INTELLIGENCE UPDATE

AI-generated operating procedures carry a safety risk


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The data center industry continues to speculate on AI's future role in operations. Although current use cases are typically limited to predictive maintenance and sensor data analysis, survey findings indicate that many in the industry are open to expanding AI's role in operational functions.

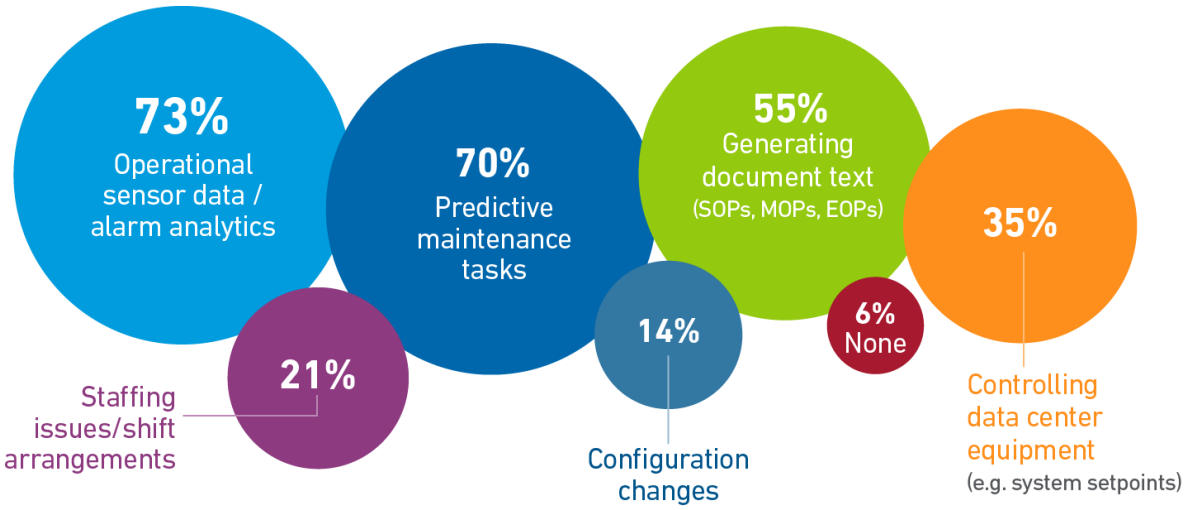
Most data center owners and operators are willing to use AI to create procedural documents, according to recent findings from the Uptime Institute Global Data Center Survey 2025. Although procedural document generation is typically viewed as a safe application of AI in data centers, AI is less effective in generating procedural documents such as methods of procedures (MOP), emergency operations plans (EOP) and standard operating procedures (SOPs). AI-generated operating procedure documents may increase the risk of system failure if they are not carefully checked by experienced facility staff. These documents often lack situational context and site-specific knowledge, which means they can fail to guard against the type of procedural errors that often contribute to major public outages.

Trust in AI varies by application

Rapid industry growth and limited resources often push operators to consider automating employee tasks. **Figure 1** shows that 55% of respondents would allow AI to generate document text for their facility's SOPs, MOPs and EOPs. However, there are significantly fewer operators willing to trust AI for other tasks, for example, making configuration changes directly to mechanical and electrical equipment (14%).

Figure 1 Willingness to use AI varies by application.

For which of the following (if any) would you allow AI to make operational decisions in a data center, assuming it has been adequately trained with historical data? Choose all that apply. (n=630)



("Other" responses are not included.)

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It can be surmised that although some operators be unwilling to allow AI to make direct decisions regarding their equipment, they would be open to it defining parameters on how and when human operators make those decisions.

This may be a shortsighted approach, potentially due to the misconception that developing MOPs, EOPs, and SOPs is merely an administrative task rather than a primary operational responsibility. As a result, operators may undervalue the importance of their team members having a hands-on role in procedural development, viewing it as secondary to more hands-on maintenance duties.

Human oversight is still required

Human involvement in the development phase of any operational procedure is as important as the finished document is to the data center facility. Without substantial human involvement, AI-generated operating procedures can face several issues.

Lack of site-specific knowledge

AI typically generates procedural steps based on information it encounters most frequently in its training data. Using information from different data center sites, AI aims to generate operating procedures that are broadly applicable. It is less likely to generate output based on a detail that only appears in an EOP from a single site, even if this detail was added in response to an adverse event. As a result, the output tends to be generic and lacking in site-specific details — or sometimes entire procedural steps. Large language models (LLMs) often struggle to identify these gaps in procedural information because their search features require a specific word or phrase to target. It is much more difficult for AI to detect what is not there without human oversight.

AI also lacks insight into site-specific culture. Workers at some sites may refer to different parts

of a data center using colloquial terms relevant to that particular site. AI may not understand that a staff member may refer to equipment by a color code rather than its formal name in day-to-day practice. Procedures, especially emergency procedures, should reflect the terminology and direction that is most intuitive to the worker, in line with how the individual has been trained.

Lack of situational context

Procedures should be tailored to the situation. In emergencies, people process concise, actionable instructions more effectively — they struggle to maintain lengthy verbal information in their working memory. Research has shown that the more complex an EOP step is, the greater the likelihood for human error (see *Effective EOPs: how cognitive science can help*).

Even if AI generates a procedure with the appropriate steps, it requires human input to ensure the language is phrased in a manner that matches how humans process information in different situations. For example, an EOP should only provide the most crucial information to resolve the situation, whereas an MOP should provide detailed narrative information.

AI software allows the user to edit text after the document has been generated; but reviewing the document line-by-line may negate the purpose of using AI in the first place. In some cases, it may be more effective to refer to the existing document written by humans that already accounts for site-specific quirks.

Missed training opportunities

The process of creating procedural documents can be integrated into new employees' training, and can also refresh the skills of senior staff by using walk-throughs to assess the document's effectiveness — adding additional details where necessary. This will prevent skill decay among experienced employees, give new employees a holistic understanding of how systems interact, and foster a stronger sense of ownership in the team's performance outcomes. This approach helps develop identification with the company early in the new employees' career, which can be a significant factor in reducing staff turnover (see *Mentorships: practical strategies for retaining new employees*).

Accidents can occur

Incident reports often conclude that a lack of site-specific detail exacerbated the impact of an outage incident. In 2017, GitLab, a development operations platform provider, experienced a severe outage that resulted in data loss. Staff attempted to restore a secondary database using procedural documents that failed to fully explain the behavior of the site's automation tools. One of these tools can appear unresponsive, but returns results reliably within a set timeframe. Without this information, the team assumed the tool had failed and attempted manual troubleshooting, accidentally deleting the primary database.

Is adoption worthwhile?

Despite the possible downsides, some operators will use AI to draft operating procedures. However, they need to remain vigilant about vulnerabilities in these documents. It is essential that operators choose software that allows documents generated by AI to be edited when necessary and that the user directs the program to write procedures in the appropriate narrative style for the situation.

Due to the significant amount of input required from the end user, AI-generated documentation may not deliver enough time savings to justify its adoption.

The Uptime Intelligence View

AI has the potential to help generate improved procedural documents as the technology advances, but it also carries significant risk. Operators should remain actively involved in developing these documents to optimize their staff's situational awareness of their site. In particular, they need to ensure that the AI-generated documents include site-specific information.

ABOUT THE AUTHOR

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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.