Driving continuous improvement

in US mine safety performance — a new approach

by Bruce Watzman

Can the United States mining industry achieve its long-stated goal of zero fatalities — and what will it take to do so? Does it require new laws and regulations, as some propose, and a continuation of the command-and-control model that has been born out of more than 40 years of regulation and enforcement under the Federal Mine Safety and Health Act of 1969? Or, is it time to consider a new model to manage safety and health and drive continuous, sustained improvement? These are questions that many are debating as mine safety performance, while improved, appears mired in a trough where improvement followed by declines seems to have become the rule rather than the exception.

Safety training is one of the 20 core modules included in NMA's CORESafety program.

Without doubt, U.S. mines have made significant progress in safety performance during the last four decades, yet the stalled decline in fatality numbers, the industry's report card of its success or failure, has led some to question whether the industry will achieve zero fatalities in U.S. mining by relying solely on the Mine Act's framework and implementing its regulations.

These are questions the CEO-led task force, set up by the National Mining Association (NMA), considered as it sought to identify impediments to zero fatalities posed by the current regulatory regime. Out of that effort came CORESafety, a common safety and health framework that relies on a management system approach to improve safety and health performance. The goal of CORESafety is to achieve zero fatalities and a 50-percent reduction in the rate of injuries in U.S. mining within five years — 0:50:5.

CORESafety is built on the plan-do-check-act model, which has been successfully deployed by industries, mining and nonmining alike, to drive continuous improvement in safety and health performance. The improvements in safety performance that can be achieved by shifting from a command-and-control regulatory approach to a risk-based systems approach built on the plan-do-check-act model have been documented in numerous industries. For example, the United Kingdom quarrying industry (Fig. 1), not satisfied with the number of reportable accidents being experienced 1995-2000, established a hard target of a 50-percent reduction in the number of reportable accidents during the period 2001-2005. Having met this target, the industry then established a further target zero for the period 2006-2010. The mechanism to achieve these reductions? The plan-do-check-act model.

Why a systems approach to drive continuous improvement?

It's often said in the mining industry that safety is common sense; however, the complexities of mine safety paint a dramatically different picture. Whether in mining or other hazardous environments, there are dozens, if not hundreds, of factors that can contribute to an injury or illness. To ensure a safe work environment, mine operators must gain some degree of control across this multitude of variables.

How can a mine control so many factors and variables? The truth is it's difficult. As a result, many mines and mining companies do what seems logical and most effective based on their understanding of what causes incidents. Some focus on U.S. Mine Safety and Health Administration (MSHA) regulations, while others focus on one, two or more key issues they believe are major controlling

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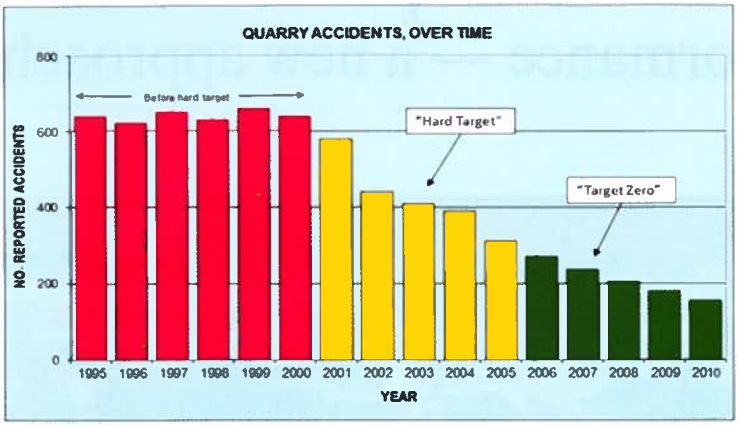
Figure 1

Number of accidents in the United Kingdom before and after the adoption of a plan-do-act-check safety model.



variables. The reality is, ensuring a safe workplace requires controlling the interrelationship of the many variables inherent in mining operations.

While it is extremely difficult to consistently and completely control so many variables and factors, experience has demonstrated the best option for a mine or mining company is to apply systematic, rather than programmatic, control to as many variables as possible. This requires the use of a safety and health management system — a structured, systematic means for managing the multitude of variables that introduce risk.

Are programs and systems really different?

Safety programs have certain characteristics: they operate in a series of steps; they are reactive by addressing hazards that have already resulted in worker injuries and they lack integration both within themselves and between different programs (if a program isn't effective, it is unlikely to get fixed until something serious goes wrong). Programs make up the bulk of occupational safety and health regulations in the United States.

Systems, in contrast, are characterized by being cyclical, proactive and responsive to feedback (a system isn't a system unless it provides information that indicates whether it's working); a system is integrated with other systems (the safety system is integrated with the human resource system, etc.) (Fig. 2). By identifying potential hazards, systems provide the potential to address circumstances that have not caused a problem and deal with them before they do. The importance of this cannot be minimized.

Across the world, the most common and successful approach to minimizing mining risks and improving safety and health performance is the application of risk-management centered safety and health management systems (SHMS) to identify hazardous conditions or practices. SHMS are the primary strategy in most nonmining industries with a high-risk profile: petroleum, chemicals, steel, railroads and commercial aviation all use SHMS.

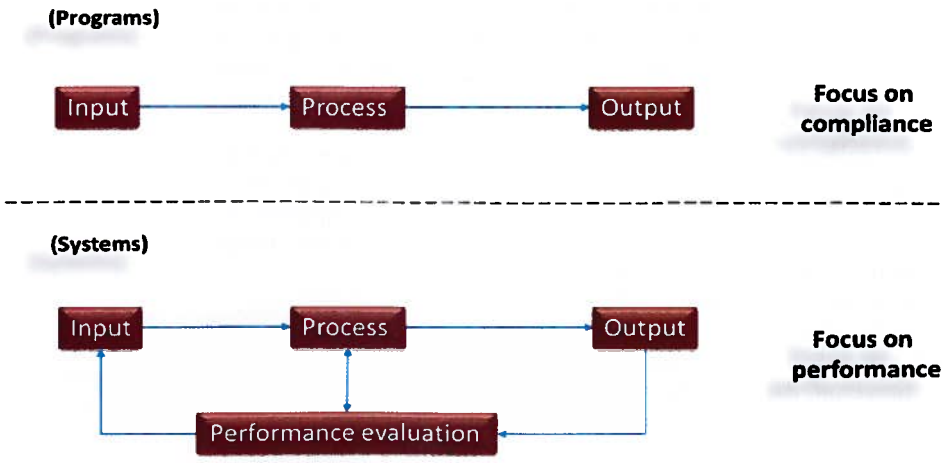
Importantly, recognition that achieving the goal of zero fatalities requires broadening one's focus to look beyond conditions is becoming more accepted in mining. As reflected by the testimony of Michael Wright, director of health, safety and environment, United Steel Workers of America:

"Since 1980, we've been collecting data on all fatalities that happen in the union. God help us, we've had more than 1,000. Not just in mining but in all industries in the U.S. and Canada," Wright said. "In 2006, we took a random sample of those cases and analyzed and asked: Was this fatality the direct result of a violation of an MSHA/OSHA or equivalent Canadian standard? Astoundingly, in just about half the cases, the answer was no."

In the simplest of terms, a safety and health management system is a collection of largely existing processes, programs, procedures, tasks, etc., that function together to produce outputs aimed at achieving a goal. A good management system deliberately links and sequences system elements to produce an identifiable and consistent way to manage safety. A successful safety and health management system also integrates, and

Figure 2

Management system versus management program.



is additive to, regulatory compliance, by focusing on all of the activities that present the potential to cause injury.

What is CORESafety?

The CORESafety system is based on critical organizational competencies, including leadership and culture, that are managed through a mining-specific management system with three broad action directives: lead, manage and assure.

Lead: The system relies on and recognizes the central importance of leaders to influence safety and health performance by positively and knowingly affecting an organization's safety culture.

Manage: Assessing and managing risk to eliminate hazards that could have catastrophic, including fatal, consequences and identifying and eliminating at-risk behaviors are all critical to a successful system.

Assure: Unlike the programmatic regulatory model that has driven the U.S. mining industry's safety to date, CORESafety participating companies measure performance against identified metrics to determine if the system is operating optimally or if modifications are required to meet stated goals.

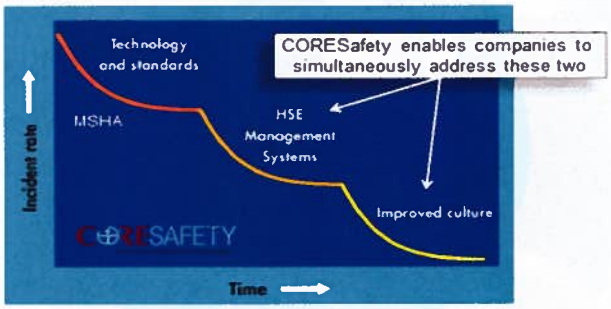
CORESafety includes 20 modules designed specifically for U.S. mining by mine safety and health professionals (Fig. 3). The modules are adaptable to the operations of all mining companies and intended to complement existing safety programs and practices.

Just as no two organizations are the same, no two safety and health management systems are exactly the same. The elements or modules in CORESafety are a recommended approach to structure a management system into workable groupings. For example, risk management — the process of identifying hazards, assessing their risks and applying appropriate controls — contains many subelements that work together to effectively manage mining risks.

It is important to remember an effective safety and health management system must do all of this in the context of the company culture, which is demonstrated through attitudes, accepted norms and behaviors. If the company culture does not recognize or embrace the management system, it is unlikely to be an effective tool. In addition, every system must have, and is dependent upon, senior management support and engagement to ensure the company's commitment and effective workforce involvement.

Figure 3
CORESafety continuous improvement.

Figure 4
CORESafety is evolution, not revolution.



Summary

CORESafety embodies the commitment of the members of the NMA to the safety and health of their employees. It recognizes that improvements in safety culture and performance are part of a journey that requires time, dedication and commitment (Fig. 4). Today, more than 125,000 mining industry employees have begun this journey and are participating in CORESafety, which is available free-of-charge to any organization. ■

Additional information on CORESafety, including the CORESafety framework and resources, is available at www.coresafety.org.