

Using Safety Culture Assessments to Develop More Effective Safety Interventions

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Reducing Injury Requires Controlling Hazards

To reduce injury, we must reduce hazards and at-risk behaviors. This first requires identifying the hazards. Identifying hazards requires a combination of employees, site leaders, site safety personnel, and outside experts knowing what to look for and regularly observing and auditing. Once hazards are identified, they should be reduced or eliminated. This can be done by either *removing the hazard completely* (e.g., substitution of materials, automation) or *designing engineering controls* (e.g., guarding, interlocks) to prevent people from coming into contact with the hazard. However, when it is not possible or practical to remove the hazard completely, lower level controls should be considered. The next most effective controls are typically *warnings* (e.g., signs, alarms) or *administrative controls and training* (e.g., job rotation, lockout/tagout procedures, equipment inspections). Finally, if none of the above controls are possible, *PPE* should be used (eye protection, respiratory protection, fall protection). Combining the lower level hazard controls may provide additional protection. However, even combined, the lower level controls will not be as effective as eliminating the hazard, thus allowing the probability of eventual injury.

Although few would argue with the need to follow the standard hierarchy of hazard control listed above, its use depends on first identifying the hazards and risky behavior. There are many methods of hazard identification. Traditional auditing and inspections by both company personnel as well as outside experts (e.g., mock OSHA inspections) can be particularly useful. When behavior-based safety is done correctly, it not only helps identify at risk behaviors, but can also identify the factors that influence them (e.g., equipment limitations, management systems, safety culture, etc.).

It is also important to ask people their perceptions of the most important hazards and their causes. However, informally asking a few questions to individuals usually doesn't allow a very comprehensive assessment of people's perceptions. Therefore, a more formal assessment, such as through a perception survey can be a useful diagnostic tool to help identify issues negatively impacting the organization's safety culture and/or which may serve as an obstacle to improvement efforts. Then, follow-up on areas of particular concern may be needed to help understand the reasons for the negative perceptions and identify strategies for change.

The Impact of the Safety Culture on the Organization

An organization's safety culture reflects the attitudes, beliefs, perceptions, and values that employees share regarding safety. Many experts agree that to optimize safety performance we must transition from a "dependent" culture to an "interdependent" one (Tebo, 2002; Geller, 2005). Organizations must leave behind the notion that managing safety primarily involves issuing rules and ensuring compliance through discipline ("dependence"). Instead, the organization's safety culture must promote a sense of shared responsibility for safety through genuine empowerment. The organization must truly value safety and everyone in the organization must feel responsible for others' safety as well as their own ("interdependence"). Further, the culture must encourage individuals to *act* on that feeling of responsibility by taking action to prevent injury to themselves and others (Geller, 2001).

Assessing the Safety Culture

Improvement of an organization's safety culture can only take place with an accurate understanding of current strengths and weaknesses. Otherwise, tremendous effort may be lost pursuing initiatives that miss the mark. In addition to serving as a diagnostic tool to help identify problems and point the way to effective solutions, the results of culture assessment tools can also be used as a performance metric to assess the success of culture change interventions. Although many experts believe survey instruments can be an invaluable diagnostic tool (Petersen, 2001), safety professionals are often reluctant to use them (Johnson, 2003).

1) What to Measure

Achieving an ideal safety culture often means moving from top-down control to collaborative involvement, creating an atmosphere of fact-finding rather than fault-finding; and promoting teamwork for safety improvement as opposed to only looking out for yourself. Key measures should include perceptions of management support for safety, peer support for safety, as well as personal responsibility for safety. Further, perceptions of the organization's safety management systems that influence the resulting culture should be measured (e.g., incident & near-miss reporting and analysis process, discipline, rewards & recognition, safety suggestions, communication, training, etc.).

2) What to Look for in the Design

The key ingredients of a perception survey are the questions themselves. In order to provide unambiguous information, they must be carefully constructed. Survey scales (e.g., groups of questions representing specific categories such as "management support for safety") should be valid (e.g., they should measure what they are supposed to). The scales should also be reliable (e.g., the measure yields consistent results). The survey should also have benchmark data or "norms" to allow a comparison of your survey results to that of an average or standard.

3) How to Administer

The analysis resulting from the survey is only as good as the data collected. Therefore, particular attention must be paid to the administration of the survey to ensure honest and candid participation. First, participants should be assured their anonymity. If people believe their individual responses will be available to others, especially to management, they may be reluctant to provide honest answers. Instead of individual names, respondents should provide their demographic information (e.g. site, department, shift, company vs. contractor, etc.). Participants should also be given a set period of time to complete the survey. Through administrations of our Safety Culture Survey, it is common to achieve well over a 90% response rate of usable/complete surveys with this method. Alternately, if surveys are distributed to participants to complete on their own time, response rates in the 50% or

lower range are not uncommon. Furthermore, for most small to average sized sites (e.g., several hundred people), it is best to have everyone complete the survey. For very large organizations (e.g., many thousands of people) it is typically acceptable to take a sample of about 50%, as long as the sample is random/representative.

4) How to Use the Resulting Data

The results of the safety culture surveys are useful in several ways. First, the results can serve as a diagnostic tool to help identify issues which may be negatively impacting the organization's safety culture and/or which may serve as an obstacle to improvement efforts.

Next, the results can be used as a performance measure to assess the success of safety improvement efforts. Specifically, when implementing safety improvement interventions, care and attention must be paid to employees' perceptions about safety and their opinions about the intervention processes. Otherwise, if behaviors change without subsequent attitude change, the change is likely to be short term and limited in scope. Therefore, repeated administrations of perception surveys can help determine if the interventions are occurring in a way that leads to the attitude change needed for long-term continuous improvement.

Although the most meaningful interpretation of survey results will come from a comparison between results taken at one time with results taken from the same employee group at a later time, comparisons across positions within a single organization and between an organization and a norm (i.e., a group of other similar companies) can suggest targets for improvement or areas where attention and support should be focused.

Examples of Using Perception Surveys to Improve Interventions

Using "should/willing/do" differences to estimate potential for improvement.

An example of how perceptions can be used when developing behavior-change interventions is illustrated by a series of questions often given as part of a site assessment before implementing behavior-based safety processes. Three types of questions on our Safety Culture Survey are 1) if they feel employees *should* perform a certain safety-related behavior (e.g., "Employees should caution their coworkers when they are observed working at-risk"), 2) if they are *willing* to perform the behavior (e.g., "I am willing to caution my coworkers about working at-risk"), and 3) if they *do* perform the behavior (e.g., "When I see a coworker working at-risk, I caution him/her").

As shown in figure 1, the results of over 85,000 respondents show most people respond favorably to the first two statements, indicating most have the necessary values and intentions. But far fewer respondents agree with the final statement, indicating there are personal and organizational barriers to this critical behavior. The possible barriers are numerous (e.g., not my job, I'll get a negative reaction, don't know how to

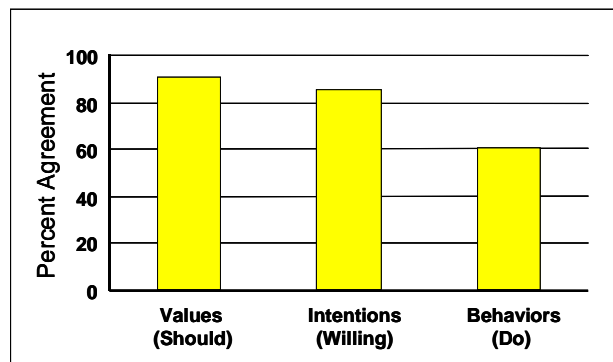


Figure 1. Responses vary when asked whether one 'should', 'is willing', and 'does' actively care for others.

As shown in figure 1, the results of over 85,000 respondents show most people respond favorably to the first two statements, indicating most have the necessary values and intentions. But far fewer respondents agree with the final statement, indicating there are personal and organizational barriers to this critical behavior. The possible barriers are numerous (e.g., not my job, I'll get a negative reaction, don't know how to

give tactful feedback, don't know the job he's doing so I can't give feedback, people here don't interact with each other in that way).

However, analogous to Gilbert's (1978) PIP (performance improvement potential) from his classic text, *Engineering Worthy Performance*, the difference between the "should", "willing", and "do" can be used to estimate the potential for improvement as well as to design the most appropriate strategy. When employees feel they should or are willing to perform these behaviors more than they currently do, a potential for relatively quick improvement in safety following basic instructional training exists. However, if employees say they don't feel they should, they are not willing, and they actually do not perform such behaviors (which is thankfully rare), the intervention strategy should address the reasons for the negative reactions. In other words, the intervention strategy would focus on the rationale such activities are important vs. simply the mechanics of how to do it and the barriers holding us back.

Using perceptions of safety management systems to target their improvement.

Organizations rely on a number of processes and procedures to manage risk and thereby decrease the chance of incidents and injuries. These generally include systems such as safety rules and procedures, safety training, hazard identification and correction, discipline, incident reporting and investigation, safety communications, safety suggestions, and rewards and recognition, etc. Each safety management system has an important contribution to make in terms of not only improving workplace safety, but also influencing an organization's safety culture. At best, when the system is poorly designed or operating ineffectively, its ability to accomplish its primary purpose will be compromised. At worst, a poorly designed, badly implemented, or ill-functioning system can also have a destructive influence on an organization's overall safety culture. For example, when incident investigations create an air of mistrust and fault-finding, safety incentive programs discourage injury reporting, accountability processes fail to recognize individuals for their accomplishments, and performance evaluations only consider safety performance to be whether the individual was involved in an incident or not, the culture cannot advance.

To compound the situation further, the systems are interactive and, in many cases, overlap. For example, hazard identification and correction requires a climate that fosters employee participation, sufficient training so employees can recognize and correct hazards, and ample communication of the hazard and/or its solution. Therefore, poor features of one system can have negative influences on other systems. For example, when employee incentive programs and/or supervisor performance evaluations are based primarily on injury rates, it is unreasonable to expect those employees to embrace an open injury reporting and investigation system. Or when the incident investigation process is viewed as extremely blame-oriented, it is not reasonable to expect employees to feel comfortable having their safe and at-risk behaviors observed. Consider the following example.

Despite a long standing, fairly structured protocol for investigating employee safety and process safety-related incidents, the management team of a mid-sized chemical manufacturing plant was concerned that the investigations were not very effective. In particular, when the incidents involved some form of human behavior the analysis nearly always stopped at identifying the contributing behavior, failing to explain *why* the behavior had occurred.

As part of an overall effort to improve the company's investigation process which would include process redesign and training, an attempt was first made to better understand the employee's

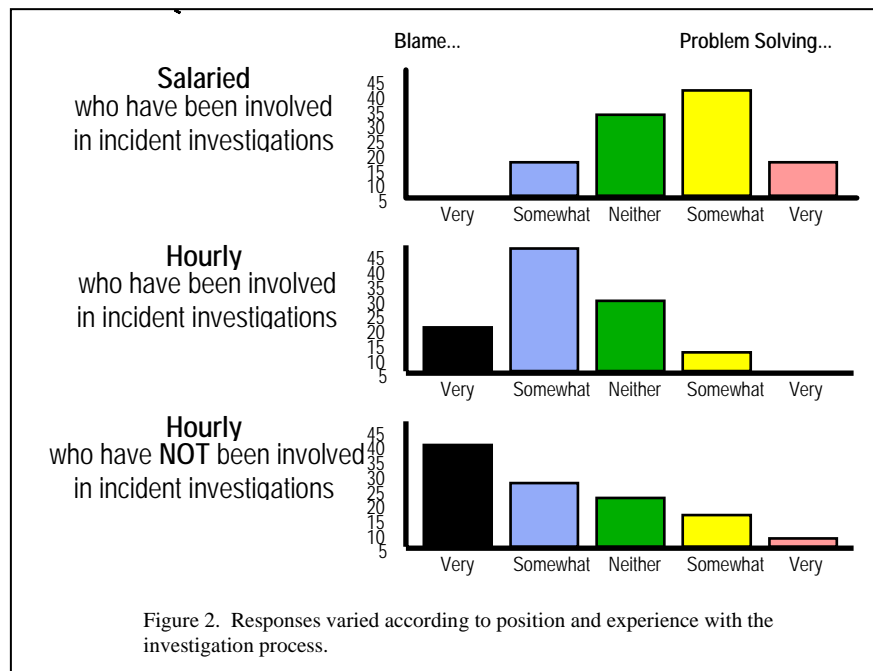
perceptions of the existing investigation process. A random sample of employees was asked to complete a questionnaire describing their experience in the reporting and investigation of incidents. The questionnaire focused on three areas. First, a series of questions addressed the individual's history of reporting near misses, minor incidents, and major incidents. For those indicating that they had ever elected to not report an incident (or would consider not doing so), they were asked to indicate the reasons why. Next, the questionnaire asked their history of participating in incident investigations. Finally, the questionnaire included several items asking their opinion of the investigation process. The questionnaire was anonymous and was administered and collected in a manner that ensured their confidentiality.

The results of the analysis revealed some interesting information. Of all employees surveyed (both hourly and salaried), 60% indicated they would *not* report an incident if they could avoid doing so. Sixty percent suggested they would likely not report an incident because “they or someone else would be blamed”, while 40% feared that discipline would result. Interestingly, company records showed very few instances of the use of the disciplinary procedures.

In examining employees' opinions of the existing investigation process, the survey responses were separated by position (hourly and salaried) and by whether individuals had or had not been involved in an incident investigation within the previous 12 months.

As illustrated in Figure 2, the salaried employees responded fairly positively. Most felt the investigations were of a “problem solving” nature as opposed to a “blame” process. The hourly respondents’

perceptions were not as favorable. Those who *had been involved* in an investigation had somewhat mixed opinions, with some holding fairly strong negative opinions, but most being neutral. On the other hand, those *who had not* recently had the experience of being involved in an investigation rated the investigations quite negatively. Unfortunately however, this group accounted for most of the hourly respondents and is representative of a large majority of the plant population. Although not ideal, it's apparently not as bad as the rumor mill has it painted. So, although participation in the process enhances most people's opinion of it, the pervading opinion is overwhelmingly negative. Follow-up focus groups confirmed these opinions as well as similar results with related questions such as whether the process yielded the “correct findings” or the “wrong findings”.



Not only was the existing investigation process failing to provide the organization with information to allow them to make true improvements and therefore minimize the possibility for similar events to be repeated, it also had a destructive influence on the organization's culture. As a result, not only were people hiding incidents whenever they could manage to do so, they were also guarded in providing information to the investigation team whenever an event was reported and investigated. As a result, the investigation was carried out with less than adequate information, likely resulting in poor conclusions, further enhancing people's negative perceptions of the process, resulting in a spiraling situation likely to continue to get worse.

In this case, the incident analysis process was redesigned to meet two goals: First, to better identify root causes of incidents and to develop effective countermeasures. Second, and equally important, to foster an atmosphere conducive to full and open participation of any employee involved in, witness to, or with pertinent information for any incident on site. New guidelines were developed concerning who was involved in each investigation, better defining the roles and responsibilities, and establishing group norms and ground rules. Also, new analysis tools were introduced to assist the team in understanding human behavior. The process for sharing information, both pre- and post-investigation was revised, and those likely to participate in investigations on a regular basis (e.g., managers/supervisors, safety department members, safety committee members) were provided specialized training.

Surveys should be followed by interviews

Based on the survey results, some items or trends may raise more questions than they answer. Structured interviews should be conducted with a representative sample of the population to gain additional details not provided through a standard survey. In effect, surveys often help reveal 'how/what' employees feel, and interviews can help explain 'why.' For example, when it comes to disciplinary action regarding safety, management and employees are often not "talking the same language" and misunderstandings often occur.

When management speaks of "punishment", they often think of a day off with out pay, a letter of reprimand in a personal file, the standard items in a progressive disciplinary policy, etc. However, employees typically have a much broader definition. Employees often equate discipline with punishment. Therefore, any action the organization takes perceived as unpleasant that happens after an incident will likely be seen as punishment for the incident.

This is reflected in the survey results of a large petrochemical company. Their survey results indicated 0% percent of management agreed with the survey question "*people here are punished for having a work injury*" and about 85% of hourly employees agreed with the statement. After following up with management to ask why they thought the discrepancy was so large, they were very confused and had no plausible answers why employees would *agree* with such a statement. Then, during follow-up interviews with the hourly employees, they were asked the same question. They too were confused. They could not see how management could *disagree* with the statement. Then, when asked to give examples of *how* employees were punished, the hourly employees would typically give responses such as "*they make us stand up in front of our co-workers and talk about the injury*". The employee groups perceived this as a very harsh punishment, whereas the management team perceived this as "positive discipline". As this

example highlights, in order to make improvements we first need to know where the discrepancies are.

Conclusions

We tend to find the hazards we look for. Therefore, we need to make sure we are searching for a comprehensive set of hazards and other barriers to safe performance. Although attitudes, perceptions, and organizational culture are certainly more difficult to measure than physical workplace hazards, this should not prevent us from measuring them. As Deming said “*It’s better to have an imprecise measure of the right thing than a precise measure of the wrong thing*”. Although this quote does not precisely fit, because physical hazards are certainly not the “wrong” thing to measure, indeed they are critical. However, they are incomplete. Because when it comes to influencing our behavior, “perception is reality” and in order to get a broader perspective of the factors preventing optimal safety performance, we should include perception surveys as part of a comprehensive approach to hazard and injury reduction.

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