

by James Reason Ashgate Publishing Co. Published in 1997 (reprinted 2002). 252 pages.

Book Review by David Fuller

James Reason is considered to be the leading authority on human error, and his work is cited by every other expert in the field. Professor Emeritus of psychology at the University of Manchester, UK, he has written many papers and books on human error. In 1997 he wrote *Managing the Risks of Organizational Accidents*.

In his preface, he writes that the book, ". . . is aimed at 'real people' and especially those whose daily business is to think about, and manage or regulate, the risks of hazardous technologies." This book is for those who want to understand how accidents happen, and more importantly, how to minimize the risk of accidents in their organization.

Reason uses many case studies throughout the book to illustrate his principles of organizational culture and human error. His "Swiss Cheese" model of defense is a paradigm of how we create layers of defenses to keep accidents from happening. No defense is perfect, and the holes are circumstances that can't be foreseen, or risks that are perhaps considered unlikely to happen. These layers are not static, but in fact are usually in a state of flux, shifting and changing over time. The Swiss cheese model allows us to see how the holes in the defense layers can sometimes line up to let threats pass through and cause accidents.

Reason states that in most cases the human error so often attributed as a cause in an accident investigation is merely a symptom of the underlying organizational factors that allow the right (or wrong, in this case) series of events to occur in just the right (wrong) sequence to result in an accident. Human error can never be eliminated because it is basic to human behavior: most of the time we automatically correct our mistakes with little or no consequence. These are called common errors. Consequential errors, on the other hand, are those that result in an accident.

Reason discusses the three levels of human performance: skill based, rule based, and knowledge based. Skill based actions are routine highly practiced tasks that are performed automatically, such as typing. Rule based activities are applications of memorized or written rules (procedures) to perform a task, such as filling out simple forms. Knowledge based activity is where most of us get into trouble, confronted with a novel problem that requires lots of attention. This focusing of attention can distract us from other tasks and can quickly lead to losing situational awareness.

Reason points out that many accidents and incidents are a direct result of maintenance on the components or systems. He applies three criteria, direct handling by humans, criticality of activity, and frequency of activity, for determining the risks of three activities usually associated with hazardous systems; normal and emergency control, and maintenance related activities. Maintenance activities rate high in all three categories: highly hands-on, highly critical, and very frequent.

Reason gives us the four critical components of a Safety Culture.

- 1)** It is a reporting culture. Unless an organization knows the extent of its problems, it can never implement ways to reduce risk.
- 2)** It is a just culture. It has a clear set of principles that differentiate between acceptable and unacceptable behavior.
- 3)** It is flexible culture. It can shift patterns of authority based on functional skill to meet changing situations.
- 4)** It is a learning culture. It doesn't disregard lessons learned, and pays attention to the nuances of daily activities. As Peter Senge said, "Learning disabilities are tragic in children, but they are fatal in organizations. Because of them, few corporations live even half as long as the person. Most die before they reach the age of 40."

Managing risks is an ongoing endeavor that requires constant vigilance and a commitment to be as safe as possible. However, we all know that if an organization is unwilling to take any risk, it soon ceases to be viable. Reason shows that an organization can maintain a balance between production and protection and still prosper. If you take one message from this book, it should be that humans will always make mistakes, if simply because not all circumstances or combination of events can be foreseen. It will always be a question of when, not if, an event will occur that could seriously damage the system, the organization, or innocent bystanders. Creating and maintaining a safety culture greatly reduces the risk that an error will become consequential.

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