Real-World Reliability

BY JAKE MAZULEWICZ, PH.D.

How high-reliability teams build resilience instead of chasing zero errors

Wildland firefighters. Air traffic controllers. Flight deck crews of Navy aircraft carriers. Operators of nuclear power plants and the national bulk electric grid. These are among the safest and most reliable work teams in the world. And they don't try to eliminate all errors and surprises.

Decades of experience have shown that the crusade to eliminate every error is both impractical and unwise. So, what do high-reliability work teams do instead? They operate so that errors and surprises don't disable them. Instead of being brittle or fragile, these teams seek to build resilience.

In the past 30 years, researchers have discovered a few unusual traits that high-reliability organizations share. For example, they tend to trust the workers with the most expertise, not the most status. They also tend to respect the complex, often sticky ground truth of how work actually gets done, instead of trying to oversimplify and "proceduralize" everything. And of course, high-reliability organizations seek to build resilience.

Many of the articles and books on high-reliability organizations were written by academics—and perhaps even for academics. The result? A lot of confusion about exactly how to turn high-reliability organizations theory into real-world practice. Many modern front-line teams in electric power utilities, gas and oil, renewable energy, maritime shipping, and other high-hazard industries are still looking for concrete, practical ways to build resilience into their everyday work.

There is no one recipe to follow. There is no single playbook or procedure that guarantees success. That's why some people now speak of high-reliability organizations—HROs—as high-reliability organizing—a verb, not a noun. Yet nearly all reliability-seeking teams use several classic, time-tested strategies. Here are three of them.

1 WATCH FOR WEAK SIGNALS

Mark leads a team of five electric utility line workers. They install, repair, and maintain the 250,000-volt power lines on 150-foot tall metal towers. Mark's team is widely respected for being consistently safe and efficient, but they often get criticized for talking too much while working. And they do chat and banter through most of the workday. Some team leaders hate this. But Mark actively supports it. Why? Because long before any of his operators get indecisive,
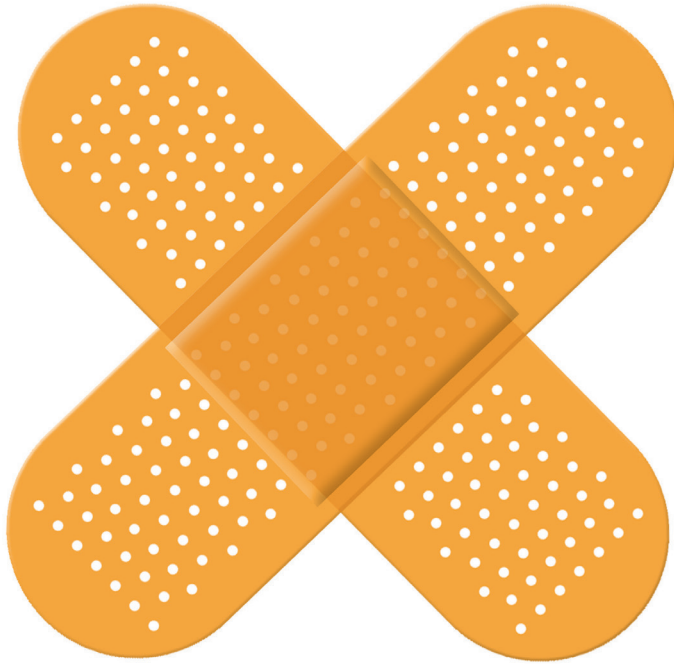
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confused, stressed, or in trouble, Mark hears subtle changes in their usually playful banter.

Mark realized this "weak signal" was a clever early warning system. Over time, he identified more weak signals and learned how and when to best respond to each one. Mark's team is more resilient than most others partly because he resolves potential problems, surprises, and errors long before most other team leaders even notice them.

What's one weak signal in your line of work that took you a long time to learn, and that helps you catch errors or problems early, while they're still relatively easy to address? What are the best weak signals that three to five of your most trusted peers use? How could you train the apprentices in your team to recognize and act on these weak signals earlier in their career than you did?

2 EMBED FAIL SAFES

How can we ensure that a carpenter doesn't accidentally put their finger into the razor-sharp, spinning blade of a table saw? The answer is simple: we can't.

Trying to eliminate all errors or to "proceduralize" everything in most modern jobs is impossible. So, the world's most high-reliability teams take a different approach. They adjust their systems not to prevent all failures, but to help them fail safely, then recover quickly, easily, and cheaply.

Many modern table saws include a clever safety system. The spinning blade actually senses electrical conductivity. If it senses a highly conductive material like your finger, it slams the spinning blade to a full stop within a few thousandths of a second. It doesn't prevent the error. It prevents that error from disabling you. The result? Instead of a severed finger

and a lifetime of regret, you get a small nick and a lesson you will never forget.

What's one common, serious error that people often make in your line of work? If it's impractical to eliminate that error, then how could you become more resilient to it? What kind of fail safe would allow you and your peers to make that error with minimal consequences, learn from it, and recover from it quickly, easily, and cheaply?

3 PRACTICE UNCERTAINTY

After World War II, a European general commented that Americans are so good at war because war is chaos, and nobody practices chaos on a daily basis like the Americans.

High-reliability teams train and practice regularly. But they don't just practice the "right" procedures for everyday tasks. They practice chaos, or at least uncertainty. For example, a pilot climbs into a flight simulator without knowing that her simulated plane will soon be struck by lightning. A nurse gives a mock medication to an advanced life-like mannequin that has been secretly programmed to simulate a heart attack without any warning. Pilots and nurses handle their respective surprises. Afterward, they debrief with their peers and learn without blame.

Does your team practice responding to unexpected errors, emergencies, or other surprises in a safe way? If not, then start with a few simple, even fun experiences like interactive, discussion-based case studies. Pick an incident relevant to your work that happened one to three years ago. Tell your team how the job started, but don't reveal the error or surprise yet. Ask them, "What are some risks you sense here, and how would you handle them?" After the discussion peaks, then reveal "what happened" in the incident and discuss what surprised them, how they would respond, and why. Debrief together to share insights, lessons learned, and good practices on how to respond to uncertainty with resilience.

For decades, high-reliability organizations have used these and similar methods to build resilience instead of chasing the illusion of an error-free workplace. What kind of results could they generate for your team? ⏹

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