THE NEW VIEW OF HEALTH AND SAFETY
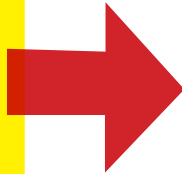
SAFETY
SOLUTIONS

What is safety?

OSHA Rate ≠ Health and Safety Performance

Traditionally health and safety has been defined as the absence of injuries and illnesses. If there are very few injuries or illnesses the workplace is considered safe. When someone asks, "How are we doing?" the OSHA recordable and lost time case rate charts are trotted out. One of the major problems with this approach is the realization that many catastrophic incidents have occurred at workplaces with low incident rates. For this reason and many others, more and more organizations are abandoning the OSHA incident rates as a primary measure.

If safety and health isn't the absence of injuries and illnesses then what is it?

System

Leadership, technology, processes, procedures, people, tools, methods, supervision, resources, culture and system deficiencies and strengths

Health & Safety

Safety and health is a property of the system. When we think about system properties it is helpful to think about our bodies. Our bodies have many properties. We can see, think, walk, write, etc. No individual part of our bodies can do these things. Only our complete bodies can do them. In the same way safety and health is a property of the workplace system. Safety and health is not found in an individual part of the system, a person, device, procedure or training program. Safety and health is the product of the interaction of parts of the system – the management system, people, work methods, hazard controls, procedures, supervision, tools, equipment and many other factors including culture, production pressure, resource constraints, goal conflicts, system strengths and deficiencies.

Extreme Cost and Resource Pressure

The goal of management in almost every organization is to continually increase the organization's product or service output with same or less resources. This is the result of economic pressure management faces from both external and internal factors. Typically the most common way to increase output with the same or less resource input is continually applying pressure and changing processes. This has very significant implications for health and safety. As we will see below, it affects how work is performed compared to how it is planned. Equally important is the recognition that many of the traditional health and safety processes, in their current form, may no longer be appropriate in rapidly changing, dynamic and resource-constrained work environments. Many serious incidents demonstrate that weekly or monthly inspections or audits, annual risk assessments and JSA's can fail to identify hazardous situations in a timely manner.
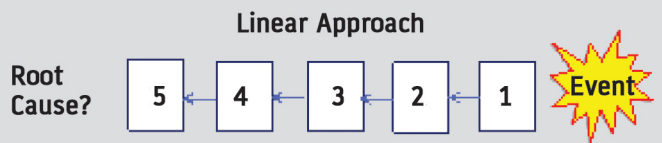
Continual Change

Input → Process → Output

Identification of hazards is not enough; system deficiencies must also be identified. Almost every serious incident is the result of a complex collection of factors. Exposure to hazards is important but many other factors play a very important and often critical role. Remember, safety and health is a property of the system. Often we hear claims that 80-90% of all incidents are caused by unsafe acts of individuals. The implication is that worker actions are separate and independent and not affected by the work environment or system in which they take place. Such anti-systemic thinking is a barrier to learning and to implementation of effective improvements.

The traditional approach is to think of incidents as being linear like a line of causes and affects. The problem is that this is not how most injuries and illnesses occur. Cause and effect charting and methods like 5-why can be helpful particularly in cases where the incident follows the laws of nature for example in cases of mechanical failure. However, most incidents involve people making decisions and taking action in dynamic situations as events unfold. Cause and effect charting processes fail to accurately represent such incidents because they attempt to chart non-linear relationships in a linear fashion.
An example may help illustrate this problem. A nurse makes a mistake while dispensing medication. Her unit is under-staffed, resulting in her being assigned additional patients. Just before the incident she is interrupted to take a call from a doctor and another nurse asked her a question about another patient. The events were linear but their impact on the nurse's ability to concentrate and correctly administer the medication was not.
A much more accurate model of incidents and how failures occur includes worker actions and errors but also recognizes the profound impacts of many other factors, again demonstrating the point that safety and health is a result or property of the system.
It is important to recognize that many, possibly most, of the elements listed are typically not identified during routine inspections and observations.
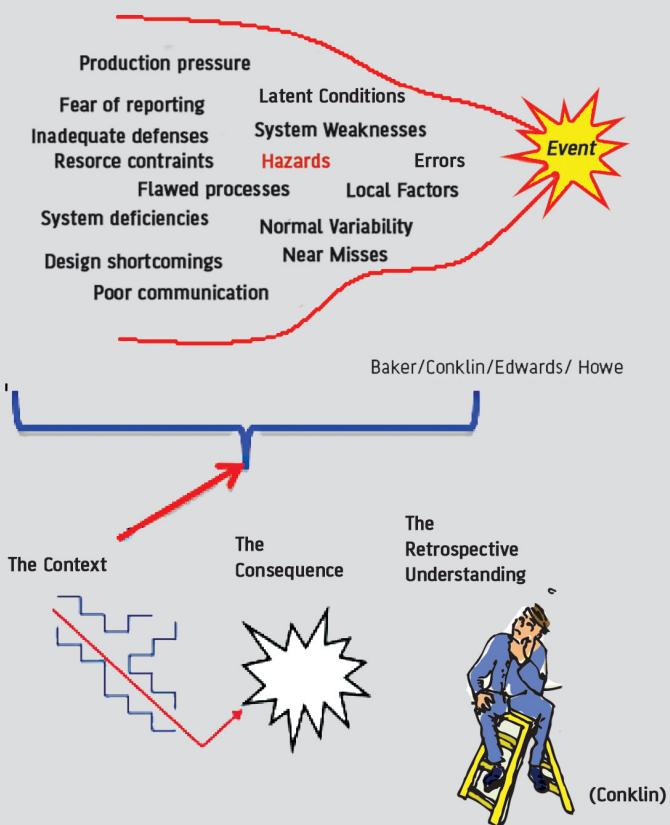
> " All human behavior is influenced by the context in which it occurs.... Many recent accidents that have been blamed on operator error could more accurately be labeled as resulting from flaws in the environment in which they operate. "
> Nancy Leveson, MIT,
> Engineering a Safer World, page 47

Linear Approach

Root Cause? ← 5 ← 4 ← 3 ← 2 ← 1 ← Event

System View

Production pressure
Fear of reporting
Inadequate defenses   Latent Conditions
Resorce contraints   System Weaknesses
    Hazards   Errors   Event
    Flawed processes   Local Factors
System deficiencies   Normal Variability
Design shortcomings   Near Misses
    Poor communication

Baker/Conklin/Edwards/ Howe

The Context   The Consequence   The Retrospective Understanding

(Conklin)

Three parts of every incident or failure

Every incident or failure has three parts: context, conse-quence and retrospective understanding. The context is the situation including the organizational factors, latent condi-tions and organizational weaknesses that influence condi-tions such as methods, staffing levels, work load, culture and actions of workers and supervisors and others. The consequence is the actual injuries, illnesses, property and environmental damage resulting from the failure. Finally, the retrospective understanding is the organization's actions following the incident.   Most organizations call this ac-cident or incident investigation. The new view transforms this process from investigation to workplace learning, which has significant implications. The new view is based on the assumption that workers are not the problem but rather a resource to be harnessed and vital for improvement.

Let's think of how work is planned and what is written in the procedure manual, standardized work sheet or JSA. On the graphic below the way work is planned is represented as the straight black line. This is how the job is supposed to be performed.

Is this the way work is actually performed?
When asked, workers quickly shake their heads no.
Why isn't work performed according to the procedure?

Workers say things like;
>> *We didn't have the right equipment*
>> *The procedure is outdated, we haven't done it that way for years*
>> *The procedure did not cover the situation we faced*
>> *We didn't have time*
>> *We lacked sufficient manpower*
>> *We were trying to get the work out and thought we could skip a few steps and still be safe*

Work as planned versus work as performed

The graphic below represented the way work is planned – the procedure as a straight black line. The way work is actually performed is represented by blue line.

Procedure – work as planned

Work as performed
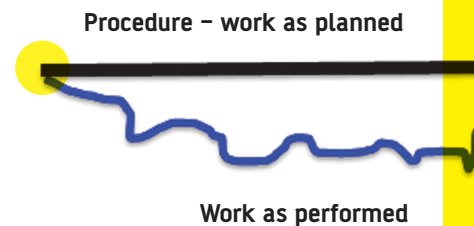
Traditionally most managers and safety and health profession-als have regarded strict compliance with procedures to be one of the elements most critical to the success of their program. The new view of safety is based on a different understanding of how work is performed and the role of procedures. Deviation from procedures – the way work was planned is not seen as necessarily bad or good. Deviation is the result of workers try-ing to adapt and balance a number of conflicting goals such as productivity, efficiency and safety in an ever-changing work-place frequently burdened by resource constraints. Frequently workers find a way to do the job that is safer, faster or easier than the procedure. In other cases they improperly assess a situation, forget a step, adapt in inappropriate ways and failure occurs.   Remember that the blue line almost always trends toward efficiency and getting the job done.

If we go back to our list of reasons given for not following the procedure, we notice that many of these reasons are the result of organizational weaknesses or system deficiencies. Examples could be excessive production pressure, lack of sufficient staff-ing, lack of equipment availability, leadership shortcomings or negative culture and lack of resources to maintain up to date procedures, just to name a few. If these and other factors are not recognized and the blue line not understood, unfortunately there can be a very gradual drift that can lead to failure. The process may take years before there is a catastrophic incident. Investigators in hindsight identify the drift. It is critical to de-velop processes that identify weak signals and drift before they result in failure. Engaging workers and establishing a culture of learning and continually questioning the safety of operations is necessary. There are two of the most important character-istics of High Reliability Organizations. Remember often the system whispers before it screams. We need processes that are sensitive to these whispers and weak signals.

Differing view of how work is performed and the role of procedures

The old view is based on four mistaken beliefs:

1. Planners can anticipate every situation that workers will encounter when procedures are written.
2. Work process, hazards and risk are static and seldom change.
3. Safety is achieved when workers mindlessly follow procedures.
4. Workers are the primary problem because they make mistakes and don't follow procedures.

The new view is based on four alternative beliefs:

1. It is impossible for planners to anticipate every situation that workers will encounter when developing procedures.
2. Work processes, hazards and risk are dynamic and frequently change.
3. Safety is always the result of workers adaptively blending knowledge, experience, procedures, support tools, physical tools and context/environment.
4. Workers are very important to success and safety because of their central role making the patchwork of processes, methods, procedures, system deficienciesand hazard controls work.

A better way to think about the organization

Organization charts are frequently used to describe the various levels or the organizations hierarchy. When thinking about health and safety there is a much better model available. The organization is represented as a stick with sharp and blunt end. Workers are at the sharp end because they are closest to the hazards – where work actually gets done. Next are the supervisors who may be quite close to the hazards and then managers, department heads, superintendents and finally executives at the blunt end furthest from the hazards.

The first question is, "Do those at the sharp and blunt end see safety in the workplace in the same way?" Normally the answer is no. Those at the blunt end generally see safety embodied in incident rate charts and work based on the black line – what is in the procedure manuals. Those at the sharp end generally see safety as how work is actually performed represented by the blue line. Their view of safety is based on their experiences trying to get the work done within the context that the organization has created – the system.

Those at the blunt end can make decisions that have a major effect both positive and negative on the sharp end of the stick. Organizational improvement depends on closing the vision of safety gap between those at the sharp and blunt end.
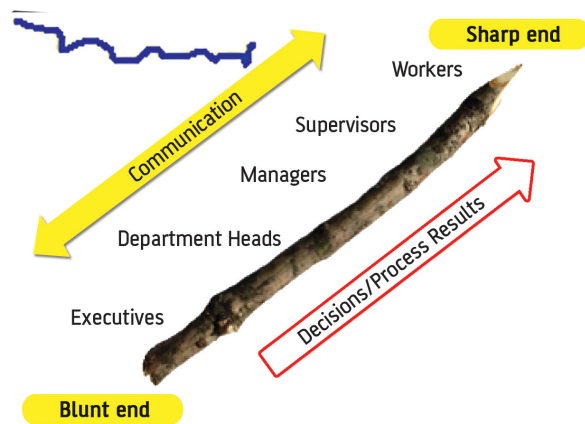
What can be done to close this gap?

The two most important changes that lead to operational and organizational improvement are:

1) Transitioning from old view to new view assumptions and mental models.
2) Providing feedback to those at the blunt end from those at the sharp end. This includes how work is actually performed given the organizational factors, goal conflicts and constraints.

Recognizing safety as an emergent property of the system means that those at the sharp end of the stick have critical information needed by all levels of management to improve health and safety and simultaneously enhance operational and organizational effectiveness.

The Principles of Human and Organizational Performance (HOP)

The new view of health and safety incorporates the principles of Human and Organizational Performance:

1. People make errors.
2. Error-likely situations are predictable.
3. All human actions are influenced by the context in which they occur.
4. Operational upsets can be avoided.
5. Our response to failure matters.

Human Error Myths

To successfully implement the new view it is necessary to dispense with common human error myths:

1. Human error is a choice.
2. No events means no human error problems.
3. Training will solve human error problems.
4. Accountability/punishment will address human error problems.
5. Significance of errors should determine the level of discipline.
6. Experience eliminates human errors.
7. Human errors are the root cause of accidents.
8. Errors are violations.
9. Errors are bad.

> "Underneath every seemingly obvious, simple story of error, there is a second deeper story. A more complicated story . . . a story about the system in which people work."
>
> (Sidney Dekker, 2006)

So what should we do?

We need to set aside old outdated myths and assumptions and begin to learn. One of the most valuable resources for learning and the richest source of information is the worker. Daily learning can take place when workers conduct pre-task planning and post-job debriefs with co-workers, team leaders and supervisors.

Learning teams can be formed that include workers familiar with the job or issue, a supervisor, support personnel such as an engineer and a HOP coach. Teams can meet to work on a wide variety of issues such as incidents, near misses, areas of concern, operational problems, high-risk jobs and design issues. The distinction often made between health and safety, operations, quality, etc. is artificial and represents old view anti-systemic thinking. Operational issues lead to health and safety issues. Health and safety issues can lead to quality issues. Taking a holistic view of the system builds collaboration, utilizes collective knowledge and broadens integration of health and safety with other areas.

Learning Teams

Learning teams typically meet for about an hour the first day talking about and charting how work is done and defining areas of concern being careful not to focus on solutions. The learning team then meets again a day or two later, which provides "soak time" time to individually think about the issue outside the group. During the second learning team session the group brainstorms solutions and assesses each suggestion. Finally the group chooses solutions and plans implementation. Individuals on the learning team take ownership to follow up. The process unlocks human potential and creativity by giving those at the sharp end of the stick a major role in problem identification and resolution.

SUMMARY

Old View

What is safety?
The absence of injuries and illnesses.

Safety would be improved if management and workers were just more committed.

Our perspective of workers
We need to help workers be safe.

Accident investigation
Who did it?
Find an unsafe act of a person.
Find the root cause.

What we look for
Looking for hazards is all we need to do.

New View

What is safety?
Safety is an emergent system property, which is improved by improving the system.

Management and workers are both affected by the intense economic pressure, which constrains resources and leads to continual process changes that can often impact safety in subtle ways.

Our perspective of workers
Workers need to help us understand how work is done and how the system affects it.

Workplace learning
How did this happen?
Discover the context.
Use a systems approach to find the multiple contributing safety and operational factors.
Analyze and solve

What we look for
Looking for hazards is important but not enough. Processes must be in place that make us "masters of the blue line". Understanding how work is actually performed provides critical insight to organizational weaknesses and deficiencies that undermine safety and operational performance.

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Special thanks to Todd Conklin, Bob Edwards, Fred Manuele and Andrea Baker.

For additional information go to
newviewofhealthandsafety.com

SAFETY SOLUTIONS

THE NEW VIEW OF HEALTH