

How to Improve the Safety Climate on Your Construction Site

*Guidance Document Sponsored by the
AIHA® Construction Committee and Management
Committee*

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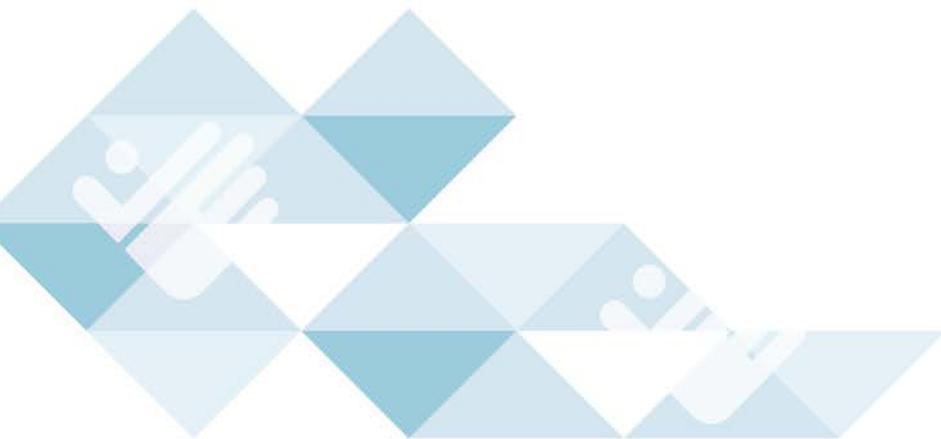




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ACKNOWLEDGMENTS

INTRODUCTION

Construction safety has improved dramatically in the past few years. Many companies have very good safety programs, but there is still significant room for improvement. Some 900 construction workers annually are killed on the job in the United States, and thousands more sustain serious injuries or suffer from chronic illnesses.

Compliance with OSHA standards is not enough: further safety improvements need to come from addressing both the physical exposures and psychosocial aspects of safety on the jobsite. Safety climate has been defined as the worker perceptions of safety on the construction site. Research on safety climate in construction has shown a significant correlation between improved safety climate and reductions in injury rates and self-reported worker safety behaviors (Schwatka, et. al, 2016).

The safety climate of a job site determines whether or not workers feel empowered to raise safety concerns. If workers do not feel comfortable raising safety issues or concerns, those problems will not be addressed and injuries are inevitable. If supervisors and forepersons do not communicate the importance of safety through their words and actions, workers will get the message loud and clear that safety is not important. By improving safety climate (e.g. worker perceptions of safety on the jobsite), safety will be seen as a fundamental part of the job and safety will improve.

Safety is not a goal: it is a journey of continuous improvement. It depends as much on how it is accomplished as on the rules and standards. Construction is a fluid, dynamic process with many moving parts. The only way to assure safety is to get everyone working together.

This guide was developed to provide practical tips to companies and safety and health professionals that sincerely want to make safety improvements in these eight areas:

1. worker participation
2. the right to refuse unsafe work
3. close-call reporting
4. safety leadership by supervisors
5. subcontractor safety
6. integration of safety into operations
7. owner involvement
8. measurement of the safety climate

In each section, we provide tips on how improvements can be made, discuss barriers to improvement and how to address them, offer ideas for small businesses (which may require different approaches in implementing the recommendations in this document), explain how to evaluate whether changes are working, and list resources.

This guide was developed as an extension of the work of the National Occupational Research Agenda (NORA) Construction Sector Council and the Safety Culture/Safety Climate Workshop



in 2013 cosponsored by CPWR, the Center for Construction Research and Training. We encourage you to explore CPWR reports and training materials on safety climate and safety leadership for further guidance.

Scott Schneider, CIH, FAIHA
Washington, D.C., May 2017

Schwatka, NV, Hecker, S and Goldenhar LM, Defining and Measuring Safety Climate: A Review of the Construction Industry Literature, *Annals Occupational Hygiene*, 2016, V. 60 #5, 537-550, accessed at:
<http://www.cpwr.com/sites/default/files/research/Defining%20and%20Measuring%20Safety%20Climate.pdf>

HOW TO IMPROVE SAFETY CLIMATE THROUGH WORKER PARTICIPATION

Front-line workers perform most of the actual “constructing” in the construction industry. They carry out plans that were designed by others via directives received from their forepersons and management. Front-line workers are the people who work “on the edge,” facing the daily work hazards and relying on their instincts, training, and experience to keep themselves safe. This unique understanding of the reality of addressing safety risks is only by the front-line workers themselves. Not engaging workers actively in the safety program is a missed opportunity to identify risks and implement controls that may not be possible at later stages of construction.

No one wants to get hurt on the job, but construction workers are often conditioned to accept the risks associated with their work and to focus on getting the job done, although they have a personal concern about their safety within the job. Workers who have never been asked about their perspective on workplace hazards or risks, or included in planning for safety, may at first be hesitant to give input on safety matters. There are many unstated norms that front-line workers have absorbed from years of experience and tradition. They are often blamed for incidents on the jobsite by being “careless.” Therefore, asking workers to actively engage in identifying workplace hazards, problem-solving, and recommendations for alternative work methods will signify a distinct change in the unspoken rules. However, the benefit to including front-line worker experience when planning work methods and safety measures is worth the investment in changing these norms.

It is vital to gradually introduce a change from a management-driven “top-down” company to a more cooperative approach that truly values the workers’ perspective and follows through with processes suggested by the workers. This guide will help companies both to initiate this change process and to use their most valuable resource, their workers, to improve site safety and performance.

Employers have legal responsibility for insuring worker safety, but workers are usually the first to find or know about a hazardous condition or situation. On the front lines they can be the eyes and ears of the safety program. If they are actively engaged in the safety process, hazards can, and will, be identified and corrected before someone gets hurt. The ideal is that every worker becomes a safety leader — not simply leaving it up to the safety manager or supervisor. All workers need to know what hazards to look for, to feel comfortable reporting them, and to be encouraged to do so without worry or fear of retaliation, punishment, termination, or blacklisting.

Safety directors should not be held responsible for safety performance results; rather, they should be responsible for facilitating safety knowledge and understanding throughout the organization and be a conduit to communicate safety-related information during the construction process. They should be responsible for enabling all staff members to understand how to “own” safety (their personal safety, as well as others’). It is only when safety is understood to be everyone’s responsibility and owned by everyone in the company that ongoing performance improvement can be truly attained.





How Can Workers Participate Effectively in Jobsite Safety?

Workers can:

- participate in safety orientation sessions to learn how they can be involved in safety on the jobsite
- help present the site orientation
- help present toolbox talks
- help train other workers in hazard recognition and their right to a safe workplace
- be trained as “safety liaisons” or safety stewards who conduct safety audits and know how to have hazards corrected
- participate in developing and presenting job safety analyses (JSAs)
- participate in site safety inspections and incident investigations
- be part of a site-wide joint safety committee, and participate in reporting unsafe conditions and incidents
- participate in worksite safety climate surveys
- be empowered with stop-work authority or responsibility
- be part of problem-solving and planning teams

How Will Worker Participation Help Improve Site Safety and the Safety Culture and Climate?

A safety climate represents *shared* perceptions among employees regarding the extent to which safety is valued, expected, rewarded, and reinforced by a company (See Schwatka, et. al. 2016). Worker participation is vital to developing a positive safety climate in which all employees agree on the value and importance of safety. Research suggests there are two critical components: (1) strong, positive, and consistent safety leadership, and (2) fostering opportunities for developing those shared perceptions.

Strong safety leaders develop a shared safety vision, exhibit safety citizenship behaviors, encourage two-way communication, and empower employees to be safety leaders by encouraging their participation in important safety-related decision making. The safety climate is a direct function of trust, and trust builds as workers and management develop closer working relationships. For example, giving workers stop-work authority demonstrates management’s trust. When workers believe their knowledge, experience, opinions, and input are valued, they become more engaged in the safety process. Management benefits by tapping into that knowledge and experience, resulting in an improved program.

Worker participation can also improve the safety climate by capitalizing on opportunities for developing positive shared perceptions regarding safety. Trained safety liaisons and stewards can be points of contact for workers who are afraid to raise safety issues with management. This can be particularly helpful with immigrant or non-English-speaking workers. Toolbox talks, participation in climate surveys, and proactively raising and discussing safety concerns all represent key opportunities for employees to see the importance of safety through workplace events, practices, and procedures and, in doing so, reach consensus on the meaning and value of safety on the worksite. Many companies have “safety huddles” before work starts to review with the crew daily tasks and allow safety issues to be raised. In addition after an

incident has occurred, some companies have “After Action Reviews” or AAR to allow workers to have input into how to prevent future such incidents.

Below, we discuss how to use these opportunities to develop shared values and consensus among employees regarding safety.

How to Facilitate Effective Worker Participation?

Participate in worksite climate surveys.

Asking employees to participate in anonymous worksite climate surveys provides a valuable opportunity for workers to give voice to their beliefs, perceptions, and concerns regarding safety on the worksite. The mere act of asking indicates concern on the part of the employer. Even more important is what is done with the resulting information. Sharing the results of any workplace survey is critical; otherwise, it is akin to taking a test but never learning the outcome. Results can be shared and discussed during toolbox talks or within safety committee meetings.

Comparing responses across different groups of employees can offer important insights into discrepant (or convergent) views on the worksite about the value of safety. For example, discrepancies can be found between different trade groups, English and non-English speakers, supervisors and journey persons, and so on. Asking employees to reflect on the results and develop actionable next steps to address areas of concern fosters a positive safety climate and helps ensure needed employee buy-in for any resulting changes.

Many free safety climate measurement tools are available. Some have been developed to apply specifically to the construction industry while others can be applied in any context or setting. Some tools also offer benchmarking information so that organizations can compare their results. A link to a recent compendium of available scales appears in the Resources section. See below for caveats about surveys in smaller companies.

Participate in reporting unsafe conditions and incidents.

Engaged workers report unsafe conditions and incidents. However, employees need to feel secure in doing so. Fear of negative consequences is a common concern. Being punished or seeing another employee punished for raising a safety concern or reporting an injury is the quickest way to ensure others will remain silent. Important lessons can be learned from “high-reliability organizations” and industries (e.g., airline and nuclear power industries) that rely on accurate and timely reporting of unsafe conditions, early warning signs, and incidents. A link to fostering a “just reporting culture” appears in Resources.

Employees also need to see change as a result of their speaking up; otherwise, they will quickly become disengaged and disillusioned. Common explanations for not speaking up include: “I took care of the problem myself”; “I didn’t think anything would be done to fix the problem”; and “I didn’t think it was important.” All these statements imply a perception that worker participation is not valued, as well as a lack of recognition that failure to speak up potentially affects everyone’s safety.



Although all organizations ultimately want an injury-free workplace, it is important to reward worker safety participation (e.g., reporting, participating in hazard identification, completing a climate survey) rather than just safety outcomes (e.g., no injuries). While “zero injuries” is a laudable goal, an overly strong focus on meeting this standard can lead to injury under-reporting, whereas a focus on safety activities and worker participation can lead to fewer injuries.

Participate in joint safety and health committees.

Some companies find that the best way to engage workers in safety program efforts is through a formal safety committee. Some companies have their own safety committees. On large jobsites with many subcontractors safety committees may include representatives of all subcontractors and/or all trades. Here are some tips for setting up and running effective committees. Links to safety and health committee guides are listed under Resources.

Tips for safety committees:

- Membership should be voluntary.
- Have equal representation by employees, management, and union (if applicable).
- Keep the size manageable, not exceeding 8 to 10 committee members.
- Meet regularly, at least once a week, with a set day and time.
- Use an agenda to guide meetings.
- Develop a written mission statement.
- Clearly define the duties and responsibilities of each committee member and ensure that all of them have the time during their regular paid work schedule to complete their duties.
- Allow time for each person to bring up a discussion point or make comments on issues being discussed.
- Record and disseminate minutes of each meeting, documenting attendance, concerns, and issues as well as and actions proposed or taken to address each issue.
- Communicate the committee’s purpose, activities, and accomplishments to the general workforce.
- Measure the committee’s progress over time, and periodically discuss what aspects of the committee are helpful and not helpful.
- Share success stories (no matter how small) at meetings to keep the tone positive and boost morale on the committee and jobsite.
- Lead by example by modeling safe behaviors and enthusiasm for the safety program.

Activities or tasks for committees:

- Develop a formal mechanism for employees to report safety concerns.
- Document reported concerns.
- Describe what actions will be taken to address concerns.
- Formulate an explanation in the event that no action will or can be taken on reported concerns.
- Develop a formal mechanism to give positive feedback. (Positive feedback and encouragement can be one of the strongest motivators for behavior change.)
- Report unsafe working conditions and practices as seen by employees.
- Discuss problem-solving techniques to identify safety issues.

- Develop recommendations for specific actions in response to employee safety suggestions.
- Develop written safety procedures and policies.
- Develop and implement safety training.
- Develop an emergency preparedness plan.
- Ensure first-aid and personal protective equipment needs are met.
- Conduct safety and health audits or surveys.
- Identify high-risk areas and tasks.
- Track injuries and near misses.
- Form subcommittees to address specific issues or projects.
- Conduct accident and near-miss investigations on both to employee injuries and vehicle accidents.
- Consider other activities that will spread the workload of the safety program.

A joint safety committee should *not* be viewed as a forum for complaints or retroactive blaming for incidents or injuries. Instead, the committee should be an effective tool to help prevent unsafe working conditions or practices, reduce the risk of injury or illness, and motivate employees and supervisors to become actively involved in a company's safety program. On all jobsites, it is important to have representation from all the trades.

Problems to Watch For

Construction is generally hierarchical, with a control and command structure. Workers often complain that they are hired "from the neck down" and are not expected to think. However, construction workers have to solve problems every day on the job. Safety directors may believe they are hired for their expertise and the need to exercise authority to make the worksite safer. Yet a safety director does not want to be considered a safety cop, where workers work safely only when he or she is coming around. The same can be said of site supervisors who are trained to be safety leaders. Supervisors cannot be with every member of their crew 24/7, and the safety-related decisions their crews make while they are not present can impact job and site safety. Every worker must be a safety leader, because safety is optimized only when every worker is involved and empowered.

How to Encourage Worker Participation?

Management has to trust employees and acknowledge that everyone wants a safe jobsite, not just a productive one. Recognizing the value of worker involvement, management must give them the knowledge, skills, and tools to this end. It may be useful to start small, such as having experienced workers deliver the toolbox talks, or developing a small project team to solve a sticky safety issue. Giving workers stop-work authority is the ultimate sign of trust (see next section on Right to Refuse).

Can Small Businesses Encourage Worker Participation?

Most small businesses do not have the resources to hire a safety director or safety professional. The person in charge of safety may be a foreperson with little formal safety



training. Providing safety training to both workers and forepersons is the first step toward engaging workers in a small business setting. Workers should be informed of their right to a safe workplace and the expectation for them to identify hazards they learned about in training. Temporary contract workers should be trained as part of a jobsite orientation *before* they begin work. A formal safety orientation can be a key intervention for small businesses.

The approach to gathering information on worker perceptions of safety and safety climate may have to be adjusted in smaller companies. Anonymity is harder to guarantee in such environments and it may be that more informal discussions produce more accurate assessments than formal surveys.

How Will We Know if Worker Participation Has Been Effective?

A key measure of worker involvement is the degree of participation. Do workers speak up at toolbox trainings? Are workers engaged at safety committee meetings? Do workers identify hazards and make sure they are promptly corrected? Has work ever been stopped by workers to correct a safety problem? If workers feel their participation is valued, they will actively participate. Another key indicator is whether workers have a perception of the safety program different from their supervisors. Survey tools in this guide can help understand these perceptions. There are also links to guidance on measuring other leading indicators of program effectiveness, rather than relying on the traditional measures (lagging indicators) of injuries and lost workdays.

Resources on How to Improve Safety Climate through Worker Participation

Communications Workers of America: Fact Sheet on Local Union Occupational Safety and Health Committees. http://www.cwa-union.org/pages/forming_osh_committees

Health and Safety Executive: Worker Engagement Case Study 13: Joint problem solving — working at height up to 4.5 m. Available at:

<http://www.hse.gov.uk/construction/engagement/crown-house-technologies.pdf>

Joint Safety Committee Guides

- <http://theworksite.org/index.php/job-safety/20-health-and-safety-committees>
- <http://theworksite.org/index.php/job-safety/24-joint-safety-committees>
- <https://pantherfile.uwm.edu/groups/sa/usa/public/Safety/safcomm.pdf>.
- <http://www.gpo.gov/fdsys/pkg/CFR-2012-title29-vol9/pdf/CFR-2012-title29-vol9-sec1960-40.pdf>

Schneider, Scott: What does worker involvement mean in construction? *Laborers' Health & Safety Fund of North America 10(4)* (2013). Available at:

<http://www.lhsfna.org/index.cfm/lifelines/september-2013/what-does-worker-involvement-mean-in-construction/>

Strategic Forum for Construction: *Short Guide to Improving Health and Safety on Construction Sites Through Effective Worker Involvement*, 2007. Available at <http://www.unitetheunion.org>

Safety Huddles

<http://www.psqh.com/analysis/safety-huddles-for-a-culture-of-safety/>

After Action Reviews

<https://www.fireleadership.gov/toolbox/after-action-review/aar.pdf>

Surveys

CPWR, the Center for Construction Research and Training, with NIOSH: Safety Culture and Climate in Construction: Bridging the Gap Between Research and Practice, 2013. [Workshop report] Available at:

http://www.cpwr.com/sites/default/files/CPWR_Safety_Culture_Final_Report.pdf

Global Aviation Information Network, Working Group E: A Roadmap to a Just Culture: Enhancing the Safety Environment, 2004. Available at

http://flightsafety.org/files/just_culture.pdf

Toolbox talks

Electronic Library of Construction Occupational Safety & Health. Available at:

[http://www.elcosh.org/en/index.php?module=Search&or_filters\[\]=100](http://www.elcosh.org/en/index.php?module=Search&or_filters[]=100)

Laborers' Health & Safety Fund of North America. Available at:

<http://www.lhsfna.org/index.cfm/lifelines/january-2014/giving-effective-toolbox-talks/>



HOW TO IMPROVE SAFETY CLIMATE ON YOUR JOBSITE THROUGH THE RIGHT TO REFUSE

Safety climate on construction sites is all about trust. Do workers trust management to place safety before productivity? Does management trust workers to stop work only when there is a serious safety problem? Explicitly giving workers the right to stop the job when they believe it to be unsafe answers these questions with a loud and clear *yes!*

Too often management distrusts workers and believes that giving workers the right and authority to refuse to work when they believe the work to be unsafe will cause unnecessary delays in the project — perhaps even resulting in costly overruns and late fees. In fact, the opposite is generally true. Workers are generally reluctant to use this authority and may be reticent about stopping work, even when they should. They often do not believe that management is sincere about letting them stop work and worry that a work refusal would result in disciplinary action or dismissal. Workers want to be productive and want to show they are good workers, particularly new workers. They do not want to be seen as complainers or slackers but value their reputation as a good worker — factors that conflict with choosing to exercise the right to stop work.

How Can We Bridge This Divide?

One contractor developed a short video that is shown to all workers coming onto the site. In this video, the company president asks workers to use their right to refuse and gives them his 800 number to call day or night if they have any problems. This kind of support from top management is unusual and very powerful in creating trust.

- Rewarding workers who exercise their right to refuse demonstrates that management is fully behind workers who refuse unsafe work. Workers should be rewarded in a way that emphasizes that refusals can prevent tragedies.
- Give workers a “red card” they can use to stop work. It can be a visible symbol of their authority that can be used to tag out a scaffold, trench, or ladder.
- Turning every worker into a “competent person” who, under OSHA rules, has the authority to stop work, based on his or her knowledge and expertise would require all workers to be better trained on recognizing hazards and how to correct them.
- Giving positive reinforcement is critical. Supervisors are the people to whom front-line workers report and look to for signs regarding acceptable behavior.
- Peer pressure can play an important role in the success of a work refusal. Everyone needs to buy into using this right for it to be effective.

Are These Methods Working?

Do workers feel comfortable exercising their right to refuse unsafe work? One measurement is the number of work refusals that occur. Of course, there could be no or few work refusals because the company has a very good program that is catching and correcting hazards before they become serious. An employee perception survey directly asks workers how they feel about exercising their right to refuse unsafe work. Over time, that measure should improve as workers become convinced that management truly supports such actions.

How to Know if Workers Are Exercising Their Right to Refuse?

Keeping track of work refusals is important. They should be documented and investigated similarly to close calls. If the hazard had not been identified and work stopped, someone could have been injured. Reviewing the log of work refusals and their causes will help prevent injuries.

Can Small Businesses Use Work Refusals?

Small businesses can use work refusals as a way to improve safety, too. In a small business, each person works more independently and should feel more empowered to control his or her work process. Small jobs may also have more flexibility as to schedule and completion deadlines.



HOW TO IMPROVE SAFETY CLIMATE THROUGH CLOSE-CALL REPORTING AND ANALYSIS

A close call is a disaster that almost happened. A slight change in conditions could have resulted in a fatality or serious injury. Only by looking at close calls can we prevent disasters and not rely on luck to protect workers.

Why Do Close-call Reporting and Analysis?

To prevent injuries, information is needed to prioritize prevention efforts. We usually start by looking at the type of injuries that have commonly occurred in the past. Even accurately reported past incidents may yield a fairly small amount of data. For every injury reported, there are estimated to be 10 to 100 close-call incidents. Reporting and fully investigating near misses or close calls supplements historical data with current data to establish trends. (While these incidents are often referred to as “near misses,” it seems more accurate to refer to them as “close calls,” since a miss did occur and no one got hurt.)

By collecting these data and using the information for prevention, employers demonstrate a true commitment to worker safety, which will lead to an improvement in safety climate. Workers need to be a part of the process: they are the witnesses and sometimes the near-victims of the close calls. Active investigation and reporting demonstrates to workers that management is focused on improvements.

Some companies may require only the reporting of incidents that meet OSHA and Mine Safety and Health Administration (MSHA) reportable criteria. However, it is more useful to implement reporting of all incidents, no matter how severe, even if they are not “recordable” on the OSHA/MSHA log. Companies should stress the importance of incident reporting, including first aids, reports with no first aid, *and* close calls to their employees. Incidental to this reporting are issues of damaged equipment, spills, housekeeping issues, and other unusual or unexpected work conditions.

Industries that are highly sensitive to incidents because of their potentially catastrophic nature (e.g., aviation, nuclear, railroads) have all instituted national anonymous reporting systems for close calls (see Resources below). Many industrial companies also have employee hotlines for anonymous reporting, suggestion boxes for improvements, and even recognition programs for employees who report conditions.

How to Get Started?

First, a “close call” must be defined. It could include:

- an incident that did not result in an injury or physical damage
- an incident where no one was injured, but the likelihood of injury was high
- first-aid cases or cases without lost workdays, which are often used as an

approximation for a close call

- any incident, unusual problem, or new hazard that occurs on site
- hazards that are identified and corrected before someone gets hurt.

Some examples of close calls (see Figure 2 below as well) are:

- A worker walks under a suspended load.
- A worker slips while climbing a ladder but does not fall.
- A tool falls off a scaffold but does not hit anyone.
- A worker working below another worker

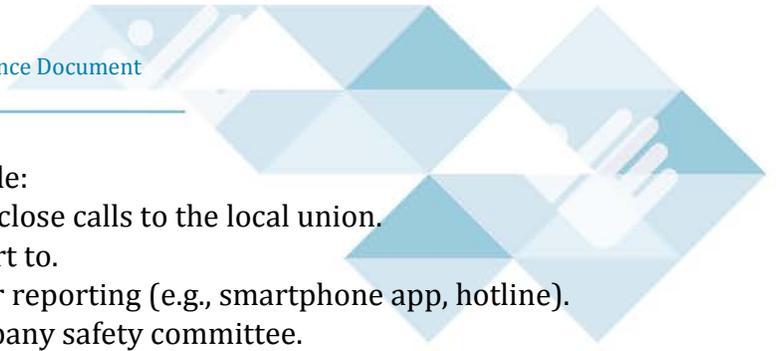
Second, the close calls have to be reported. (See Potential Problems to Address, below.) The definition of a close call and its reporting system should be jointly developed by workers and management. Cast a wide net:

- Collect information on any unusual event on the job and on common events that could result in an injury, even though an injury or damage did not occur.
- Track information such as employee tenure, training, job conditions, and the root causes of the incident.
- Develop a structured incident reporting process that includes open-ended descriptions of the event. It should be structured so as to probe conditions, procedures, and planning before probing any acts by employees. Look for contributing factors and conditions and ask what would have been the worst possible outcome, if the event did occur.
- Investigate the incidents according to a predefined protocol.

Encourage employees to report incidents by guaranteeing that such reporting is no-fault. It is the safety management system that creates unsafe conditions and the safety management system that must be improved. There will always be a program, policy, work practice, or training that can be improved upon. Improvement is a continual process that does not, and cannot, end.

As the data accumulate, the more frequent types of incidents will be determined and can then be placed on a checklist of possible events (see Figure 1 below). Trends can be spotted and potential problem areas identified. At the same time, workers will learn that reporting incidents is an important part of their job and is valued by management. Positive reinforcement for reporting is important. Be aware that some workers may be reluctant to report because it may lead to a procedural change, which they may consider negative. There is also peer pressure not to get another worker in trouble, so it is important to not assign blame but to focus on corrective actions to prevent future incidents. In egregious cases, discipline may be required for serious mistakes or even intentional actions, but discipline needs to be predefined and fair in its application. Too often incidents are blamed on “carelessness” and the “solution” is to discipline the worker and call for more training. That approach misses the boat. Blaming the worker does not address the underlying causes of incidents and does nothing to prevent future incidents since each is seen as an individual case of bad behavior.





Suggestions to encourage reporting include:

- Have construction workers report close calls to the local union.
- Hire a third party for them to report to.
- Identify a truly anonymous way for reporting (e.g., smartphone app, hotline).
- Have close calls reported to a company safety committee.
- Use focus groups run by a third party to solicit information.
- Develop a national anonymous reporting system run by the government or industry (see Resources below).

Using Incident Surveys

If a structured system is not the right starting point for a company, it is best to start with an anonymous incident survey approximately every three months or on some defined schedule. Surveys have to be simple and give workers an opportunity to say whatever they want. Many answers will not be relevant, but some will be important. This will familiarize the entire staff with the concept of 100% incident reporting. Make sure survey participants understand that management wants to identify every injury, along with incidents with the *potential* for an injury (not just those that reach OSHA-recordable severity). Surveys should include an open-ended response space for participants to describe events they have observed and room to report incidents not included on the precoded list. After each round of the survey, identify the most common or most important incidents reported and begin to build a checklist of these events.

Report the results of each survey in an aggregated fashion so that no one report or specific incident can be identified and traced back to individual workers. Again, some responses will not be relevant and can be removed from the analysis. (Some workers will inevitably view the survey as an opportunity to complain about anything, not just safety. Such comments should be addressed, but outside the safety effort.) Regular, dependable feedback will encourage participants to continuously assess their work environment for hazards and improve their vigilance for situations that may lead to an incident.

Beyond Zero

Some companies obsessed with reaching zero do not realize that zero incidents are probably not achievable. Furthermore, even with zero incidents, close calls occur. A goal of zero incidents may incentivize underreporting. Thus, zero incidents is probably not a reasonable goal. If a company is successful in achieving zero incidents, it may identify many more and different types of incidents than focused on in prior years by using close-call reporting. The company will no longer be able to advertise “X-thousand man-hours without an incident,” but the close-call information will become an important leading indicator of potential problems. The type of incident prevented by better close-call reporting could be catastrophic, so weighing this against a blemish on the zero-injury record should be in everyone’s interest.

Lastly, workers need to be informed of the results of these investigations and reporting on a timely basis. They have to see the prevention activities that came about from the reporting of

incidents in order to understand the value of prevention and to protect them from the next incident occurring. Consider implementing a regular mechanism for such communications (e.g., newsletter, bulletin board, toolbox talks).

Potential Problems to Address

- 100% incident reporting will be the most difficult during the first few months of the program. Establishing trust and confidence in the survey and in an anonymous reporting system is more important than worrying about the accuracy of the data during this time. The first year will be a learning process for the safety personnel analyzing the data, as well as for the employees and managers asked to report incidents on the job.
- Establishing a no-fault system is a huge challenge. When a problem is identified, it is important for everyone to take ownership of it and to recognize it as a team failure, not an individual one. Workers are already afraid of being fired and blacklisted for reporting injuries that should be reported under OSHA-recordable standards. They will strongly resist making reports of minor injuries or non-injury incidents that could come back to them later as blame, or result in procedural changes they view as faultfinding. The company, managers, and employees must establish a trust and a strong partnership to identify and correct potential hazards at the worksite.
- Humans make mistakes. A worker's reputation as a skilled, dependable employee is his or her primary recommendation for the next job. Thus, it is common for workers to refrain from reporting any incident in which there might be the slightest hint of an error made by that worker. This is also human nature. But if 100% incident reporting is the key to eliminating hazards before they produce an injury, it requires workers, managers and company leaders to step up, take responsibility, avoid blaming others, and work together to identify solutions to the problems that are uncovered. For example, long hours under time pressure can lead to an array of common safety problems. Fatigue dulls the ability to detect the changing nature of hazards on the construction site. The best solutions for this problem will depend on the trade, the project, and the shared experiences of the crew. The key is that the *entire crew* must be willing to confront the problem as one that affects them all and requires a crew-based approach. Such an approach will de-emphasize individual differences and reduce individual stigma or blame while creating a positive, proactive group responsibility for solving the problem.
- While it is tempting to impose penalties for not reporting, this may be counterproductive. Peer pressure and positive reinforcement are much more effective.
- Creating an easy-to-use incident-reporting system can be difficult, but is very important to achieving success. Workers and management will not use a system that is complicated and cumbersome. A poorly designed system will be underutilized and lead to lost opportunities.

Can Small Businesses Do Close-call Reporting?

A strong case has to be made to small businesses for close-call reporting. Reporting and investigating injuries is tough enough for small businesses, so investigating close calls will be



a stretch. Owners can include the requirement in contract terms or provide contract incentives for tracking and correcting problems.

Close-call reporting is even more important for small businesses because they are less likely to have many accidents. (They have fewer people and man-hours.) Workers tend to know each other and may even be related. Small businesses have proportionately more immigrant workers, who have real fears of reporting, and domestic workers who are minorities and thus fear being singled out. There is a greater fear of blacklisting in small businesses, and it is harder to be anonymous. When someone reports a concern or incident, it is likely everyone knows who has made the report. Small businesses are also less likely to be unionized with fewer mechanisms to protect against discrimination for reporting.

A third-party reporting system would be the best solution, although that is probably easier to implement in larger companies. This may be difficult to justify for small employers, since it adds a cost to an incident that otherwise would not cost the company anything. Perhaps this is a service that insurance companies can offer, along with safety consultation services, but they would have to offer it with a guarantee that they would not raise rates as a result. (Underwriters unfortunately base rates on the frequency of incidents and not as much on severity. Thus, an increase in non-injury incidents, as will be expected under this program, might be seen as a negative rather than a positive by underwriters.)

Furthermore, a third party would be in a position to aggregate reports from many small businesses. Local trade organizations (Associated General Contractors of America and Associated Builders and Contractors, to name two) could provide this service to their member companies and share the results in local meetings. The reports would summarize data from many small contractors in the same trade. This approach will minimize the possibility that single events would be associated with a single company and group of workers. If the event is so unique that the company and workers will be identified, the incident could be sequestered from the report. This approach allows small businesses to learn from the experiences of businesses similar to their own.

Reporting system success stories in small businesses should be shared. For example, one small company encourages reporting of injuries by providing light duty on full pay to any worker who reports an injury to himself or herself. This way the reporting worker does not have to rely only on workers' compensation payments.

How to Know if Close-Call Reporting Is Working?

The first indicator of success will be an increase in the number of incidents reported after the first six months or a year, as compared with a baseline year when the program first started.

As experience with the survey increases and the definition of an "incident" in a particular trade becomes more clearly specified, the results will suggest actionable solutions to the more common and more important problems. Thus, the second indicator of success will be the ability to propose solutions to some of the incidents identified. The third indicator of success will be a drop in the number of incidents for which interventions were developed.

As experience with the survey increases, the nature or quality of the close-call reports should converge toward a consistent set of circumstances. One way to track this convergence is to spot-check the reports for similarities in close calls over time. This is one measure of the accuracy of close-call reporting. Over time, it will be these measures that contribute to the overall success of this approach. A series of reliable measures accumulated over a year or more will be the most important indicator of success of the intervention.

As noted above, zero incidents is not a very useful approach for a program of improvement to safety. However, the approach outlined here should lead to a decrease in the serious incidents for which interventions exist, and a leveling off and eventual decline in the number of less serious incidents.

Figure 1 and 2. Sample Near Miss Reporting Form and Types

Fill out the form in your own words. The near miss you report today may save somebody tomorrow!

Discovery Date: _____	Report Date: _____	General Foreman Name: _____	
Time: _____		Your Name (Optional): _____	
Discoverers' Job Description:			
<input type="checkbox"/> Field Non-Manual	<input type="checkbox"/> General Foreman	<input type="checkbox"/> Foreman	<input type="checkbox"/> ES&H
<input type="checkbox"/> Piping/pipefitter	<input type="checkbox"/> Welder	<input type="checkbox"/> Indirect	<input type="checkbox"/> Rigger
<input type="checkbox"/> Heavy Equipment Operator	<input type="checkbox"/> Other: _____		
Where Discovered: <input type="checkbox"/> ISBL: _____ <input type="checkbox"/> OSBL: _____ <input type="checkbox"/> Tanks: _____ <input type="checkbox"/> Camp: _____			
Near Miss Type:			
<input type="checkbox"/> Dropped Object	<input type="checkbox"/> Fall Protection	<input type="checkbox"/> PPE	<input type="checkbox"/> Electrical
<input type="checkbox"/> Confined Space	<input type="checkbox"/> Scaffolds	<input type="checkbox"/> Ladders	<input type="checkbox"/> Barricades
<input type="checkbox"/> Heavy Equipment Operation	<input type="checkbox"/> Other: _____		
Description of Near Miss/Hazard/Unsafe Condition: _____			
Any Immediate Actions Taken? _____			

Source: Brian McKay, “Measures of Effect: Near Miss Reporting on Construction Site Injuries,” 2013. Reprinted by permission.

Near Miss Type	Description
Barricades	Crossing of barricades without permission or need, removal or accidental destruction of barricades
Excavation	Improper excavation of slopes, techniques, permits or procedures
Falling/ Flying Objects	Dropped objects and flying particles from welding slag or grinding
Material Storage	Inappropriate position and movement of materials in storage that expose workers to unsafe conditions (e.g., tipping moments)
Pinch Point	Personnel coming in between equipment and super structure
Slips and Trips	Full body movements or tipping moments under pace

Source: Brian McKay, “Measures of Effect: Near Miss Reporting on Construction Site Injuries,” 2013.



Resources on How to Improve Safety through Close Call Reporting and Analysis

Aviation Safety Reporting System, National Aviation and Space Administration website:
<http://asrs.arc.nasa.gov/>

Balfour Beatty: “Roadworkers Safety — Silence is Consent (Part 1)” 2009. [Video]
<http://www.youtube.com/watch?v=oAvrFYkP3P0>

Close-call reporting systems for firefighters

- <http://www.firefighterclosecalls.com/>
- <http://www.nationalnearmiss.org/>

Close-call reporting system for the railroads

- <http://www.closecallsrail.org/>

International Atomic Energy Agency: *Near Miss Reporting in Nuclear Plants*. Safety Reports Series No. 73. Available at: http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1545_web.pdf

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National Safety Council, with NSC Alliance and OSHA: *Near Miss Reporting Systems*, 2013. [Case study] Available at:
http://www.nsc.org/news_resources/Resources/Documents/Near-Miss-Reporting-Systems.pdf

Schneider, Scott: Was anyone almost hurt on your worksite today? *Laborers’ Health & Safety Fund of North America 4(8)* (2008). Available at:
<http://www.lhsfna.org/index.cfm/lifelines/january-2008/was-anyone-almost-hurt-on-your-worksite-today/>

HOW TO IMPROVE SAFETY CLIMATE THROUGH LEADERSHIP BY SUPERVISORS

Supervisors, including first-line forepersons, are the key to ensuring a positive safety climate on any jobsite. The safety values and beliefs of the supervisor, whether in line with the company's or not, can have a huge impact on jobsite culture. How supervisors encourage site safety or react to safety related issues that are raised is critical. Do workers believe supervisors when they claim that safety is very important to the company? Do supervisors insist that hazards get corrected promptly? Does safety lose out to productivity when the pressure is on? Are shortcuts ignored or tolerated when there is a time crunch? Do supervisors have the support of upper management? Ultimately, the supervisor is not only the production supervisor on site but the safety supervisor as well.

Supervisors should believe in safety requirements, actively participate in safety initiatives, encourage employee safety involvement, and listen to employee concerns and address them promptly. Those who do have better safety and production results than those who are not proactive, do not pay attention to safety, or let safety slip when under pressure to get the job done.

Measuring Safety Leadership on a Jobsite

How do supervisors get selected or promoted? Is safety performance from past projects a consideration, or are selection and promotion based solely on the worker's reputation for getting the job done on time and under budget? Has a supervisor ever been held accountable for not paying attention to safety on the site?

To achieve desired goals, supervisor safety leadership has to be measured. There are a variety of ways for contractors and their supervisors to measure supervisor safety leadership. Several measurement methods are recommended, as there is no one right way.

- Typically, assessments are completed by the supervisor's direct manager. This might include safety audits of the supervisor's work area as well as observations of the supervisor's toolbox talk delivery and crew engagement.
- Self-evaluations of safety leadership behaviors by the supervisors themselves can provide useful insight. The HSE Leadership Check Tool, provided in Appendix 2, is a free self-check for supervisors.
- Finally, it is critical to hear from the supervisor's crew members, as they are the ones directly impacted by the leadership behaviors of their supervisor. Such feedback can be obtained from anonymous surveys asking crews about their supervisor's safety leadership style and commitment to safety. Appendix 2 provides sample criteria for this assessment.

Once conducted, assessments cannot be forgotten; action must be taken. Contractors and





supervisors must work together to create a safety leadership development plan. The development plan should include:

- a two-way discussion between the supervisor and the supervisor’s manager about the results of the assessments, what improvements should be made, and why they should be made
- specific goals based on the assessment results that will help supervisors improve their safety leadership skills

Supervisors are usually selected via “next in line,” whether by tenure or production skills. These supervisors need to be trained in safety management techniques to be successful in their role, especially in a proactive safety culture. Many supervisors receive, or are required to take, the OSHA 30-hour Outreach Training Program, which covers OSHA standards but does not provide safety management education. They need training on a variety of other skills, including how to understand and build a proactive safety culture, communicate with employees, give an effective toolbox talk, conduct a site safety audit, and preplan the job with all aspects of safety in mind. They will also need to know the elimination/mitigation/protection process as well as how to encourage worker participation, develop listening skills, and mentor and coach employees. OSHA recently approved an optional module for the 30 hour course called Foundations of Safety Leadership which does begin to address these deficiencies. The appendix provides details on what skills and training supervisors should have.

Programs on supervisor training are available from union training funds as well as third-party sources such as local construction safety councils and the Board of Certified Safety Professionals (BCSP). Some contractors even require their supervisors to become certified by BCSP as Safety-Trained Supervisors (STS).

A well-planned job is a safe job. Supervisors have numerous responsibilities, and planning for safety has to be integrated into them, even though time for planning is always a challenge for supervisors. Having many resources to make the planning process easier for supervisors will lead to more effective supervisors. Those resources can take the form of new computer systems, software, processes, and forms.

Potential Problems to Address

A supervisor’s primary job is to get the job done properly (on time, under budget), and safety is sometimes seen as competing or interfering with that goal. In addition, supervisors are under enormous time pressures. They have highly stressful jobs (often working six days a week), and it can be difficult for them to take time away from their busy schedules for training in safety management.

When companies have safety personnel on the jobsite, supervisors can have a “not my job” mentality. They may believe any safety issue and all safety leadership is the responsibility of the safety representative. In reality, the safety representative is a resource to assist in the supervisor’s safety leadership.

Accountability for safety relies on proactive measures such as developing leading safety metrics, instead of using lagging indicators (injuries reported). Using lagging indicators leads to the “hopefully we will be lucky” mentality and incentivizes underreporting. Moreover, rewards for safety shortcuts encourage undesirable behaviors.

How Can We Encourage Supervisor Safety Leadership?

Can training be modularized and administered over several weeks (e.g., 1 to 2 hours a week)? Some union programs and trade associations already have supervisor training courses available in shorter, more frequent time spans. While this can be helpful, there has to be commitment from the company and supervisor to complete all sessions. Planning jobs around the training can be useful. When this is not possible, others may have to step up and assist in the supervisor’s absence. Some courses are offered after working hours. Keep in mind that when training is after hours, the employee may not retain as much due to fatigue from working that day. Tying promotions to training will help encourage participation. CPWR has recently developed a 2½-hour safety leadership module called “Foundations of Safety Leadership,” which has been approved by OSHA as an elective for its 30-hour course.

Supervisors need to be educated and empowered in the safety management side of their job. They need to realize they are the true safety leader on site — and they make or break their company’s culture on site. They need to understand their role and responsibilities and how to execute their responsibilities effectively. A selling point for management should be that leadership skills for safety (communication, planning, mentorship, feedback, etc.) carry over to all aspects of supervisory performance so that safety and production truly can go hand in hand.

Supervisors with good safety climate scores (from surveys) and who score high on worker participation rates should be rewarded (e.g., time off, better assignments, more training). Rewards for positive behaviors will encourage supervisors to continue to conduct themselves in this manner and engage employees in a proactive safety program.

Can Small Businesses Use Supervisor Safety Leadership?

In small businesses, the supervisor is usually the (working) foreperson, who in some cases is also the owner. This individual has to get the work done as well as supervise. The only way he or she can afford to pay attention to safety is if the owner of the company (assuming it is not the foreperson) supports the safety efforts and insists safety is a priority and a core value of the organization.

The owner should go so far as to include safety requirements in bids or estimates, knowing the company will probably lose some bids because of it. Doing things the right way has to be more important than doing things cheaply. That means investing more time in planning for safety and having the right equipment for each job (e.g., if a 20-foot ladder is needed, make sure workers do not show up with a ladder that is too short).



Small companies may lack adequate computers or software for project safety planning. Membership in a trade association may be a solution. Developing a process with paper forms is another approach. Small companies have to be convinced that planning ahead for safety and supervisor training will pay off in return on investment down the road. Short courses on safety for supervisors need to be more widely available for small businesses.

Measuring the safety climate in small businesses is problematic due to a small sample size and lack of anonymity. Other proximate measures or leading indicators are needed to judge success.

How to Know if Supervisor Safety Leadership Is Working?

Safety climate scores from surveys are one measure of success. From these surveys, direct feedback on the site safety climate can be obtained and improvements can be tracked. Feedback on specific supervisors may be attainable, but that is often difficult to do anonymously due to small sample sizes. Observations from other supervisors can also be useful. Other leading safety metrics, such as number of hazards identified and corrected or number of close calls reported, can be useful to track the success of efforts. For these metrics to be useful, however, employers have to demonstrate to their supervisors that they will be evaluated on them. “What gets measured gets done.”

Appendix 1: Supervisor Training

Supervisor Safety Fundamentals

Safety curriculum for a field supervisor should include:

1. OSHA rules and regulations, including workers' rights and OSHA inspection procedures
2. jobsite auditing/walk-arounds and correcting hazards
3. accident/incident investigation and root cause analysis
4. safety incentive programs (e.g., limitations, how to use incentives appropriately)
5. emergency response to incidents
6. planning for safety
7. job safety analysis
8. leading indicators and metrics to evaluate the safety program
9. time and stress management
10. toolbox talks
11. communication skills with workers and upper management
12. safety and health committees
13. encouraging worker participation
14. developing and fostering a safety culture
15. accountability/developing a blame-free culture
16. subcontractor safety and management
17. competent person requirements
18. mentoring and coaching
19. drug and alcohol employee assistance programs



Appendix 2: Safety Leadership Assessment Tools

HSE Leadership Check Tool:

<http://www.hse.gov.uk/construction/lwit/assets/downloads/leadership-check-tool.pdf>

Safety Leadership Considerations

My supervisor ...

1. Expresses satisfaction when I perform my job safely
2. Makes sure I receive appropriate rewards for achieving safety targets on the job
3. Provides continuous encouragement to do my job safely
4. Shows determination to maintain a safe work environment
5. Suggests new ways of doing my job more safely
6. Encourages me to express my ideas and opinions about safety at work
7. Talks about his/her values and beliefs regarding the importance of safety
8. Behaves in a way that displays a commitment to a safe workplace
9. Spends time showing me the safest way to do things at work
10. Would listen to my concerns about safety on the job
11. Strictly enforces safety rules and regulations
12. Praises me when he/she sees I am following proper safety procedures
13. Offers no incentive or rewards for following all the safety policies at work
14. Punishes me when I ignore safety rules.

Source: Kelloway, Mullen, & Francis, 2006 and Probst & Brubaker, 2001

Appendix 3: Case Study of Supervisor Safety at Safway Group

In the latter half of 2007, safety managers were discussing concerns with branch managers and field supervisors to try to address a problem. Safway had never properly defined the roles and responsibilities of supervisors or provided them with the appropriate education.

In 2009, Safway developed the first version of the Supervisor Safety Training program. This five- to six-hour program educated supervisors on the definition of safety culture, Safway's desired culture and expectations, and how to achieve such a culture. The topics of the training included the difference between a proactive and reactive culture, jobsite safety and hazard recognition, safety meetings, employee training, the scaffold modification process, and incident reporting and investigation protocols. The point of the training was that the supervisor is not just a supervisor: he or she is a safety leader.

As the supervisors took this learning back to their positions and safety concepts continued to be reinforced, Safway's recordable rate dropped 24%. Safway's next step was to become more effective in the job hazard analysis (JHA) process. The team approach was introduced in the Supervisor Safety Training program, and engaging the employees in the process was critical. Branch and safety management coached supervisors and crews on how to involve all employees in the JHA process. Employees were taught that the JHA form was not just a piece of paper to complete because the company requires it, but rather a job preplanning tool. It was their responsibility to participate in the process.

The crews also learned they could conduct a more detailed analysis because everyone has different levels of knowledge and experience. Sometimes the newest member of the crew becomes the most important worker: to him or her, everything is new and can be a potential hazard. This person can counteract the complacency that long-standing crew members may have.

By changing the JHA process to include employees, supervisors felt less pressure to accomplish the task single-handedly, and Safway was more successful overall in identifying hazards.

The role of the supervisor remained the critical role in the company. In many cases, this position can make or break the jobsite subculture, which affects safety performance. This environment may be the only culture an employee is exposed to, and it is what the customer perceives as the "Safway" brand.

In 2013, Safway expanded the Supervisor Safety Training program to a full day and trained or retrained the supervisors. Additional time was dedicated to culture and the JHA process. In addition to the content of the original program, supervisors were educated on

new employee mentoring, employee coaching, employee behaviors, the correction of behaviors and disciplinary action, safety attitudes, providing safety feedback, elements of risk, the JHA process (including five continual steps), and the team approach to the JHA process.

During the last quarter of 2013, Safway changed the entire job-planning process, adding a site hazard assessment to assist in the bidding and preplanning phases. Sales, construction management, and supervisors began conducting the process to help engineer or mitigate hazards prior to crews going on site. Sales representative training on the process was conducted in 2014 to engage this group in the safety and environmental areas of job planning and bidding. The JHA process was revised so it became a task safety analysis within the JHA, requiring all employees to participate.

Safway continues to develop training programs for supervisors, such as hazard recognition and safety observations, to help make them stronger safety leaders and give them the tools to be successful. Safway's safety culture continues to grow stronger each day, with dedicated work at all levels of the company. The supervisor is extremely important. At the local branch or crew level supervisors establish a subculture that both reinforces and contributes to the corporate safety culture Safway wants to maintain. Thus, the role of the supervisor within the company is critical to the success of the company's safety culture.

Source: Carrie Heller, Safway Group

Resources on How to Improve Safety Leadership by Supervisors

American Society of Safety Engineers: *Pre-Project & Pre-Task Safety and Health Planning Standard* (ANSI/ASSE A10.1–2011). Available at:

<http://www.asse.org/ansiasse-a101-2011-pre-project-pre-task-safety-and-health-planning/ansiasse-a101-2011-pre-project-pre-task-safety-and-health-planning/>

Board of Certified Safety Professionals: Safety Trained Supervisor Program. Available at:

<http://www.bcsp.org/sts>

Colorado State University, Safety Management Applied Research Team (SMART): “Safe Talk Program” (LeAD Safety Training Series). Available at: <https://vimeo.com/channels/827238>

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McVittie, D. and P. Vi, Construction Safety Association of Ontario (CSAO): The Effect of Supervisory Training on Lost Time Injury Rates in Construction. (Feb. 2009) Available at:

http://www.ihsa.ca/pdfs/research_docs/374_W040.pdf

Oregon OSHA: Supervisor Safety Manual. Available at:

<http://osha.oregon.gov/OSHAedu/safety-and-the-supervisor/1-160i.pdf>



HOW TO IMPROVE SAFETY CLIMATE THROUGH SUBCONTRACTOR PREQUALIFICATION AND OVERSIGHT

How Can Subcontractor Prequalification Help Improve Safety Culture and Climate?

Increasingly, work in construction is subcontracted out, and the general contractor (GC) is often being replaced with a construction manager. Even subcontractors (or subs) are subbing out parts of their work to second- and third-tier subcontractors. While the GC may have a great safety program and is actively working to ensure a positive safety climate among employees, what about safety among the subs? How do GCs ensure the subcontractor safety culture and climate is equivalent to their own? If they fail to do this, the safety climate on the job will be undercut, because subs under tight budgets and short deadlines will be tempted to cut corners.

How Does Prequalification Work?

The selection process is vital to having safety as a priority for subcontractors. How are subcontractors selected on the jobsite? Lowest bidder? Prior experience? Availability? Reliability in terms of getting the work done on time and under budget?

Where does safety come into play? Is safety performance a criterion in selecting subs? How is subcontractor safety assessed? Are the OSHA 300 log data, history of OSHA violations, and experience modification rate (EMR) being reviewed? Those are just lagging indicators and may not be accurate. Most safety-conscious, industry-leading contractors focus on leading indicators rather than lagging indicators. They want to know what resources the contractor has devoted to safety (e.g., Is there a full-time safety director? What kind of safety training does the contractor require or provide for employees and supervisors? Are there strong safety policies, including encouragement of worker participation and the right to refuse unsafe work?) All the elements of a strong proactive safety program that GCs rely on should be the ones they look for when hiring a subcontractor. (See appendix for sample questions.)

Executive Order 13673, Fair Pay and Safe Workplaces, which was rescinded by the new Administration, required that a contractor's safety record must be considered for all federal contracts over a certain dollar value, as are the safety records of subcontractors.

In the past few years, several companies have been created to assist with prequalification of contractors and subs. These companies ask prospective contractors to fill out detailed questionnaires and submit their safety programs, which are then rated by a computer program. Contractors are assigned scores, and owners and GCs can agree on cut points for what is minimally acceptable on their sites. These programs can be expensive, but they can help streamline the prequalification process.

If subcontractors do not have those policies and practices in place, the GC has to (1) educate them that on-site expectations for safety may be higher than they have previously experienced, and (2) inform them that there will be oversight to ensure safety is a top

priority. If safety is not a priority for a subcontractor, he or she may have to be removed from the job, asked to get a different crew, or be mentored to come up to speed. The high and clear expectations set by the GC will make the difference. Subs are working for the GC; thus, the GC's demands on performance will dictate how they perform.

Subcontractors must be integrated into the site safety effort starting with the planning process (including the estimators). One aspect of integration is to create a sitewide log of injuries and illnesses that includes all subcontractors. This will help create a better injury picture for the whole site and treat subcontractor employees the same as the GC's own employees.

Subcontractor employees must attend the site safety orientation before working on the site. At the orientation they will hear and understand the safety expectations of the GC. They will also learn how to report incidents and hazards and see that reporting is encouraged. The GC should receive reports of incidents and hazards that have been reported to the subs (either directly or through the subs) so the GC can see the safety system in action and that hazards are being corrected in a timely manner. (Generally these will come up at the weekly safety meetings.) A written assessment of the safety knowledge of subcontractor employees as part of the orientation could also be helpful for identifying gaps and the need for additional training to increase subs' level of knowledge of safety requirements.

Subcontractors must attend the weekly safety and production meetings to help coordinate safety efforts and increase safety communication on the site. Often hazards created by one sub expose other workers to the risk of injury. This is why it is essential that this coordination effort occur regularly. It is helpful to take minutes at these meetings and circulate them so documented action items can be followed up and corrections tracked to completion.

What Are the Barriers and Pitfalls to Implementation?

There is a strong temptation to hire subs based on a low bid or friends that GCs have worked with before. There will undoubtedly be pressure to do so. But if someone gets seriously hurt or killed on the jobsite, even if he or she works for a subcontractor, the GC's reputation is on the line. It takes time and resources to screen the safety records of subs and factor that into the hiring process — and, yes, it is easier to just ask subs for and review the numbers they provide, such as EMR or injury rate data. But going that route is risky. It has been said that numbers do not lie, but they can deceive. The reported numbers can hide problems if the sub is misrepresenting his or her record. If a GC is serious about hiring subs with a true commitment to safety — those who are willing to buy into the GC's safety approach and philosophy — he or she has to expend the effort to actively screen them and oversee their work.

Just as the GC should include safety performance in the overall contract bid, he or she must demand of subcontractors a similar attention to the requirements necessary to do the job safely. (It does not work when the GC demands compliance with safety requirements but the contract bids do not include safety requirements in the actual bid.) In other words, the time and materials necessary to complete the work safely must be specified in the contract.



Oversight of subcontractor work goes beyond reviewing accident logs. It means the GC should have an employee attend the sub's toolbox talks and safety meetings, be on the jobsite regularly, talk with the sub's employees and forepersons, and discuss safety performance at every production meeting with the subs present. With this oversight, when deficiencies are found, the sub is made aware of them and the deficiencies are immediately corrected. In short, supervisors and site managers need to leave their site office trailers more often, walking the site and talking with employees (including subcontractor employees) to assess actual site safety conditions in real time.

When contractors have subbed out dangerous parts of their work to reduce their incidence rate and exposure, they often have found that an employee of the sub was killed on the job. Under OSHA's multiemployer workplace policy in construction, the GC may have some liability (e.g., if the GC were deemed the "controlling employer").

How to Work Around Barriers and Pitfalls?

General contractors who subcontract out their work need to be shown that the time and resources they expend in screening and overseeing subs results in a safer jobsite. Stories of subcontractors who have had serious incidents help make the risks visible, given that it takes only one major incident to stop work and impede productivity on the job. Costly incidents will occur unless close attention is paid to safety performance in selecting and overseeing subs. Of course, the alternative is for GCs to perform more of the work themselves, relying on their own safety program and employees to ensure the work is done safely.

How Can This Intervention Be Adapted for Small Businesses?

Small businesses tend to self-perform work and not sub it out as often as larger companies. They tend to be the ones doing the subcontract work. Small businesses will find it helpful to develop simple methods (e.g., checklists) to document their safety programs to better respond to these types of requests from GCs.

Intervention Evaluation

The best evaluation mechanism is a safety climate survey of subcontractor employees. The scores can be compared with scores from the GC's employees to see, for example, how they rate their subcontractor's safety efforts. If the subs score substantially lower than the GC's employees, actions must be taken to identify the weaknesses and corrective actions.

Appendix: Sample Questions to Prequalify Subcontracts

While it is common to ask subcontractors to submit their history of OSHA violations and experience modification rate (EMR), such measures may not be the best gauge of their safety performance. Below are some questions that may be more informative:

- Can you provide references from other contractors you have worked for who can attest to your safety performance?
- Do you have any safety professionals on staff or on retainer? If so, what are their qualifications and training?
- How do you involve your employees in safety? Do they have the explicit right to refuse unsafe work? If you have a multilingual workforce, how is this handled as far as safety is concerned?
- How do you encourage reporting of incidents, near misses, and unsafe conditions? Do you have any incentive programs that may discourage reporting?
- How are safety incidents investigated?
- How much and what type of safety training do your supervisors get? Do they get training on skills like communicating about safety?
- Do you prequalify companies that you subcontract work to based on their safety performance?

Resources on How to Improve Safety Through Subcontractor Prequalification and Oversight

AIHA Construction Committee: *Health and Safety Requirements in Construction Contract Documents*, 2005. (Stock no. SCOG05–660). Order at:

<https://www.aiha.org/marketplace/Pages/Product-Detail.aspx?productid={0399F67D-4778-DE11-96B0-0050568361FD}>

Executive Order 13673, Fair Pay and Safe Workplaces, 2014. Available at:

<https://www.dol.gov/asp/fairpayandsafeworkplaces/>

HOW TO IMPROVE SAFETY CLIMATE BY INTEGRATING SAFETY AS A VALUE INTO A COMPANY

Safety will never be successful as a stand-alone program. It will always be viewed as separate from the goal of production and often seen as an impediment. Likewise, it is hard to improve safety culture if the organizational culture of the company does not support it. Despite the fact that integrating safety within the organization is probably the most effective way to align the goals of the safety program with the organization, improvement of safety culture always goes back to management's commitment to change. There are several ways to integrate safety as a value into company culture:

- **Design for safety.** Integrating safety into the design of a project is the most effective (and cost-effective) way to address safety issues. Companies with design-build projects have an advantage in that respect. Owners willing to pay additional upfront costs for a safer-to-build design will reap benefits in the short term from fewer workaround solutions and in the long term through lower maintenance costs over the life cycle of the building or structure. This is also referred to as Prevention through Design.
- **Planning for safety.** Integrating safety into the planning process will save time and money as well as make the job safer. It will help avoid the time crunches and pressure that lead to safety shortcuts. Some companies hire experienced workers to help plan the job, since they can best anticipate the types of problems that will arise. Safety should be explicitly integrated with “constructability reviews,” an approach that is increasingly used on larger projects.
- **Integration of safety into production meetings.** Weekly or daily production meetings are held at most jobsites. Safety should be part of each of those meetings (and hopefully not put off until the end of the agenda when time is short). Implementing safety into production meetings takes commitment from the job superintendent, who will require support and participation from company management. On multiemployer worksites where different trades or subs can, and will, create potential safety problems for one another, these meetings including safety will be extremely helpful.
- **Task hazard analysis.** Daily safety huddles or toolbox talks are important because workers performing the tasks need to understand the hazards of each task, not simply be told what to do. The foreperson needs to encourage each worker to participate in the process and make the meetings a regular occurrence for each task, regardless of how routine the task may seem.
- **Integration of safety into the bidding and estimating process.** Training estimators, project managers, and engineers to recognize and include the costs for safety training and equipment will help make sure safety does not suffer when cost overruns occur. Including safety as a line item in bid documents makes all bidders operate on a level playing field and ensures no one can underbid by skimping on safety. Owners can also play a part by requiring minimum levels of worker safety training and competencies in the bid process.



How Can This Approach Help Improve Safety on a Jobsite?

Safety will be seen as a part of doing business — a necessity and not an additional burden imposed by government regulation. A safe workplace will be a worker right, not an obligation. Workers in such companies will see that safety is central to the company's mission and will be more likely to participate and speak up about issues.

Potential Problems to Watch For

- Integrating safety into design is difficult because of the institutional and legal barriers from the architectural community. Design-build projects have the best chance to overcome these barriers, but other project owners can be educated to recognize the value of integrating safety during the design phase by stressing value-added engineering. Also, the construction firm is responsible for designing and building all temporary structures such as scaffolding, temporary supports, and prefabricated sections and can take steps to design those with safety in mind.
- Building safety into the planning process has become easier with new planning software. Many companies use risk analysis programs or processes early in the planning (and even bidding) process to identify potential problems in the work execution. Many companies now understand the importance of planning efforts to keep a job running smoothly. A well-planned job reaps many benefits, just as a clean and orderly jobsite results in a safer site.
- Integration into the planning process takes a competent superintendent who understands the importance and role safety plays and how it can affect production (e.g., how a single incident can stop work and have dramatic ramifications for the schedule, as well as the company's reputation).
- Including safety as a line item in bid documents is happening more often (required by the Federal Highway Administration in the highway sector for federally funded work, see Guidance resource below), but there is institutional resistance from owners who still believe low-bid contracting is the best way to go. Training and educating estimators about safety and integrating it into bids will be a long process, since companies tend to try to underbid one another and are pressured for lowball estimates. Best-value contracting, where an owner proactively takes safety into account, will help minimize this practice and encourage companies to look at safety as part of good business practice.

Can Small Businesses Integrate Safety Into Their Operations?

Small businesses are under enormous pressure to cut costs and often run on thin profit margins. They can best integrate safety during the planning process. When small contractors are planning a job, they need to make sure they have the right equipment to ensure it can be done safely. Government and trade associations should provide training for small contractors, not only on the safety requirements but also on cost-effective ways of meeting them. That said, giving workers personal protective equipment (PPE) is not always the most cost-effective way of protecting them. PPE has many hidden costs (e.g., proper storage, cleaning,

replacement, and training). Some small companies have come up with innovative ways to meet and exceed the requirements. Such solutions should be shared more widely. There are small contractors who practice high safety standards to distinguish themselves in particular markets. They recognize they will lose some bids because of this but they will win others. This is not typical but the fact that they exist demonstrates that it is possible

Trade associations, OSHA consultations, and union safety and health staff are often valuable safety resources available at little or no cost for small businesses. Simple checklists could be developed that might be helpful.

How Will We Know That Integration Has Been Successful?

The best indicator that safety has been fully integrated into an organization is that everyone in the company treats safety as a part of his or her job, freely raising and solving safety problems that arise. No one waits for the safety professional, or even the next safety committee meeting, to resolve issues. It is a continuous improvement process with everyone taking ownership.



Resources on How to Integrate Safety as a Value Into a Company

American Society of Safety Engineers: *Pre-Project & Pre-Task Safety and Health Planning Standard* (ANSI/ASSE A10.1–2011). Available at:

<http://www.asse.org/ansiasse-a101-2011-pre-project-pre-task-safety-and-health-planning/ansiasse-a101-2011-pre-project-pre-task-safety-and-health-planning/>. See also the ASSE Tech Brief (2012) for this standard at:
<http://www.asse.org/assets/1/7/A10.1TechBrief.pdf>

Design for Construction Safety website: <http://www.designforconstructionsafety.org/>

NIOSH Prevention through Design webpage:
<https://www.cdc.gov/niosh/topics/ptd/default.html>

NY State Constructability Review Process:
<https://www.ogs.ny.gov/BU/DC/docs/pdf/04041EightyPctConstructabilityReview.pdf>

Laborers' Health & Safety Fund of North America: Best Value Contracting. Various articles available at: <http://www.lhsfna.org/index.cfm/occupational-safety-and-health/topics/best-value-contracting/best-value-contracting/#tabs-1>

Rebbit, Dave: Is 'Safety Culture' Dead? *EHS*, 2014 [Blog] Available at:
http://ehstoday.com/print/blog/safety-culture-dead?group_id=29321

Roadway Safety Consortium: *Guidance on Payment for Temporary Traffic Control*. Available at:
https://www.workzonesafety.org/files/documents/training/courses_programs/rsa_program/RSP_Guidance_Documents_Download/RSP_Payment_for_TTCs_Guidance_Download.pdf

Schneider, Scott: New ANSI Standard Tells Employers to Plan for Safety. *Laborers' Health & Safety Fund of North America 8(8)* (2012). Available at:
<http://www.lhsfna.org/index.cfm/lifelines/january-2012/new-ansi-standard-tells-employers-to-plan-for-safety/>

HOW TO IMPROVE SAFETY CLIMATE THROUGH OWNER INVOLVEMENT

How Can Owner Involvement Help Improve Safety Climate?

Owners or clients are the ones paying for a project, and contractors generally perform up to their expectations. There have been many examples of owners who have placed a high priority on the safety of how their projects are constructed or have used safety requirements as a bidding criterion. These owners have also gotten involved in project oversight, not to micromanage a project but to ensure that their safety emphasis is being implemented on the project.

Intel is one example. It places a high priority on safety and devotes significant resources to safety. In fact, the company has had project plans reviewed for safety by workers and prospective subcontractors, resulting in significant changes to the plans to make them easier and safer to build. Owners that build safety into the design of their project also understand the importance of making safety a priority throughout the life cycle of the building.

Contractors generally adjust their safety performance to the demands of the owner. If an owner is pressing for and providing incentives for early delivery and not paying attention to safety on the job, it will be reflected in contractor safety performance. Safety is a cost but also an investment and an insurance policy against failures (e.g., serious injuries and fatalities) — not to mention that it is also the right thing to do. A homeowner, for example, would not want workers reroofing his or her house or trimming a tree without fall protection. Most owners and contractors think the same way. They want a green building that is better for the environment, but it should also be a building that is better for the work environment and the workers who build it and maintain it.

How Does Owner Involvement Work?

Owners should include safety prequalification in their job specifications. Some use safety performance as a minimum qualification and then decide on the low bidder among those who qualify. Others assign a safety score that is weighted into the bid. In any case, lowest bid is replaced by lowest qualified bidder. Safety scores should be focused on more than just the lagging indicators (e.g., OSHA log, injury rate, experience modification rate) and include leading indicators such as evidence of worker participation in safety, resources devoted to safety (e.g., safety personnel and their qualifications), and safety training.

Owners should then devote time and personnel to safety oversight (e.g., walking the jobsite, attending safety meetings, raising the topic of safety in production meetings). Reviewing incident reports and requiring root cause investigations also demonstrates owner commitment to safety.

Owners can also have a significant influence on jobsite safety on their projects through implementation of an Owner Controlled Insurance Program or OCIP. Under an OCIP, the owner provides workers compensation insurance for the entire project and thus has a real incentive to ensure a safe worksite.



Owners can also ensure a safer site by incorporating Prevention through Design (PtD) into the design of all of their projects. Safer design is the most cost-effective way to prevent injuries so by being willing to add a small amount to the cost of the project upfront, the owner will ultimately save significant amounts through making the project easier and safer to build and maintain throughout the lifecycle of the building or structure.

Lastly, there have been many successful examples of owner involvement in jobsite safety. Perhaps the best example is the London Olympic Construction, which resulted in very low injury rates. Secondly, in Australia Federal construction is governed by the “Model Client: Promoting Safe Construction” best practices which incorporates many of these elements. Links to both examples are provided below in the resources section.

What Are the Barriers and Pitfalls to Implementation?

Although some owners understand the benefits of a safe jobsite and prevention through design, others focus solely on short-term costs and getting the lowest bid and cheapest product. Just like architects, owners do not want to get involved in “means and methods.” Owners see safety as the responsibility of the contractor they hire (and legally it is, under OSHA), and they worry that getting involved with safety will present them with liability if there is an accident and someone gets hurt. They may assume that requiring OSHA compliance in their contracts is sufficient, not understanding the inadequacy of many OSHA standards or that OSHA standards are merely a minimum.

How to Get Around Those Barriers and Pitfalls?

Just as contractors have reoriented their focus to fostering a safety culture and understanding the impact safety has on productivity, owners are now seeing the benefits of green buildings and should be able to see safer design and execution of the project as a plus. Having examples of how owner attention to safety has resulted in a better product and actually saved money might be helpful.

In some parts of the country construction industry stakeholders have recognized that raising the bar for safety is an industry-wide challenge. Stakeholders- including owners, contractors, insurers, regulators, and others- have come together to increase safety performance through education, prequalification, business-to-business mentorship, and other measures that have impact on the industry regionally. While contractors are still competing for jobs, a collaborative process can help continuously raise the expectations on all contractors and through mentorship help smaller contractors compete in larger markets. Owners have a critical role to play in such area-wide efforts because they can lay down expectations for bidders and contribute to the industry meeting those expectations over time. (See for example the SafeBuild Alliance in Oregon)

How Can This Intervention Be Adapted for Small Businesses?

Homeowners might be considered small owners and could have an interest in how the work around their house is performed (e.g., requiring fall protection to be used by roofers and tree-trimmers). No one wants a fatality or serious injury to occur at their house as a result of work they commissioned. This is one reason homeowners often require licensed renovators (if the state has licensing) or at least look at consumer reviews. It might be useful to make the safety records of these companies more available to homeowners so they can factor that into their decision making.

Intervention Evaluation

Owners can see the impact of their attention to safety in the safety performance of their contractors. Safety climate surveys by the owner could also be useful, especially to minimize fear of retaliation among workers and to encourage them to answer honestly.

Resources on How to Improve Jobsite Safety Through Owner Involvement

Design for Construction Safety website: <http://www.designforconstructionsafety.org/>

Laborers' Health & Safety Fund of North America: Best Value Contracting. Various articles available at: <http://www.lhsfna.org/index.cfm/occupational-safety-and-health/topics/best-value-contracting/best-value-contracting/#tabs-1>

Portland Oregon Safe Build Alliance: <http://safebuildalliance.com/>

Health and Safety at the London Olympics:
<http://learninglegacy.independent.gov.uk/themes/health-and-safety/>

Australian Model Client Safety Framework:
<http://www.fsc.gov.au/sites/fsc/engageaccredited/modelclient/pages/modelclient>

HOW TO IMPROVE JOBSITE SAFETY BY MEASURING THE SAFETY CLIMATE

Safety climate on the jobsite cannot improve unless one knows the starting point. By measuring safety climate, the company can pinpoint areas for improvement.

Safety climate measurement normally involves anonymous surveys of workers and management (supervisors) on the site. Many surveys have been designed for research purposes, with efforts also to develop more practical tools for field use. (See the appendix for sample questions.) Many companies hire professional evaluators to survey their workforce. In some cases this can be helpful, in that they are seen as separate from management and this might allow workers to be more open in their responses. But if the site is large enough and the survey is truly anonymous, a third party survey may not be necessary.

The main goal is to identify what workers think of the company safety program. Do they feel comfortable raising safety issues? Do they feel their safety concerns are taken seriously? How does site management see the safety program? Is there a difference in what workers and management see? Often workers view the safety program less favorably than management. The data from the survey can then be used to devise interventions — changes in management practice to address and close the gap.

A second approach has been laid out in the literature and in the CPWR Safety Culture Assessment Tool (S-CAT). This is the rubric model. For each safety climate factor, a scale has been developed explaining the various “maturity levels” for an organization. Each organization can then rate themselves and see where they fall for each factor along that scale from “inattentive” where the company is not really paying attention to safety to “reactive” where they only respond to concerns after the fact, “compliant” where they do the minimum required by law, “proactive” where the company tries to stay ahead of the curve and ultimately to “exemplary” where the best practices are used to ensure a safe worksite. An example of one such rubric is included below. Once a company has identified itself along these rubrics the goal would be to use these rubrics in setting goals for the company to move them along these scales towards becoming exemplary.

What Are the Barriers and Pitfalls to Implementation?

- The biggest problem with safety climate surveys is the lack of anonymity. If workers feel the survey is not truly anonymous, they will not answer truthfully.
- The second problem is the construct of the survey. If it is too long or the questions are too complicated or confusing, you will not get useful data.
- The third problem is getting people to fill the survey out. Unless you get a good cross section of the workers on the site (e.g., all trades, all shifts), the results may not be representative.
- Lastly, interpreting the data can be tricky. The results should point you in a positive direction and give you a good idea of where improvements are needed.



- A final note: Sometimes workers use surveys to complain about specific issues or individual problems. Those problems need to be addressed — but outside of the survey response.

How to Get Around Those Barriers and Pitfalls?

- Use a relatively short survey (10 or fewer questions).
- Use a third party to administer the survey to make sure it is anonymous.
- Use one of the standardized surveys that have been used extensively in the construction industry (see appendix).
- Have a small group of safety leaders from the site work with you on survey development, administration, and interpretation.
- Give workers paid time to take the survey (e.g., during a toolbox talk).
- Make sure the results are communicated back to everyone in a timely manner and a plan is developed to address the results.

Other publications from CPWR will give you concrete ideas of ways to address any gaps that are identified (see Resources section below).

How Can This Intervention Be Adapted for Small Businesses?

Surveys are difficult to do anonymously in small businesses, and the data are more difficult to interpret. It may be more useful to do individual interviews. Having a third party do the interviews will encourage workers to speak freely and honestly.

Intervention Evaluation

In conducting an evaluation, ask these four questions: Did everyone fill out the survey? Did each worker provide useful feedback? Could the survey be used to target improvements? Are follow-up surveys showing any improvements?

Appendix: Sample Survey Questions

How often are the following statements true?

1 Never	2 Rarely	3 Sometimes	4 Often	5 Always

Source: Institute for Work and Health survey on benchmarking. <http://www.iwh.on.ca/at-work/61/prevention-team-develops-tool-to-measure-leading-indicators>

Inattentive	Reactive	Compliant	Proactive	Exemplary
Management rarely comes to the jobsite. When present, they often are poor safety role models. When employees bring concerns to management they are not acted upon and the employees are labeled troublemakers.	Management gets involved only after an injury occurs. They often blame employees for injuries. Safety rules are enforced only after an incident or when safety audit results are negative.	Management conforms to OSHA regulations. Managers sometimes participate in safety audits but corrective actions are focused on employee rather than program deficiencies.	Management initiates and actively participates in safety audits. Managers ask employees for advice and feedback. Management conducts spontaneous site visits and recognizes employees for identifying hazards and working safely. Management participates in safety program development and provides adequate resources to ensure a positive safety climate. Safety programs and policies are reviewed annually.	Management integrates safety into every meeting and engages in continuous improvement regarding safety conditions and hazard reduction. External audits are used. Managers are held accountable for safety expectations. Safety trends are analyzed. A formal process for corrective action exists.

Source: CPWR Management Rubric
<http://www.cpwr.com/sites/default/files/Safety%20Climate%20Workbook%20and%20SCAT%20070716.pdf>



Resources on How to Improve Jobsite Safety by Measuring the Safety Climate

CPWR, the Center for Construction Research and Training, with NIOSH: Safety Culture and Climate in Construction: Bridging the Gap Between Research and Practice, 2013. [Workshop report] Available at:

http://www.cpwr.com/sites/default/files/CPWR_Safety_Culture_Final_Report.pdf

CPWR: Worksheets and a Rating Tool to Help You Strengthen Jobsite Safety Climate, 2016. Available at:

<http://www.cpwr.com/sites/default/files/Safety%20Climate%20Workbook%20and%20SCAT%20070716.pdf>

Institute for Work and Health (IWH): Organizational Performance Metric, 2016.

[Questionnaire] Available at:

https://www.iwh.on.ca/system/files/documents/iwh-opm_questionnaire_2016.pdf

IWH: Organizational Performance Metric: Follow-up questions to further identify areas for improvement, 2016. Available at:

https://www.iwh.on.ca/system/files/documents/iwh-opm_follow-up_questions_2016.pdf

U.S. Department of Energy: DOE Standard: *Human Performance Improvement Handbook*. Vol. 2: Human Performance Tools for Individuals, Work Teams, and Management," 2009. pp. 100–120. Available at: http://energy.gov/sites/prod/files/2013/06/f1/doe-hdbk-1028-2009_volume2.pdf

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