age of their workers is 45. Succession planning is a growing issue for them. Somehow they will need to capture the wisdom of the current workers and transfer that to the next generation who will be younger. Written manuals and SOP's may be insufficient for conveying all the critical information and procedures.
- On a related issue, their BBS observation checklist has rather general response definitions. I questioned the utility of that and they expressed that others have commented similarly. I think the current observation format works for them because their workers are experienced and the brief response definitions work as short-hand for more elaborate behavioral definitions. They will need to bolster the training materials supporting the BBS observations as newer workers enter the refinery who lack a history with their installation.
- The physical plant is on 900 acres and includes both older and newer equipment and facilities. Some parts of the installation exhibit poor ergonomic design and workers must fit to awkward situations to accomplish work tasks. This is being corrected when possible but hazardous configurations of valves, lighting, ladders, etc. will likely remain until extensive re-engineering is done.
- John Swearingen asked about how to better integrate the BBS system across levels of the organization (bringing more supervisors and managers into the process). The continued engagement of the entire workforce in the program will come up against the resistance of some who still decline participation in the BBS observation system.
- Economic challenges appear mounting to threaten sustaining the BBS operation as profits are very thin (or absent) in the gasoline refining industry. Options for more cost-efficient ways to run their BBS program are perhaps on the horizon. Given I spent only one-day on-site I don't have the data to suggest how to trim operations without losing effectiveness. It seems a weakening economy and tougher days are ahead, and they may have to curtail some operations or offset costs.

## Recommendations:

- The Marathon Petroleum Company IRD BBS program appears to be a properly designed, well-run behavior-based safety system. It has produced impressive improvements in safety behavior and corresponding decrease in injuries and illnesses. It is highly recommended that the current operations be supported so that they continue.
- Options for systematizing the process across levels of the organization should be further examined. One possibility would be to elaborate the current use of safety incentives (gas cards for completing observations) by interlocking the requirement of individuals conducting a quota of observations with their work unit's completion of needed oversight activities. For example, a given worker would earn the gas card if:
  - He/she completed the set number of observations (peer or self) **and**

- The work unit supervisor conducted shift meetings to review data and coordinate hazard control, re-training, etc.

Pending budget, the incentive system could be widened to include higher levels of the organization in the over-sight process. This would effectively create communication across levels of the organization that promotes integration of BBS functions. Incentive systems are best used as a short-term mechanism to promote 'buy-in' and establish behaviors. Fading them is recommended and the inter-locking system proposed here is one way to gradually taper the use of financial incentives by broadening the behavioral requirements for awards.

- The BBS observation checklist is somewhat general in terms of behavioral detail for targeted at-risk behaviors. This seems to work well with the current, experienced work force. Addition of new workers might require more elaborate behavioral definitions to help them learn the subtle aspects of refinery operations.
  - The video-taping of operations will add media to their training program to help convey the nuances of running the place and the quirks of the older equipment that is not so user-friendly. This seems a wise investment for future training needs.
- BBS operations are challenging to develop, implement, and manage. The IRD team impressed me with their expertise, enthusiasm, and effectiveness. I'd recommend exploring ways to offset the costs of the Robinson refinery BBS process by transferring their BBS technology to other Marathon refineries (as was done with the IRD sub-contractors). I'd seek cost sharing from the other sites. In essence this BBS team could be a real asset to a cooperative of Marathon refineries. This group is good and other refineries would find them to be both effective and affordable sources of proven technologies (relative to other options in the market-place).

Conclusion:

It was a pleasure to tour this facility and view the performance of this team. My impression was that people were open to showing all of what they do. The sample of what I saw suggests that they are indeed running an effective BBS process. My recommendation to the CCBS is for re-accreditation of the Marathon Petroleum Company IRD BBS program.

Respectfully Submitted,

Mark Alavosius, Ph.D.  
Trustee  
Cambridge Center for Behavioral Studies  
11/20/08