

Relationship-Based Safety: Moving Beyond Culture & Behavior

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Abstract

- Many organizations struggle with communicating that safety is a priority over production. This article examines the literature on complexity management and relationship psychology theory for the purpose of finding applications to meet this challenge. These disciplines offer new ways to approach the dilemma of maintaining safety as a priority in people's minds when competing with day-to day pressures and multiple demands.
- A key lesson from the growing field of literature in complexity management is how people, their ways of thinking, and their relationships create unpredictable outcomes (constructive and destructive) that cannot be changed or controlled through static programs and procedures. Instead social interaction and relationship serve as the vehicle to transmit information and influence decisions.
- This article recommends management tools that leverage human capability and social interaction to identify problems before they lead to injuries and the destruction of property. Early warning communication systems to recognize deviances as they first appear can help regain loss of control quickly when necessary. Recommendations fall in three areas:
 1. Continual reinforcement
 2. Repeated communication
 3. Perpetual assessment

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Relationship-Based Safety: Beyond culture and behavior?

1 Introduction

It is a challenge for leaders to maintain safety as a priority in people's minds. Research points to several organizational influences such as leadership style, supervisor involvement and communication systems that determine the importance allocated to safety (Janssens, Brett & Smith, 1995; Tucker, 2006). Lessons from the BP oil spill and other disasters reconfirm that complex multiple demands from stakeholders play a key role in system failures. Deadlines and goals have to be evaluated and communicated over and over because in an ever-changing environment priorities compete for time and attention.

Complexity Management Theory (CMT) and Relationship Psychology offer new ways of understanding this dilemma in high risk, rapidly changing environments. Because change is continuous, static approaches such as rules and procedures do not influence people's priorities. They propose that people's decisions and actions—how they determine what is important—are influenced through their interactions and relationships. Thus, social interaction and relationship are seen as powerful vehicles to transmit information and influence behavior. Based on these assumptions, two important implications emerge. First, CMT would suggest that safety maintains priority status as long as relationships and social interactions support it. Second, it is vital for management to recognize that the quality of relationships and how people interact within and across departmental lines is an indicator of the organization's ability to prevent failure. Later there will be further discussion about the nature of these quality relationships and how to support and develop them.

This article recommends practical application of these theories in the form of management tools that leverage human capability and social interaction to identify problems while they are still “faint signals.” Early warning communication systems to recognize deviances as they first appear can help regain loss of control quickly when necessary. Within these perspectives, three central areas emerged as essential to leveraging organizational relationships to create greater safety awareness and resilience in responding to potential dangers:

- Continual Reinforcement
- Repetitive Communication
- Perpetual Assessment

2 Brief Background on Complexity Management and Relationship Psychology

Investigation reports on the Gulf oil spill of April 20, 2010 may help to illustrate some of the key concepts that have emerged from CMT and relationship psychology. These insights could help address the question of how to maintain safety as a priority in the day-to-day decision-making of employees and managers at all levels.

2.1 Key Concept Illustrations from 2010 Gulf Oil Spill

Expect the unexpected (Weick & Sutcliffe, 2001): The people working on the Macondo oil well on that day did not expect an explosion. The unexpected arrived and their systems failed resulting in loss of life, extensive damage to the environment, and to the economy. There were people directly responsible for anticipating and preventing just such disasters. Experts in what Karl Weick, a thought leader in high reliability organizations (HRO), calls “managing the unexpected.” In retrospect the warning signs were there. Recognizing them beforehand is the goal of safety efforts based on complexity (Dekker 2005).

Nothing happens by accident and it's unpredictable (Sagan, 1993; Pidgeon, 2011): The Oil Spill Commission report on the Gulf of Mexico disaster states, “Most of the mistakes and oversights at

Macondo can be traced back to a single overarching failure—a failure of management. Better management by BP, Halliburton, and Transocean would almost certainly have prevented the blowout by improving the ability of individuals involved to identify the risks they faced, and to properly evaluate, communicate, and address them. A blowout in deepwater was not a statistical inevitability (Gulf Spill Commission, 2011:90).” CMT might disagree that it was not inevitable, (see Perrow, *Normal Accidents*, 1984) but it would agree that a series of decisions, interactions and events led to that result. However, CMT differs in that blame is not assigned to human error, thus managers are not blamed but are tasked with the responsibility to prevent these events and must seek frameworks outside of their established views if they are to manage the unexpected.

A mindset of constant awareness and inquiry are the strongest preventative measures (Weick, 1999). To this point Hopkins (2011) examined an inquiry held by the US Coast Guard and US Department of Interior¹ and found that a management visit to the drilling rig at the time of the well blowout highlighted how senior management focused on spills, trips and falls while entirely missing the signs of pending disaster. The paper goes on to report that there were members on the executive team that day that had knowledge that might have helped to avert the explosion. Unfortunately, the engineers who were working on the problem misinterpreted test results, and managers up the line did not verify test results against real time data, so no questions were asked. Hopkins summarized his criticism saying that the focus of safety for these VIPs, as well for their companies, was on managing conventional safety hazards, not major process safety hazards.

Accidents come from relationships, not broken parts (Dekker, 2005). It was also reported that four days before the April 20 explosion, an e-mail noted that engineers had not taken all the usual steps to center the steel pipe in the drill hole, a standard procedure designed to ensure that the pipe would be properly cemented in place. “(W)ho cares, it’s done, end of story, will probably be fine and we’ll get a good cement job,” (Mufson & Kornblut, 2010). Dekker challenges the current prevalent notions about accident causation and system safety. He argues that even now, what profess to be systemic approaches to explaining accidents are still caught within a limited framework of ‘cause and effect’ thinking, with its origins in the work of Descartes and Newton. Instead, Dekker draws his inspiration from the science of complexity and notes how seemingly reasonable actions at a local level may have unseen (and unknowable) effects that ultimately results in system failure.

Competition and scarcity of resources is a constant influence on where people focus their attention and resources (Dekker, 2011). In another investigation, the final Commission report on the Gulf oil spill states, “BP engineers focused heavily on the biggest challenge: the risk of fracturing the formation and losing returns,” (2011:99). The message was amplified in the New York Times (2010):

“Did financial pressure compromise safety, especially when BP chose riskier equipment? The longer the drilling of the oil well continued, the more expensive it became. The total cost of the project swelled to \$140 million from \$96 million as delays ensued. Additionally, by the day of the disaster, BP was 43 days behind schedule, costing the company at least \$40 million more. Amid these setbacks, BP selected riskier and less expensive equipment, including a type of metal casing that would save the company \$7 million to \$10 million, witnesses say. For the first time, on Thursday, a BP official acknowledged that price mattered in the well’s operation. ‘Every conversation, every decision has a cost factor’,” said David Sims, a vice president.” (Brown and Fountain, 8/27/2010)

In summary, there are severe limitations to the amount of control management has over people’s behavior, complex technology or the environment (ecological, economic, or political). CMT switches leadership attention from controlling to maintaining awareness, continuous learning, and adaption. *Awareness* refers to staying in the present, looking for the unexpected, and remaining mindful that our own expectations limit our ability to see reality. *Learning* is gaining knowledge through experience (mistakes and successes), and through interactions with trusted individuals. *Adaptation* is the ability to

¹ Deep Water Horizon Investigation. <http://www.deepwaterhorizoninvestigation.com> downloaded 3/9/2012.

accurately interpret data and acquire the capabilities to act on the data to correctly adapt to changing conditions.

2.2 Theoretical Background and Application of Complexity to Day-to-Day Work

The human factor is one of the most important elements of an accident prevention program (Alston, 2003; Hollnagel, 2009; Fukui, 2001). Complexity management and relationship psychology research offers new frameworks to understand and leverage the human component in organizational system. Both draw analogies from chaos theory (Waldrop, 1992). According to Fritjof Capra (2007), a physicist now focused on organizational change theory, complexity's underlying principles offer new insights for understanding why change efforts fail and how to design change strategies for a constantly changing environment.

In nature, order emerges from disorder through processes of spontaneous self-organization in absence of direction (Stacey et al 2002). Yet the management sciences focus on planning, control, and measurement as the means of achieving outcomes. It is based upon the principle of causality, considered to be the ultimate form of reason. But a great change is setting in. According to quantum physics, under natural circumstances outcomes absolutely conforming to specific theories are almost an exception due to unpredictable influences. There are many examples of theories firmly established through the scientific method that declined in replicability over time, and often when new findings disprove a theory, research journals tend not to publish the results (Lehler, 2010).

Ralph Stacey (Director of the Complexity and Management Centre, Business School of the University of Hertfordshire), after years of study arrived at the conclusion that organizational results stem from the quality of interaction and communication between individuals and groups (2007). He calls this theory "Relationship Psychology," and it rocks the foundation of popular approaches to accident prevention like behavior based observation programs because it takes the focus away from individuals to organizational relationships in all of its forms. It looks at human interaction as the primary influencer in organizations; systems such as rewards, measurements, or rules do not control outcomes. Instead, outcomes are influenced by 1) the human tendency for self-interest and relating everything to their own experience, 2) conversations that shape people's understanding of what is true and what is appropriate action (although sometimes the conversation takes place silently within), and 3) the radical unpredictability of the direction in which connections and relationships evolve (Stacey, 2007).

For those thinking that this way of looking at organizations sounds far out, consider also David Rock's work in neuroscience (2008). His SCARF model (status, certainty, autonomy, relatedness and fairness) describes five domains of social experience that the brain treats as survival issues. This research on the brain revised Maslow's hierarchy. It appears the people's need for relationship and to be fairly treated triggers the same areas of the brain as the need for food and shelter. This could provide scientific evidence to justify paying attention to quality of relationships in organizations.

2.3 How does this apply in day-to-day work?

Another researcher, Jody Gittell, presents extensive evidence that in healthcare the quality of relationships among staff members correlates with the quality of health care they deliver. Patient satisfaction improved and operational costs lowered through improved co-worker relationships (Andersen et al, 2005, Ellingson, L.L., 2002, Gittell, J.H. 2003, 2009, Godwyn & Gittell 2011). In particular Gittell's (2003, 2009) theory of "relational coordination" brought the theory into practical application. She developed an organizational assessment to measure the quality of relationships and correlate them to organizational results including lower accident rates. The survey and its use to create change may be viewed at www.rcrc.brandeis.edu.

In addition, while Gittell's research focused on intact workgroups and collaboration across functions, Simard and Marchand (1995) cemented earlier research finding that supervisory participative management of safety and the quality of interaction was the best predictor of work groups to take on safety initiatives and correlated to lower lost-time accident rates.

3 Continual Reinforcement

Leaders face many obstacles in maintaining safety as a priority. Companies today live in a very aggressive and competitive environment that focus decision-makers on short-term financial criteria during economic crisis rather than on long term criteria concerning welfare, safety, and environmental impact. (Rasmussen & Svedung, 2000: 10). Maintaining safety as a priority requires continual reinforcement and assessment of the communication process because obstacles to trust and miscommunications constantly arise. In the absence of reinforcement, competing demands begin to win influence over safety. Open dialogue and communication about conflicting priorities is important because their suppression means management no longer has access to the information it needs to course correct decision-making that overrides safety as a priority. Unfortunately, the very presence of a leader can suppress information (Tost, Gino & Larrick, 2011, 2012). Therefore, they have to actively seek out disconfirming information through multiple sources.

3.1 Conversation as a Tool for Reinforcement

Conversations where divergent perspectives are heard and result in correct action are not only the result of established protocols but also of a culture that breeds trust. This level of communication requires the investment of time, good listening skills, and openness to different perspectives. Nuclear power plants have an employee concerns department that ensures total protection for an employee who has a concern and does not feel heard by management. Yet some people still report fear of speaking up. The Nuclear Regulatory Commission considers a “chilled work environment” (employees feel management represses reporting concerns) one of the most serious safety hazards (www.nrc.gov). The first trait they look for in a safety culture is the existence of a “Safety Conscious Collaborative Work Environment.”

Maintaining trust and open communication require constant reinforcement. The underpinning is the nature of the relationships between crewmembers, across department, and in employee-management relations. Friendliness and interpersonal skills are assets in building trust according to Schulman (1993). Neither legal protections nor formal concerns programs are sufficient to ensure the free flow of information from the front lines to management. Research has shown that trust levels affect an organization’s ability to give and receive information. Trust has also been demonstrated to have positive impacts on organizational safety and safety performance (Burns, Mearns & McGeorge, 2006; Conchie, Donald & Taylor, 2006; Conchie & Donald; 2008; Hale, 2000; Reason, 1997). Without trust you have no communication and without communication you have failure (Schein, 2011).

3.2 Behavioral Observation?

Behavior observation programs are based on reinforcement theory and are designed to encourage the development of safe behavior. There are many reported benefits per users of this process (Mettert, 2006; Marsik, 2004) as well as vendors (Krause et al., 1999; Geller, 1999). Per Krause (1999), there was no direct evidence that observations could be entirely responsible for the positive results because the program entailed multiple elements including leadership involvement and an emphasis on communication. However, the number of observations seemed to correlate to lower injury rates.

CMT would hold that the observation is not the change agent because it takes place in a specific point in time then ends. Continuous reinforcement is needed to change behavior. Without it there are too many variables influencing an individual, some of which may have much more influence than random periodic observations. The following interviews may illustrate why the observation itself may fail:

Interview I

Q: “Did you ever approach xx to ask him to follow the proper scaffolding before his accident?”

A: “Yes, he thanked me and stopped. When I saw him again he had gone back to doing it his own way.”

Interview II

Q: “Do you feel comfortable approaching peers to stop an unsafe act or situation?”

A: “Yes, but they don’t always listen. Sometimes they tell me to mind my own business.”
(Carrillo, 2012)

In an interview with James Howe, former assistant director of health and safety for the UAW and currently president of Safety Solutions, he revealed that he has been conducting surveys on the use of safety observation programs for several years (2012). His audiences consist of safety managers and employees representing many industries that were using or are using observation programs. The question he asks is, “What percent of the observations that you collect do you suspect are pencil whipped?” The average response per audience is that over 52 percent of the forms do not represent real data. Thirty-two percent of the audience estimates that 75 percent or more of observations submitted are filled out without an actual observation. Howe commented that thousands of dollars and man-hours are spent collecting data that is 50-75 percent invalid. Users say maybe it doesn’t matter since injury rates are going down and at least people are thinking about safety and doing something tangible. Howe’s point is that, “Since a sizeable investment is being made to collect largely inaccurate data, why don’t we invest in involving employees to collect data that will actually help us? Is there a way to make observation programs useful?”

Don Eckenfelder (2003) states, “Behavior based safety (BBS) places behaviors in the wrong place. It suggests they are at the core or foundation of loss prevention. They are in fact only one part of an elaborate set of interrelationships where the more critical or foundation concepts are culture and processes or programs. BBS largely ignores the fact that loss prevention is not *primarily* a technical or behavioral problem: It is *primarily* a social or cultural problem.”

There remains the fact that many BBS users report improvement. A clue may lie in the research conducted to identify key success factors in successfully implemented “behavior based safety programs.” The elements found consisted of intense communication forums, training on proper social interaction, and management commitment that appear to result in increased trust in management, trust in co-workers, and reduction of injuries (Geller, 1999). Within the context of CMT, one would expect that a behavior observation could change a person’s behavior at a specific point in time. However, without ongoing interaction, assessment and real-time vigilance the behavior will revert. In organizations where BBS includes lots of conversation and engagement, it could be that the interaction and communication engendered by these programs is far more important than the number of safe or unsafe behaviors.

4 Repeated Communication

The challenge of communicating the same message across the organization is enormous because multiple subcultures exist, each with their own language and assumptions (Schein, 2010)². At times a manager feel s/he has been very clear on what they want done or corrected only to find that some time later their requests have not been fulfilled. Ineffective reactions include withdrawal, anger, or attempts to exert tighter control over people who are not complying. Managers often misunderstand the reasons behind the non-compliance, which may have a lot to do with competing priorities. By taking aggressive action towards the other party, they may be blocking off communication and the very information that they need to avert a failure (Weick & Sutcliffe, 2001).

Reinforcing safety as a priority is a constant two-way communication effort. A leader cannot decide priorities in isolation. As Mangusson (2010) noted, “Other factors, such as the commitment and willingness from employees to accept and understand which factor should be in first hand between safety and production, are also seen as determinants of the safety success in the company,” (22). Relationship psychology proposes that people decide what they believe based on conversations with people they trust.

² Schein, E.H. (2010). Fourth Edition. Organizational Culture and Leadership. San Francisco: Jossey-Bass.

In other words, hold regularly scheduled meetings that include employees with leader/supervisors to help people agree what safety as a priority means in the context of the work that must get done. There are challenges to this approach because the content and outcome of conversations cannot be fully controlled. There is a tendency to believe that we can set a clear direction and then everyone executes from the same page. More time in conversation or re-questioning priorities is seen as inefficient especially if it leads to changing the plan. In reality, however, both the environment and people's understanding of the situation is constantly shifting. Instituting the expectation that the plan can be revisited and should be opens up the gate for important preventative information.

4.1 Factors that Influence Priorities

Communication and social interaction influences behavior with unpredictable outcomes, Management cannot control interactions nor outcomes (Stacey (2002, 2007). In Stacey's model the powerful influences on behavior are politics, threat of exclusion or loss, rewards, acceptance, security, and protection. These influences operate consciously and unconsciously overriding any formal policy or organizational structure. Empowerment and flat organizational structures try to address this issue but do not change the reality that power sets priorities.

In view of the multiple stakeholders influencing priorities repeated face-to-face communication is considered the most effective way to maintain attention because of its non-verbal cues, and its ability to build connections among participants (Weick & Sutcliffe 2007). It is estimated that up to 93% of a message is non-verbal. This means that email is the most limited. If conversation is the main agent of change in belief systems, a manager's time should be allocated accordingly. Instead, managers and supervisors spend most of their time in meetings, doing email, making calls and extinguishing fires (Bruch & Ghoshal, 2002). This has a negative impact on a manager's ability to influence the way people think and feel about organizational priorities. Managers may feel that they've clearly defined the priorities, but life in the field tells a different story.

4.2 Invisible Safety Tradeoffs

Interview with plant manager (Carrillo, 2012)

Q. Do you feel that people understand that safety is a priority even though sometimes they have to make tough trade-offs?

A. There are NEVER any tradeoffs. Safety is always the number one priority and everyone here knows it.

Interview with a mechanic in same plant

Q: "Has management communicated that safety is a priority over production?"

A: "Yes."

Q: "Do you believe it?"

A: "Yes. I've never worked at a safer plant."

Q: "Do you think safety is always a priority over production?"

A: "In training sessions and meetings "Safety over Production" is always more important. In the field it is applied on a sliding scale based on who is involved and how bad the job needs to be done. People take risks and I've seen managers walk by and say nothing."

Not recognizing the trade off is one problem; another is when management decides to make an exception to an established safety procedure. An operator gave the example that certain redundant checks that were mandatory during normal running of the plant were dropped during outages when time was running short. "If it's safe during outages, why isn't it always safe?" The impression left was that management was inconsistent. Management's reply was, "If we were to follow every step of what

corporate asks us to do we would add 25% to the overall workload. Corporate doesn't want more overhead. Exceptions must sometimes be made."

Employees are quick to note when management walks by a safety violation or makes an exception to a rule. Often times neither operators nor managers are aware that they are making trade-offs (Perrow, 1984, Vaughan, 1996). The dilemma is that employees want certainty and consistency from management, but the environment is every changing, and there are times when a rule may not apply 100%. If management wants this leeway, employees expect it as well. The fear is that all will fall into chaos and accidents will propagate. It is difficult but somewhere in defining safety as a priority there needs to be included the notion of continuous evaluation and questioning. Instead of frameworks where rules are static and if you break them you are in trouble, an organization could benefit from a set of assumptions where you start with the understanding that the rule is there for a reason, that it is open to question, and that there is an established process for the questioning to take place. This requires investment in skill development and time for frank conversation.

4.3 Technology and Social Interaction

A strategy that utilizes the dynamics of relationship psychology is collaborative learning. John Shook, the CEO of Lean Enterprise Institute, and former CEO of Beth Israel Deaconess Medical Center, explains that learning collaboratively means more than each person learning individually while occupying a shared space. Collaborative learning is two or more partners who actively endeavor to learn together through shared experience. The power of learning collaboratively is that it is a way to achieve economies of scale in learning -- spreading lessons within an organization and beyond (Shook 2012).

The Diablo Canyon nuclear power plant is utilizing social networking technology to enhance learning on every aspect of the organization, including safety. Employees can upload videos of situations they are dealing with to ask for input or they can post solutions they have discovered. Terry Musch, head coach for the executive team at Diablo, remarked that participation was the highest they have ever experienced in any of their employee involvement programs. Encouraging innovation, communication and group learning plays a key role in removing the obstructions to reporting deviations, which are also known as innovations (Musch, 2011).

5 **Perpetual Assessment: the need to be in the present**

Loss of communication, focus or misinterpretation of events can happen any time (Schulman, 2004). That is why HRO's are continuously monitoring and measuring their systems. Mechanical parts will eventually wear out, people become desensitized to risks, and failures happen. Given the reality of a constantly changing environment where many of the changes are not visible, a constant state of awareness and assessment is necessary. Weick (1999) refers to this as "mindfulness."

Unfortunately instead of awareness, a poor regulatory framework with conflicting inspections and audits produce long to-do lists, causing organizations to focus time, money, and personnel on the "must do" rather than on the "should do." Rather than basing decisions on real information, all levels of the organization are heavily influenced by perceptions of scarcity, competition and political pressure (Dekker, 2005; Hollnagel, 2006). These things will not change and cannot be eliminated.

Senior management is responsible for establishing a system to identify influences that might derail safety as a priority and addressing deficiencies in real time and on a continuous basis. However, it is often difficult to see these influences or define them in a convincing way as safety hazards. *Resilience engineering* and *drift* offer frameworks to recognize these signs, thus allowing for the development of processes to identify and correct deficiencies before failure (Dekker 2005; Hollnagel, 2005; Snook, 2000).

5.1 Drift: natural erosion of procedure

Practical drift is "the slow uncoupling of local practice from written procedure," (Snook, 2000: 225). Examples of drift can be seen everyday in the workplace as people skip steps in operational

procedures or eliminate them altogether. Drift cannot be prevented. Hollnagel et al. suggest, “that it is in these normal, day-to-day processes of organizational management and decision-making that we can find the seeds of organizational failure and success,” (2005: 84). Diane Vaughan spoke of “normal deviance” in her analysis of the NASA safety culture after the Challenger disaster. When people do things out of scope long enough, it becomes the right way. Dekker goes well beyond normalization of deviance in showing how none of the changes are ever recognized as deviance in the first place as demonstrated by the Columbia Shuttle disaster. Apparently NASA had not been able to address the tension between acute production goals and chronic safety risks that plagued the Challenger (2003 NASA Report)³.

In the complexity paradigm these types of challenges cannot be eliminated. Drift can be noticed and addressed when it first appears if there is continuous reinforcement to look for deviances and bring them up for discussion in non-punitive conversations. This takes the most precious commodity, time, to engage in conversations with employees in various forums. Because the reinforcement must be continuous it can't be a sporadic or short-lived effort.

Figure 1: Organizational Culture Barometer (Reprinted with permission from Don Eckenfel

Organization Culture Barometer™	Maturity Level	Values	Value Not Held	Value is Controversial	Value is Validated	Value is Accepted	Value has True Meaning	We are the Value
			0	2	4	6	8	10
<p>Your Logo Here</p> <p>Our Culture</p> <p>What is this sheet trying to measure and why is it important?</p> <p>Culture is nothing more than a collection of day-to-day experiences. Not everybody sees these experiences in the same light. When trying to determine how common certain values are in a company's day-to-day culture, it is important to gather a wide range of viewpoints.</p> <p>The sheet presents 10 related values. Each of these values are followed by descriptions of six different day-to-day experiences that employees encounter as they go about their jobs.</p> <p>Based on your day-to-day experiences, you are being asked to score which level your company operates most of the time.</p> <p>Your score helps to determine which areas need the most help and which areas are the strongest.</p> <p><input type="checkbox"/> Hourly <input type="checkbox"/> Salaried</p>	1	Never "Shoot the Messenger!"	Errors are ignored; mistakes are punished; reporting is discouraged.	Positive responses to negative results happen but infrequently.	The need to accept failures as opportunities is intellectually understood. Application of the knowledge is limited, but growing.	"Bad news" is now frequently responded to with improvement efforts. Punishment is infrequent.	A vision of how to improve through deficiency detection and response is developing. It is getting clearer day-by-day.	Well intentioned mistakes are met with resources to capitalize on the knowledge and get better. Good tries are often rewarded.
	2	Only Respond to Root Causes	Rewards correlate with action and reaction, not analysis and measured response.	Expressed interest in seeking true causes usually yields to emotion and "quick fixes."	Leadership understands the need to find root causes, but the tendency is still to jump to conclusions.	Management supports the money to find underlying causes. But, they are often distracted.	Finding the proximate cause of system failures and addressing them is becoming the norm.	Management is relentlessly uncovering root causes. They, they diligently redesign systems. They are almost never distracted.
	3	Do It Right the First Time	Speed and quantity are the watchwords. No one really cares about rework and its costs.	Quality is mostly a lot of talk. Rewards are not consistent with the talk. The talk doesn't help much.	Quality is mostly a lot of talk. Rewards are not consistent with the talk. Some people are starting to listen and act accordingly.	The culture is changing; employees are accepting "total" quality control. Emphasis on preplanning is increasing.	Workers have pride in their work. Finished product inspection is minimal. Workplace efficiency is near optimal.	No finished product inspection occurs. Quality is less. Any errors are addressed promptly. Systems are adjusted to avoid recurrence.
	4	Everyone Needs to Buy-In	Mission and objectives are determined by a small group of leaders. Workers are viewed as sub-human. They are never consulted and rarely informed.	Efforts to involve employees in decision-making are tokenism. The efforts, when made, look like "talking down."	Concern for employees is mentioned. Their ideas are solicited, but rarely taken seriously.	Employees are starting to be listened to. Feedback is often provided. Concerns, at times, appear in business plans.	All employees are seen as full partners. Everyone receives the same information; their ideas get the same respect and attention.	Excessive communication is called into question. Management is consultative about clarity of messages.
	5	Above All, Keep It Simple	Volume of words is valued above succinctness – complexity over clarity.	The need to simplify procedures and documentation is acknowledged, but it doesn't happen very often.	Efforts are being made to reduce all forms of bureaucracy, and some rewards are going to people who are complying.	The organization is committed to simplifying all forms of communication. It is catching on, and people are talking about it in the halls.	Beliefs and values relating to simplification are firmly established. The culture is changing and almost everyone is supportive.	Excessive communication is called into question. Management is consultative about clarity of messages.
	6	You Should Lead With Safety	Safety is rarely discussed with mainstream interests. It is not associated with the "really important" aspects of business.	Safety is driven by obvious concerns, such as OSHA and insurance requirements. Injury costs are viewed as required overhead.	A "safety program" exists, but is separate from other business activities. Results are usually around average.	Safety is a part of every manager's responsibilities. It goes beyond compliance. Results are consistently better than the competition.	Safety's importance is firmly planted in the company psyche. We are below industry averages. Safety is being integrated into every facet of work.	We all recognize the benefits of world-class safety, nothing else is acceptable. Safety is seen as a profit center – and a way to best the competition.
	7	Learn From Every Experience: Improve Every Day	Learning through trauma and knee jerk reaction is the predominant management method.	The organization is exhibiting enhanced approaches to learning from experiences; learning is confined to some specific areas.	"Wake-up" calls have heightened sensitivity. Process improvement based on experiences is becoming more normal.	The organization recognizes the need to change more frequently. It takes a few experiences; people are more willing to change.	In our business sector we are generally recognized as a leader. Occasionally, significant change signals are missed, but not very often.	Everyone recognizes the need to grow a little each day. A spirit of learning and inquisitiveness is pervasive. A disciplined response follows learning.
	8	Employ Healthy People or Help Get Them Healthy	Hiring is haphazard. Failing employees are justified. Everyone is aware of the cannibalistic culture. Turnover is very high.	Human resource importance is largely talk. Exceptional hire and rehab efforts are usually the result of exceptional managers, not the process.	Awareness of the correlation between exceptional people and exceptional results is growing. HR rescues are fewer in. People skills are improving.	Hiring and screening processes are reasonably effective. Wellness and employee assistance programs are gaining favor.	Only top people are hired; they are judged on what they accomplish. Diversity is honored. EAP and wellness programs are maturing.	Excellence in obtaining and growing top employees is the hallmark of the organization. Turnover is nil.
	9	Inspire Someone-- Anyone-- Every Day	Working conditions are drab. Most people seem to be down most of the time. Only physical/tangible powers are recognized.	Intimacy is sparse. Complaints are abundant. The tone is apologetic. Efforts to make the work place pleasant are infrequent.	Management is waking up to the need to tap into the inherent goodness of employees. Creativity is periodically encouraged.	Management recognizes the need to uplift employees. Getting rid of aggravations and supporting families is becoming common.	Graciousness, gratitude, and good manners are proliferating. Bad behavior is becoming unpopular. A strong positive atmosphere is emerging.	Everyone enjoys coming to work. Work is a part of the solution to domestic challenges, not part of the problem. The workplace is an incubator for talents.
	10	Act On What is Likely to Happen, Not What has Happened	Discussions of the future are scoffed. The culture is based on "What have you done for me lately."	Planning for the future is talked about but yields to the pressures of the day. "A day late and a dollar short" could be seen as our motto.	Efforts are being made to act more and react less. Management realizes that analysis and preplanning could predict important future events.	The organization is now routinely looking into the future and preplanning. They have a growing vision of the importance of acting instead of reacting.	We are starting to look like a visionary company. We have a crystal ball. We have a culture that knows how to predict future events and act on them.	Our company is widely admired. Others say we have a crystal ball. We have a culture that knows how to predict future events and act on them.

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5.2 Measuring Drift

The message is to expect drift and continuously measure for it. Deviance can't be seen unless one is looking for it because it emerges seamlessly as a logical solution. The lack of adverse consequence

3 <http://caib.nasa.gov/news/report/pdf/vol1/chapters/chapter8.pdf> downloaded 3/19/2012

reinforces the belief that it is safe until the system fails. Gathering the data to detect drift in its beginnings, however, faces major obstacles. One is the challenge of maintaining a state of vigilance. Another is creating the environment where people will admit errors or risk-taking. Lastly, knowing what data to collect and how to interpret it is a huge challenge. These capabilities may not be possible in an organization with low trust and poor communication (Whitner et al., 2006).

Since successful companies already have many forms of auditing, what is needed is a way to measure the first signs of drift, and what the nuclear industry calls “faint signals (Conner, 2012).” One approach that seems to work is the “Organizational Culture Barometer” (Figure 1) shown with permission from Don Eckenfelder (1996). To create the barometer, Eckenfelder gathers people from all levels of the organization to ask them, “What makes a safety culture work and how would we know it is working?” Eckenfelder believes it is the process of developing the barometer and using it to guide discussions on a regular basis that helps course correct before problems are visible as demonstrated in the Lincoln Paper case.

5.3 Lincoln Paper and Tissue Case

Lincoln Paper and Tissue is a US paper products manufacturer. According to VP of HR, Bill Peterson, the Culture Barometer survey has been used to structure monthly conversations between employees and supervisors where employees describe where the company is doing well or not doing well. These conversations have taken place once a month for an hour and 15 minutes and a cultural shift has begun. “The supervisors used to put up slides or videos and talk to the screen with their backs to the audience. Now there is a vital conversation happening where everyone is involved.” Since the scores indicated more interaction was needed, they’ve held creative events like one morning all the managers and supervisors stood at the front of the plant for a meet and greet and reminder that safety is an important priority. The employees were very surprised, but it caught their attention. On another occasion all the fire trucks were lined up with lights flashing so that everyone asked, “What’s happened?” The answer was, “Nothing yet but we have to stay alert.” These ideas are only a couple of many that have emerged from a continued conversation between managers and union leadership. Peterson continued, “We really haven’t done anything else differently other than focus on getting people engaged in conversation, and we are seeing definite improvements.”

6 **Putting It All into Practice**

Top management commitment in occupational safety is viewed as a key factor in accident prevention (Chew, 1988; Cohen, 1977; Cohen and Cleveland, 1983; Davis and Stahl, 1967; Simard and Marchand, 1994; Simonds and Shafai-Sahrai, 1977; Smith et al.,

Simard and Marchard (1995) also provide evidence that worker attention to safety is higher when the supervisor: (1) has some power and influence over decisions that affect the safety of his work- group, (2) practices joint involvement with his/her work team in the conduct of accident prevention activities, and (3) participates in social interaction—particularly listening to employees. These three elements based on data collected from 100 manufacturing plants with over 23,000 employees support two CMT approaches. 1) Safety management should be decentralized and allow more autonomy at the shop floor level between supervisor and workers, and 2) that managers and employees be given the skills to develop relationships and understand the importance of social interaction.

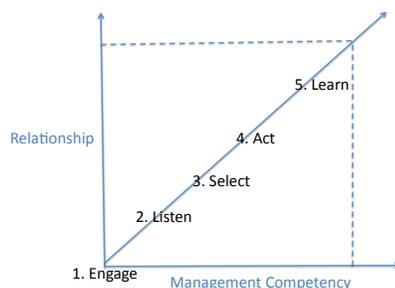
6.1 Building Relationships to Expand Organizational Capability

The “Expanded Leadership Capability” model (figure 2) attempts to capture the skills for leadership development that builds relationships and organizational competency. It is recognized that a successful leader needs to be competent both as a manager/supervisor and a relationship builder. As shown, capacity for leadership grows with increase management competency (horizontal axis), and the ability to build relationships (vertical axis). The vector represents five sets of sequential leadership actions that lead to expanded capability. Each set consists of leadership practices to increase both personal and organizational capacity to see reality, notice errors and hazards as they emerge, and take action to correct them before they become failures.

Five Sets of Leadership Actions to Expand Capability

1. **Engage:** Entering into interaction through conversation creates the relationships that determine outcomes.
2. **Listen:** The closed mind sees what it believes to be true. Listening with an open mind allows for the possibility of discovering a larger truth through other perspectives. There is the inner perspective of listening to the self--including feelings and intuitions. There is outer perspective that includes listening to others.
3. **Select:** The process of choosing correct actions involves interpreting data correctly through conversation. This is akin to achieving a common understanding of reality with others. Conditions for success include mutual respect, a common understanding of the data, and mutual trust.
4. **Act:** Action takes us from the inner world to the outer where we can test our view of reality. We surround ourselves with people willing to speak up, to question, and we construct the environment that allows the truth to emerge. Only then do we take action.
5. **Learn:** Giving up blaming others and yourself for making mistakes makes it easier to face reality. Continuously observe the results of your actions to add to your understanding of the truth.

Figure 2: Expanded Leadership Capability © Rosa Antonia Carrillo



6.2 Relationship-based Change Model

When the idea of human error as the greatest contributor to accidents began to be re-examined, it soon became apparent that people provide a positive contribution to safety through their ability to adapt to changes, gaps in system design, and unplanned for situations (Hollnagel, 1993; Rasmussen, 1983). We depend on people to solve problems and innovate when unexpected events occur (Schein, 1996; Hollnagel et al, 2006). To fully utilize this human capability social interaction is a necessary part of the

problem solving process. The *Relationship-Based Change (RBC) Model* framework (figure 3) encompasses these elements and represents a unique and distinctive approach to managing change.

The *(RBC) Model* incorporates the concepts and insights provided by CMT and the last 50 years organizational development experience. It focuses on establishing structures to ensure adaptive responses to change and the effective management of ambiguity. It encompasses strategies to build and maintain relationships, communication networks and processes, problem solving and communication skills, and related competencies.

Figure 3: Relationship-Based Change Model © Rosa Antonia Carrillo



Relationship-Based Change Model
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Step	Process Description	Change Agent Actions
1: Dissatisfaction	<p>Dissatisfaction with the current experience is creating a desire for change. Neither the preferred outcomes nor the nature of the obstacles are yet clear. The beginning is a time for mental preparation including the awareness that what you have believed to be true could keep you from seeing the truth now and shedding expectations about the situation or potential outcomes. Judging and blaming are obstacles to freedom of expression.</p> <p>The leadership actions to imbed new values lie primarily in the hands of management. EHS staff authority lies in their technical expertise, interpersonal skills, and their ability to help the organization be clear about who is sponsoring the pursuit of excellence in EHS. Staff members do not have programs—sponsors do. The staff helps others achieve their goals.</p>	<ul style="list-style-type: none"> ▪ Get clear on the impact of the problem and its consequences. ▪ Enlist allies who agree. ▪ Enlist sponsors for change. (Line managers only)
2: Engagement	<p>Engagement is the path to developing a common understanding of the problem and acceptable approaches to solutions. To do this the questions must go beyond what’s working and not working to uncovering the beliefs that have formed around why things work or don’t. Arriving at a common sense of the problem allows for the development of common sense solutions that are more likely to be</p>	<ul style="list-style-type: none"> ▪ Face-to-face communication ▪ Educational seminars on impact of relationships, drift, and communication on safety.

	<p>embraced. Training supervisors to listen, act, and give and receive feedback, along with repeated demonstrations of commitment eventually enroll engagement.</p> <p>Face-to-face communication is the most effective. When working with virtual teams and to control costs, use interactive technology.</p>	<ul style="list-style-type: none"> ▪ Teach supervisors and their direct reports communication skills for everyday work. ▪ Institute skills into job planning and safety meetings.
3: Inquiry	<p>Gather people in intact work groups and with other groups that affect each other. Include others who understand the larger picture. We cannot solve the complex problems we've created with yesterday's beliefs. Trained facilitators are needed to help participants maintain a state of awareness free of expectations or projections. The focus is on asking the right questions. Encourage going beyond appearance to the invisible dynamics that affect people's interpretation of events and decisions (relationships, beliefs, pressures, past experiences).</p>	<ul style="list-style-type: none"> ▪ Train internal facilitators to keep people focused on problem solving (not blame) and open dialogue ▪ Institute regular communication meetings around work issues— make safety part of agenda
4: Seek a Common Understanding	<p>The goal is sensemaking to arrive at a common sense of the problem and possible solutions. Through common understanding we engender trust and open communication; and thus, gather support. It is important to develop strategies that reach every level and subculture in the organization. Who do you need to win over or neutralize? Who is vital versus nice to have? Identify silos, communication breakdowns, and create structures to bridge the gaps. Do you need new roles, new teams or task forces?</p>	<ul style="list-style-type: none"> ▪ Relational Coordination Survey ▪ Gather political support ▪ Commitment mapping ▪ Create boundary Spanners ▪ Coordinators
5: Perpetual Assessment	<p>This is a state of constant awareness and evaluation. Describe and measure the ways of thinking that people need to adopt to correct deficiencies as soon as they appear. Continuously gather and review data with relevant stakeholders. Determine what the data means and correct actions.</p>	<ul style="list-style-type: none"> ▪ Design custom perception survey with stakeholder representatives ▪ Use interactive technology
6: Integration	<p>Newly understood data reveals former misunderstandings and false ideas. Taking correct action is more likely now that the problem is seen more clearly. Not everyone sees the new reality at the same time. Part of the reframing is realizing that progress may be slow, small interactions can have big consequences, and preparing mentally for setbacks.</p>	<ul style="list-style-type: none"> ▪ Scenario Planning
7: Vigilance	<p>Changes occur in stages or layers and by necessity each completion is a new beginning. This is a time for vigilance to monitor the measurements previously set up, and prepare to change course if necessary. This is not a time to relax. Neither visible progress nor apparent failure should be taken for granted. All of the above processes continue to ensure that corrective action will have the intended results.</p>	<ul style="list-style-type: none"> ▪ Milestones ▪ Actions ▪ Due dates ▪ Core group meetings ▪ Social Network Monitoring

7 Conclusion:

In summary, neither complexity management nor relationship psychology theory claims to dethrone all other management theories anymore than quantum physics has debunked Newton's laws of physics. Instead it identifies the limitations of those laws and seeks to explain what lies beyond them. As long as people and the environment continue to get hurt by the unintended outcomes of poor decisions and lack of understanding, there will be a need to keep asking questions. Professionals working with CMT (resilience engineering, drift) are asking a lot of the right questions.

The questions expressing doubt or concern are very quiet compared to the loud cacophony of financial, competitive and political pressures. Failure, disaster, death, loss and injury come as a consequence of not hearing or listening to those voices. A sense of humiliation is normal after disasters

such as the Gulf oil explosion, but leadership can facilitate learning and progress with the right frameworks to understand what happened and the strategies to prevent occurrences.

Learning from failure and disaster is the only productive path to pursue. The bigger the failure the greater the number of established beliefs become open to question. For example, success and reliability would seem to be a lot safer state, but it can have the potential of putting people metaphorically to sleep. People's guards go down, and early signs of failure go unnoticed. Drift and deviance grow so subtly that they look "normal" and they are unconsciously accepted as the right way to do things. The US cultural norm, "If it ain't broke don't fix it" and "run it till it breaks, then we'll fix it" is squarely opposite to preventative action, yet it is largely unquestioned and forms the foundation of *just-in-time-maintenance*.

Management is tasked with managing these realities and this article has proposed that an important strategy to manage these challenges is relationship building. Healthy relationships across all levels of the organization are an important component of strong positive safety cultures, but building a culture is fundamentally different from building airplanes. While both are complex, only one is living, which means reactions and interactions that will always have an element of unpredictability. Thus the importance of constant awareness and keeping a pulse on what is being talked about or not becomes critical. For this reason maintaining open communication and trust levels is also a priority for leaders.

Investing in the development of relationship building skills doesn't mean stopping training, hazard analysis or operational procedures. It means opening one's eyes to the whole story of influences on human behavior. It means considering the impact of communication on emotions and therefore awareness so that better actions, more effective corrective actions can be taken before deficiencies create failure.

In summary, accidents are not just the consequences of technology failures, but also a result of complex interrelated social and organizational factors. The challenges in today's organizations can no longer be met by addressing the human-machine interface with training and procedures. The workers' sense of values (derived from their identity), their ways of thinking, their ability to solve unforeseen problems may hold keys to preventing accidents. Safety is sustained as a priority within the context of relationships making the creation of high trust working environments among members and across functions of the organization extremely important.

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