

STANDARDS

Surge Protection

DCE 9000 standard is defining a quality foundation for rapidly growing AI-era data centers
by Govind Ramu and Gino Tozzi

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he digital world is expanding at a dizzying pace, but the physical foundation it rests on seems to be cracking under the strain. Driven by the explosive growth of artificial intelligence (AI), edge computing and cloud services, global demand for data centers is expected to triple by 2030.^{1,2}

To meet this exponential need, the industry must execute an estimated \$6.7 trillion in global capital investment by the decade's end, with \$5.2 trillion earmarked specifically for AI-ready facilities.³ In the United States alone, capacity demand is projected to grow by 20 to 25% annually.⁴

While these macroeconomic figures are staggering, they mask a critical operational vulnerability: Our infrastructure supply chains currently are stretched to the breaking point. With data center physical infrastructure scaling at a hyperscale rate of two to three-times year-over-year, we are quickly discovering our traditional quality management systems (QMS) are insufficient to mitigate the risks associated with this unprecedented growth.

Urgent need for industry-specific standard

Currently, the data center industry relies heavily on generic ISO 9001 certifications. While ISO 9001 provides an essential foundation, it is intentionally generic and does not fully address the specialized technical requirements and operational complexity of modern data centers.

To compensate for these gaps, hyperscalers and operators historically have developed highly customized, proprietary customer-specific requirements.

This fragmented approach forces infrastructure equipment suppliers to navigate an excessive administrative workload, subjecting them to dozens of redundant audits and widely varying metrics for the exact same products. The friction this causes in the supply chain is palpable.

In a recent industry survey, 87.8% of respondents said they agreed that the sheer speed of innovation in modern data centers is creating significant risks to quality and reliability, while 78.1% stated that existing quality frameworks are inadequate for today's complexities. Furthermore, a resounding

92.5% said they agreed that a certifiable industry standard would drastically improve global consistency and predictability across data center builds.⁵

Simply put, we cannot build the resilient infrastructure of tomorrow using the fragmented quality management tools of yesterday.

Introducing DCE 9000: A transformative framework

To bridge this critical gap, Google is part of the collaborative effort leading the development of Data Center Excellence (DCE) 9000, the industry's first tailored QMS standard specifically designed for data center physical infrastructure.

Administered by the Telecommunications Industry Association (TIA) Quality Excellence for Suppliers of Communications (QuEST) Forum—the same body that successfully revolutionized the telecommunications industry with Telecommunications (TL) 9000—DCE 9000 represents a true paradigm shift. It is moving the industry away from reactive “firefighting” toward proactive, risk-based management approaches.

DCE 9000's initial scope is highly targeted, focusing on the critical mechanical, power and cooling infrastructure systems located outside the server hall. This global standard is designed for broad use across critical infrastructure, supporting consistency from design and manufacturing through deployment and operation.

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Structurally, DCE 9000 uses the ISO 9001 High-Level Structure but introduces an “adders” model, similar to the highly mature aerospace (AS 9100), automotive (IATF 16949) and telecom (TL 9000) industries. We are deeply customizing *Section 8—Operation* has been segmented across vital life cycle activities: design, manufacturing, assembly, testing, installation, commissioning, operations and maintenance. This approach creates a shared, consistent technical language across all life cycle stages, reducing ambiguity and avoiding inefficiencies caused by differently interpreted requirements.

The power of collaboration and data-driven benchmarking

The development of DCE 9000 is a testament to the power of inclusive industry collaboration. We have convened a coalition of stakeholders, including hyperscalers (such as Google, Amazon and Oracle), data center operators, tier one leading equipment manufacturers, general contractors and

DCE 9000—AT A GLANCE

- » **What:** Data Center Excellence (DCE) 9000, the industry's first tailored QMS standard is specifically designed for data center physical infrastructure.
- » **Who:** The Telecommunications Industry Association (TIA) QuEST Forum is administering the new standard.
- » **When:** Draft standard is scheduled to be released in September 2026. Official publication targeted for March 2027.
- » **Contribute:** To join the TIA working group on the standard, contact membership@tiaonline.org.

commissioning agents. This holistic representation is critical because the standard is designed to align roles and responsibilities clearly across the transition—from factory build to site commissioning—supporting smoother coordination and more consistent outcomes.

One of DCE 9000's most transformative elements is its reliance on data-driven metrics and benchmarking. Taking a page from the TL 9000 playbook—which historically drove an estimated \$1 billion-plus in annual savings for the telecommunications sector—rigorous, auditable counting rules and normalized metrics (such as defect rates per megawatt) have been instituted. Through a secure, double-blind system administered by the University of Texas at Dallas, organizations will benchmark anonymously their performance against industry averages and “best-in-class” markers.⁶ This unprecedented transparency will allow for the identification of systemic design weaknesses and component failure trends across the globe, driving billions of dollars in potential industry savings without exposing proprietary company data.

Cultivating a culture of quality and field safety

DCE 9000 is designed to support a consistent, disciplined approach to quality across the data center ecosystem, reinforcing a continuous improvement culture rather than introducing additional administrative burden. By standardizing expectations and establishing clear flow-down controls, the framework helps reduce the cost impacts associated with rework, waste and avoidable equipment performance issues over the infrastructure life cycle.

The standard also supports improved field safety and risk management by applying uniform verification criteria to critical infrastructure. Consistent, clearly defined requirements help promote safer installation and commissioning practices while supporting long-term infrastructure durability. This consistency aligns closely with industry sustainability objectives because resilient, well-built infrastructure enables more efficient operation and reduces the need for premature replacement of resource-intensive components.

Rollout strategy for industry adoption

The effectiveness of any standard depends on its adoption across the ecosystem. DCE 9000 is being developed as a fully auditable and certifiable standard, with an adoption approach centered on market-driven incentives rather than prescriptive mandates. Certification is intended to provide a clear, independent signal of an organization's commitment to quality and process maturity, supporting consistent evaluation within procurement, qualification or supplier assessment processes. Over time, this enables greater alignment between operators and suppliers while encouraging broader participation through demonstrated value rather than obligation.

To ensure the ecosystem is prepared, TIA is actively developing a code of practice to educate and upskill existing for-profit certification bodies and ISO 9001 registrars. Concurrently, qualified training partners are developing comprehensive professional training curriculums so auditors and industry practitioners have the exact tools they need to seamlessly adopt and audit against these new requirements.⁷

Accelerated publication timeline

Because the AI-driven market is expanding at up to 10-times historical rates, there is not the luxury of a traditional three-to-four-year standard development cycle. An accelerated timeline to meet the moment is necessary.

The draft standard is slated for release for comprehensive industry review in September 2026. Following consolidated reviews, as well as beta testing of a measurement handbook and the finalization of terminology glossaries, the official publication and launch of the third-party certification ecosystem are targeted firmly for March 2027.

A call for collective industry action

This is an important moment for the data center industry. As data centers continue to underpin the global digital economy, the quality, safety and reliability of physical infrastructure will play an increasingly central role in our shared success. DCE 9000 represents a collective opportunity to strengthen supply chain resilience, reduce inefficiencies and help protect the significant investments being made to support the next generation of digital services.

We encourage all participants across the data center ecosystem—including owner/operators, equipment manufacturers, engineering firms, general contractors and quality professionals—to engage early in this effort. Participation during development allows organizations to better understand the standard's intent, prepare for future adoption and provide practical input based on real-world experience.

Organizations also may wish to begin conversations with their ISO 9001 registrars to raise awareness of DCE 9000 and connect them with TIA resources as the certification ecosystem evolves.

Most importantly, this phase offers a meaningful opportunity to help inform the standard's final shape. By joining the TIA working group (contact membership@tiaonline.org), stakeholders can contribute directly to building alignment across the industry and supporting a more consistent, resilient and high-quality foundation for the AI era. **QP**

editor's NOTE For a list of resources used to compile this column, visit this column's webpage at qualityprogress.com



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