Dynamics

Creating a safety conscious organization and workforce

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HEALTH, SAFETY, AND PERFORMANCE AT WORK — IS IT A JUGGLING ACT?

There is often a distinct trade-off between performance and safety that is present in many organizations. The upper echelons of organizations are staunch in their approach to safety: Safety IS First! However, the vast majority of the time this message is poorly translated as it makes it way to the 'shop room floor'. This first became abundantly clear to me from a consulting project for a major Oil and Gas company. In discussions with upper level executives and managers, I routinely heard the message that safety IS first and foremost — always! However, when I held similar talks with employees who worked on the oil rigs, I found that they heard the corporate message, Safety IS First, but the actual message they more readily heard and followed was from their immediate supervisor. The immediate supervisor's message was a more daily message and can be encompassed in two words: 'hurry up'. If you were in such shoes, what would you do? You are on the job to perform at a high rate and are rewarded (e.g., continual employment, financial bonus) for completing assigned tasks in as short of a period as possible. Do you 'hurry up' as suggested by your immediate supervisor or do you follow safety protocol that upper management supports? If you are the manager, what would you be telling your employees? This is the dilemma that is faced by many employees and managers. As a manager, how can you strive for high performance and high safety and health for yourself and for your employees?

IMPORTANCE OF HEALTH AND SAFETY IN ORGANIZATIONS

Thousands of deaths and disabilities occur each year in the United States with an estimated 6,000 deaths accredited to workplace accidents while work-related injuries and illnesses are estimated to reach 4 million in a given year. While these numbers are staggering for individual employees and their families, the organizational costs associated with poor safety within organizations is also staggering. We must also consider the amount of lost time due to employee accidents and associated costs for organizations that experience accidents. Furthermore, there are large financial penalties and governmental mandates that organizations could face for poor health and safety standards and practices. As these numbers indicate, poor occupational safety and health is an important problem that needs to be addressed, yet there is a lack of criticality placed on occupational health and safety. This is not to say that we have not made ground in improving health and safety in organizations. When we look to the past and the state of occupational safety and compare that to today, we have made remarkable progress. For example, regulating agencies have been put in place to govern safety practices at work (e.g., OSHA) and many lessons have been learned from previous industrial accidents (e.g., Chernobyl; coal mining disasters) all of which have helped reduce the occurrence of workplace deaths from 21,000 in 1912 to 5,000 in 2014. While an approximate drop of 16,000 deaths may not sound like a long way to have come, consider that in 1912 there were 95 million people in the United States compared to 300 million today — the ratio of deaths to population is much smaller. We have truly come a long way, but there is still a long way to go.

History

The safety movement and accident prevention initially began by attempting to identify accident-prone employees. This 100+ year search has seemingly failed to identify the accident-prone employee and has virtually been dismissed today. However, this has given way to what many people label 'Human Error'. Human error is the failure of a desired course of action to achieve the expected results, is typically the

blamed culprit for most occupational accidents and injuries, and has traditionally been cited as the number one cause of accidents. What does human error actually tell us about the reason(s) that lead to the accident or injury? Nothing. Human error is a catch-all phrase for errors that are attributable to a person, but it does not provide much insight to the problem of occupational safety. Human error, just like the accident or injury, demands an explanation. Human error does not consider a host of other factors well beyond the employee's control: the work environment, co-workers, supervision, and resources. In fact, individual employees are typically at the receiving end of many organizational deficiencies resulting in poor safety and health.

Researchers have summarized two views of occupational safety: 'the old view' and 'the new view'. The old view is akin to the traditional human error approach as described above. The old view has apparently failed and is no longer accepted today. The new view on the other hand, sees human error as a symptom and not a direct cause. First, human error is a symptom of a combination of deeper root causes (e.g., personality dimensions, work design). Secondly, system safety is not inherent. That is, people have to create safety because work systems are not always in concert with the multiple goals that employees simultaneously pursue (i.e., work systems are not perfectly engineered for safety). Lastly, human error can be and has begun to be systematically linked to various features of people and the operating environment. This new view suggests that managers need to utilize multiple techniques (i.e., selection, training, development) to create a safer workplace for all employees.

The new view of human error and accidents suggests that occupational safety research needs to begin to address the factors that have previously been swept under the rug of human error (e.g., work design, personality, cognition, leadership/supervision, climate). The 'people, tools, tasks, and operating environments' comprising the new view can all be treated as inputs or antecedents of safety (i.e., safety performance & safety outcomes). That is, each one of these things can be thought of as symptoms of occupational safety to varying degrees. Hence, a more modern thought on health and safety has moved toward looking at a combination of employee characteristics and environmental characteristics and how each one can influence safety related outcomes.

Old view	New view
• Blame human error	• Employees are often at the receiving end of problems
• Search for the accident-prone person	• Search for underlying characteristics
• Safety can be 100% engineered	• Safety is not 100% inherent in work design and engineering
	• Need to examine features of employees, tools, tasks, and work environment together

DEFINING HEALTH AND SAFETY OUTCOMES

The Occupational Safety and Health Act was passed in an attempt to preclude future accidents and poor health in organizations. OSHA has been very helpful to organizations in meeting safety standards and to employees in recognizing their rights. The Act has been instrumental in improving occupational health and safety due to the Act focusing on multiple aspects of occupational health and safety:

"To assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under the Act; by assisting and encouraging the States in the their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes" (the Act, 2004).

Even with the tremendous benefits that have accompanied OSHA, there are still many problems that exist today. Some of the common problems have to do with actually determining what constitutes the criterion domain for safety (i.e., safety criterion problem). This problem is often manifested by management not fully understanding health and safety. To fully address health and safety, employers need to move beyond simple compliance with OSHA, which in-and-of-itself is a very good thing, and begin to build a safety conscious workforce. Given this lack of understanding in the health and safety criterion domain, it is often the case in human resources that action plans for improving health and safety are put into place without fully identifying the outcome or goal. OSHA has been instrumental in defining 'accidents' and providing standards for safe work environments. However, the focus has been narrowly defined. To fully address the entire spectrum of occupational health and safety, a much broader net needs to be cast, as is called for by the 'new view' for occupational health and safety.

In general terms, *occupational health and safety in organizations can be defined as actions, behaviors, and outcomes that employees engage and produce in almost all jobs to promote the health and safety of co-workers, customers, the public, and the environment.*[1] Historically, this has not been the case. As previously mentioned, researchers and HR practitioners have sought to identify the most parsimonious explanation for poor health and safety: the accident-prone employee. This search began in the early 1900s for two primary reasons: (1) transportation, critically important to the success of business, was an emerging field as the United States began expanding and (2) persons affected by the transportation movement (i.e., operators, pedestrians) needed to be kept safe. While this movement failed to identify the accident-prone employee, it has led to the development of two general classes of safety related criteria that HR managers should be cognizant of and utilize in gauging the safety of their workforce: (1) Safety Outcomes and (2) Safety Behaviors — see Fig. 1.

Accidents and Injuries

There are many forms of safety outcomes, yet the most emphasized is the accident. Accidents have been studied across disciplines (e.g., Management, Psychology, Engineering, Sociology, Medicine). Most studies examining accidents

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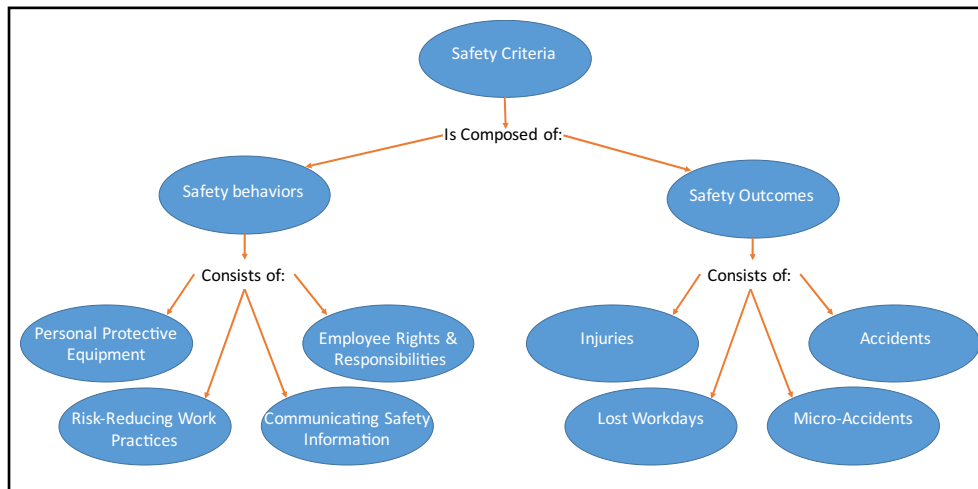[1] Definition quoted from Burke et al., 2002, *Personnel Psychology*.

Figure 1   Safety Related Criteria

have measured accidents as the number of *recordable accidents*, which according to OSHA are ones that require medical attention. Recordable accidents consist of injuries that require more than simple first aid treatment. By far, the most common ones are strains and sprains, yet the second largest group is 'other', exemplifying the criterion problem associated with safety. We need more research with better methods to more fully understand safety.

Traditionally, accidents and injuries have been lumped together, yet accidents can happen in which no injury occurs such as in an instance of damage to a piece of equipment. However, for the sake of simplicity, they are lumped together here as they are highly related. Recordable accidents are an infrequent event and thereby create increased difficulty in managing occupational health and safety if human resources or managers are focusing only on recordable accidents. Collecting this type of outcome data has traditionally relied on the individual employee (i.e., self-report) or supervisor reports leading to organizational records (e.g., OSHA compliance documents). There have been other measures associated with accidents that have commonly been used to study occupational safety such as lost and restricted workdays as OSHA also regulates these. These indices help keep track of the severity of accidents and injuries following the logic that the more days lost or restricted, the more severe the accident or injury. There are several underlying issues associated with these methods of criteria reporting: lying, faulty memory, and poor record keeping. Accidents can disrupt daily work operations and cost organizations money and other resources. Hence, accident and injury reports might be systematically underrepresented in organizational records for fear of regulatory agencies (e.g., OSHA). Depending on the organizational culture or climate (s), employees have no real reason to falsify accident and injury reports and perhaps managers might be better served by using self-reports of accidents and injuries to avoid the potential underreporting bias that might be present in organizational records of accidents. Research concluded that many injuries are simply not reported because they seemed to be too minor in nature even though the majority of these injuries required medical attention beyond basic first aid and time off work to for

recuperation. However, managers must also consider if the minor injury was made worse during activities 'away from work'. If so, the reporting structure would need to compensate for the severity of work versus non-work accidents. It appears that self-reports of accidents and injuries could serve as an important barometer for improving or worsening safety conditions in an organization.

A more recent attempt to assess accidents and injuries in the workplace involves 'micro-accidents'. Micro-accidents are minor accidents that require basic first aid treatment. Zohar has noted three advantages of micro-accidents: (1) they occur more frequently than recordable accidents and lost work do, (2) they provide an objective measure of safety outcomes not as affected by sources of bias commonly found with other methods (e.g., self-report, OSHA compliance records), and (3) they are strongly related to lost-day accidents and recordable accidents. Using micro-accidents allows managers to better track accidents and thereby reduce the frequency of them.

Unsafe Behavior

Safety performance is distinct from accidents and injuries and should be treated as such even though they are related. Oftentimes, unsafe behaviors in the workplace might be labeled as safety performance. Safety performance has four main components: (1) properly utilizing personal protective equipment, (2) engaging in work practices that reduce risk, including adherence to safety practices and procedures, (3) communicating health and safety information, and (4) exercising employee rights and responsibilities. Many jobs require employees to protect themselves from potential hazards through the appropriate utilization of equipment such as goggles, HAZMAT suits, and hearing protection; employees are also trained to perform tasks using such equipment. The second aspect of safety performance, engaging in work practices to reduce risk, is essentially following standard operating procedures outlined for task completion. Employees should also communicate health and safety information that is pertinent to their workplace in an effort to improve health and safety for all involved parties. Lastly, employees

are bound by regulatory agencies to report unsafe working conditions and accidents to appropriate authorities. Each one of these facets is important to overall safety and should be emphasized by human resources and management on a daily basis to better ensure the health and safety of all employees. These behaviors, taken as a whole, constitute safety performance in a parsimonious and generalizable manner.

Safety Behavior and Safety Outcomes

It is important to highlight that behaving unsafely may or may not result in an accident. Researchers conclude that unsafe work behaviors tend to lead to accidents. In a recent meta-analysis of these relationships, the meta-analytic correlation between safety performance and accidents was found to be $-.31$. This moderate relationship suggests that unsafe acts do not always lead to accidents or injuries. Sometimes acting unsafely may actually increase productivity and sometimes acting safely may still result in an accident. For example, taking safety short-cuts to save time and costs generally do not result in an accident and sometimes actually increase productivity (i.e., unauthorized productive behavior). However, the costs associated with a single accident might far outweigh the benefits stemming from short-cuts. Additionally, changing one's behavior to act more safely does not necessarily avoid all accidents; there are other forces at work that might influence this relationship that are well out of the control of the individual employee. Thus, a person might change his/her behavior, but still fall victim to an accident. It is up to managers and human resource officers to help strike a balance among safety behaviors, safety outcomes, and performance. Managers and other organizational agents can do so through a variety of methods.

Similar to the new view of occupational health and safety, recent research suggests that managers must balance employee performance, outcomes, selection, training and development, and the work environment itself to help reach optimal health and safety. By focusing only on safety performance, managers might be mis-managing. Likewise, managers that simply manage for accidents might be mis-managing. Mangers need to manage for both safety performance, the actual behaviors enacted by employees toward being safe, and accidents.

WHAT ORGANIZATIONS AND MANAGERS CAN DO

There are several issues in which managers and HR agents can assist employees. However, in lieu of tackling one or two, research strongly suggests that the development of a safety conscious workforce is the best overall method to increase health and safety in the workplace. The creation of a safety conscious workforce is not a small undertaking. In fact, it is a large undertaking with many individuals involved and a great deal of resources invested back into the workforce. However, once setup, the workforce should be producing increased efficiencies with a great reduction in accidents, injuries, stress levels, and increases in overall employee health and safety. Below, we discuss several important ingredients that constitute a safe workforce.

Selection

A traditional approach to safety has been to avoid hiring accident-prone employees. However, as you are aware by now, this is not a valid approach. The failure to identify the accident-prone employee does not mean that practitioners should give up on selection methods to help in occupational health and safety. In fact, recent research is beginning to identify several employee characteristics that are predictive of safety and accidents in the workplace. Recall that the personality trait of conscientiousness is typically used in selection assessments. Research has found that this personality trait is also predictive of safety performance and safety outcomes. Multiple other characteristics of individuals have also been shown to be predictive of safety performance and outcomes: safety knowledge, safety motivation, locus of control, risk taking, and neuroticism. Many of these characteristics are present in existing selection systems and could be used to identify safer employees. In fact, many HR consulting firms today utilize these characteristics in selection, to hone prediction of job performance and safety performance. AOE Science has developed a safety assessment and profile report that is based upon years of research and includes many of the characteristics mentioned above. Getting the right people with the right foundation for safety in the workplace seems to be a critical first step in developing a safety conscious workforce.

Training

Training in organizations is fundamental. Training is also crucial in the development of occupational health and safety. Safety training research has suggested that training for safety needs to be highly engaging. Yet, the majority of safety training is simply compliance based for OSHA requirements. For example, a friend of mine recently completed his safety training for the year for his job working in the oil fields in Texas and Oklahoma; his training consisted of a self-paced PowerPoint presentation — that was it and this is a dangerous job. Lectures are one of the least engaging methods of safety training, yet are quite common, as are videos, presentations, and written materials. These methods do not transfer to the workplace and do not last long term. Recall, that training can be viewed as a success if the knowledge and behaviors transfer to the workplace and last for an extended period of time. Simple safety training does not typically meet these criteria. Safety training requires a high level of employee engagement. Michael Burke and colleagues meta-analyzed safety training methods and found that as safety training became more engaging — requiring participants to play an active role in the training, as opposed to a passive role — employees demonstrated greater knowledge retention of health and safety information and a greater reduction in accidents and injuries. For example, having employees role-play through several critical safety incidents is far more effective than simply watching a video that demonstrates the same thing. Watching is one thing, but doing it is something entirely different. In fact, it appears that highly engaging training methods improve safety in the workplace three times more so than the least engaging methods do. Even with the evidence to support highly engaging safety training,

organizations have yet to fully adopt these techniques. If you have the right people in place with the right materials, organizations and HR agents can successfully mold employees and the work environment toward a more complete safety conscious workplace.

Supervision & Climate

Perhaps one of the more promising aspects of occupational health and safety in recent years is the attention to the work environment and the 'feel' that employees report with the environment. This 'feel' is termed climate and when that 'feel' is reported with regards to safety, it is called safety climate. Safety climate is defined as shared perceptions of employees regarding safety policies, procedures, and practices that are utilized in a given context. The context is often defined by the group leader or supervisor. This supervisor provides the necessary inputs for the safety climate thereby giving rise to the climate. The leader essentially sets up the standards for safety that his/her employees are expected to follow. These standards can be called norms and safety norms are very powerful for guiding appropriate and inappropriate safety behaviors. Safety climate has been shown to positively impact safety performance and safety related outcomes in both primary research and in meta-analytic research. In fact, the emphasis of safety climate is the strongest meta-analytic predictor of safety related outcomes (e.g., accidents & injuries; $-.51$).

Safety climate is comprised of many dimensions that taken together form the climate for safety. As displayed in Fig. 2 and listed below, safety climate has seven dimensions.

1. **Management commitment:** The extent to which people perceive that management values safety and engages in communication and actions that support safety.
2. **HR practices:** The extent to which people perceive that selection, training, and reward systems contribute to safety.
3. **Safety systems:** Perceived quality of policies, procedures, or interventions implemented by an organization with the intention of improving safety outcomes.
4. **Supervisor support:** The extent to which people believe their supervisor values safety as reflected in communication, encouragement, and consequences.
5. **Group processes:** Perceptions of communication and support for safety within work groups or the extent to which employees perceive that their coworkers provide them with safety-related cooperation and encouragement.
6. **Boundary management:** The perceived quality of communication between the work group and other relevant stakeholders regarding safety issues.
7. **Risk:** The extent to which workers perceive the work itself as dangerous.
8. **Work pressure:** The extent to which the workload overwhelms one's ability to perform safely.

Figure 2 Components of Safety Climate

Of all of these characteristics, perhaps the single most important in terms of impact on safety performance and safety outcomes is HR Practices followed closely by management commitment to safety. However, each dimension of safety climate is significantly related to safety performance and safety outcomes. Safety climate is a powerful tool that can drastically shape your workplace for safety. Couple safety climate with proper selection and training techniques, the complete package for a highly safety conscious workforce comes to a front. Yet, there is still a critical piece of the occupational health and safety picture missing, which is the evaluation of safety.

Evaluation of Safety Performance

Due to the emphasis on appraising employees simply on task performance that is tied closely to a job analysis, safety is often left off the evaluation. Safety is simply not considered a task that is crucial for other tasks — it is important for all jobs. If safety is not appraised and rewarded, then why would employees actually care about being as safe as possible? Organizations and organizational agents get the performance they reward, not the performance they expect. For example, employees more often than not see the writing on the wall — 'we value safety, but not enough to appraise and reward for it'. This sets up the dilemma I opened with; the emphasis is likely on getting things done as quickly as possible. Safety should be evaluated alongside other important dimensions of job performance. This can be done in a multitude of ways:

- Ask for supervisor evaluations of employee safety (e.g., BARS)
- Provide individual rewards for accident free days and helping others behave safely
- Use safety as part of developmental programs (e.g., developmental performance appraisal)
- Train managers to observe and enforce safety practices

Physical Work Characteristics — Human Factors

Human Factors, sometimes called Engineering Psychology or Ergonomics, is the study of human beings and their interaction with the environment and the systems and products that are produced to facilitate work. The primary goal of Human Factors is to design work systems to increase human performance as well as to engineer design of systems for increased efficiency and safety. The single overriding purpose of Human Factors is to find an optimal match between the cognitive and physical abilities of employees and work systems. The following definition was adopted by the International Ergonomics Association in August 2000:

> "Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and other methods to design in order to optimize human well-being and overall system performance."

While engineers might have believed that safety can be engineered, humans are still completing the work — mistakes are made in the process and accidents do happen. Human

Resource officers, managers, and employees need to work with engineers to design the workplace and the systems, products, and tools employees use to maximize safety.

Creating a Safety Conscientious Workforce

Many times as managers, you are (or soon will be) faced with the decision to select or train or develop. Let us suppose we need to increase the safety consciousness at a chemical manufacturing plant. This organization has never had a great deal of safety problems before, yet all of sudden in the past three years, accidents have been increasing at an alarming rate. You, as the manager, have been tasked with fixing this problem. Your investigation reveals that the root problem lies in the fact that there are a tremendous number of individuals retiring from the plant and many new employees are joining the ranks. Accident data spikes within the first two years of employment and slowly declines thereafter (see Fig. 3). You ask yourself the question: should I select or train employees to overcome this problem? This very question is what many managers ask themselves — they force one OR the other.

The notion of 'OR' thinking is problematic from the get-go. It is a false disclaimer and forces us to make a choice, when in reality this choice is quite limiting. We need to move to 'AND' thinking. How can we get a safety conscious workforce? We select AND train AND develop. Fig. 4 summarizes this viewpoint on safety that also captures the new view on occupational health and safety. This model takes advantage of employee characteristics and features of the work environment. From an organizational perspective, organizations first need to select high performing and safely behaving employees as best as selection methods will allow. Next, organizations need to train employees about the safety specifics of the job and organization. This should include safety knowledge and safety skills training. Third, organizations need managers and current employees to be supportive of safety to give rise to a high safety climate. Organizations also need safety to be a part of employee appraisals in order to hold employees accountable for safety. Lastly, organizations need to ascertain that work systems are engineered with safety in mind following a human factors approach. While any one of these approaches will result in improved occupational health and safety, the simultaneous combination of all of them is likely to have the biggest positive impact on health and safety at work.
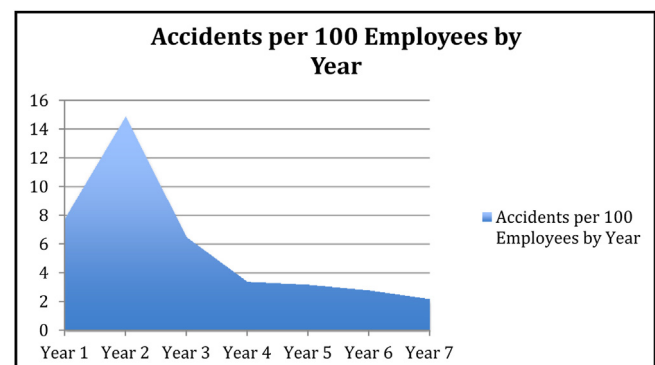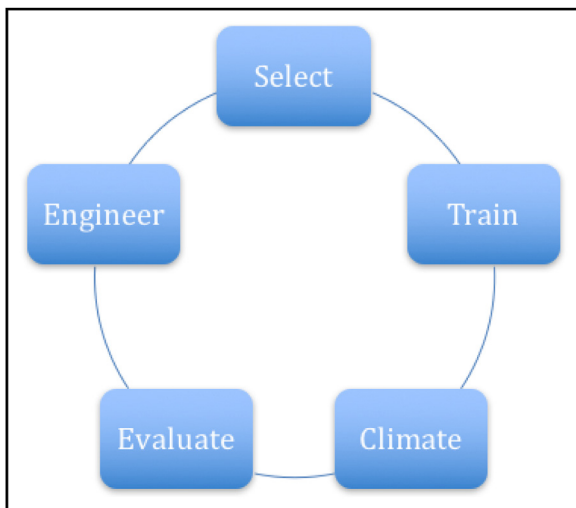

Figure 3   Accidents by Year on Job

Figure 4   Components to a Safety Conscious Workforce

MOVING TOWARD ACTION

With the knowledge that you have gained, what would you do to balance the performance of individuals, groups, and the organization with safety and health in this organization? There are several issues that come to mind for different organizational agents:

What should top management do?

- Continue to emphasize safety and make sure the emphasis is carried all the way to the shop-room floor, so to speak

- Demonstrate and motivate employees for a safety conscious workforce

What should middle and lower level management do?

- Follow top management's lead and emphasize safety along with performance
- Identify tasks that are critical to safety
- Create context specific safety climates to deal with specific safety-sensitive tasks
- Reward and appraise for safety
- Create a safety conscious workforce

What should front line employees do?

- Assist management in identifying safety issues
- Support colleagues when safety is pertinent
- Take initiatives for own personal health and safety

What should HR do?

- Make sure policies are in place that align with a safety conscious workforce
- Assist all employees with safety needs and training
- Collect and analyze safety trends to meet safety needs of the organization
- Lead the development of a safety conscious workforce movement

Taken together in a framework like this, organizations should be able to confidently put up large signs reporting that they have achieved hundreds of accident free days.

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Craig Wallace is primarily interested in predicting and explaining facets of performance and effectiveness by integrating individual level theories of personality, motivation, and emotion with higher-level organizational constructs such as leadership and climate. Through this research, Dr. Wallace hopes to create a work environment that is conducive to all employees, both physically and psychologically, leading to high levels of organizational effectiveness and employee well-being. He has published his research in leading management journals, is a two-term Associate Editor for the *Journal of Management*, and is a fellow in the Society for Industrial/Organizational Psychology (Department of Management, Spears School of Business, Oklahoma State University, United States; e-mail: craig.wallace@okstate.edu).