

Case Study: Koch Refining uses Total Safety Culture Principles to Improve Safety

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Background

Koch Petroleum Group in Pine Bend, Minnesota has experienced significant safety improvements since the Fall of 1997 after implementing their behavior-based safety process. Pine Bend has 750 full-time employees, with 385 union employees represented by PACE International.

Total Safety Culture

Achieving safety excellence requires going beyond the traditional safety focus of engineering and regulation. Because human behavior is a contributing cause to most incidents and injuries, safety excellence can only be achieved by addressing the human dimensions of safety. Reducing at-risk behavior and increasing safe behavior requires understanding how such behaviors are motivated by system and cultural influences. Developing and sustaining a supportive safety culture hinges on understanding and applying the principles of behavioral science and person-based psychology to build tools and methods which encourage personal responsibility and interpersonal interaction about safety. We call this actively caring and it is an integral part of a Total Safety Culture.

In a Total Safety Culture, employees not only feel responsible for their own safety, they feel responsible for their peers' safety, and the organizational culture supports them acting on that responsibility. Individuals have the necessary tools and methods, as well as appropriate person states (e.g., self-esteem, group belonging, personal control) to actively care for the safety of co-workers. Additionally, the organization's formal management systems and leaders' informal management practices facilitate actively caring by encouraging, recognizing, and reinforcing appropriate behaviors. So, achieving a Total Safety Culture involves the development and implementation of a behavior-based observation and feedback process, the assessment and refinement of existing safety management systems, and the improvement of management and employee practices influencing the safety culture.

Behavior-Based Safety (BBS) Observation and Feedback

To achieve a Total Safety Culture, where employees feel as strong a sense of responsibility for the safety of their coworkers as they do for themselves, it is necessary to increase the openness and frequency of safety communication. A critical observation checklist encourages interpersonal behavioral observation and feedback, which improves this communication. The checklist has categories of relevant safety behaviors with corresponding columns to mark behaviors as either safe or at risk. The checklist also has a Comments Section to provide specific information about an observation. Employees provide one-on-one feedback regarding the safe and at-risk behaviors observed. To ensure anonymity, the observee's name is never recorded.

At Koch, these cards are filled out by hourly employees and put into a collection box. They are collected by union members.

The feedback which follows the observation provides positive social support for doing a task safely even when at-risk alternatives are easier, faster, and more convenient. Information about at-risk behaviors is given to avoid potential injury. The data from the observation cards are collected, compiled, and then shared with the employees as group feedback. This provides specific information and enables the DO IT process to improve safety performance.

The **DO IT** process involves four sequential steps: a) **D**efine relevant target behaviors to increase or decrease in frequency, b) **O**bserve target behaviors during a baseline phase and set specific goals for achievement, c) **I**ntervene to improve the target behaviors, and d) **T**est the impact of the intervention by continuing to observe the target behaviors. If the desired results are not achieved, other interventions are implemented. When improvement goals are met, other target behaviors are selected for improvement.

Pine Bend's BBS Process

The behavior-based safety effort at Koch Pine Bend is lead by Marv Foss, the Health and Safety Representative. In 1997, the BBS implementation team designed the behavior observation checklist (Figure 1). Koch employees were then introduced to the voluntary, non-punitive nature of BBS through 8-hour training classes. Every month, the BBS team analyzes the data from the observation forms, documents trends in at-risk behaviors, and communicates the results to the remaining workforce.

The focus of the BBS at Pine Bend is on pro-active, process measures of safety. Small incentives ranging from free meals to gift certificates are provided for employees conducting: behavior observations, safety audits, safe work permit audits, pre-work checklists, near-miss investigations, and safety meetings.

BBS Success

Mr. Foss points out, "The important part is lowering the number of at-risk behaviors and conditions we have in our refinery. By using the observation process along with all of the other pro-active tools we have introduced to everyone, we are doing just that." In fact, the number of behavior observations increased from 6,000 in 1998 to 19,000 in 1999. There were also 5,000 safety audits, 700 incident analyses, and 22,000 "What-if" safety meetings in 1999.

Since BBS implementation, the number of injuries dropped from 27 to 15, and TRIR rates dipped from 3.4 to 1.7. Koch Pine Bend received three safety awards at the National Petrochemical Refinery Association conference last April for a million man hours without a lost time (currently at 2.4 million man hours), a calendar year without a lost

time (currently at 514 days), and a 25% improvement in their recordable rate compared to the last three years.

While improvement efforts continue and some obstacles remain, BBS implementation has greatly helped Koch Pine Bend improve their safety efforts and reduce injuries.