

# Examining Safety Culture/Climate

A Workshop Report

OCTOBER 2013



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## EXECUTIVE SUMMARY

The Safety Culture/Climate Workshop was held June 11–12, 2013 in Washington, DC. The workshop was conducted jointly by The Center for Construction Research and Training (CPWR), the National Institute of Environmental Health Sciences (NIEHS), and the National Institute of Occupational Safety and Health (NIOSH). Participants in the workshop examined academic literature on safety culture and safety climate, and presented case studies of the role of safety culture in workplace accidents. The workshop participants also reviewed historical and current workplace safety and health policies and programs, including their influence on overall safety culture.

CPWR and NIOSH, as part of their joint construction safety and health research initiative, have initiated several research projects over the years to assess various elements of positive safety and health performance in the construction sector. In 2008, the National Occupational Research Agenda (NORA) Construction Sector Council identified safety culture as a “ready for impact” research priority goal. Acknowledging variations in safety cultures among various industry sectors, the workshop was organized into two separate tracks — construction and non-construction — to foster more in-depth dialogue about safety culture in each of those workplace contexts.

The NIEHS track focused on the connection between safety and health programs, and safety culture. Sessions included discussions about: 1) the role of workplace power dynamics and how they can influence safety culture within an organization, 2) workplace health and safety programs as a foundation for fostering positive safety culture, 3) overcoming barriers to developing these programs, and 4) strategies for maintaining a strong safety culture.

The CPWR/NIOSH construction track focused specifically on identifying the gaps in research, best practices, and tools for promoting safety culture. The goals of this track were to: 1) help define what safety culture and climate means in the realm of the construction industry; 2) identify ways to measure safety culture and climate at construction sites; and 3) identify effective ways to improve safety culture and climate across the construction industry. Participants included small and large contractors, unions, academics, and consultants.<sup>1</sup>

For NIEHS, the Safety Culture/Climate Workshop was the second installment of a three-part process to increase understanding about the role that worker training plays in helping achieve safe and healthy workplaces. The first workshop in this three-part discourse, held in October 2012, focused on the topic of program evaluation. This first workshop in the series explored the types of evaluation tools being used by NIEHS/ WETP awardees across their training programs. Tools included metrics being used by other federal agencies to evaluate training programs to empower participants with increased insight into effective approaches to program evaluation. The final installment of the series will focus on developing a vision for future areas of focus to enhance the ways in which training can improve workplace safety and health.

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<sup>1</sup> A separate full report from the construction track is forthcoming from CPWR.

## INTRODUCTION

**For the past thirty years, the United States has experienced an era of waning worker protections. Most if not all of the hard-fought victories for worker protections including pensions, unemployment benefits, Social Security, workers compensation, worker safety and health rules, and EPA rules have been under relentless attack in recent history.**

Rena Steinzor, J.D., Professor of Law at University of Maryland Francis King Carey School of Law and President of the Center for Progressive Reform, highlighted the challenging environment regarding workplace health and safety regulation and enforcement in testimony before the Senate Judiciary Subcommittee on Oversight, Federal Rights, and Agency Action on August 1, 2013. Steinzor stated, "...agencies are not carrying out their statutory missions of protecting people and the environment in a timely and effective manner." She cited "political interference in agency rulemaking, 'bureaucracy bashing,' inadequate resources, and outdated legal authority" as the major culprits of this "regulatory dysfunction."

In his remarks to the Safety Culture/Climate Workshop participants, David Michaels, Ph.D., Assistant Secretary of Labor for Occupational Safety and Health at the Occupational Safety and Health Administration (OSHA), commented that much of the resistance to proposed requirements

**"...agencies are not carrying out their statutory missions of protecting people and the environment in a timely and effective manner."**  
—Rena Steinzor

for injury and illness prevention programs is coming from industry trade associations.<sup>2</sup>

The current contemporary workplace has also become an environment where far too many employers are using strategies, including disciplinary action up to and including termination, to discourage workers from reporting injuries in an attempt to minimize workers compensation costs. This behavior by management generates mistrust between workers and management regarding safety issues and concerns.<sup>3</sup> Consequently, hazards in workplaces go unidentified and remain unaddressed. This approach, focusing on reducing reported injuries, actually perpetuates the workplace conditions that lead to exposures and injuries. It produces a poor safety culture.<sup>4</sup>

In this climate of diminishing worker protections, some proponents of workplace health and safety programs have viewed safety culture as an unattainable or near utopian idea. Safety culture skeptics view a focus on safety culture as a distraction from more concrete efforts to require employers to implement safety and health programs in the workplace. This view has been a point of contention among workplace health

2 A participant accentuated this view further during a small group discussion, reporting that after a union and hospital worked collaboratively on an issue that then led to a mandatory safety regulation, the hospital stated they would never again work with the union on anything that could possibly lead to a regulation.

3 A 2013 CPWR-sponsored study entitled, "Construction Workers' Reasons for Not Reporting Work-Related Injuries: An Exploratory Study," found that among the most common reasons why construction workers did not report injuries were that they feared disciplinary action by employers in a variety of forms. Reasons included fear that the employer would not hire them again in the future or revoke eligibility for safety incentive prizes, and fear that the worker would be labeled complainers or "weak."

4 Mark Griffon.

and safety advocates. However, as reflected in discussions in both workshops, safety culture is an essential part of the conversation and the efforts to achieve and sustain safer workplaces.<sup>5</sup>

### Background to the Workshop

The NIEHS Worker Education and Training Program (WETP) provides funding to nonprofit organizations with a demonstrated track record of developing and delivering high quality safety and health training to workers who are involved in handling hazardous waste or in responding to emergency releases of hazardous materials.

The major objectives of the WETP are to prevent work-related harm by assisting in the training of workers in how best to protect themselves and their communities from exposure to hazardous materials encountered during hazardous waste operations, hazardous materials transportation, environmental restoration nuclear weapons facilities, or chemical emergency response, and to undertake minority workforce development.

Safety cultures exist within every organization, and while not all of these safety cultures promote and/or nurture safe workplaces equally, all of the workers trained through the WETP will function within organizations. A greater understanding of safety culture will help the WETP to determine how best to address safety culture in trainings, and how best to communicate information about safety culture to trainees in a way that will help to equip them with increased knowledge to better protect themselves and promote safer workplace environments.

The U.S. Department of Energy (DOE), an NIEHS partner through its DOE Nuclear Worker Training Program, also has a long standing emphasis on safety culture as a principal foundation of their Safety and Health Program Rule, 10 C.F.R. 851,

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5 Steve Hecker.

Integrated Safety Management System (ISMS) and Voluntary Protection Program. In particular, the *ISMS Description* outlines how EM conducts work following the seven ISM Guiding Principles, the five ISM core functions, and also incorporates the four supplemental safety culture elements from DOE Implementation Plan to Improve Oversight of Nuclear Operations (in response to Defense Nuclear Facilities Safety Board Recommendation 2004-1), dated October 2006.<sup>6</sup> A recent increased emphasis on safety culture by DOE has prompted NIEHS to focus on safety culture as well.

The terms safety culture and/or safety climate awaken a range of sentiments among workers and employers, and across various industry sectors. In light of differing views about the issue, the intention of this meeting was to facilitate a fruitful dialogue to further explore the concepts of safety culture and climate as they relate to the NIEHS worker training program and advancing the discussion on protecting workers. By linking these concepts to safety and health programs, the hope was to ensure that participants understood that good safety culture cannot be achieved without a strong and actively utilized safety and health program.

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**The terms safety culture and/or safety climate awaken a range of sentiments among workers and employers, and across various industry sectors.**

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6 DOE Integrated Safety Management Policy web site, <http://energy.gov/em/downloads/integrated-safety-management-policy>, accessed 9/21/13.

# SAFETY CULTURE/CLIMATE WORKSHOP SUMMARY

## Framing the Issue

For the workshop keynote address, Senior Lecturer Emeritus Steve Hecker, M.S.P.H., of the University of Washington School of Public Health provided an engaging historical background on the terms “safety culture” and “safety climate.”

The term “safety culture” initially surfaced in the 1980s, following major workplace disasters, such as the Chernobyl nuclear disaster (1986) and the Piper Alpha oil explosion (1988). Indeed, “poor safety culture” was cited as the major causal factor in the case of Chernobyl. The growing popularity of the term stems from a human compulsion to, in the wake of catastrophic events, identify a reason and assign a name to explain complex factors (beyond technical failures) that we cannot see and cannot always control. As a result, culture is often cited to explain such events.

Despite increasing reference to safety culture in recent years, there remains extensive confusion over what exactly safety culture is and what it really means. The confusion is evidenced in the literature utilizing the term where “safety culture” is often used interchangeably with “safety climate,” according to Hecker.

These two terms are closely related, but there are important differences. For example, the concept of safety culture is derived from the broader concept of organizational culture. Schein (1992) describes organizational cultures as “a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.” Thus, culture can be defined as a set

of shared beliefs and values of group. Within an organization, culture can be viewed as the personality of the organization. Culture is often associated with qualitative assessments. On the other hand, climate describes a snapshot in time, reflecting perceptions at that particular moment. An organization’s climate can be compared to the mood within an organization during a particular timeframe. Climate is often associated with quantitative assessment, according to Hecker.

The failure to acknowledge the characteristics distinguishing safety culture from safety climate creates confusion about the terms, what they encompass, and how to measure these conditions in a workplace. It diminishes the value of the individual terms as separate but related instruments for measuring and assessing factors that influence workplace health and safety conditions.

### SLIDE 1: Comparing Culture and Climate<sup>7</sup>

CULTURE	CLIMATE
Deep	Snapshot
Stable	Superficial
Values Principles Convictions	Perceptions
Qualitative	Quantitative

**PERSONALITY ANALOGY:**  
**Culture**—Trait (fixed)  
**Climate**—Mood State (variable)

SEO 2004

<sup>7</sup> Slides 1–3 are recreated from Steve Hecker’s presentation.

**SLIDE 2: A Look at Safety Culture, Safety Climate and Safety Programs**

SAFETY CULTURE	SAFETY CLIMATE	SAFETY PROGRAM
<ul style="list-style-type: none"> <li>• Values, beliefs</li> <li>• Deep, stable</li> <li>• The way we do things here</li> <li>• Management culture</li> <li>• Craft culture</li> <li>• Artifacts</li> <li>• Communities of practice</li> <li>• Learning culture</li> </ul>	<ul style="list-style-type: none"> <li>• Shared perceptions</li> <li>• Superficial, snapshot</li> <li>• Management commitment</li> <li>• Trust</li> <li>• Safety vs. production</li> <li>• Accountability</li> <li>• <b>Safety compliance</b></li> <li>• <b>Safety participation</b></li> </ul>	<ul style="list-style-type: none"> <li>• Safety management systems</li> <li>• Safety audits</li> <li>• Hierarchy of controls</li> <li>• JHA</li> <li>• <b>Safety performance</b></li> <li>• Root cause investigation</li> <li>• Safety training</li> </ul>

**SLIDE 3: Characteristics of a Positive and Effective Safety Culture**

HERE ARE A COUPLE OF ADDITIONAL PERSPECTIVES THAT MIGHT HELP
<p>A positive and effective safety culture</p> <ul style="list-style-type: none"> <li>• Propels toward maximum safety and health despite external pressures and specific leaders</li> <li>• Respects all that can go wrong; “doesn’t forget to be afraid”</li> <li>• Is an <b>informed</b> culture</li> <li>• Is a <b>reporting</b> culture</li> <li>• Is a <b>just</b> culture</li> <li>• Is a <b>flexible</b> culture</li> <li>• Is a <b>learning</b> culture</li> </ul>

(Reason, Managing the Risks of Organization Accidents, 1997)

**Views of Error: The System View versus the Person-Centered View, and Impacts on Safety Culture**

Mark Griffon, a member of the U.S. Chemical Safety and Hazard Investigation Board (CSB), discussed two competing approaches to reviewing workplace health and safety incidents and injuries — the system view of error and the person-centered view of error — and how they impact safety culture.

A system view of error approach acknowledges that human beings are fallible and that errors are to be expected. It focuses on reviewing factors that influence errors and seeks to change the system and/or conditions of work to prevent such error. Griffon commented that this holistic approach to reviewing incidents helps to foster positive safety culture in workplace.

In contrast, the person-centered view of error focuses on individual behaviors, including assigning blame, as a point of change to reduce reported injuries. Griffon asserted that the person-centered approach is ineffective in reducing injuries and cultivates a poor safety culture. Unfortunately, the person-centered approach is often management’s preferred approach for reviewing health and safety incidents, as it is less costly and time consuming for them.


To underscore an example of an organization embracing the person-centered approach and how it negatively impacts safety culture, Griffon recalled the 2005 BP Texas City disaster. Griffon noted that BP embraced the person-centered view of error at the Texas site. The preference for this narrowly focused approach to reviewing health and safety incidents resulted in an environment where workers felt as though safety concerns could not be raised without fear that there would be negative consequences. Thus, workers



remained silent, hazards went unidentified, and the organization was unable to learn from previous mistakes. Even when workers did raise concerns through internal surveys, the issues remained unaddressed by management. Such conditions cannot support a positive safety culture. Instead, Griffon asserted that to cultivate a positive safety culture, workers need to be encouraged to report concerns and injuries, and management needs to freely accept reporting.

CSB's system view of error approach to investigating the incident helped to reveal multiple factors that influenced the conditions that led to the disaster. Among the factors identified by the CSB were a lack of safety leadership and trusting relationships, personal safety emphasis, and an infrastructure failure at the Texas City BP site.

Griffon commented, "Safety culture is a term being used too loosely, and it [tends to be used to] blame the worker. Safety culture should look at an organizational structure, and the intended happening versus what happened, and why decisions were made the way they were."<sup>8</sup>



**"Safety culture is a term being used too loosely, and it [tends to be used to] blame the worker."**  
—Mark Griffon

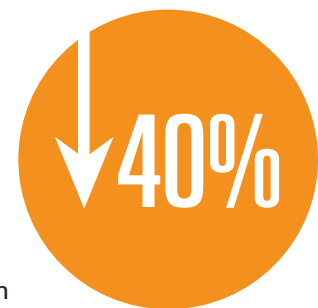
### Injury and Illness Prevention Programs

David Michaels, Ph.D., Assistant Secretary for Occupational Safety and Health at OSHA, discussed safety culture, and injury and illness prevention programs.

Michaels shared that management safety systems greatly influence workplace safety conditions. Every employer has a safety system. Even where there is a lack thereof, that is the employer's safety management system. Industry's mindset and approach to addressing occupational safety and health regulations continues to be dominated by a "compliance culture," but industry compliance with federal standards is not enough to address the health and safety issues in the workplace, according to Michaels. Hazard identification processes need to be proactive and take place before problems occur. Employers control the workplace, so we must have them on board, he declared.

Michaels cited employee bonuses and other material rewards programs for low injury rates as a culprit leading to underreporting. He noted that one recent investigation revealed a railroad company was penalizing workers for breaking "situational awareness" rules. Injured workers were not reporting injuries for fear that they would cause cancellations of parties for workers with no injuries.

Michaels said injury and illness prevention programs are an effective means to proactively promote and achieve safer workplaces. A recent study<sup>9</sup> from the RAND Corporation focusing on California showed that where inspectors asked to see health and safety training programs, injuries, and illnesses fell 40 percent in the same workplace the following year.



8 Campbell, Ryan, WETP workshop identifies strategies to promote effective safety cultures, E-Factor, July 2013, <http://www.niehs.nih.gov/news/newsletter/2013/7/spotlight-wetp/index.htm>.

9 Mendeloff, et al, An Evaluation of the California Injury and Illness Prevention Program, RAND Corporation, 2012.



This example illustrates that health and safety programs are effective, but they are only effective when they are used, just as “condoms don’t work if they are in the drawer,” Michaels stated.

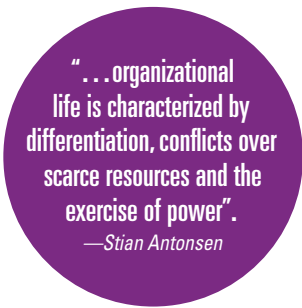
Michaels also briefly discussed other advantages to health and safety management programs. “Injury and illness prevention programs are a no brainer,” Michaels purported. Not only do they help to save lives, but they also help to save companies money. For example, such programs can result in reduced health insurance premiums and decreased worker absenteeism due to injury. Still, Michaels noted, industry trade associations have persistently resisted proposed requirements for employers to develop and maintain injury and illness prevention programs. Michaels called upon organized labor and its allies to help OSHA to push this requirement through.

### Safety Culture and Power in the Workplace

Craig Slatin, Sc.D., M.P.H., of the University of Massachusetts Lowell, gave a presentation based on a 2009 article by Stian Antonsen entitled, “Safety Culture and the Issues of Power.”<sup>10</sup>

Antonsen found that while there is no one clear definition of safety culture, it usually refers to “a set of safety related attitudes, values or assumptions that are shared between members of an organization.”

Antonsen notes that this suggests organizational unity, but Antonsen argues that “...organizational life is characterized by differentiation, conflicts over scarce resources



“...organizational life is characterized by differentiation, conflicts over scarce resources and the exercise of power”.  
—Stian Antonsen

and the exercise of power.” Thus, organizations actually consist of coalitions of persons and groups with different and sometimes conflicting interests, and are not necessarily unified entities. These coalitions or groups often emerge according to the degree of power or influence individuals possess within an organization. These divisions often develop along the lines of work routines, as unique experiences within the organization lead to particular understandings of group activities. Organizations can contain multiple sets of individual and group values, attitudes, perceptions, competencies, and patterns of behaviors at different levels of the organization. In other words, organizations can consist of several subcultures.

Safety culture research and practice is improved when power is acknowledged, Slatin remarked.

Slatin briefly discussed Steven Lukes’s “Three Dimensions of Power” that are outlined in the Antonsen article, and how power influences workplace culture regarding issues of health and safety. Lukes’s first dimension of power proclaims that “position power” influences the availability of information, control over rewards and resources, and how alliances and networks form. Lukes’s second dimension of power suggests that different groups and actors engage in a tug-of-war and struggle to set agendas. “Those who are not present at the table are often on the menu,” Slatin commented. Lukes’s third dimension of power suggests that once power is shaped, it enables the dominant group to significantly influence the goals, values, and attitudes in the workplace.



“Those who are not present at the table are often on the menu.”  
—Craig Slatin

10 Antonsen, S., Safety culture and the issue of power, Safety Science 47(2009) 183-191.

Slatin pointed to Antonsen's reference to the Challenger disaster as an example of influences of power on organizational decision making and how it can impact concerns for safety. Antonsen notes, "Normalization of deviance from safety practices does not come about in a power-free context."

Slatin highlighted three of Antonsen's lessons regarding power and safety culture. First, "there is often disagreement about what is dangerous and what is safe," according to Antonsen. Second, there are shared concepts in organizations, but also concepts that are not shared. "Building consensus can easily turn into manipulation," said Antonsen. Finally, Antonsen also said, "a culture which influences safety positively is not necessarily...homogenous and free from conflict, but one in which there is enough headroom to deal with conflicting views in a constructive manner."

### Overcoming Barriers to Developing Strong Safety and Health Programs and Safety Culture

Representatives from the United Auto Workers and Lavonia Ford Transmission Plant (LTP) in Michigan discussed how the union and employer have successfully established a health and safety workgroup to proactively address related concerns in the factory.

The health and safety workgroup at the Ford Plant was established in July 2012, and meets semi-monthly. The group includes representatives from both the UAW and Ford, including the plant's Human Resources Manager.

To support the workgroup's goals and success, they established confidentiality rules for the interactive process. These rules were set to promote openness, and to reduce concerns about negative repercussions for voicing health and safety concerns and to demonstrate a

commitment to addressing concerns. The rules have ultimately provided a foundation for trust between the plant workers and their employers.

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**To support the workgroup's goals and success, they established confidentiality rules for the interactive process.**

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The workgroup examined the health and safety culture at the plant, creating a matrix to identify opportunities to improve workplace conditions. The group developed a matrix of the factors that they believed influenced the plant's safety culture. The group identified various practices that were hindering a safer workplace, and were even contributing to heightened risk for injuries.

For example, the plant previously had not reported near misses. Workgroup members noted that recording near misses can significantly enhance the ability to see where the greatest hazards to health and safety exist. The plant now encourages workers to report near misses.

Through the workgroup, employers also learned that workers feared retaliation and punishment for reporting injuries. A labor relations drop box located in plain sight of supervisors discouraging workers from reporting concerns has now been replaced with an anonymous system with reporting kiosks located in various areas in the plant where any person can report behavioral, facility, and other concerns. The reports are reviewed weekly.

In addition, a revised pre-task analysis now promotes dialogue among workers about health and safety concerns and helps to improve safety while reducing cumbersome paperwork.

Previously, if a worker was hurt on the job, they had to appear at a 7:30 am managers' meeting

to explain their injury. The process was intimidating for workers, and the early meeting time discouraged workers from reporting injuries. This ineffective system has now been replaced with an interview process between the injured worker and a health and safety representative. The UAW shared that the change is encouraging workers to report their injuries, allowing the plant to more effectively identify and address health and safety hazards.

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**Previously, if a worker was hurt on the job, they had to appear at a 7:30 am managers' meeting to explain their injury. The process was intimidating for workers, and the early meeting time discouraged workers from reporting injuries. This ineffective system has now been replaced with an interview process between the injured worker and a health and safety representative.**

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Workgroup discussions have led to physical changes at the plant. For example, a dangerous machine that, without a ladder, posed unnecessary risks to workers, now has a ladder with proper tie-offs and safety measures. Electrical control boxes in high voltage areas that previously enticed workers to go in to reset them have been moved away from the high voltage areas.

Currently, the group is working to explore opportunities to perform maintenance on large machines without having to enter into them, a practice that continues to generate safety concerns.

## CONCURRENT BREAKOUT SESSIONS

### Safety and Health Programs and Safety Culture during Disasters

Jim Remington, R.N., of the NIEHS briefly discussed the difference between Stafford Act and National Contingency Plan disaster response efforts. Stafford Act responses were described as having less formal requirements for training, while National Contingency Act response efforts, based on experience during the Deepwater Horizon, consist of a more formal approach including requirements for standardized health and safety training for responders.

Remington noted that tremendous communication difficulties can emerge during disasters with regard to consistent messaging about hazards related to response efforts coordinated by state and local government, and by the federal government. Consistency in the information distributed during a disaster is important. John Morawetz of the International Chemical Workers Union Center (ICWUC) added that each organization also brings its own safety culture to disaster response efforts. Each organization has its own priorities, goals, programs, and insurance. The mixed messaging about hazards and the mixing of different safety cultures can significantly complicate the need to protect workers during response efforts, Morawetz warned.

Session participants broke into several small groups to identify and discuss the different groups and organizations that respond to disasters, and worked to identify their strengths and limitations with respect to safety culture. The groups and organizations identified included a vast array of federal agencies, state and local agencies, community-based/faith-based organizations, residents and immigrant workers, private industry, health and mental health practitioners, labor unions, and others.

The organizations identified varied in their capacities to foster and facilitate positive safety culture during disaster response efforts. For example, federal agencies were noted as possessing the congressional authorization and expertise to protect responders, but lacking in local knowledge and in the ability to conduct effective outreach to affected groups. State and local government agencies, including environmental, health, police, and fire departments possess stronger local knowledge and valuable expertise, but usually have very limited manpower and resources to commit to response efforts. On the other hand, community-based and faith-based organizations may not possess the same subject-matter expertise, but their local knowledge is unparalleled. These organizations tend to conduct effective outreach for organizing response efforts. Faith-based organizations have a particularly valuable ability to reach beyond community and state lines to rally support for response efforts. In addition, residents and immigrant workers provide manpower and an ability to support immediate needs of affected residents in the wake of disasters.

It was also noted that labor unions can be helpful in providing manpower and health and safety training to ensure that responders are aware of hazards and possess the knowledge to protect themselves. Private industry can donate significant quantities of equipment, including personal protective equipment (PPE) and other immediately needed supplies for those affected by the disaster.

Attention was also called to the manpower provided by immigrant workers during disasters. While valuable to response efforts, oftentimes they do not receive important training and thus are not adequately aware of potential hazards. Moreover, for several reasons, it can be very difficult to track long-term health issues that might surface in these groups of responders.

**TABLE 1: Characterizing what Various Stakeholders bring to a Response**

Participants broke into small groups, selected a stakeholder and then noted the actions, positives, and negatives of each group’s culture and focus.

GROUP	ACTIONS/PRIORITIES	POSITIVES	NEGATIVES
<b>First Responders</b>	Life safety, security	Well-trained, experienced	Jurisdiction limits, finite resources
<b>Utilities</b>	Restoration of services	Command and control, feedback from customers	Time, manpower, resources
<b>Volunteers</b>	Help everyone	Willingness to help	Regulation is difficult; Defining is difficult
<b>Faith and Community Organizations</b>	Help everyone	Organization, willingness to help	Hazard exposure, lack of training
<b>Non-Profit Organizations</b>	Needs assessment	Brand recognition, timely access to resources	Mission-driven blinders

### Safety and Health Program and Safety Culture at DOE

Patricia Aldridge of the HAMMER Hanford Training Center, and Ted Outwater of the NIEHS discussed safety and health programs and safety culture at the Department of Energy (DOE).

DOE sites operate in a complex environment made up of large workforces and include contractors, subcontractors, residents, and Native Americans. This complex structure creates challenges to ensure that all workers receive equal training preparation, and that policies and regulations are implemented consistently.

A major issue cited was flawed implementation of the 10 C.F.R. 851 safety and health rule. Aldridge noted that primary concern revolves around the 851 Rule, which mandates government contractors to comply with OSHA worker health and safety standards, among other standards, and to develop written safety and health plans.

It was noted that many contracts at DOE are performance-based, and contractors discourage injury reporting to save time and money. The 851 rule is rarely enforced, and thus is criticized as an ineffective policy. Incentive contracts that reward contractors for completing work ahead of schedule and/or below cost were identified as being the greatest threat to the worker protections under the 851 rule.

According to the discussion in the breakout session, in Oak Ridge, Tennessee, the 851 rule is not taken seriously. A high rate of contractor turnover results in diminished accountability. Workers view trainings as disconnected from actual work. The importance of PPE, including respirators, is not stressed enough. Session participants noted that the injury reporting systems at DOE facilities are often unclear, and/or workers are afraid to report for fear of retaliation and punishment. Some reporting systems lack feedback mechanisms; most are contractor-specific and confuse workers.

Achieving safer workplaces and a more positive safety culture at DOE facilities is complicated by its complex organizational structure. Commitment to safety is inconsistent across DOE sites and contractors, yet the term safety culture is frequently used. The overuse of the term with varied degrees of commitment has resulted in the term's poor image among DOE workers. Participants in this session agreed that DOE staff need to take a stronger stance on promoting safety culture and connecting the safety gaps at the DOE sites.

The DOE Health, Safety, and Security (HSS) group plans to work on the safety culture issue over the next few years. They recognize that scalability is an issue at the sites, and a more decentralized approach may be a suitable solution.

Session participants laid out additional actions for moving forward. First, DOE must work to repair the perception of the 851 rule, and ensure workers are equipped to use it as tool for promoting safer workplaces. Contractors must be properly trained and informed of their responsibilities under the 851 rule, and they should be held accountable for failing to meet their obligations under the rule.

In addition, DOE contractors need to become more actively invested in the local communities where they operate, and demonstrate good faith in their operations regarding worker and community safety.

### Overcoming Barriers to Worker Involvement in Safety and Health Programs and Its Implications for Safety Culture

Sharon Beard, M.S., of the NIEHS, and Mark Catlin of the Service Workers International Union (SEIU) Education and Support Fund asked session participants to identify major barriers to worker

involvement in safety and health programs. Three barriers were examined in-depth:

- ***No formal involvement of workers in the development and implementation of health and safety policies and programs***

Examples of formal involvement include contractual involvement, defined involvement, equal involvement (as opposed to having a seat but no voice), and cross functional team (workers, union, Health and Safety Committee, consistent meetings focused on related issues). Ideally, workers should be involved in all of these aspects.

Participants cited some examples where formal worker involvement already exists, including the Railroad Health and Safety involvement approach and the UAW and General Motors joint formal involvement plan, where workers and management work together to identify the best paths forward on health and safety matters.

Participants also noted challenges to formal involvement, including contractor organizations. Contractors are often focused on profits and sometimes view worker involvement as a hindrance to this goal. In addition, participants commented that contractor turnover is often high, and that hinders their ability to establish credibility and trust, which takes time.

- ***Written policy and translation to practice***

Written policy can be a good foundation for worker involvement and promoting safer workplaces. However, policy does not always translate into practice. Worker involvement in policy development helps to ensure that major health and safety concerns are addressed in a way that translates well in the workplace.



One participant noted that the UAW and General Motors contract language provides a good model to secure worker involvement in health and safety efforts. It includes committees and joint programs as well as direct policies. Another participant shared that the New York Workplace Violence Law was written with union input, and requires union input in policy design and worksite assessment.

- **Management mentality (a reluctance to cede power and work jointly with workers)**  
Many participants indicated a difficulty in overcoming management's reluctance to give power to workers or a committee.

The DOE integrated safety management system requires minimum elements of any safety program and encourages employee involvement. It encourages management to work with labor and solicit their participation. Issues come up, however, with changing contractors and different mindsets. Worker safety committees and an external facilitator have been helpful in opening dialogue. However, sometimes managers bring in new managers with mindsets similar to themselves, who maintain the status quo; the 'different' managers are those more likely to challenge the status quo. These issues make real employee involvement difficult and impede the effectiveness of ISMS.

When working to gain power, participants discussed the importance of committees talking through the decision process and addressing budget issues, the decision-making process, quorum issues, etc. Starting with small issues and expanding to larger ones can be a good model. This approach allows the committee to build off previous success and show how it can work without feeling overwhelmed.

University of California Los Angeles (UCLA) conducted a study looking at workplace decision makers and their thoughts on why training is valuable and how they see it manifested in the workplace. Decision makers feel that after training, workers are working more safely (participants overwhelming agreed), but decision makers showed little support for involving trained workers in safety committees.

### Normalization of Deviance and the Erosion of Safety Practices

Nick Del Re of the New York Fire Department provided a brief overview of the IAFF's two-day Front-Line Safety Program, which was developed by trainers selected from among the IAFF's cadre of 100 trainers across the country. The class reviews line-of-duty fatality statistics as well as injuries and illnesses from exposures to infectious diseases and hazardous conditions. They also noted that the statistics did not include those who died of a heart attack or stroke within 24 hours of stressful duty. He highlighted that 343 firefighters died at 9/11, and that there have been 21 related deaths and 1,562 disability retirements related to respiratory problems directly resulting from that event.

Del Re explained that normalization of deviance is a phrase originally coined by sociologist Diane Vaughan while she was researching the 1984 Challenger disaster. It describes the natural human tendency, particularly in high-pressure situations, to:

- Want to take shortcuts
- Accept a lower standard of performance
- Rationalize that it is the only way, regardless of the risks, to complete the mission



Normalization of deviation occurs gradually through small shifts in behavior away from accepted practice. Over time, a lack of negative consequences creates greater temptation to adopt shortcuts and previously unacceptable behaviors. Unchecked by consequence, these new approaches become the standard, widespread, or usual practice, procedure, or custom. In this way, safety incidents and disasters become “predictable surprises.”

Del Re suggested that each person, team, and work unit should recognize their vulnerability to deviate from accepted practice, and become vigilant in resisting it. This requires commitment to perform fundamentals consistently and diligently day-in and day-out.

Participants were asked to identify strategies to prevent, overcome, and protect from normalization of deviance. Participant responses included:

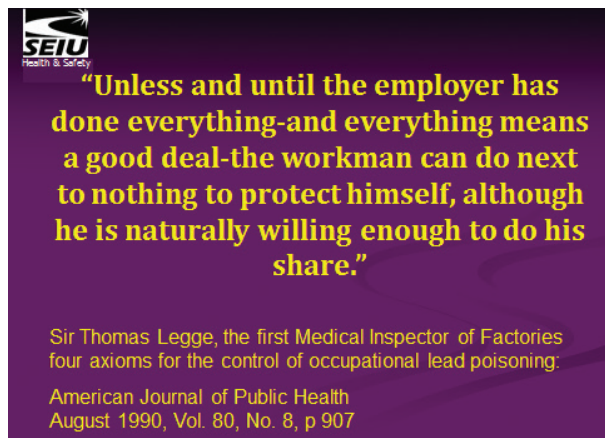
1. Recognize your vulnerability and that we all take shortcuts somewhere.
2. Execute to meet standards; plan the work, work the plan.
3. Consider your instincts; we have them for a reason.
4. Make sure to archive and review near misses/ disasters in your industry and similar ones.
5. Trick yourself out of a routine. Change ensures you follow the standard and do not normalize actions that are not part of the plan.
6. Have someone verify and review your plan.
7. Discussing what could happen helps with prevention. Do not avoid sticky subjects.
8. Ask “what if” in a job briefing. It is important to understand backups and how things work or could not work.

Del Re suggested that workers should ask themselves whether a tempting short-cut could compromise safety in the long run. It is also critical to document and review near-misses, mistakes, and disasters.

Workers were encouraged to become safety leaders. A safety leader is someone who acts with safety as the primary value and gets others to do the same.

### Safety Culture: Challenges Ahead and a Path Forward

Eula Bingham, former Assistant Secretary for Occupational Safety and Health at OSHA, noted that in all of her experience, money is the most important issue preventing safety culture. Time and time again, the incidents she was called into were a result of companies prioritizing profit over safety.



Mark Catlin of the Service Worker International Union (SEIU) offered five major points about safety culture and exploring a path forward.

First, it is important to acknowledge the confusion that is out there about existing data regarding what helps produce safer workplaces.

Second, there is no single view of safety culture, but multiple views. We need to listen and learn from one another.

Third, we need to agree on the components of an effective injury and illness program. Once defined, NIEHS should work to develop a checklist to identify programs that fail to effectively protect workers and foster safe work environments. Behavior safety programs should be identified as ineffective.

Fourth, we must not ignore the influence of power and money. Power and money influence health and safety decisions in the workplace. Too often, worker safety falls from priority to production and profit.

Lastly, we should work together to identify gaps and confusion, and support research that pushes what we want to see happen.

“Change is hard, but it is possible,” Catlin concluded.



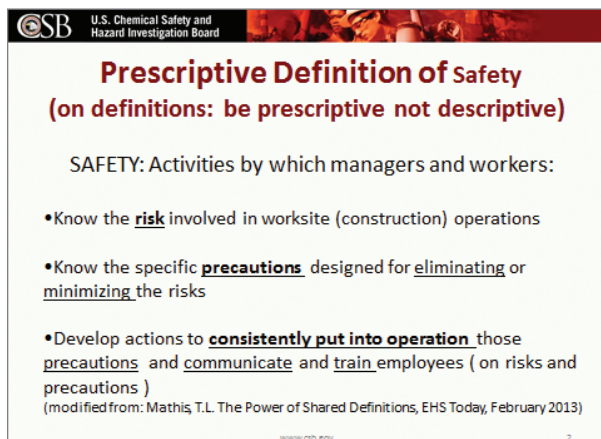
## CLOSING SESSION

### A Culture of Safety

Rafael Moure-Eraso, Ph.D., Chairman of the CSB, discussed the idea of a culture of safety as opposed to safety culture.

He noted that often we are interested in safety culture because we are interested in managing worksite safety. To begin, we must therefore have a good definition of safety culture, one that is prescriptive and indicates action. He noted that all workplaces have a safety plan — even lacking a plan is a plan — and all have a culture.

He provided a prescriptive definition of safety (*see inset*).



**CSB** U.S. Chemical Safety and Hazard Investigation Board

**Prescriptive Definition of Safety**  
(on definitions: be prescriptive not descriptive)

SAFETY: Activities by which managers and workers:

- Know the **risk** involved in worksite (construction) operations
- Know the specific **precautions** designed for **eliminating** or **minimizing** the risks
- Develop actions to **consistently put into operation** those **precautions** and **communicate** and **train** employees ( on risks and precautions )  
(modified from: Mathis, T.L. The Power of Shared Definitions, EHS Today, February 2013)

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Safety is the activities by which workers and managers know of the risk of a particular operation, know of the precautions to take to eliminate and reduce the risk, establish policies to put into operation those precautions, and adequately communicate and train workers on these risks and precautions.

Safety culture is a shared set of beliefs, norms, and practices about safety that are documented and communicated through a common language. We have to determine what value the concept and practice of safety has in the overall value system

of an institution. Safety culture is not always a culture of safety.

A culture of safety is characteristic of an organization that has an overriding commitment to safety, one that values it most among all values. Therefore, an organization with a strong safety culture is said to have a culture of safety.

Many sites have different safety cultures because they value the concept differently; that is, safety falls into different places within their value systems. Knowing about safety culture by itself does not fully describe the complex relationship between the organization's culture and its safety performance.

The CSB does root cause accident investigations, and often has to look at institutional mindfulness of risk and what to do about it. He noted that safety is a collective endeavor, not individual, so a worksite is organized by the institution that has control. To be effective, we need meaningful participation of the workers and their representatives. Levels of involvement depend on independent, protected representation of the workers on the premises.

What practices lead to a culture of safety?

- **Reporting culture:** Near misses, systemic errors, and behavioral reporting.
- **Just culture:** Avoiding blame on those who report; positive feedback from reporting helps stimulate reporting. This includes full protection of whistleblowers, and efforts to look for deficiencies in work organization.
- **Learning culture:** Learning from reports, have a place for lessons from system errors from personal behavioral safety programs and worker representatives included in safety management.
- **Flexible culture:** Decision making by those best equipped and most knowledgeable, not necessarily senior management.

The investigation by the CSB of the BP chemical refinery in Texas City in 2005 is an example of applying and investigating all of these aspects of culture (listed in bold on the previous page). The disaster stemmed from the overflow of a splitter tower system, resulting in a vapor cloud that ignited, exploded, and caused \$1.5 billion in damage and 43,000 community members to shelter in place.

Findings of the CSB established an emphasis on safety management: they recommended that the BP Board of Directors form a safety culture review panel to do a formal company-wide evaluation of safety culture.

Deficiencies in safety culture were the major root cause of the BP accident. The CSB found that: 1) the company did not provide effective oversight of safety culture, 2) senior management failed to provide leadership and oversight to prevent the catastrophe, 3) senior management failed to estimate risks (particularly the impact of a 25% cut in operational expenses might have), and 4) they relied on personal safety indicators rather than process safety indicators.

Other recommendations to BP from the CSB included:

- Appointing a new board member with expertise in process safety management
- Strengthening the safety program by:
  - a. Adding an incident reporting system
  - b. Requiring prompt corrective actions based on lessons learned from reported incidents
  - c. Developing, with workers, leading and lagging indicators of process safety

Recommendations to OSHA included:

- Amending the PSM standard to add a new Management of Change review to include:
  - Impact of budget cutting
  - Impact of staffing changes
  - Impact of major organizational changes, such as mergers, acquisitions, and reorganizations

Safety culture deficiencies were the main root cause of the accident at the BP Refinery in 2005. Other conclusions on safety culture deficiencies from the CSB investigation of BP included:

- Choices were made in the budget that impacted safety: the value of safety was secondary, and BP cut process safety without reviewing the safety implications of those cuts.
- Other major refinery investigations show additional Safety Culture problems for many U.S. refineries.
- Knowing about Safety Culture itself, does not always define performance.
- Investigations need to search for more work organization deficiencies and systemic errors and to learn from those errors and avoid just looking at individual errors.

John Howard, M.D., of the National Institute of Occupational Safety and Health (NIOSH) noted that over time a new paradigm has emerged where the focus has turned to labeling accidents as a failure of risk management and assigning blame. This paradigm makes it difficult to examine accidents holistically. Identifying the cause and the origin of the problem without assigning blame can be difficult to accomplish, but a blame-free environment that everyone believes in is essential. Ensuring adequate resources are committed to safety improvement initiatives is also vital.

Dr. Howard noted a need for research and publications that clearly capture how to define and improve safety culture through management systems.

More return on investments in research that focuses on health and safety programs is needed to demonstrate to employers the value of these programs.

Howard emphasized the importance of reaching out to those that did not participate in the meeting, and those hostile to the concept of safety culture. He noted that, "This is an exciting but frightening point.

It's important to get people involved and excited, but at the same time you have an obligation to continue forward."



"It's important to get people involved and excited, but at the same time you have an obligation to continue forward."

—John Howard

## CONCLUSION

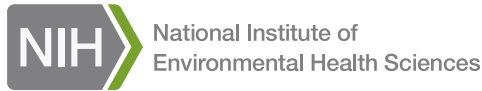
Joseph "Chip" Hughes, Jr., M.P.H, Program Director of the NIEHS WETP, noted that the meeting sought to blend the history of safety culture with the present. Safety culture is a core outcome of the NIEHS WETP. While the process is typically owned by management, it has a super structure which includes research. Building a foundation of peer-reviewed research will assist with properly defining the safety culture term.

Who owns the responsibility for a safety culture? If you do not take responsibility yourself, nothing will happen and the power struggle will continue. Grantees and advocates have the role of "building the bridge between personal responsibility and organization structure," according to Hughes.

Workers are trained so that they understand their rights. Workers have to understand why a safety culture is important, and they have to understand the consequences. Integrating these concepts into training will allow this message to be communicated.

The discussions that began at this workshop will no doubt continue to inform how the program, and the individual grantee organizations that help define the program, will move forward. Discussions on deficiencies in safety culture and the role workers can play in strengthening safety culture will surely continue in the NIEHS October 2013 workshop, "Meeting the Challenge: Worker Safety and Health Training for the Future."

# APPENDIX A: WORKSHOP AGENDA



## Safety Culture/Climate Workshop

Omni Shoreham Hotel, Washington, DC • June 11–12, 2013

### DAY 1: MORNING | Shared Plenary Session

7:00–8:00 a.m.	<b>Registration and Continental Breakfast</b> ..... <i>Palladian Foyer</i>
8:00–8:10 a.m.	<b>Welcome and Introductions</b> ..... <i>Palladian Room</i> <i>Pete Stafford, Executive Director, CPWR – The Center for Construction Research and Training</i>
8:10–8:50 a.m.	<b>Framing the Issues</b> <i>Steve Hecker, Associate Professor Emeritus, University of Oregon/CPWR</i> This session will include a brief history of safety culture, putting safety culture into perspective, and a look at how research findings inform our understanding of safety culture/climate.
8:50–9:30 a.m.	<b>CSB Investigations and Safety Culture</b> <i>Mark Griffon, Board Member, U.S. Chemical Safety and Hazard Investigation Board (CSB)</i>
9:30–10:00 a.m.	<b>Break</b> ..... <i>Palladian Foyer</i>
10:00–10:20 a.m.	<b>Injury and Illness Prevention Programs</b> <i>David Michaels, Assistant Secretary, OSHA</i>
10:20–10:50 a.m.	<b>Q &amp; A and Charge to track sessions</b> <i>Donald Elisburg, Senior Advisor, NIEHS National Clearinghouse</i>

### DAY 1: MORNING | Separate Track Sessions

<b>NIEHS TRACK</b> <b>The Connection between Safety and Health Programs and Safety Culture</b> <i>Palladian Room</i>		<b>CONSTRUCTION TRACK</b> <b>Safety Culture and Climate in Construction: Bridging the Gap between Research and Practice</b> <i>Hampton Room</i>	
11:00 a.m.–12:00 p.m.	<b>Session 1: Workplace Power, Safety and Health Programs, and Safety Culture</b>	11:00 a.m.–12:00 p.m.	<b>Framing Session: Safety Culture and Climate—Defining and Framing the Issues for the Construction Industry</b> Presentations and multivoting
12:00–1:00 p.m.	<b>Lunch</b> ..... <i>Palladian Room</i>	12:00–1:00 p.m.	<b>Lunch</b> ..... <i>Palladian Room</i>

## DAY 1: AFTERNOON | Separate Track Sessions

<b>NIEHS TRACK</b> <b>The Connection between Safety and Health Programs and Safety Culture</b> <i>Palladian Room</i>		<b>CONSTRUCTION TRACK</b> <b>Safety Culture and Climate in Construction: Bridging the Gap between Research and Practice</b> <i>Hampton Room</i>	
1:15–3:00 p.m.	<b>Session 2: Overcoming Barriers to Developing a Strong Safety and Health Program and Safety Culture</b>	1:15–3:00 p.m.	<b>Session 1: Key Factors that Contribute to Safety Culture and Climate</b> Presentations and small group discussions
3:00–3:15 p.m.	<b>Break</b> ..... <i>Palladian Foyer</i>	3:00–3:15 p.m.	<b>Break</b> ..... <i>Hampton Foyer</i>
3:15–5:00 p.m.	<b>Session 3: Maintaining Safety and Health Programs: Normalization of Deviance and the Erosion of Safety Practices</b>	3:15–5:00 p.m.	<b>Session 2: Evaluating Safety Culture and Climate—Why? How? What Does It Tell Us?</b> Presentations and small group discussions
5:00 p.m.	<b>Adjourn for the Day</b>	5:00 p.m.	<b>Adjourn for the Day</b>

## DAY 2: MORNING | Separate Track Sessions

7:30–9:00 a.m.	<b>Registration and Continental Breakfast</b> ..... <i>Hampton Foyer</i>		
<b>NIEHS TRACK</b> <b>The Connection between Safety and Health Programs and Safety Culture</b> <i>Capitol Room</i>		<b>CONSTRUCTION TRACK</b> <b>Safety Culture and Climate in Construction: Bridging the Gap between Research and Practice</b> <i>Hampton Room</i>	
9:00–10:00 a.m.	<b>Session 4: Report Back from the Breakout Sessions</b>	8:30–10:15 a.m.	<b>Session 3: Solutions for Improving Safety Culture, Safety Climate and Safety Outcomes</b> Presentations and small group discussions
10:00–10:15 a.m.	<b>Break</b> ..... <i>Hampton Foyer</i>	10:15–10:45 a.m.	<b>Break</b> ..... <i>Hampton Foyer</i>
10:15–11:15 a.m.	<b>Themes from the Previous Day</b>	10:45–11:45 a.m.	<b>Session 4: Needs and Next Steps For Bridging the Gap and Moving Forward</b> Discussion on how best to move construction safety culture/climate forward
11:15–11:45 a.m.	<b>Session 5: How Safety and Health Programs and Safety Culture fit into the WETP Strategic Plan and Future Funding Announcements</b>		

## DAY 2: CLOSING | Shared Plenary Session

12:00–1:00 p.m.	<b>Closing Speakers</b> ..... <i>Hampton Room</i> <ul style="list-style-type: none"> <li>• <i>Rafael Moure-Eraso, Chairman, CSB</i></li> <li>• <i>John Howard, Director, NIOSH</i></li> </ul>
1:00	<b>Adjourn</b>







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Environmental Health Sciences

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