INTELLIGENCE UPDATE

Error-proof emergency communications for facility teams


Rose Weinschenk

20 May 2025

Improving individual performance is a proven way of reducing human error. However, in the data center industry, operators often overlook team-level errors arising from poor communication among staff members, particularly across different departments and levels of the workforce. This breakdown in communication can foster an environment where preventable errors go unnoticed or unaddressed.

Operators may struggle when choosing effective strategies to enhance communication and minimize team errors. Many training programs are not tailored to the mission-critical environment of a data center, and workers may not be receptive to “soft skills” training if they deem it irrelevant to their core duties.

This report presents strategies to improve communication and responsiveness among data center teams, drawing insights from other mission-critical fields such as aviation and emergency medicine. Previous Uptime Intelligence research has shown how these industries apply cognitive science principles to procedure design to reduce individual human error (see *Effective EOPs: How cognitive science can help*). Data center operators can apply this same framework to mitigate points of failure that arise in group settings.

A Crew Resource Management framework

Industries that rely on team cohesion in emergency settings often turn to Crew Resource Management (CRM) — a set of communication standards developed by NASA in response to fatal aviation incidents caused by poor communication. CRM removes unnecessary information from interactions during an emergency and conditions team members to speak up when they detect anomalies during their shift.

By reducing cognitive load, CRM allows team members to devote more working memory to shared situational awareness and problem solving, thereby lowering the risk of human error. A holistic CRM strategy targets several common pitfalls that undermine team responsiveness.

Hierarchy paralysis

Hierarchy paralysis occurs when critical information is withheld by junior staff due to the belief that speaking up may undermine the chain of command. Junior operators may notice an anomaly or suspect a procedure is incorrect but often neglect to disclose their concerns until after a mistake has happened. They may assume their input will be dismissed or even met with backlash due to their position. In many cases, their default stance is to believe that senior staff are acting on insight that they themselves lack.

CRM trains employees to follow a structured verbal escalation path during critical incidents. Similar to emergency operations procedures (EOPs), staff are taught to express their concerns using short, direct phrases. This approach helps newer employees focus on the issue itself rather than navigating the interaction's social aspects — an area that can lead to cognitive overload or delayed action. In such scenarios, CRM recommends the "2-challenge rule": team members should attempt to communicate an observed issue twice, and if the issue remains unaddressed, escalate it to upper management. Higher-ranking workers familiar with CRM can anticipate this neutral form of feedback without becoming defensive.

Task fixation

Task fixation is the tendency of workers to hyperfocus on a specific task or element of a task, leading to a loss of situational awareness. When the brain detects a threat, it devotes all its cognitive resources toward resolving it. Stimuli that are unrelated to the priority task are deprioritized. In extreme cases, this can lead to auditory exclusion — the temporary inability to process sounds the brain deems irrelevant — to preserve attention. In a data center, task fixation can result in operators ignoring alarms and generally losing situational awareness, increasing the risk of error.

CRM anticipates task fixation by embedding periodic "go/no-go checkpoints" into procedures. At these checkpoints, operators are trained to confirm with team members that certain conditions are met before proceeding. This strategy opens space for junior-level employees to voice challenges. It also helps workers avoid task fixation by prompting them to break from each task to reassess the conditions of their work environment.

Miscommunication

A core aim of CRM is miscommunication management. CRM recognizes that during emergencies, individuals can process only small strings of information. Multiple sources of auditory stimuli can further disrupt the transfer of information. As a result, lapses in communication can drive team members to assume that others are handling or addressing tasks, leading to coordination failures.

Briefings with Uptime Network members revealed that while miscommunication can occur between any two staff members, it is more often observed among senior personnel with long

tenure. Complacency may lead these individuals to assume that a coworker will perform an action without a verbal or visual confirmation. For example, an experienced operator performing a load transfer may yell that they are about to drop utility power, expecting a junior coworker to respond by closing the generator's break tie. However, the less experienced staff member may assume the operator intends to proceed with the break tie open. The action is performed, and an outage occurs.

Another common scenario involves a staff member mistaking a coworker’s affirmative response as confirmation that a task has been completed, rather than simply acknowledged. Vague phrasing, such as “got it,” can be misinterpreted, potentially meaning either that the command was heard or that the action was performed. This ambiguity can lead to errors.

It is vital to eliminate unnecessary information, verify that the message reaches the intended recipient, and confirm that it has been understood correctly. In CRM, this process is called closed-loop communication. It reduces interactions to five key steps:

1. Person A issues a verbal command to Person B.
2. Person B acknowledges their understanding of the command by repeating it back to Person A.
3. If the repeated information is correct, Person A authorizes Person B to proceed.
4. Person B completes the task and alerts Person A of the status change.
5. The cycle repeats until all steps are complete.

This structure ensures that there is little room for ambiguity or gaps in situational awareness between operators.

Role confusion

Role confusion emerges when employees fail to pre-assign duties for potential emergency scenarios before a shift. In such cases, workers spend valuable cognitive resources developing a plan rather than implementing it. Under these conditions, information can be difficult to process, and any plans may overlook crucial tasks. This also increases the risk of task overlap.

CRM addresses role confusion through pre-shift briefings that ensure all team members know their roles and those of their coworkers. While pre-shift briefings are common in many work settings, CRM adds some distinctive elements. CRM-informed briefings incorporate input from the entire team rather than a single individual. They also emphasize situational awareness by asking team members to identify potential risk areas ahead of the shift. This slight adaptation primes team members to react quickly to any of the various situations that may arise.

Making it permanent

CRM training directly incorporates desirable “soft skills” into daily procedures as clear, actionable steps. However, implementing CRM often requires staff to modify their established routine, sometimes by adding new tasks. In some cases, this can lead to resistance, as workers

may be hesitant to adapt to new rules or changes to familiar routines.

However, team leaders can increase the likelihood of successful CRM adoption by following these guidelines:

- Incorporate verbiage into EOPs and standard operating procedures, such as go/no-go checkpoints, that directly prompts staff to perform specific CRM actions.
- Have respected team leaders model the new behaviors to encourage broader adoption by staff.
- Provide positive feedback for junior-level staff who alert the team about potential issues.
- Design failure drill scenarios that include problems CRM can solve, such as role ambiguity, and assess for specific CRM behaviors.
- Use checklists that include CRM steps in all post-drill briefings.

The Uptime Intelligence View

Strengthening emergency protocols can help eliminate miscommunication between employees and departments. Owners and operators can adopt strategies from other mission-critical industries to reduce human error and improve team responsiveness. While interpersonal issues between departments and individuals in different roles are inevitable, tighter emergency procedures can ensure consistency and more predictable team behavior.

Other related reports published by Uptime Institute include:
Effective EOPs: how cognitive science can help

ABOUT THE AUTHOR

Rose Weinschenk

Rose is a Research Associate at Uptime Institute covering staffing and education in data centers. Her background includes psychology research, with a focus on ethics.

RWeinschenk@uptimeinstitute.com

About Uptime Institute

Uptime Institute is the Global Digital Infrastructure Authority. Its Tier Standard is the IT industry's most trusted and adopted global standard for the proper design, construction, and operation of data centers – the backbone of the digital economy. For over 25 years, the company has served as the standard for data center reliability, sustainability, and efficiency, providing customers assurance that their digital infrastructure can perform at a level that is consistent with their business needs across a wide array of operating conditions.

With its data center Tier Standard & Certifications, Management & Operations reviews, broad range of related risk and performance assessments, and accredited educational curriculum completed by over 10,000 data center professionals, Uptime Institute has helped thousands of companies, in over 100 countries to optimize critical IT assets while managing costs, resources, and efficiency.