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Organizational Mindfulness: Safety Culture and Change Management

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Introduction

There is a pervasive view that organizations have a distinct culture and that this organizational culture has implications for safety. The term *safety culture* implies that some organizations are safer than others specifically because of differences in organizational culture.

The questions arise:

- What is organizational culture?
- Can we reasonably map organizational culture onto a safety dimension and, if we can, what is the difference between a safe and an unsafe organizational culture?
- How might we promote change from an unsafe towards a safe organizational culture?

I summarize my views on these questions in this brief.

To ground my conceptual discussion, I offer a few illustrations of organizational dysfunction and organizational health. I then draw lessons from those illustrations to answer the questions I have raised. I argue that organizational dysfunction emerges from a failure in mindfulness as that term is defined by Weick, Sutcliffe and Obstfeld (1999), a cognitive state characterised by a rich awareness of discriminatory detail and a capacity for effective action in response to complex, dynamic events.

There is, however, a problem. Much of the discussion on the failings of mindfulness is associated with management. On the other hand, a more mindful management might be seen as indulging in micro-management; a management pattern widely recognized as counter-productive. Here I argue that the solution to this conundrum lies not in a management style that balances competing demands for management oversight and operational autonomy but rather in management sensitivity to (or mindfulness of) the complex operational challenges faced by the organization's work force.

Organizational Dysfunction

A major disaster will typically trigger an in-depth analysis of organizational processes. Accident reviews offer a window into the functioning of an organization that can point to the sorts of patterns that characterize organizational dysfunction. Here I will review three major accidents as a means of gleaning insights about the patterns that may cause trouble. In addition, a detailed analysis by Weick and Sutcliffe (2001) offers a view into an organization that suffered a major disruption in production, albeit one that cannot be classified as a major accident.

Deepwater Horizon

In April of 2010, the oil drilling rig, Deepwater Horizon, blew out in the Gulf of Mexico (Figure 1), killing 11 workers and, over a period of three months, dumping almost five million barrels of oil into the Gulf of Mexico. As reported by the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (2011), there were safety systems and backup safety systems, all of which failed at critical times, and there were management and teamwork failures largely in the areas of poor planning and poor coordination.

Figure 1: Deepwater Horizon in the Gulf of Mexico, after blowing out on 20 April 2010

The coordination between the three separate organisations that worked on the rig was poor, in part because their priorities were not well aligned. Management oversight was meager at best and there was no apparent attempt by management to ensure that the different organizational entities were well integrated. To the extent that management was visible, the emphasis was on economy and completion schedule.

Prior to the accident, procedures had been adjusted as needed because the existing guidelines had been developed decades previously for shallow-water drilling. While there was a thicket of rules and procedures, there was uncritical acceptance that those rules and procedures, developed for a markedly different context, were relevant to this situation. Rules that impeded progress were typically adjusted on the spot.

Management expressed concerns about personnel safety but neglected system safety entirely[1]. Signs of impending disaster were discounted, standard safety practices were ignored, and emergency response procedures were clumsy and were probably unworkable even in benign circumstances. Some workers expressed discomfort in relation to safety issues but did not elevate their concerns to a management level that could investigate and then take action.

Herald of Free Enterprise

The Herald of Free Enterprise was a roll-on roll-off ferry that operated between Zeebrugge in Belgium and Dover in the United Kingdom. In March of 1987, it sailed from the port of Zeebrugge with its bow door open. Water poured in and then sloshed to one side of the ship causing it to capsize (Figure 2). The vessel was lost and 193 of those on board perished. The accident report identified a number of issues. The open hull design that would allow water to slosh to one side, the lack of a bow door indicator on the bridge, and the need to ballast the bow down while in port to align with the docking facility had all been identified as problems prior to the accident, and there were several others. Most of these issues had already been recognized at the operational level but they had not been accorded a high priority for resolution at the management level.

Figure 2: The Herald of Free Enterprise after foundering, Zeebrugge, 6 March, 1987

[1] A failure in personnel safety has the potential to harm a small, localised contingent of the work force. Failure to comply with safety clothing standards offers an example. A failure in system safety has the potential for widespread harm to personnel and to physical structures throughout system and beyond its physical confines.

This accident can be attributed to various breakdowns in design, management and operations (Reason, 1990). Those who were responsible for procuring the vessel had failed to adhere to best practice in terms of ensuring that the ship would remain stable under adverse conditions and that the vessel and the docking facilities were compatible. Management had focused on the financial success of the enterprise while they neglected their strategic responsibilities regarding resolution of known safety concerns. The vessel's officers had failed to establish procedures that would ensure the vessel was ready to leave port. In this case it would seem that there was a rather casual attitude to safety at the design, management and operational levels.

Union Pacific Railroad

In September, 1996, Union Pacific Railroad merged with Southern Pacific Railroad to form the largest railroad in the United States. The senior management of the new entity, drawn primarily from Union Pacific Railroad, implemented a number of cost-cutting strategies that created serious problems. Within a year of the merger, four workers had lost their lives in rail-yard accidents and another five had lost their lives in train-on-train collisions. As reported by Weick and Sutcliffe (2001), reductions in staffing compromised maintenance and led to crews working beyond statutory limits. Similarly, dispatching became unreliable because dispatchers were assigned to regions with which they were unfamiliar. All of these problems arose from well-motivated but ill-informed attempts to realize efficiencies from the expanded size of the new entity.

The most far reaching problem originated in the Houston, Texas yard of the new entity. The Houston yard, formerly a Southern Pacific Railroad facility, had a capacity of 3,500 cars. Approximately a year after the merger, the yard became locked up with over 6000 cars, affecting freight movements from the south-east through to the northern-central areas of the United States. Movement in the Houston yard had always been tight and Southern Pacific Railroad had kept cars moving by use of procedures that exploited local opportunities. The management of Union Pacific Railroad mandated a change to more standard procedures without consulting those operational personnel who understood the special constraints of the Houston yard.

There was a degree of hubris in this decision. Management had taken the attitude that they knew how to run a railroad and they wanted to rationalize the untidy operational procedures of the now defunct Southern Pacific Railroad. They apparently did not imagine that those *untidy* operational procedures had an operational rationale. Nor did they consult the local expertise that could have informed them that their standard procedures were unworkable within the particular constraints of the Houston yard and they apparently did not offer a cultural climate in which the local experts could volunteer an opinion.

Friendly Fire

In the aftermath of the First Gulf War, the US defence forces mounted an operation in Northern Iraq, designated Operation Provide Comfort, to protect the Kurdish population from reprisals by the Iraqi government (Figure 3). During this operation, two USAF F-15s shot down two US Army Black Hawk helicopters under the impression that they were Iraqi helicopters. All on board the Black Hawk helicopters (which included a number of UN peacekeepers) perished. The accident, analysed in detail by Snook (2000), occurred despite continuous surveillance by airborne command-and-control and despite a host of carefully designed systems that should have prevented it.

Figure 3: Northern Iraq, showing the area protected by Operation Provide Comfort

The F-15s involved in this accident were assigned the task of sanitizing the operational area, i.e., of ensuring there were no enemy aircraft and that it was safe for other allied flights. Although the F-15 flight was to be the first into the area that day, the two Black Hawks were already there. The F-15 pilots asked at two different times whether there were allied flights in the area that were not listed on the Air Tasking Order and both times they were advised that there were not. Although it was mandated (and also widely understood) that all flights over the area were listed on the Air Tasking Order, US Army Black Hawk operations had not been listed for some time. Incompatible communication systems and procedures prevented the F-15 pilots from communicating directly with the Black Hawk pilots. Although Air Force and Army pilots were accommodated at the same military base, their cultural divide was marked.

One of the requests from the F-15 pilots regarding unlisted flights went to the airborne command-and-control crew who knew of the Black Hawk operation. Some members of the airborne command-and-control crew followed the engagement of the F-15s with the Black Hawks without raising the possibility that these two helicopters, read by the F-15 pilots as hostile, were in fact US aircraft. This particular airborne command-and-control crew was on their second mission in Iraq, having recently assembled as a team in the US. Airborne command-and-control crews are required to participate (as a team) in two simulator-training sessions prior to deployment from the US. This crew participated in only one session. Furthermore, three of the crew's senior members did not attend even that session because, they argued, due to their seniority and experience they did not have to. They had apparently forgotten that this training was about teamwork rather than about individual competence.

Snook's (2000) analysis of this incident reveals that coordination within the airborne command-and-control team was poor, coordination between functional units (army and air force) was poor, and that the senior command staff failed to ensure that due attention was paid to systems integration throughout the operational task force. The operational commander was fully engaged, maintaining an active interest in operational matters, but was unable to enunciate a strategic vision for coordinating the many different operational elements of the overall mission. Mission capability at the unit level was a priority but total system capability was not. In addition, there was a strong commitment to rules, order, and accountability, but no oversight to ensure

that the rules were complete and correct from a systems perspective. There was a generally mindless assumption that adherence to the existing rules would ensure safety.

Summary: Organizational Dysfunction

Every industrial accident or disruption is unique but familiar patterns emerge. Management may be neglectful in regard to their strategic responsibilities or naïve in regard to the operational complexities faced by their workforce. They may be casually inattentive to the operational challenges that demand strategic guidance (Herald of Free Enterprise, Deepwater Horizon, Friendly Fire) or they may impose rules or constraints on operations without fully understanding operational complexity (Union Pacific Railroad). There can be a somewhat casual approach to system safety at all levels of the organisational hierarchy (Deepwater Horizon).

Additionally, an operational workforce can settle into functional groupings and behavioural patterns that do not coordinate well primarily because of their diverse and possibly incompatible goals (Deepwater Horizon, Friendly Fire). Members of the operational workforce become aware of issues but do not raise their concerns to management, possibly because they have no confidence the advice will be well received (Deepwater Horizon, Union Pacific Railroad). Production pressures become salient while concerns about safety are suppressed (Herald of Free Enterprise, Deepwater Horizon).

In their discussion of the problems experienced by the Union Pacific Railroad, Weick and Sutcliffe (2001) reflect on the concept of mindfulness. They argue that Union Pacific management failed the test of mindfulness by neglecting the operational expertise resident in their workforce. Instead they exhibited mindlessness; they developed a simplistic view of operations which led to imposition of a set of clumsy, disruptive work practices that did not take account of the complexity or the dynamic nature of operations.

In their application of this concept, Weick et al (1999) and Weick and Sutcliffe (2001) do not clearly distinguish management from operational responsibilities. However, mindlessness at either level can disrupt system performance. This concept can, therefore, be employed to cover cognitive states exhibited by both management and operational personnel. Within the events described in this section, neither management nor operational personnel were mindful of the risks posed by the work environment. Nor were they mindful of how they should monitor each other or interact with each other. Indeed, these patterns of mindlessness are pervasive at both management and operational levels within systems that experience major accidents.

Organizational Health

It is at least possible that the patterns associated with organizational dysfunction are in fact, resident in even healthy organizations and that organizations that do suffer a major accident or disruption are just unlucky in that chance factors, always latent in a complex and risky world, have aligned to work against them. Here I evaluate a contrasting proposal, that there are organizations that perform much better because mindfulness is integrated into their organizational culture.

Aircraft Carrier Flight-Deck Operations

One remarkable contribution in this area is from an ethnographic study by Rochlin, La Porte, & Roberts, 1987) of flight-deck operations on a US Naval Aircraft Carrier. This study revealed how a collegial, self-organizing sub-system at the operational level can function as a robust and productive entity within a rigidly structured, hierarchical system. The operational entity studied in

this work was the flight-deck crew responsible for launching and recovering aircraft. During operations, aircraft take off from and land on the deck of an aircraft carrier at a rate comparable to that of a busy commercial airport but do so in an operational space that is a fraction of that available at any commercial airport. It is potentially dangerous work, but serious accidents are rare. This study is one of several that have examined systems characterized as High-Reliability Organizations, essentially organizations that function safely and effectively in high-risk environments (Christianson and Sutcliffe, 2009).

Carrier flight-deck operations demand a high-level of teamwork between the members of the flight-deck crew. There are no published procedures for this work. The flight-deck crew develops their own operational procedures during work-ups as they gradually increase their rate of launching and recovering aircraft to operational levels. During workups, there is a universal emphasis on development of efficient and robust procedures and on acquisition and improvement of skills. Furthermore, the shipboard environment is dynamic, posing different situations and different variations on challenges. All crew members are acutely aware that routine operations can quickly transition into crisis at any time. They recognize that they cannot afford to disengage mentally from the on-going work processes in a manner that could lead to carelessness or error.

The problem of maintaining productivity and safety on the flight deck is complicated by regular turnover in the crew. Full replacement is typically completed over a 40-month period. The replacement is gradual however, and new crewmembers are familiarized with the system through a form of apprenticeship in which longer-serving crewmembers teach and demonstrate the essential procedures and coordination. The operational activities are marked by a collegial style of collaboration in which experience and expertise take precedence over military rank. However, this collegial activity coexists within a hierarchical system in which rank takes precedence. While engaged in routine business on the ship, a crewman will defer to an officer but on the flight deck, may advise, instruct or correct that same officer. This work suggests that, within an effective organization, there is mutual respect between hierarchical and collegial systems as they work together in a self-organizing fashion (Figure 4).

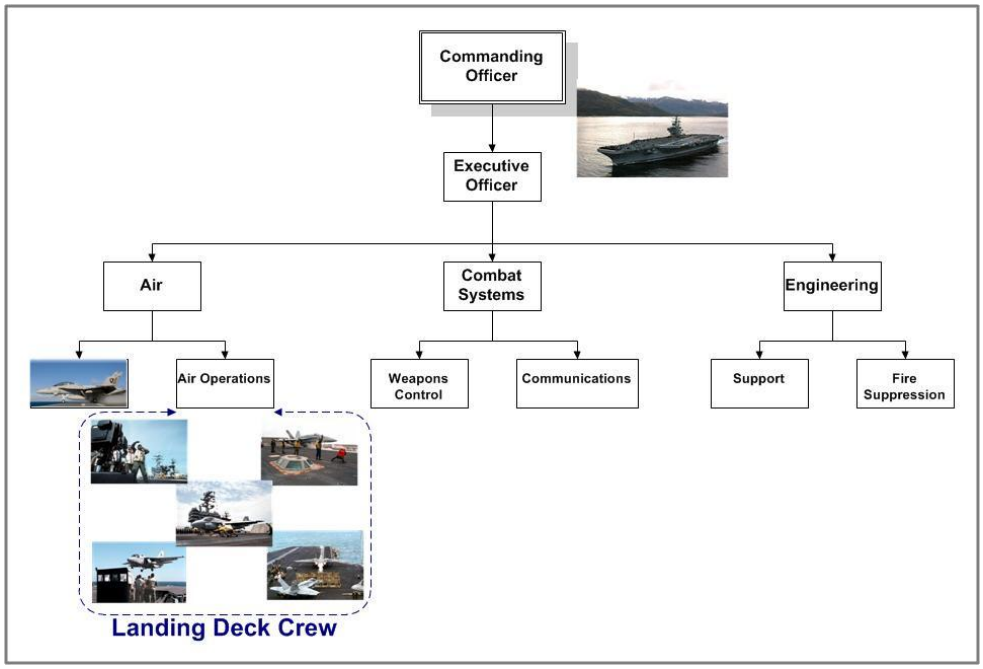

Figure 4: The landing deck crew of an aircraft carrier functions as a self-organizing entity within a hierarchical structure

As is characteristic of other high reliability organizations that have been examined, there is a mindfulness in this system that is directed at ensuring productivity and safety. The authority of management is ever-present but it does not impinge on the processes of productive work. The authority of the command hierarchy maintains order and discipline but does not impose constraints on how work units are organized, on how work is managed, or on work processes that are employed.

Knowledge Management

While the flight-deck example illustrates how people of different status, knowledge and authority can collaborate in the execution of operational work, it suggests that the most important role of management in relation to that work is to keep out of the way. Another illustration from a military environment offers a slightly different perspective.

The US 5th Fleet, while supporting the NATO offensive in Afghanistan during 2001 and 2002, implemented a web-based information system (Adkins & Kruse 2003). The use of this system evolved over several months but its networking and collaboration tools eventually transformed the way information was used and shared for planning and executing missions within the US 5th Fleet.

Members of the Fleet at different levels of command reported that the new information system facilitated their work. Furthermore, the new system had a number of unanticipated benefits. It induced high levels of motivation and innovation in its users. Some of those developing web pages became very good at providing summary analyses that others found more informative than the summaries they would have generated on their own. Those web pages served as important knowledge archives for planners who had previously found it challenging and onerous to extract the meaningful implications from the raw information available to them.

Planning staff noticed a dramatic difference in the way they did their work. Previously, they had found themselves overloaded, formulating plans reactively with critical deadlines looming. They found it considerably easier under the new system to respond to planning requests because essential information was easier to find and to interpret. No longer were they struggling to meet critical deadlines. Rather, much of their time was now spent on contingency planning; preparing ideas and summaries they could later co-opt as needed to develop a plan under a tight time constraint. Staff at all levels found that the new system supported informal discussions because the required information was available at any work station in the Fleet. Those involved no longer had to run to a stateroom, ready room or operation centre to access information critical to a discussion.

Early doubts and concerns about the new system evaporated as those working with it experienced its benefits. Only those from outside the 5th Fleet, who did not have an opportunity to work directly with the new system, maintained their scepticism.

Much of the success of this system can be attributed to enlightened management. In developing the system, senior officers emphasized the use of conventional tools that could be mastered quickly. They promoted use of the system at all levels of the command hierarchy, they remained ready to dispense with legacy systems and practices that became redundant, they supported a transformation in the practices of information management, and they publicly acknowledged the efforts of those who used the system effectively. They facilitated the acquisition of resources and encouraged the development of effective practice. In essence, they remained engaged with operational activities and mindful of operational complexities, and they validated the new cultural norms but refrained from being intrusive as they did so. They demanded results but trusted their operational staff to develop their own procedures.

Again, there is a mindfulness evident in this system but in this illustration, it is evident at both the operational and management levels. The command staff did not ignore the operational work[2] but rather encouraged those working at the operational level to work mindfully. It is unlikely that man the command staff agers understood all the complexities of the operational work but they did not impose simplistic constraints and it appears they at least understood that the work was complex.

Summary: Organizational Health

Most evident about these two illustrations is the mindful emphasis on and a concern for productivity. In the flight-deck illustration, we see that rank defers to expertise during operational work. In the knowledge management example, we see that senior command staff encourage and support the emergence of a productive culture. All at the work-face seem to be engaged with the challenges and intent on doing something useful not only in relation to their own activities but also in relation to the organization's mission. They have, in other words, a healthy operational culture.

The flight-deck illustration might suggest that this is led from those engaged in the operational work and that management is irrelevant. The knowledge management illustration corrects this view by revealing that management has an important support and validation role. It is not clear that this system could have been implemented effectively without support from senior officers in the 5th Fleet.

The sense of engagement in these two illustrations is strong; individuals and teams at the work-face were fully engaged with the challenges and opportunities resident in the work while management was fully engaged with the success of the work. These organizations were mindful in the sense established by Weick and Sutcliffe (2001); they were sensitive to the complexity and demands of operational work, they deferred to expertise and they maintained their commitment to effective operational performance.

While mindfulness is important at both management and operational levels, management has a particularly critical role to play. In being mindful, managers must be concerned with operations but must focus on supporting and encouraging good practice rather than mandating its details. They need to defer to the operational expertise of their workforce when making decisions about what processes and procedures are to be used. Management in a mindful organization will ensure organizational resilience. Managers will focus on strategic issues related to long-term planning, recruitment, promotion and training. They will concern themselves with essential priorities such as adherence to best practice, productivity, safety and staff welfare.

The term *mindfulness* can also perform useful work if used to characterize the mindset of operational personnel. It would seem that in both the flight-deck illustration and the knowledge-management illustration, operational personnel were mindful of the challenges and opportunities in their own work environment, of how they should interact with others in their own environment, and how their work impacted the overall mission.

These engaged and mindful patterns of behavior at both the management and operational levels stand in stark contrast to the disengaged and mindless patterns observed in the illustrations of organizational dysfunction.

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[2] The impression drawn from Rochlin et al (1987), that the most important role for management in relation to operational work is to keep out of the way, emerges primarily from the emphasis in that paper on the work processes within the flight-deck crew. In contrast, by exploring both work and management processes, Adkins & Kruse (2003) clarify that management has an important role in supporting effective work processes.

Interim Summary: Dysfunction versus Health

Much of the literature in this area suggests that the problem of organizational dysfunction starts with management. Westrum (2009), for example, observes that organizations have cultural styles and argues that management is largely responsible for the one that emerges. He identifies three patterns; a pathological emphasis on power and control, a bureaucratic emphasis on rules, order and accountability, and a strategic emphasis on mission capability.

Because these cultural patterns correspond to popular views of organizational culture, I will use them as a benchmark against which to reference observations on organizational dysfunction and organizational health. However, given that my purpose is to examine the viability of different cultural styles rather than to prejudge them, I will exercise caution in applying value-laden terms such as *pathological* or *bureaucratic*, reserving them for organizational patterns that are clearly dysfunctional. Furthermore, I will neutralize the pejorative reference to *power and control* by substituting the term *authority*. Thus I will emphasize three constructs:

- authority,
- rules, order, and accountability, and
- strategic emphasis on mission capability.

Stripped of the pejorative language, it is evident that there is a plausible rationale for each of these cultural styles. My goal here is to go beyond plausibility by assessing whether these constructs are useful for understanding organizational dysfunction and organizational health and, to the extent they are, to suggest how we might rationalize their competing demands.

In the accidents I describe above, a pathological application of authority is less evident than a disengaged, mindless style of management. In fact, the flight-deck illustration suggests that a balanced approach to authority can contribute to organizational effectiveness if that authority is not wielded mindlessly.

My analysis did not reveal clear examples of an overly-bureaucratic emphasis on rules, order, and accountability although it is clear that the management of Union Pacific Railroad was mindless in imposing rules that did not take account of the complex realities of the operational work. The Deepwater Horizon illustration further suggests that insufficient application of authority and casual disregard of rules, order, and accountability can, at least in complex, high-risk operations, exacerbate problems.

My two illustrations of organisational health suggest the benefits of a strategic emphasis on mission capability.

The key indicators of organizational dysfunction to emerge from my analysis only partially overlap Westrum's organizational patterns. Management imposes constraints on operations without fully understanding operational complexity (i.e., an ill-judged application of authority) or, alternatively, becomes disengaged from operational concerns. Management empasizes the significance of certain important values and neglects others. Neither junior staff nor operational personnel are confident that they can express concerns about operational matters to their management and possibly because of that, become disengaged from crucial safety-related processes. Operational units do not coordinate well with each other. Finally, personnel at all levels treat procedures as formal requirements without consideration of the intent behind them (i.e., a mindless adherence to rules, order, and accountability).

The Management Conundrum

In arguing that management can exhibit a pathological emphasis on power and control or promote a bureaucratic emphasis on rules, order and accountability, Westrum (2009) subscribes to a common view that managers can be too engaged with operational concerns. They can, in other words, fall into the trap of micro-management. In contrast, analyses of the three accidents I describe above under the heading of organizational dysfunction suggest that managers can be too remote from operational concerns. They can, in other words, fall into the trap of pathological disengagement. This seeming contradiction emerges, I suggest, from an overly simplistic but nevertheless widespread conception of hierarchal management.

Organizations as Multi-Level, Hierarchical Systems

Within scientific circles, there is pervasive view on this matter that aligns closely with the simplistic idea that managers are in charge and workers must follow their instructions. Leveson (2004) proposes that an organization should be viewed as a multi-level, hierarchical system with control loops connecting the levels (Figure 5). The downward path carries information that imposes constraints from management on operations and the upward path carries reports from operations to management regarding compliance and the current state of affairs. This proposal is echoed by Vicente and Christoffersen (2011). However, this is an overly-simplistic view that may be true to at least some extent in an assembly line but it is not even an approximate description of how knowledge-intensive organizations function.

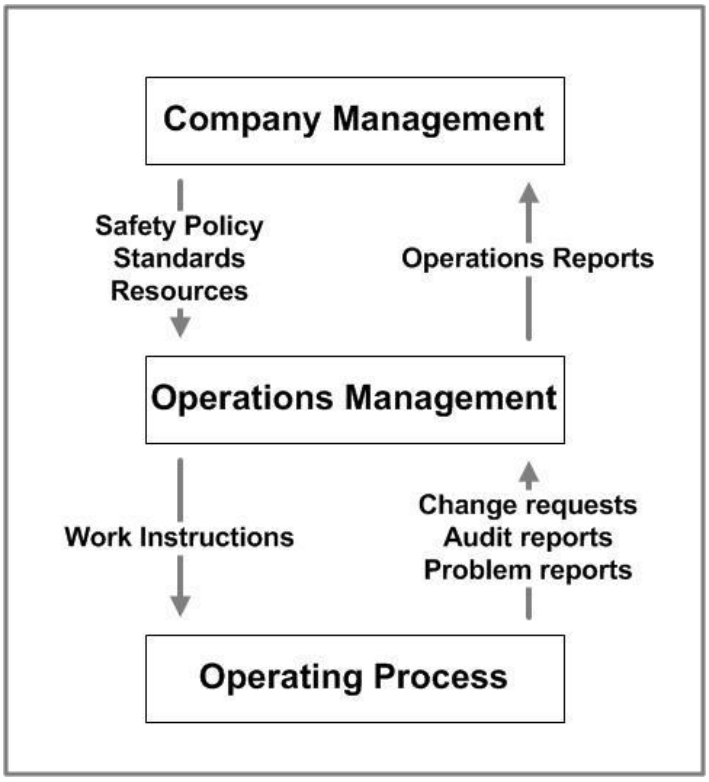

Figure 5: An organization may be viewed as a multi-level, hierarchical control system (figure adapted from Leveson, 2004).

In commenting on this, I am reminded of an accident report prepared for the US Nuclear Regulatory Commission following the now rather ancient Three-Mile Island accident (Hopkins, Snyder, Price, Hornick, Mackie, Smillie and Sugarman, 1982). One recommendation was to implement a more severely hierarchical system. In fact, the authors of this report recommended a military-style hierarchy. This particular comment from that accident report illustrates the paucity of thinking in this area. Not only would this approach promote micromanagement but, as suggested by my flight-deck and knowledge management illustrations, it is not even a hallmark of effective military organizations.

There is also a technical problem with this approach. Hierarchical control systems become unstable unless the quality and the latency of information in the feedback loops are carefully tuned (Jagacinski & Flach, 2003). Multiple levels of hierarchical control, as shown in Figure 5, exacerbate the stability challenge. Such precise and stable tuning is impractical in a system in which much of the functionality resides in the human participants. Human behavior cannot be finely tuned and tightly regulated in the manner required for a multi-level hierarchical control system. It is difficult enough to make any single individual follow a set of detailed instructions precisely. In an organization with hundreds of staff, such as a hospital or an aircraft carrier group, such an attempt would be entirely counterproductive.

However, it is unrealistic to imagine that a large organization like a hospital or aircraft carrier group could function without some sort of management structure. It would seem there is no realistic alternative to a hierarchical system. Someone has to be in charge? If we assume that we need a management structure and that some form of hierarchy is essential, how might managers interact with operational staff in a meaningful way without falling into the trap of micromanagement? The fact that organizations are multi-level, hierarchical systems is indisputable. How could it be otherwise? The point at issue is whether the simple model, *management commands and subordinates obey*, is a valid characterization of effective organizations.

Organizations as Hybrid Systems

It might initially seem that management must balance competing demands, walking a tightrope between pathological micro-management and pathological disengagement. The illustrations I have reviewed indicate otherwise; that the interaction between management and operational personnel in an effective system is more complex than suggested by Leveson (2004) or Vicente and Christoffersen (2011). Management must be concerned with strategic issues but must be careful about how they deal with tactical or operational issues. By following the naïve model, the management of Union Pacific Railroad created problems as they mandated clumsy and ineffective operational procedures while ignoring the operational expertise that was available to them. The two military examples offer a contrast in perspective. Senior command staff did not interfere with the operational expertise that maintained the safety and productivity of carrier flight-deck operations and the knowledge management illustration reveals how senior command staff actively supported operational work without negating the expertise of operational personnel.

These two military examples in particular suggest that that a healthy organization is one in which the hierarchical and self-organizing structures work together in mutual support. Organisational health depends considerably on a hybrid system in which management authority maintains strategic oversight while allowing and actively supporting operational experts to develop and maintain effective work processes.

Culture

Culture refers to the beliefs, values and behavioural patterns that constitute a way of life. As noted by Fleming and Croskerry (2009), culture influences how individuals and groups view the world. Culture persists independently of group membership; a culture will continue to exist even after all individuals who make up the current group have moved on and have been replaced by others. New members of the organization become acculturated by observing others, by assimilating their patterns of behaviour, and by internalizing social feedback. They then maintain the culture so that other incoming members become acculturated in their turn (Rochlin, La Porte, & Roberts, 1987).

What is Organizational Culture?

As is evident from these ideas, culture is not about individuals in isolation but rather about how group norms constrain and shape collective behavior[3]. While nations and ethnic groups may have distinctive cultures, we can also think of organizations as having a distinctive constellation of beliefs, values and behavioural patterns. Thus we can speak in terms of organizational cultures. An organization's prevailing culture becomes most evident when that organization responds to problems and opportunities. Consistent with the illustrations I have provided, Christianson and Sutcliffe (2009) suggest that organizations can be distinguished by cultural practices such as those relating to decision making, strategic assessment, reliability of performance, investment in training and acknowledgement of staff initiative.

How Does Safety Culture Relate to Organizational Culture?

The notion of safety culture implies a cultural continuum between health and dysfunction, with different organizations scattered along that continuum. However, safety is just one of multiple priorities for an effective organization. Those organizations that fall towards the dysfunctional end of the continuum are not only unsafe but perform poorly on all manner of organizational dimensions. While safety should always be a priority, the functional health of an organization has implications well beyond safety. Thus, assessment of an organization's safety culture can be taken as an indication of an organization's cultural health. In the next section of this brief, I will focus on the more general issue, that being organizational culture. Transition from a dysfunctional to a healthy culture will bring myriad benefits that will reveal themselves on a wide range of organizational performance indicators, safety among them.

Cultural Change

Given that there are organizations that do not perform well because of a dysfunctional culture, how might we transform a dysfunctional organizational culture into a healthy one or, in other words, how might we transform a mindless, disengaged organization into a mindful, engaged one?

Knowledge Management

The new system developed for the US 5th Fleet, resulted in a transformation of the information culture. Plans and schedules had previously been formatted in accordance with standard

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[3] In a strict sense, behaviour is always individual, but the term *collective* when applied to behaviour refers to similar patterns of behaviour exhibited by many members of the group in response to prevailing attitudes shared by group members.

templates and information that came to the fleet through the standard messaging system had previously been archived in a standard messaging format. Typically, such standard formats have a rigid conceptual structure that does not align well with the conceptual structure of the operational work. Messages in the standard military format contain much information that is not relevant to the problem at hand and the information that is relevant to the problem at hand may be scattered over several messages. These rigid templates and formats favour those who prefer to approach their work as a routine, mindless exercise but frustrate those who wish to engage energetically and creatively with the challenges of their work.

In addition, junior staff in the US 5th Fleet had previously used briefings, prepared with considerable effort, to update senior command staff on operational matters. In anticipation of the new system, those who prepared briefings expressed concerns that their workload would increase because they now had the additional work of summarising incoming information in Web pages. Others expressed concerns that some in the information management sequence would hoard information. These concerns proved unfounded. No one hoarded information and the briefing requirement was eliminated when senior command staff realized that they could become better aware of operational matters through the Web pages than they could through briefings.

Members of the task force at different levels of command believed that the new system helped them develop a better situational appreciation of task force operations. To illustrate, a watch commander commented on the requirement to know about all aircraft missions scheduled during his watch. Normally, the watch commander would rely on an Air Tasking Order[4], a document that lists all aircraft missions in a text-based, spread-sheet format. This watch commander observed that the Air Tasking Order had not helped him develop a situational appreciation of daily flight operations but with the advent of the new information system, he could now build a robust mental picture of all allied flights and their relationship to allied forces in the area.

There was wide appreciation throughout the fleet that the knowledge management system had generated significant benefits for everyone. Those who experienced the benefits of the new system became believers. Expressions of concern came only from outside the fleet, essentially emanating from those who knew of the system but did not experience its benefits directly. In summary, one lesson to be drawn from this work is that cultural change becomes practically inevitable under circumstances in which the changes actually result in benefits, all those engaged in working with the changes have opportunities to experience the benefits directly, and management is fully supportive of the changes.

Team Culture

A training approach, first known as Cockpit Resource Management, and now known as Crew Resource Management, has become an almost universal component of pilot training within commercial and military aviation. This approach was developed after analysis of a few high-profile accidents implicated the roles of poor cockpit communication and dysfunctional command relationships (failures of interpersonal communication, leadership, and decision making) in defective teamwork within the flight crew. In general, training in Crew Resource Management focuses on team management skills, briefing strategies, situation awareness and

[4] Within military aviation, the Air Tasking Order is a standard knowledge artefact. Recall that it was implicated in the friendly-fire incident discussed under the heading of organizational dysfunction.

stress management. The change of name from C*ockpit* to C*rew* Resource Management was stimulated by the fact that this program was so successful that it found its way out of the cockpit. In the early 1990s, it was extended to the training of flight attendants, dispatchers, and maintenance personnel (Helmreich, Merritt & Wilhelm, 1999) and more recently, to training in health care (Sundar, Sundar, Pawlowski, Blum, Feinstein & Pratt, 2007).

Two major factors, meaningful command support and positive experience with the new cultural norms, are at play in the success of Crew Resource Management within commercial and military aviation. While these programs explicitly emphasize the development of team-coordination skills, they also have a significant cultural component in that they seek to enhance managerial effectiveness by emphasizing change in individual styles such as authoritarian behaviour by leaders and lack of assertiveness by juniors.

There is, however, a need for caution. Not all trainees benefit from Crew Resource Management (Helmreich, et al, 1999) and those who fail to benefit from the standard offerings do not respond well to remedial training. Although the general findings have been positive, success has not been universal.

Additionally, even programs that are effective in one organization do not fare well when transported to another organization (Helmreich & Wilhelm, 1991). This is most likely because the scenarios in the transported programs are not specific to the new organization. It seems that there is a structure that must be followed but that each organization and each cultural entity must develop their own program in accordance with their own cultural norms, their own work goals and their own work problems (Musson & Helmreich, 2004).

Also note that Crew Resource Management first gained traction in an atypical work environment. The piloting of a commercial or military aircraft is an exceedingly technical and rigorously controlled activity and, in comparison to the general work force, aircrew are exceptionally disciplined. Crew Resource Management was introduced to pilots with the approval of statutory authorities and support by management. Additionally, as a component of their training, aircrew were given an opportunity to experience the benefits of Crew Resource Management within realistic simulator exercises. While its extension into other areas of aviation and into healthcare seems to be going well enough, it may be less effective in a poorly-controlled work environment such as deep-water oil drilling where management may be disengaged from operations.

Change Management

Weick (1984) has argued that the effectiveness of efforts directed at organizational change can be influenced by the scale at which the problem is conceived. If conceived at a large scale, progress can be blocked by cognitive and affective limitations. Strategic action becomes disorganized, actors find it difficult to maintain a cognitive awareness of what needs to be done, feedback on effectiveness of action becomes diffused, and actors become chronically discouraged. Weick proposes that even large-scale problems should be conceived in more modest terms. Given the unavoidable cognitive and social constraints on human actors, an incremental strategy that pursues a series of concrete, achievable outcomes (in Weick's terms, a series of *small wins*) will help a change-management working group retain its focus and energy and will build a pattern of success that will generate both self-belief and external credibility.

Duhigg (2012) references Weick (1984) if forwarding the concept of a *keystone* habit. His argument implies that certain behavioral patterns within an organization have the power to shape other seemingly unrelated patterns. His refers to safety as a keystone habit. Thus a

concerted effort to improve safety within an organization can start a chain reaction that will impact other organizational patterns.

In Duhigg's illustration, a large manufacturing company had accumulated a dismal safety record. A new Chief Executive Officer announced that safety was to become a priority and he reinforced that message over an extended period. One particular strategy implemented to pursue the new approach to safety was to open the lines of communication from the work force to management. Operational personnel had not previously been confident that they could raise concerns about operational matters to their management. In the new approach, operational personnel were encouraged (even required) to bring safety concerns to the notice of their management who then took those concerns seriously and also commended those who raised concerns. Given this positive experience, operational personnel soon learned that they could raise issues related to productivity and efficiency. Management handled these issues in the same manner, thereby allowing the chain reaction of the keystone effect to benefit the company on multiple dimensions[5].

Patterson, Grenny, Maxfield, McMillan and Switzler (2008) observe that dysfunctional behaviours at organisational, team or individual levels are not easily modified. They argue that resistance to change must deal with through persuasion. However, they also argue that persuasion is doomed to fail unless the change management program offers an option for replacing the old, ineffective ways of behaving with new and effective ways. They recommend a two-phase program that first identifies effective behaviours and then embarks on an effort of persuasion aimed at encouraging adoption.

Effective behaviours may not always be obvious, especially for an organisation that has chronic problems in the particular area of concern, and so there may be a need to discover a behavioural pattern that can be effective. The goal is to find or develop vital behaviours that make a difference. The recommended approach is to find an organisation, team or individual that is effective in accomplishing the required goals and to then isolate the vital behaviours by comparing those that lead to success with those that lead to failure. The focus should be on the practices (not outcomes[6]) that lead to success and on what people should do to succeed (versus what they should not do).

As is consistent with Weick (1984), a program for change should not be detailed and comprehensive but rather should promote a small number of practices that are both manageable and self-reinforcing. Musson & Helmreich (2004) make a similar point when they comment on the key elements of Crew Resource Management that are particularly relevant to health care. In essence, the recommendation is that those developing a change program should not attempt to do too much and should be judicious in their selection of features from successful programs.

Additionally, any program for change that has been developed in this way should be evaluated in its intended environment. As noted above in reference to an observation by Helmreich &

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[5] I offer this illustration from Duhigg (2012) with some caution. Duhigg's rationale does not align precisely Weick's small wins rationale and the illustration Duhigg offers is anecdotal. I view this as an intriguing idea but one that requires some systematic exploration.

[6] Effective behaviours do not inevitably produce good outcomes, largely because a host of unmanageable factors can influence outcome.

Wilhelm (1991), even programs shown to be effective in one environment are not always effective in a new environment[7].

This completes the first phase of change management. The second phase, persuasion, should engage people in the experience of confronting the problem and working through the proposed solution. Those whose behaviour must change should be given an opportunity to engage with both the problem and the solution in ways that are meaningful to them. Ideally, this will be done in some sort of interactive experience, possibly a realistic simulation or exercise as undertaken within Crew Resource Management training for commercial aviation. Stories of successful action can also be effective if they contain a rich narrative. The prime requirement is that those who are being asked to change their behaviour must be able to engage vicariously with the experience of success in the face of challenges that come with implementing the new behaviour.

Management Culture

The literature in this area is not always clear about whether organisational dysfunction is a problem to be resolved at the level of management or at the level of operational work. My review suggests that a healthy organisational culture requires mindfulness at both levels. However, I concur with Westrum's (2009) observation that management dominates an organization's cultural style. Management had an important role to play in all of the positive illustrations I have outlined here. In particular, it is difficult to imagine how the new knowledge management system of the US 5th Fleet could have worked without support and validation from the senior command staff. Further, it is difficult to imagine how the movement towards Crew Resource Management could have succeeded in commercial aviation without statutory approval and management support.

What, then, is the solution when management fails to support the essential changes? It is evident from my illustrations above that a disengaged management contributes to a dysfunctional culture. How is it possible to engage a chronically disengaged management in the process of cultural change? Management is, after all, in charge no matter how well or how poorly the organization is functioning. Furthermore, it seems unlikely that managers who promote a dysfunctional organizational culture will respond constructively to a suggestion that they are part of the problem.

Movement in the right direction might be stimulated by the intervention of a statutory authority. The recent grounding of the Australian division of Tiger Airways by Australia's Civil Aviation Safety Authority presumably alerted the senior management of Tiger Airways to the criticality and systemic nature of their problems and presumably stimulated a systematic overhaul of procedures. Similarly, a threat of withdrawal of service by a major supplier or potential loss of a major client might stimulate critical self-reflection followed by organisational overhaul. Nevertheless, managers are human and as such, are remarkably resistant to confronting their own flaws. This particular problem remains as the major unresolved issue in the area of dysfunctional organisational culture and is one that is unlikely to have a straightforward solution.

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[7] The introduction of checklists into surgery offers a cogent illustration. As described by Gawande (2010), the successful use of checklists in other industries encouraged their introduction into health care. Nevertheless, early implementations were only marginally successful. Careful evaluation led to the improvements that established the value of checklists in surgery.

Summary: Cultural Change

The general strategy for cultural change that becomes evident from my review involves a two-stage process. The first step is to identify behaviors that lead to success and to then assemble a modest set of those behaviors into a new program. The second part of the cultural change process is about persuasion; how can we encourage possibly reluctant members of the organization to participate fully in the new program. This part of the program relies heavily on allowing people to experience the benefits of the new processes, either within operations, within realistic training simulations, or through rich, engaging narratives.

As noted in its definition, culture is about beliefs, values and behavioural patterns. That might seem to suggest that cultural change can be achieved by manipulating beliefs, values and behaviours of operational workers. However, the illustrations of organisational health I have reviewed indicate that enlightened approaches by a management have a powerful impact. Any program aimed at modifying the beliefs, values or behaviours of operational workers is likely to fail without a parallel transformation in the beliefs, values and behaviours of management.

General Summary

The ethnographic style of analysis I have used here is necessarily based on a limited number of illustrations. There are some other illustrations of organizational health and countless other illustrations of organizational dysfunction but those with which I are familiar do not add to the key indicators of organizational dysfunction or of organizational health that I have covered here. Nevertheless, it remains possible that different illustrations would offer other insights and we should remain sensitive to that possibility.

While my analysis was motivated by a general concern with safety culture, I argued that safety culture is aligned with organizational culture and that safety is just one of the many dimensions on which an organization must excel. Productivity, efficiency and competitiveness, to name only those that come immediately to mind, are also important. I often hear claims from senior managers such as *safety is our number one priority*. I suggest that such a claim be viewed with caution. The National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling (2011) noted that prior to the Deepwater Horizon accident, BP management had been making such claims for many years without any noticeable improvement in system safety. In the terms I outline in this brief, their approach, while possibly sincere, was mindless. If, on the other hand, the establishment of *safety as the number one priority* is mindful, being aimed at tapping the power of small wins or generating benefits from changing a keystone habit, it is likely to generate widespread benefits.

Early in the brief, I noted Westrum's (2009) cultural styles; a pathological emphasis on power and control, a bureaucratic emphasis on rules, order, and accountability, and a strategic emphasis on mission capability. I argued that organisational dysfunction does not result from an emphasis on power and control or on rules, order, and accountability, but rather from a mindless and disengaged approach to the complexities and challenges of work at both the management and the operational levels. I have no doubt that a mindless and disengaged emphasis on power and control or on rules, order, and accountability is a sign of a dysfunctional culture, but I see no evidence that a mindful and engaged approach to power and control or to rules, order, and accountability is associated with a dysfunctional culture.

What I do see is that disengagement and mindlessness are always problematic, whether exhibited by managers or by operational personnel. In contrast, mindfulness and engagement are powerful forces within healthy organizational cultures. Building on Weick and Sutcliffe

(2001), I view managers and operational personnel as mindful if they are sensitive to the complexity and demands of operational work, if they defer to the expertise held by others, and if they are committed to effective operational performance. I view managers and operational personnel as engaged if they maintain a strong connection to the challenges and opportunities resident in the work, if they continue monitor progress actively, and if they are conscious of having a stake in progress.

It has proven notoriously difficult to transform a dysfunctional organizational culture into a healthy one. The problem stems, at least in large part, from the fact that a dysfunctional management style has a strong influence on organizational culture. Managers, as is true of people in general, are remarkably resistant to confronting their own flaws. Nevertheless, cultural change is possible given relevant statutory approval and management support.

To succeed, a program of change should identify the problem and then develop a workable solution. That solution might often be found in similar organizations that have a healthy culture. Full implementation of the change requires a concerted and focused effort to persuade those whose behavior must change of the value of the program. A training program that provides experiential engagement with the benefits of the new program has also proven to offer a powerful method of inducing change in organizational and safety culture.

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