

Pyramid Building

Safety culture can be envisioned as a pyramid with safety values at the base.

BY RICK DARBY

BOOKS

An Essential Shift

Safety Culture: Building and Sustaining a Cultural Change in Aviation and Healthcare

Patankar, Manoj S.; Brown, Jeffrey P.; Sabin, Edward J.; Bigda-Peyton, Thomas G. Farnham, Surrey, England and Burlington, Vermont, U.S.: Ashgate, 2012. 258 pp. Figures, tables, references, index.

For most of aviation history, safety progress took place on two fronts: improved technology and regulation derived from lessons learned through accident investigation. Enormous advances have resulted. But while technology and regulation still have a role, they appear to have reached a point of diminishing returns.

“In the early years of aviation, most of the accidents were attributed to unreliable technology,” the authors say. “As the technical reliability improved ... the complexity of challenges increased; and as the business of air travel became more complex, the improvements in technology alone were no longer sufficient to improve safety.”

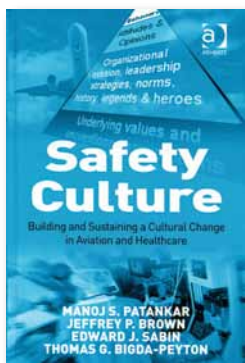
Similarly, they say, “The compliance-based safety culture has reached its saturation limit: further addition of regulations is not likely to

produce an appreciable increase in safety. On the contrary, addition of regulations could restrict the system’s ability to improvise in the face of new threats.”

What will provide the next game changer in risk management? The authors, and many safety specialists, argue that the answer is evident and in some quarters already established in practice: a safety culture in aviation *organizations*. The authors say, “In the last three decades, the emphasis has shifted toward the human element — first in terms of team communication (crew resource management and maintenance resource management) and now in terms of organizational change.”

Organizational safety culture, however, is a different *kind* of concept than technology and regulation. Compared with those, it is in some ways more elusive. Technology is based on application of physical laws, regulation on enforcement of written rules. Organizational safety culture is structured by principles, but ultimately is about attitudes and values that cannot be reduced to a formula.

As the authors are quick to point out, the values of a safety culture can co-exist with and ultimately benefit business management. But at



the level of day-to-day decision making it may well go against traditional practices and natural human reactions. Take, for instance, the idea of a “just culture,” which the authors describe as “an essential philosophical shift.”

The concept can be a hard sell to managers who are paid to maximize profits. To be just to *them*, commercial aviation is a notoriously boom-and-bust business, rife with bankruptcies, and managers need to be tough-minded in pursuing profit if their companies are to survive. The authors point out, however, that “as long as organizations and legal systems use consequence of an error, rather than the underlying behavioral pattern, as the primary criterion to decide rewards and penalties, an unjust culture will prevail. At-risk behaviors tend to be rewarded when they produce positive business outcomes and penalized when they produce negative business outcomes.”

The authors counsel abandoning that policy: “In the future, emphasis must be on controlling the underlying at-risk behavior regardless of the consequence of the behavior. A non-punitive error reporting system, through improved quality of work and increased productivity, is a foundational mechanism to not only improve the safety but also make a significant contribution to the financial health of the organization.”

Despite the popularity of the term “safety culture,” it is not always clear what such a culture includes. The book is organized around a model developed earlier by two of its authors, Patankar and Sabin, which they call the safety culture pyramid.

“At the tip of the pyramid is safety performance (or safety behaviors), followed by safety climate (or employee attitudes and opinions regarding safety); next are the safety strategies and, finally, safety values form the foundation. We present this model as a pyramid because it provides a unique way of describing the linkages across various theoretical constructs.”

Safety Performance

Safety performance includes “events such as accidents, incidents and errors, as well as the

individual human behaviors that may be safe or unsafe practices,” the authors say. Historically, accident investigation has focused on performance problems such as “blatant disregard for established procedures, lack of training, routine preference [for] speed over accuracy and, in some cases, rewarding of risk-taking behaviors. Most such investigations focus on the behavioral aspects or factors that are readily observable and directly attributable to the accident under investigation.”

They cite the report on the 1989 Air Ontario accident at Dryden, Ontario, Canada as a turning point, when “the investigators were specifically instructed to go beyond the traditional causal mapping and uncover the deeper, organizational issues. ... From the perspective of the safety culture pyramid, the contributing factors are very important because they may contain information about underlying and commonly present behavioral traits and systemic opportunities that should be managed in order to improve the safety performance of the organization.”

As with the other three levels, the book contains a detailed chapter considering issues implied by safety performance. One issue is whether safety performance management is reactive, proactive or predictive.

“One could consider these categories as progressive improvements or as a measure of maturity,” the authors say. “Integral to this strategy is the data acquisition and analysis capability. In a reactive strategy, the undesirable event serves as the trigger and a [root cause analysis] approach is used to assemble the relevant data; however, the data tend to be focused on a specific event and on the historical trend of precursors. In a proactive strategy, safety performance data are collected as a matter of standard and routine practice, and systemic issues are addressed prior to the occurrence of an undesirable event. ... In a predictive strategy, the data analysis is significantly sophisticated; multiple sources and types of data are integrated; and advanced data mining tools are used to discover unique patterns

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of coincidences that are typically difficult to identify.”

Safety Climate

Safety climate consists of employee attitudes and opinions about safety. “Survey questionnaires are commonly used to measure safety climate, which is a snapshot of the sample population at the time of the survey,” the authors say, noting that there are currently more than 50 safety culture/climate survey instruments.

The chapter discusses how questionnaires are developed, tested and used. The authors look at ways safety climate can be affected by interventions such as training. They describe a survey consisting of questions and discussion items for focus groups drawn from the U.S. Federal Aviation Administration Air Traffic Organization, Technical Operations. Many illustrations of the kinds of information that can be obtained through a survey are included. For example:

“Initially, most participants commented that their current safety culture was very good and needed little improvement. Their reasoning was based on a high equipment availability level. However, as the discussion continued, they acknowledged that the number of highly skilled senior staff is decreasing due to retirement, while the number of new systems to be maintained and the number of flights are increasing; the system is being stressed. The safety limits of this system are not known, but it seemed to be held together by several individuals who routinely went beyond their call of duty.”

Safety Strategies

The safety strategies layer of the pyramid comprises “leadership strategies; organizational mission, values, structures and goals; processes, practices and norms; and history, legends and heroes.”

Safety strategies can be broadly classified as value-based or compliance-based, the authors say. The difference is between strategies internal to the organization versus those derived

from external pressures, whether regulatory- or business-generated. “In most cases, however, safety strategies are a result of a combination of the two — there’s a sufficient level of readiness for change in an organization and the external pressures serve as catalysts, accelerating the adoption of the changes,” the authors say. “Compliance-based strategies tend to be reactive and focused on the short-term goals; value-based strategies tend to be proactive and focused on the long-term goals.”

Leadership drives safety strategies, the authors say: “Alignment across organizational mission, values, strategies, structures, processes and practices is critical in achieving a strong safety culture.”

Safety Values

“Shared values and beliefs are the foundation of a culture,” the authors say. “In understanding the safety culture of an organization, it is critical to delve deep into the discovery of the shared values, beliefs and unquestioned assumptions.”

The enacted values of an organization — the ones actually practiced — may be at a considerable distance from those proclaimed in official statements and public relations material. The chapter discusses two methods to discover the enacted values within a group.

- “Deep dialogue” is a kind of conversation that digs beneath the surface of people’s conventional and automatic responses, engaging them in “productive and reflective thinking so as to fully express the deepest beliefs and unquestioned assumptions that may be linked to their behaviors.”
- “Narrative analysis” elicits “stories or experiences of employees across the organization to extract themes that can be associated with enacted values.” Examples of such themes are consideration, organization and planning; timely information; and participation in decision making.

“If the enacted values don’t conflict with the espoused values, there’s likely to be less

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confusion and dissatisfaction among employees,” the authors say. “[Other researchers] argue that values are owned and practiced by individuals, not organizations; individuals imprint their values on the organization. So, if there’s a significant gap between the espoused and enacted values of the organization, the personal values of the leadership of the organization need to be assessed.”

Besides the pyramid or “vertical” scale of safety culture, the authors propose two “horizontal scales” along which organizations can be categorized.

One is the accountability scale, whose states are “secretive,” “blame,” “reporting” and “just” cultures. To take the two extremes: in a secretive culture, “the organization is highly reactive, operates in a crisis mode for most events and basic resources are tied to operational metrics with extremely limited accommodation for safety issues. Therefore, when safety issues arise, resources are either cannibalized from existing operational requirements or external sources, such as insurance claims or [government] aid, need to be accessed.”

In a just culture, “the people are encouraged, even rewarded, for providing essential safety-related information. In normal operations, emphasis is placed on the development of strong safety behaviors — actions, independent of their outcomes, are judged. Risk-taking behaviors are penalized, regardless of the actual loss/benefit, and risk-conscious safety behaviors are supported, even if they result in an undesirable event. Emphasis is placed on systemic investigations and solutions. Both management and employees are held accountable for safety improvements, and therefore employee-management trust is very high.”

The second scale, the learning scale, involves states including “failure to learn,” “incremental learning,” “continuous learning” and “transformational learning.” An organization stuck in a failure to learn state is “characterized by recurrence of undesirable events with similar causal contributors.” Where incremental learning rules, change is typically in response to specific

negative experiences, and learning behavior is directed at preventing those particular events from recurring. For example, “in the case of aircraft maintenance, the organization conducts special training regarding wheel maintenance but does not address known errors in other maintenance procedures with similar root causes.”

A continuous learning organization “creates systems — structures, processes and people — that not only capture learning opportunities but also implement solutions that address broad systemic issues.”

An organization in a state of transformational learning “would already have a system in place to prevent errors and be proactive in minimizing the probability of errors across the organization. Such an organization would also be recognized among its peers as one that leads in safety innovations and shares safety information freely — an organization that does not compete on safety.”

Crucial Ingredient?

Situational Awareness

Salas, Eduardo; Dietz, Aaron S. Farnham, Surrey, England and Burlington, Vermont, U.S.: Ashgate, 2011. 546 pp. Figures, tables, references, index.

“Research over the past three decades has demonstrated the importance of situational awareness in the safety and efficiency of flight operations,” the editors say in the introduction to this massive volume. “For instance, situational awareness has been described as a crucial ingredient for proficient decision making in the cockpit. Yet a universal agreement of what situational awareness actually represents remains ambiguous and some have questioned the utility of the construct entirely.”

The book consists of reprints of academic and scientific papers, divided among the following headings: “Definitions and Theoretical Perspectives”; “Methodological Issues and Approaches”; “Applications of the [Situational Awareness] Construct”; “Beyond Aviation”; and “Commentary and Review.”

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