Session No. 636

Safety and Health Integration: Understanding Systems Thinking To More Effectively Implement ANSI Z10

Katherine A. Hart, Ed.D., CSP
K.A. Hart & Associates
Alameda, CA

Introduction

The concept of integrating safety and health into the business framework appears to be the next major focus for safety and health professionals. Today it even has its own acronym – ISM (Integrated Safety Management). And why not? The idea of streamlining how the business operates, interweaving safety with the systems, processes, tasks, and jobs of the business so finely that one cannot discern what is safety and what is in fact the actions people are doing should be the dream of every safety and health professional. Especially in this age of downsizing, rightsizing, streamlining, and increasing operational efficiencies, integration would seem to be the right thing to do in a business sense. And while many professionals profess this is what they want to have happen, the actuality of what really is occurring is in opposition. Typically what happens is that safety, like other departments within the organization, creates separate policies, procedures, processes, and guidelines. These are combined together and called a health and safety management system. Let's be clear, this author fully supports the belief that having some form of health and safety management system is imperative. What this paper is challenging is the implementation of that management system. The question is whether to focus the implementation for integration from a collaborative perspective or a competing one. The concern is that professionals are using the word integration, which requires a collaborative frame of reference, but their immediate and historical frames of reference are from a competing model. This paper will explore the author's belief of the current existing problem. It will then introduce the concepts around systems thinking and collaboration to offer a new frame of reference and understanding for safety professionals.

Problem Identification

Most professionals in safety, if they have been in the field for any length of time, are familiar with the basic 3E's of safety – engineering, education, and enforcement. Engineering involves the practice of identifying safety hazards, evaluating those hazards for their risk potential (frequency versus severity models) to injury employees, customers or public (depending on your frame of reference), applying controls (engineering, writing procedures and developing training as administrative, and determining personal protective equipment) to eliminate or reduce the hazard, and re-assessing to ensure the controls are in fact working. Education involves teaching people about the hazards that exist in their jobs, which can't be completely eliminated, and the

written procedures they must follow to ensure they don't get hurt. Enforcement involves punishing employees in some form when they do not in fact follow the procedures they were trained to do in the education phase. This 3E of thinking permeates every aspect of our being. It is the historical foundation for how safety professionals approach their work. It is further supported by regulations promulgated by governing agencies. These regulations for the most part follow the 3E's process by outlining what needs to occur when a new hazard is identified.

Other areas of thinking about safety have been presented over the years, such as behavioral safety, cultural safety, and safety leadership. Behavioral safety focuses on how to affect change at the individual level through the identification of safe and unsafe actions. Tracking and reinforcement of safe behaviors will modify employee actions to follow prescribed procedures when performing their work. Cultural safety looks at the underlying customs, meanings, and actions that reinforce or disconnect safety from the business. It begins to get at how safety is perceived and recognized by people throughout the business. Safety leadership teaches that the top leaders of the organization must be involved in safety, committed to its implementation, and responsible for its success or failure within the organization. And now we have the next phase, combining all of the above concepts into what is called a health and safety management system (HSMS).

Using the ANSI/AIHA Z 10 – 2005, American National Standards for Occupational Health and Safety Management Systems, let's take a look at how all these previous perspectives fit into place. The 3 E's fit into Section 4, Planning, Section 5, Implementation and Operation, and Section 6, Evaluation and Corrective Action. There have been some new additions, namely in terms of auditing and feeding back into the overall system context. Additionally, there is now an emphasis on design review and management of change, procurement, contractors, and emergency preparedness. This is not to say we haven't been addressing them, they are just more clearly identified now within the system. The behavioral, cultural, and leadership aspects fit into Section 3, Management Leadership and Employee Participation, Section 7, Management Review, and Section 4, Planning. According to the authors of ANSI/AIHA Z 10, this standard focused on the strategic levels of policy and processes, yet does not provide detailed instructions for procedures, job tasks, since these need to be developed and tailored to each organization's needs.

Okay, so now we have a neat and tidy package to move safety and health towards becoming its own operating system within the organization. So what's the problem? The difficulty is that creating this system has not addressed or eliminated any of the core problems that arise when trying to implement safety and health. Safety professionals are still up against fundamental questions of what is more important – 1) safety or cost? 2) safety or production? 3) safety or speed of getting the work done? 4) safety or whatever the current issue the organization is faced with? What should employees focus on – safety or the work they need to do? What should managers focus on – safety or the work they are required to do? Creating a systems approach to safety only elevates and makes more evident the understanding that safety is thrust into competing against the other functioning systems that comprise the organization. So how do safety professionals respond to this dilemma? Some of the responses the author has heard range from "Safety needs to be a value within our organization.", or "Leaders need to step up and become more involved in safety, then it will be important.", or "Eliminate safety first so that safety is equally considered along with cost and quality." Realize that all of these responses still have the underlying dilemma of pitting safety against the rest of the business. On the other hand, leaders ask questions like "How do I measure a value?" or "What are people really suppose to do

to be more safe?" or "What exactly do you want me to be doing differently today than I did yesterday regarding safety?" or "How do I help to instill safety into the business to make a difference, but balance this with other competing needs?"

To address the challenge of safety competing with other business systems, the concept of integrating safety into the organizational structure has been put forth. Instead of safety competing, it becomes just the way work is done throughout the company. Safety is no longer the safety and health professional pushing safety, but rather the organization absorbing the concepts of safety within its very core of existence. This sounds great, but what the heck does it mean or look like? How do safety professionals go about integrating concepts and ideas from the safety system into the already existing business framework or system? And more importantly, how do they help reframe this idea of non-compete for both themselves and others? This challenge of re-framing from a competitive viewpoint to one of collaboration requires a new way of thinking. A paradigm shift from "safety centered" to "business centered". To enable this shift, requires looking at not just the individual parts of business, but at the business as a whole. It requires recognizing the interdependencies of systems and processes that comprise the whole. In short, it requires an understanding of systems thinking.

Defining Systems Thinking

There is a Chinese parable, supposedly originating from the Han Dynasty, that tells of three blind men trying to envision what an elephant looks like. As they sit around a campfire exchanging information they have received from others, a merchant joins them with an elephant in tow. Hearing of their dilemma, the merchant offers each blind man the opportunity to feel his elephant. The first blind man touches the elephant's right and left foreleg. He relates that the elephant is similar to two tall trees with no branches. The second blind man touches the elephant's tail. He disagrees with the first man, saying the elephant is in fact similar to a straw fan that swings back and forth to provide a breeze. However, it is not so big or well made, since the main portion of the fan is rather wispy. The third blind man feels the elephant's trunk. He of course disagrees with the first two opinions, indicating that the elephant is like a snake, being long, round, and very strong. Of course the three blind men can come to no conclusion, since none of them have thoroughly examined the whole elephant. According to the parable, how can anyone describe the whole until he has learned the total of the parts?

This parable, while simple in its telling, reveals great insight when coupled with the concept of systems thinking. Systems thinking is a body of knowledge focused around the simple belief that the whole is greater than the sum of its parts. And to examine the whole, whatever it may be, is best done by looking at the interrelationships and inter-connections of all the parts that comprise the bigger picture. The framework for systems thinking is to see the patterns of change, rather than the static "snapshots" or single events in time. As a field of study systems thinking is relatively young, originating out of the post Work War II era. According to Alfred Kuhn and Robert Beam (1982), the theories and concepts began to take a formal approach with the founding of the Society for General Systems Research in 1954, today known as the International Society for the Systems Science (ISSS). The purpose of the society was and is devoted to the interdisciplinary inquiry into the nature of complex systems, and remains one of the most broadly inclusive societies today.

To understand systems thinking some basic terms need to be defined for a common language to emerge. A system constitutes any two or more interacting or interrelated components. And while not everything is a system, particularly nonliving things, all living organisms are systems. A very simple example, a stone placed in a garden does not constitute a system. However, the ground itself, if you were to examine the plants in combination with the dirt, earthworms, surrounding birds, etc, would comprise a system. What helps us to understand and articulate a system is our ability and perspective to see how the system works together. As an example, for those who have no knowledge about marine biology, they would look at the ocean and just see an endless horizon of water. While others, looking at the same vista would see a complex and interconnected system of sea life, plankton, kelp, corral, sand, wave movement, etc. As one metaphor puts it, "it's all in the eyes of the beholder."

So let's take a look at a system most of us can understand and relate to, the company to which each person works and operates within. This organization of people comprises a complex living system, applying the simple system definition. Not only is the organization a system, but it is a controlled system. Controlled systems are goal-oriented, self-regulating, and very adaptive to the influencers upon it. The other distinguishing characteristic of a controlled system is that there is some type of subsystem that serves in a decision-making or executive function, selecting among alternative responses based on the variables presented, and trying to achieve or maintain a preferred state. Whether it is the organization as a whole, various departments within the organization, or tasks being performed as parts of the organization, these are all identified as controlled systems. Another way to think of controls is the responses made by those that comprise the system, based upon how it is being acted upon.

There is also the distinction as to what are constraints upon the system. Constraints, as defined by Kuhn and Beam (1982, 32), are those "forces outside the system that limit or influence its behavior . . ., whether they be imposed by nature or by other persons." As an example, the promulgation of a law or regulation to govern the health and safety of people is a constraint imposed by the government. How the system, or organization in this case, determines it will respond to the constraint is dependant upon a number of different factors happening within the organization itself. And why is this important? Because as members of the organization or system, we have the opportunity to affect change and modify how the system responds, based on our own perspectives and how we communicate with others within the system.

Senge et al. (1994, 90) describes, a "system is a perceived whole whose elements 'hang together' because they continually affect each other time and operate toward a common purpose." So not only is the need for interrelationships important and working towards a common purpose or goal, but the concept of interacting over time is crucial. Meaning that the interaction does not just take place once, but is a continual and perpetual cycle that keeps evolving and, in most cases maturing.

Another component for systems thinking is the concept of a structure. Structure has a multiplicity of meanings, based on how one uses it. As an example, structure can include how the organization is set-up in terms of reporting relationships, flow of work, and processes. One evidence of structure is found by looking at an organizational chart. This depicts who reports to whom, and supposedly how the work is carried out. Though in point of fact, what is often seen visually may not actually depict what is occurring. This then is another part of the structure, how the interrelationships between and among people happen, both formally and informally. Structure

can also means the attitudes, perspectives, quality of products, ways in which decisions are made, and many other aspects that make up the organization. According to Senge et al., (1994, 90), it is important to understand that ". . . structures in systems are not necessarily built consciously. They are built out of the choices people make consciously or unconsciously, over time." From a systems perspective, this also means that these choices, if made evident to people, can be changed over time.

Feedback, from a systems perspective, reveals how actions reinforce or counteract (balance) each other. Most of us are use to applying feedback in positive or negative terms. Good feedback means something went well, and negative feedback means something needs to be corrected. In systems thinking, there is no right or wrong feedback, only the recognition of what is occurring and the opportunities available to intervene and adjust the system. For feedback represent a reciprocal flow of influence. Influence in this case is both a cause and an effect, since nothing is ever influenced in just one direction.

Senge et al. (1994) contends that Westerners have a difficult time understanding systems thinking, because the very basis of our language and sentence construction is linear and non relationship focused. For example, when we construct a sentence we rely on a subject-verb-object pattern. We translate this to event A causes event B. Yet how can we relate, from a systems perspective, that event A causes B, which in turn affects A, which are both being acted upon by events C, D, etc. Hence when systems are typically described or articulated, it is much easier to show a causal loop diagrams. These enable one to pictorially explain how the system is interacted upon by influences, internal or external, as well as constraints.

Systems Thinking and Integration

In his book *The Fifth Discipline: The Art and Practice of the Learning Organization*, Peter Senge identifies eleven laws of systems thinking, which can re-interpreted to understand how to more effectively implement safety integration.

The first law according to Senge (1990, 57) is "Today's problems come from yesterday's 'solutions'." Meaning that the challenges we are up against today were created by our past endeavors and actions. With respect to integration, the mindset we have typically approached the safety discipline with is one of competition and reference. Many have preached the importance of talking about safety at the beginning of every meeting, ensuring safety is forced into the discussion. What has resulted is not an increased focus on safety, but the attitude of getting it out of the way so that more important topics of business conversation can be discussed. If safety professionals want to re-orient safety to be integrated into the business framework, then they are going to have to find alternative ways of communicating how to implement safety, moving away from the competitive mindset.

The second law Senge (1990, 58) explains is "The harder you push the harder the system pushes back." What he describes is the notion of compensating feedback, which underscores that belief that the more effort and energy expended does not necessarily change the system, rather it reinforces what already exists. Using the safety discipline as an example, many safety professionals believe that the more hours they personally expend working on safety will spotlight the importance of safety for the company and get others focused on the practicing safety.

Unfortunately the reverse happens, the more effort they put in the more people realize they do not need to be involved and the less interested in safety they become.

The third law Senge (1990, 59) provides is "Behavior grows better before it grows worse." This law combines both the interrelationship of change with the notion of time. In the short run, any type of change will produce some type of positive effect, if just because it is different than the norm. The difficulty is that eventually, over time, the effect or change will backfire and create an even worse situation. Let's take the classic safety measurement and incident reporting scenario and see how it plays out. Managers measure the success of their safety programs based on the number of employee incidents. If the number of incidents increases then supposedly the company has a bad safety program. And if the numbers decrease then supposedly the company has a good program. Add to this scenario incentives that are instituted to encourage supervisors and employees to work more safely by rewarding them when no incidents occur. As we all know, the short run behavior increase is that fewer incidents occur. Over time however, the severity of incidents goes on the rise. The reason is that both supervisors and employees attempt to hide incidents in order not to lose their incentives. From a safety integration standpoint, if we want to measure the effectiveness of implementing safety into the business framework, measurement systems need to be established that support integration as opposed to working against its success.

The fourth system law says Senge (1990, 60) is that "the easy way out usually leads back in." What he is explaining is that applying similar solutions to already existing problems may give us a level of comfort and appear to make life easier, but in fact we need to re-examine what we are doing because we are still dealing with the same problem, over and over again. This is very much like the integration approach, if safety professionals continue to approach it from a competing framework, then they will be continually dealing with the same problem and not breaking the cycle. Coming up with a different way to address the problem enables different solutions and outcomes to become possible.

The fifth law Senge (1990, 61) explains, "the cure can be worse than the disease," deals with the solution selected for the problem at hand. In many instances the solution actually exacerbates the problem rather than bringing about resolution. If safety professionals approach safety integration as they have other problems in the past, attempting to emphasize safety as separate from the business, then they will only be magnifying the problem as opposed to highlighting how to shift safety to a more collaborative approach.

The sixth law, according to Senge (1990, 62), is that "faster is slower." The difficulty when approaching problems from a systems perspective is that the solutions take much longer to implement, with a slow and steady pace bringing gradual change over time. From an integration focus, this means that success will not be immediately apparent. In fact, small gradual changes may be hardly detected initially. And while this can become discouraging, persistence with doing the right actions, consistently, over time will begin to yield considerable results.

The seventh law Senge (1990, 63) discloses as "cause and effect are not closely related in time and space." Understanding of this concept requires the recognition that what appears closest to the problem, doesn't necessarily start closest to problem, but lies someplace else. It is much easier to point at a problem and believe the solutions are closely related, rather than stepping back and seeing the whole picture. An example Senge (1990) uses, if there is a problem on the

manufacturing line, then it is typical to look for the cause in manufacturing. In the case of safety integration, getting others to adopt safety concepts and practices does not necessarily mean focusing on others, but rather focusing on one's self as the cause. As Senge (1990, 63) presents, "there is a fundamental mismatch between the nature of reality in complex systems and our predominant ways of thinking about that reality." Until we adjust our own views of reality, then we cannot influence or change the system for others.

The eighth law Senge (1990, 63) explains is that "small changes can produce big results—but the areas of highest leverage are often the least obvious." The difficulty in systems thinking is that the most obvious solutions do not necessarily fix the system; in fact they may contribute to making matter worse in the long run. On the other hand, often small, well-focused actions can product significant improvements if they are done in the right place and at the right time. From an integration perspective, safety professionals have always been taught that we must get the ear of senior leadership to affect change and acceptance of safety in the organization. And while senior leadership certainly needs to be involved, significant change can be brought about when identifying department champions to build collaborative relationships with. Working with these department champions will help target key leverage points where integration can be successfully implemented.

The ninth law Senge (1990, 65) puts forth is "you can have your cake and eat it too—but not at once." Often times the most difficult dilemmas when looked at from an event or single instance in time perspective can appear insurmountable. Yet when viewed from a process perspective, being able to see the events over time, the opportunities to affect change becomes both possible and plausible. With respect to integration, identifying the many different business processes where safety can be embedded will yield tremendous results over time.

The tenth law Senge (1990 66) explains as "dividing an elephant in half does not produce two small elephants." This goes to the very heart of systems thinking, trying to discern what's occurring must be examined from a holistic view, and not simply by looking at the individual parts. To holistically examine a problem means seeing beyond the existing silos, examining the issues at hand beyond the existing boundary lines that have been established. In the case of integration, this requires the ability to step back from looking only at the safety system, seeing it as a separate existing system within the company. It means seeing safety as being embedded within all business systems, not operating as a separate entity.

The eleventh law, perhaps the most difficult for many, Senge (1990, 67) proposes is to place no blame. There is a tendency to blame others – regulators, those not in favor of safety or not agreeing with the safety professional – for the circumstances of the problems being dealt with. Systems thinking supports the belief that you are the cause of your own problems, and that the most effective way to tackle the problem is to change your thinking. If safety professionals really want to integrate safety into the business, then they must begin building relationships and partnerships within the company that support this thinking. The collective "they" are not the problem, rather it is the self-focused, isolated individual who is blaming others that creates the greatest impediment to success.

Closing

In closing, if safety professionals are to move forward in integrating health and safety into the business framework they need to move beyond creating a stand-alone health and safety management system. Using principles of system thinking, they must re-frame their understanding of safety as being in competition with the other existing business systems to recognizing the collaborative opportunities that exist with other system owners. Conversations that focus on envisioning what safety integration looks like within existing business processes is a starting point. This does not mean creating new safety procedures, but rather enabling others to see the infinite possibilities for intertwining safety into their business processes, and then making it happen. There is tremendous opportunity to move beyond the traditional safety models, to co-create organizations that embody safety values and principles into every aspect of their being. The only things standing in the way of making this happen – our own current realities of competition and scarcity.

Bibliography

ANSI/AIHA Z 10 2005. *American National Standard for Occupational Health and Safety Management Systems.* Virginia: American Industrial Hygiene Association. 2005.

Kuhn, Alfred and Robert D. Beam. *The Logic of Organization.* San Francisco: Jossey-Bass Publishers. 1982.

Senge, Peter. *The Fifth Discipline: The Art and Practice of the Learning Organization.* New York: Doubleday Currency. 1990.

Senge, Peter, Art Kleiner, Charlotte Roberts, Richard B. Ross, and Bryan J. Smith. *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization.* New York: Doubleday Currency. 1994.