

# The High-Reliability Organization

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There is a high potential for catastrophic failures in the dynamic and complex world of aviation operations. Yet, catastrophes are avoided on a daily basis due to processes and procedures working correctly. And even when errors do occur, the likelihood of a catastrophic failure due to cascading errors is extremely remote. That's the good news.

Now the bad news. When cascading errors do occur, with little or no mitigation, the probability of a catastrophic event becomes more likely (think Swiss Cheese model). Catastrophes are typically the end stage of a series of failures that may have been latent in the system for a long period of time, perhaps years. Catastrophes typically are not the result of one errant individual; instead, that individual may just be the "trigger puller" for an accident that was waiting to happen. In many cases, accident precursors can be traced all the way back to poor management decisions at the highest levels of the organization.

By definition, a high-reliability organization (HRO) is an organization that has succeeded in avoiding catastrophes in an environment where normal accidents can be expected due to risk factors and complexity. An HRO has five characteristics:

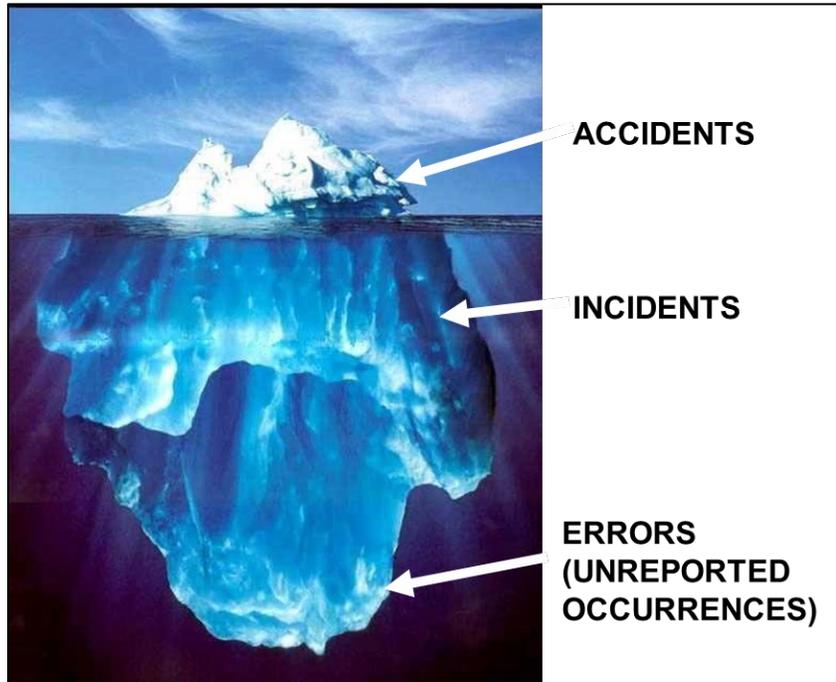
- Preoccupation with failure
- Reluctance to simplify interpretations
- Sensitivity to operations
- Commitment to resilience
- Deference to expertise

## **Preoccupation With Failure**

History has shown that organizational complacency has been a factor in major accidents. Organizations that have had no significant failures over a long period of time may feel as if failures—especially catastrophic failures—are so unlikely, that they begin to let their guard down. Complacency can affect the entire organizational hierarchy.

HROs recognize that complacency is a significant threat and they address this with a preoccupation with failure, almost to a point of obsession. Rather than thinking “everything is okay because we haven’t had an accident,” HROs constantly dig deeper and focus on the seemingly trivial occurrences that, over time, can become more consequential. This is done by treating any lapse as a symptom that something may be wrong, and viewing multiple “small errors” as weak signals of larger failures. Collecting data for small lapses and errors can be challenging, as many of these trivial events are not required to be reported. Thus, the organization encourages reporting of errors through a voluntary, non-punitive reporting system.

Rather than ascribing blame or punishment, an HRO uses these reports to focus solely on understanding “what’s going on below the waterline” and to put corrective and preventive measures in place to prevent these events from “rising to the surface” as an accident. The well-known Iceberg metaphor (see figure below) is used to show the various depths of safety event visibility. Non-HROs may put their emphasis on the middle and top levels by utilizing a mostly reactive approach to accidents and incidents. HROs, on the other hand, put more emphasis on the bottom of the iceberg (proactive).



The "Iceberg" Metaphor

### **Reluctance to Simplify Interpretations**

HROs resist the common tendency to oversimplify explanations of events and to steer away from evidence that disconfirms management direction or suggests the presence of unexpected problems. In organizational behavior, it is very common for management, as well as line personnel, to oversimplify things for the sake of efficiency and expediency. As mentioned earlier, complacency can be a major contributor to this type of behavior. This may be compounded by other factors such as:

*Hindsight Bias*- The tendency to believe that current and foreseeable outcomes will be the same as outcomes that have happened in the past, despite disconfirming evidence.

*Confirmation Bias*- The tendency to search for, interpret, focus on, and remember information in a way that confirms one's preconceptions, even if erroneous.

*Path of Least Resistance*- A pathway that provides the least resistance to forward motion by a given object or entity, among a set of alternative paths.

In most circumstances, these factors, when they are part of the behavioral dynamic, lead to no adverse outcomes. In other circumstances, an oversimplification of explanations can have catastrophic results. That was the case in the Bhopal gas leak accident in 1984. Union Carbide (the operator) stated that a gas leak could never happen because the plant was closed. But a gas leak did happen, and 3,787 people died as a result. Management made a critical mistake by oversimplifying the situation—*the plant was closed*.



Union Carbide Plant, Bhopal, India (1984)

## **Sensitivity to Operations**

HROs are highly vigilant. They have the big picture of what is going on by integrating information about operations and performance into a single picture of the overall situation and operational performance. This sensitivity to operations (or situation awareness) allows for early problem identification, permitting action before problems escalate.

In order to achieve the above, an HRO will have a high level of team situation awareness. This means that *all* personnel should have a “working mental picture” of the operation. Highly effective communication and teamwork are required. HROs will understand the limitations and challenges of group dynamics and address them accordingly. A few of these group dynamic limitations are: *groupthink* (the desire for harmony or conformity in a group can result in an irrational or dysfunctional decision-making outcome), *pluralistic ignorance* (“I’m sure someone else will report it or take care of it”), and *assertiveness* (speaking up if something doesn’t look right, or is wrong or incorrect).

## **Commitment to Resilience**

HROs understand and accept that human error and unexpected events are both persistent and omnipresent. They are prepared to take action when something goes wrong—even by surprise. HROs are able to respond to, contain, cope with, and bounce back from undesirable change swiftly and effectively, providing resilience in a complex and dynamic environment. Therefore, it is key for the organization to have an effective emergency response plan (ERP), contingency plans, and the ability to solve problems expeditiously and decisively.

Airlines have begun to realize the benefits of resilience-building in flight operations by incorporating evidence-based training (EBT) programs. EBT builds resilience by focusing on the management of threats, errors, and undesired aircraft states (precursors to accidents and incidents). This type of training better prepares flightcrews for unforeseen situations (i.e., ‘Black Swan’ events). Although every possible scenario cannot be anticipated, or trained for, EBT enhances pilots’ skill sets so they are able to effectively, and synergistically, work through various situations that may occur.

### **Deference to Expertise**

Safety knowledge is limited at the highest levels of the organizational chart. Upper-management is involved with business processes, and their focus is on, among other things, profitability, production, expansion, mergers and acquisitions, return on investment (ROI), etc.

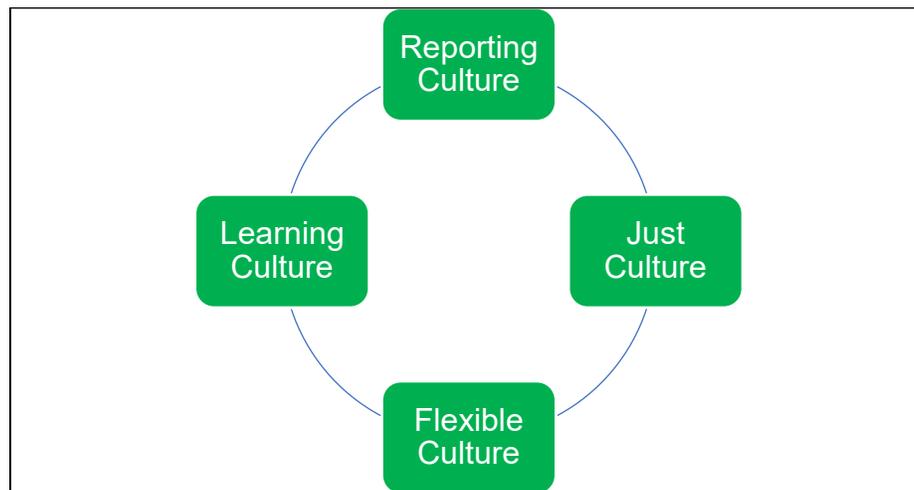
Personnel involved in safety processes are found in positions lower on the organizational chart. These employees are subject matter experts (SMEs) in safety and quality processes, who are closest to the problem, and are in a much better position to make operational safety decisions quickly and accurately. HROs loosen hierarchical restraints so that the organization can shift leadership, when required, to SMEs who are more qualified and able to deal with problems directly. This eliminates the bureaucratic hurdles that can impede prompt resolution of safety issues.

## Becoming an HRO

The good news is that HRO processes can be effectively achieved through your safety management system (SMS). The bad news is if that if you do not have an SMS, it will be nearly impossible to be an HRO. HRO implementation is a deep-seated process that is, or will be, part of the organization's DNA. An HRO can be measured (quantified), felt (cultural zeitgeist), and heard (communicated) throughout the entire organization.

The foundation for a successful HRO is *safety culture*. This includes management buy-in, trust, shared perceptions of safety by management and workers, and the understanding that everyone, at every level, is responsible for safety.

Safety Culture can be further classified into the following subcategories, which are essential elements of an HRO culture:



Essential Elements of an HRO Culture

## **Reporting Culture**

A Reporting Culture encourages the use of a non-punitive reporting system to capture the otherwise unreported hazards, errors, and other safety events that are occurring at the “bottom of the iceberg” (discussed earlier).

## **Just Culture**

A Just Culture encourages safety communication from all levels of the organization, and where personnel are not punished for actions, omissions, or decisions taken by them which are commensurate with their experience and training. However, a line is drawn where gross negligence, willful violations, and destructive acts are not tolerated.

## **Flexible Culture**

A Flexible Culture is a culture that can quickly adapt to situations before outcomes become consequential. As mentioned earlier, HROs are able to respond to, contain, cope with, and bounce back from undesirable change swiftly and effectively, providing resilience in a complex and dynamic environment.

## **Learning Culture**

A Learning Culture is a culture that learns from its mistakes and makes changes as needed. Organizations with a Learning Culture understand that errors and near misses are effective learning tools that can help to prevent safety occurrences in the future. This is in

contrast with organizations that hide, or suppress, safety information, often with the belief that if it's hidden "it never happened," or "it will just go away." Unfortunately, many organizations still subscribe to this paradigm.

### Summary

Aviation, like any other high-risk industry, must manage safety risks in complex and dynamic environments. In this article, the five characteristics of an HRO were discussed. These were: 1) Preoccupation with failure, 2) Reluctance to simplify interpretations, 3) Sensitivity to operations, 4) Commitment to resilience, and 5) Deference to expertise.

Organizations must have a culture that will support the fundamental objectives of an HRO. The key elements of a safety culture are: 1) Reporting Culture, 2) Just Culture, 3) Flexible Culture, and 4) Learning Culture.

Hopefully, this article shed some light on what an HRO is, as well as how to become an HRO. And to reiterate an important point: HRO processes can be effectively achieved through your SMS!

Is yours a high-reliability organization? Think about it.

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## Works Referenced

National Advanced Fire & Resources Institute. (n.d.). HRO Implementation on the Shoshone National Forest. [http://www.high-reliability.org/Shoshone\\_Case\\_Study.pdf](http://www.high-reliability.org/Shoshone_Case_Study.pdf).

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (1999). Organizing for High Reliability: Processes of Collective Mindfulness. In B. M. Staw & L. L. Cummings (Eds.), *Research in Organizational Behavior* (Vol. 21, pp. 81-123). Greenwich, CT: JAI Press, Inc.

Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the Unexpected: Assuring High Performance in an Age of Complexity* (1st ed.). San Francisco: Jossey-Bass.

Weick, K. E., & Sutcliffe, K. M. (2007). *Managing the Unexpected: Resilient Performance in and Age of Uncertainty*, Second Edition. San Francisco, CA: Jossey-Bass.

Weick, Karl E.; Kathleen M. Sutcliffe (2001). [Managing the Unexpected - Assuring High Performance in an Age of Complexity](#). San Francisco, CA, USA: Jossey-Bass. pp. 10–17. [ISBN 978-0-7879-5627-1](#).