

The **Future** of Data Center Construction: **Embracing Modularity**

Introduction

In the context of the rapidly evolving data center landscape, characterized by the integration of artificial intelligence (AI) and increasing computational demands, this presentation explores the shift towards offsite modular (OSM) construction methodologies to address both demand for new data center capacity and escalating power requirements from the grid to the chip level. The discussion centers on the implications of advanced computing capabilities on data center infrastructure, with a particular focus on volumetric construction techniques.

The proliferation of AI workloads necessitates a robust power infrastructure capable of supporting higher power densities while ensuring operational reliability, quality, safety, and efficiency. Goldman Sachs Research projects that global power demand from data centers could increase as much as 165 percent from 2023-2030. OSM is identified as a critical solution, providing the necessary flexibility, scalability, and dependability for successful deployments. This discussion highlights the importance of modular and volumetric construction methods in meeting the intensive construction demands imposed by AI-driven computational needs. By implementing modular designs, engineering can optimize the layout and installation of essential infrastructure components such as switchgear, thereby enhancing facility power load density. This optimization accelerates revenue generation without the need for physical expansion of the data center footprint while also reducing total cost and unpredictable on-site risks.

Key takeaways include:

- **Defining the essential role of modularity in addressing significant construction and power infrastructure demands in contemporary data centers influenced by AI technologies.**
- **Innovations and future proofing for data center operations, including the shift towards advanced monitoring, autonomous operations, protection, and control systems that cater to the dynamic requirements of AI-enhanced facilities**
- **The necessity for switchgear solutions that efficiently and safely manage increased electrical loads, a requirement effectively supported by modular construction.**

By embracing modular construction strategies tailored to the unique challenges posed by AI and heightened computing demands, data centers can achieve enhanced efficiency, scalability, flexibility, and adaptability. The OSM approach allows organizations gain greater control over project timelines, costs, and quality while also future proofing their operations.