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Creating a Safety Culture in a High Reliability Organization

J. Greg Meyer, CSP
Deputy General Manager
B&W Pantex
Amarillo, Texas

Introduction

High reliability organizations (HROs) have a unique safety challenge. They develop into HROs as they establish reputations for continued delivery of their product in a safe and secure manner. They frequently work in a "high consequence, low probability" environment. After years of operations without serious accidents or injuries, companies can begin to feel that "it can't happen to them," employees can become complacent, safety programs can become stale.

This paper will discuss how to create a safety culture that is tailored to meet the special challenges of HROs. Many safety professionals have been faced with implementing get-well programs, upgrading poor safety programs and then working to keep the successful programs functioning well. The challenge here is to make an excellent safety program even better and the way to do that is to transform the safety program into a safety culture!

The Basics

Chances are that companies functioning as HROs already have good safety programs. (It is possible to have good safety results without a good safety program!) This section is focused on the basic concepts that an organization must have in order to achieve safety excellence.

Core Values

Many companies claim that safety is their top priority. In fact, they should make a stronger statement. Priorities can change – the focus on safety never should. Accordingly, I think companies should refer to safety as one of their core values; a basic foundation of the organization and one that remains constant. Here are the core values I promote:

- We will perform all work safely and compliantly.
- We will protect our workers, the public, and the environment.

Principles

There are basic principles of operation and execution that implement those core values;

- Safety is a line management responsibility. That message needs to come from the front office and be consistent throughout the entire management team. All workers are responsible for their own safety, but management is responsible for the safe performance of all work.
- Field presence – as discussed earlier, managers need to be out and about to see first hand what is going on. The workers want to see managers in the field – it validates that their work is important. The managers need to get feedback from the employees; it won't happen if the manager remains in the office waiting for the information to flow up.
- Build safety and compliance in up front. Don't try to add it after the fact. Safety and compliance should be part of the design or job planning process. Employees should participate in the job hazard analysis and the development of controls.
- Field ESHQ resources are enablers, not policemen. Safety professionals should be in the field assisting teams in performing work. Nobody needs the safety person to stop the job until the team completes the right permit; the safety professional should be engaged up front to identify the required permit and assist in its preparation and approval.
- All injuries are preventable. If top managers don't believe this philosophy, no one else will. There is a constant debate with human performance subscribers that know that humans make mistakes. The key point is that with training and preparation, with qualified work supervisors, with solid procedures and controls, those human errors don't need to translate into injuries. There are many organizations that perform at the zero injury level; your company should be one of them.
- Workforce needs to be engaged. Employees need to feel ownership of the safety program. This is what makes VPP so powerful. Nobody knows the work better than the people performing the work. Nobody knows the hazards better than the people performing the work. Why would you create a safety program that didn't include this critical piece? You can engage the workers through many mechanisms: safety meetings, pre-job briefs, lessons learned, joint safety walkdowns, etc.

Management Expectations

Management needs to set clear expectations to all employees when it comes to safety. As a minimum, the expectations should include the following topics:

- Zero injuries.
- Line management is responsible and accountable.
- "Safe and compliant" applies to all work, regardless of who performs it (i.e., Subcontractors).
- Prepare for the unknown. Stop work and re-analyze hazards when conditions change.

Workforce Expectations

Management is not the only group that has expectations; so do the workers. They need to be equally clear in expressing these expectations and managers need to be aware of them and consider them in everything from work assignments to policy making to job preparation. These workforce expectations might include:

- Employees and subcontractors expect to work in a safe and secure environment.
- Employees expect to actively participate in ensuring their own safety.

- Employees feel empowered to raise safety concerns without fear of retribution.

Here is where the employee engagement piece is so beneficial. If your workforce is empowered to actively contribute, these expectations will manifest themselves in normal business practices. Earlier, I covered how operating principals invoke the core values. Listed below are key steps that should be taken and safety culture tools than can be used to implement the safety culture.

Key Steps

- Set expectations that are described above.
- Communicate. Communicate. Communicate. You cannot over-communicate when it comes to safety. Many workers will not hear the message the first time; many will forget the message over time. Constant reinforcement is required.
- Demonstrate commitment. This also serves to reinforce the message. Managers have to "walk the talk." They need to be visible in the workplace. They need to understand the conditions the employees work in and judge for themselves if improvement is needed. Managers need to provide support to the work teams; provide them with the right tools for the job, improve working conditions if necessary, listen to worker feedback for improvements.
- Build trust. This is what employee engagement is all about. This last step is more of a state of achievement rather than an overt act. All the actions covered so far are designed to achieve this final outcome. This trust is very fragile; a single action can destroy the trust; that action could be a bad decision, an improper action, a careless comment. Unintentional consequences of well-intentioned actions can be problematic. Employee councils that participate in formulation and review of policies can help prevent surprises in this area.

Safety Culture Tools

- Stop Work Authority and Safety Timeout – Any employee should have the authority to stop work if he/she thinks it is unsafe to continue. Many employees are uncomfortable with exercising Stop Work authority; on the other hand, most do not have a problem with taking a safety timeout to clarify a safety question before resuming work. The difference is the presumption that work will promptly resume after the timeout. This takes the sting out of stopping work, keeping both the worker and the supervisor happier.
- First-line supervisors, especially Safety Trained Supervisors – Experience has shown that having dedicated supervisors on jobs reduces injury rates. They have the ability to look ahead, see problems coming and deal with them before they are big issues. Safety Trained Supervisors are more effective due to their training and certification. The supervisors are not as effective if they supervise many jobs or if they are working foremen.
- Leading indicators – Everybody tracks the typical lagging indicators such as TRC Rates, LTC rates, etc. They are beneficial to compare historical performance and to help demonstrate that *performance* is changing. Leading indicators, while more difficult to develop, will help alert management that *conditions* are changing and safety performance could be affected.
- Recognition, positive reinforcement – It doesn't need to be a formal ceremony, in fact, many workers don't like that; but all workers like to be noticed and appreciated. A quick comment, pat on the back or a thank you for a job well done makes a big difference to anybody. Significant safety achievements by the organization should be recognized in an

announcement, a ceremony or a celebration. This does two things, thanks the workforce for working safely and builds pride in the organization.

High Reliability Organizations

Many people might be wondering how you define an HRO? What does a company have to do to earn that classification? In fact, there is no single definition and there is no checklist to complete that suddenly qualifies a company to be an HRO. Simply put, an HRO is an organization that operates in a demanding environment and does so with an impressive safety performance record. Some believe that organizations that are extremely complex (almost to the point of being unmanageable) yet continue to function well have to be HROs. They have a *culture of reliability*.[1] Many HROs are comprised of teams that work at a sustained high level of performance; those teams frequently succeed because of an increased reliability in individual performance. HROS have certain characteristics: preoccupation with failures rather than successes; reluctance to simplify interpretations; sensitivity to operations; commitment to resilience and deference to expertise.[2] HROs do not accept that accidents are inevitable. For these types of organizations, a different type of safety culture is required.

High Reliability Theory

- Accidents preventable by organizational design and management
- Safety is <u>the</u> priority
- Redundancy enhances prevention
- Decentralized approach gives prompt and flexible response
- "Culture of reliability" encourages uniform and appropriate responses at field level
- Continuous ops and training can maintain high reliability
- Learning from accidents can be effective, and can be supplemented by anticipation and simulations

Sagan, The Limits of Safety

Table 1. High Reliability Theory Applicable to HROs.

<u>"Low Probability, High Consequence" Events</u>
Many HROs deal with an event that is extremely unlikely to happen but if it should, consequences are extremely severe. Due to the severity of the consequences, this unlikely event cannot be permitted to occur. Examples of these types of events might include:

- Nuclear Reactor accident
- Gas Refinery explosion
- LNG Tanker explosion

To prevent these catastrophic events from occurring, organizations develop and implement Control Sets that are very comprehensive. Hazard analysis walkdowns take place; accident scenarios are formulated and controls are identified; barriers are designed; in-depth engineering analysis is performed to properly credit facilities, equipment and barriers; extensive training is provided to employees.

Worker attitude is another important factor for consideration. Workers know that the likelihood of such an event occurring is extremely low; they know they are well trained; they know that the controls are comprehensive. As a result, they can be lulled into believing that "it can't happen to me." To counteract such an attitude, continual reinforcement of training principles is important. Workers should understand the reasons for the hazards; they should be briefed on the theory behind the analysis; they should participate in the development of the controls.

Blending Proven Safety Programs

There are many excellent safety programs being used by organizations. These typically include programs such as Integrated Safety Management, Behavior Based Safety, VPP, and Human Performance Initiatives. Why not combine the best parts of them into your safety program? We've all heard the saying "One size doesn't fit all." That applies in many areas, including safety. You shouldn't hesitate to tailor any safety program to fit your individual needs.

Organizational Learning

This area is one that separates HROs from other organizations. Most companies attempt to learn from their mistakes; they do so by conducting critiques and issuing lessons learned. The better companies also try to learn from the mistakes of others. HROs take this philosophy to still another higher level, a level referred to here as Organizational Learning.

One attribute of an HRO is a preoccupation with failures rather than successes.[3] HROs expect things to go well and, when things don't go well, they are eager to discover the factors that contributed to the breakdown. Organizational Learning from events requires substantially better analysis and understanding than many organizations are willing to support. One good tool for organizational learning is the causal factor analysis. This method incorporates human factors into a root cause investigation. Not only does management understand what the root cause is, they also know why it got that way. This in-depth analysis is time-consuming at first, but can be streamlined once trained teams are formed. The teams should be a cross-functional team consisting of all both support groups and applicable skill groups. Members of management and craft workers should be included. This results in a more thorough investigation and adds transparency to the process. The Causal Factor Analysis is not a tool to be applied to every occurrence, but should focus on the information rich events described below.

Some senior managers may resist this approach due to the associated cost. They need to take a different view and consider that the cost of investigating an event with minimal consequences to

the organization can be minimal when compared to the significantly larger cost of a downstream accident that could have been prevented.

The Information-Rich Event

A learning event does not have to be one that resulted in severe consequences. We all have been sensitized to react strongly to those types of events. Why not react just as strongly to events that have low consequences but many learning opportunities? These information-rich events can provide extremely useful feedback and improvement data that the company can gather at a low cost. The problem is that many companies do not recognize these types of events when they occur. HROs examine every occurrence and decide which ones should be included in this category.

Example

Workers at one company were installing anchor bolts; they drilled into a concrete floor and hit a flat conduit tray carrying energized 110 volt service lines. The breaker tripped, no one was injured. This company, striving to be an HRO, had hazard analysis programs, comprehensive training programs, a penetration permit program, a strong electrical safety program and an impressive safety record. At the initial critique, there were a number of surprises or inconsistencies. Accordingly, the company declared this incident to be an information-rich event and commissioned a casual factor analysis.

- The utility locator scope in this area was being performed by the non-destructive evaluation (NDE) group, not the Utility Locator group. This informal transfer of work scope was not recognized by management. The NDE equipment was set to look for rebar, not electric utilities.
- The scans had indicated metal and the concrete was marked accordingly. The worker decided he should drill between the marks; assuming that the makers indicated rebar. In fact, the marks were the edge of the flat conduit tray and the worker drilled right in the middle of it.
- The hazard analysis was inadequate; it didn't consider that there might be utilities run under the concrete floor
- An electric cordless drill was used instead of a grounded drill
- A Safetygram mandated the use of electric drill stops. Drill stops were used although the procedure had not updated to require their use.

The management team learned there were many gaps between how they imagined work was performed and how it was actually being done. Their self-assessments and management tours had not alerted them to these gaps. If they had rested on their laurels and not aggressively pursued the indications from the critique, the work practices would have continued to diverge and a potentially serious accident might have been the ultimate result.

Consider the pictures below as another example; there is just as much learning available from the situation on the left as the casualty on the right. Why wait for an accident to occur before learning how to improve?

Exhibit 1. Which event would you rather learn from?

Mind the Gap!

Many managers really don't understand how work is performed in their organizations. They have an image or a belief of what they think is happening, when in fact, the work team may be performing in a very different manner. This gap is frequently revealed during the investigation following an accident.

This is why the principle of field presence is so important. The manager needs to be out observing work to ensure he/she understands the work practices in use and can adjust them if necessary. One author on human behavior, Sidney Dekker, talks about the gap between *Work-As-Imagined* and *Work-As-Done*. His conclusion is that "The problem is not that different images of work exist. Problems arise when organization not sufficiently aware of gap between images. Having a gap is not an indication of a dysfunctional organization—but not knowing about it, and not learning why it exists, is. The more ignorance about gap, more difficult it is to make effective organizational investments in safety, as you may be inventing in the wrong thing."[4]

HRO Safety Culture Tools

In the Basics section, I discussed various safety tools for administering a good safety program. An HRO requires additional tools to complete the transition from safety program to safety culture. These tools are critical; they take information flow to information analysis; they take

lessons-learned to organizational learning; and they take management support to management engagement.

- Incident Review Boards – A monthly meeting where executive managers review all events that have occurred in the past month. These events might include accidents, injuries, near misses, unusual occurrences, etc. The review includes: tracking and tending of such incidents; what corrective actions were taken in the past and what do the recurrences say about the effectiveness of those actions; do these events signal any programmatic breakdowns;
- Corporate Assurance Systems – A systems of scheduled self-assessments covering both administrative reviews (programs, records) and evaluations of work in progress. Watching work performed in the field helps close the gap discussed earlier. Assessors should be trained; assessments should have requirements and reference documents identified as guidelines. Opportunities for improvement should be tracked to closure.
- Causal Factor Analysis – An excellent tool for analyzing why incidents happen. A critique will capture the facts of what happened but it won't always answer the "why" question in sufficient depth to prevent recurrence. A good CFA process incorporates many aspects of human performance to broaden the response to the "Why" question. This analysis will generate "judgments of need" from the investigating team that should lead to more effective corrective actions by the organization. These can be time consuming and may not be appropriate for all incidents, but should be seriously considered for the information-rich events.
- Differing Professional Opinion process – In highly technical working environments, there can be many opinions on how to interpret data. Engineers and scientists tend to relish those discussions, but that doesn't mean differences don't exist in other fields. An attribute of HROs is deference to expertise. One lesson from the NASA Challenger investigation was that a mechanism needs to exist to hear and evaluate those minority opinions.

Conclusion

Not every company will be a high reliability organization, but every company can benefit from transitioning from a safety program to a safety culture. An absolutely critical element in becoming an HRO is demonstrated safety leadership. Many of the elements proposed in this paper seem to require extra focus, extra effort when they should be the norm. Leaders make that shift happen. Leaders communicate a vision. Leaders create a culture. You will only achieve HRO performance levels with *Safety Leaders*; you cannot get there with *Safety Managers*.

Bibliography

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[2] Weick, K. & K. Sutcliffe. *Managing the Unexpected: Assuring High Performance in an age of Complexity.* San Francisco, CA: Jossey-Bass, 2001.

[3] Ibid

[4] Dekker, S. *The Field Guide to Understanding Human Behavior*. Burlington, VT: Ashgate, 2006.