Challenges of Data Center Construction in the O&G Industry

- Time to market
- Harsh Environments
- Remote Locations
- Risk & Complexity
- 24 x 7 Operations

Technology Drives Oil and Gas Exploration

Complexities in oil and gas exploration and production are expanding, as is sophistication in equipment and processes. Oil companies are investing heavily in digital oil field technologies, aiming to maximize oilfield discovery and recovery, eliminate non-productive time, and increase ROI and profitability through workflow integration.

Regulatory and privacy compliance, low-latency requirements, seismic and satellite imaging, and instrumented oilfield equipment - with sensors capturing millions of data points per minute, drive the need for extensive processing capability near exploration and production (E&P) operations. In many cases this means building a small data center in a harsh, rugged environment not typically suited for sensitive IT equipment. These factors give rise to the need for a protective, self-contained data center or small IT room that is ruggedized, repeatable and specifically designed for the environment and application.

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Digital Oilfield Implementation Concerns

Building a data center in a remote and harsh environment introduces additional challenges and cost compared ton a typical data center deployment. The ability to source standard products and components in remote locations is more difficult and often takes more time. Locally available expertise and construction practices can vary from country to country. The additional transportation time and cost of the building materials and personnel support must be factored when planning the budget. Harsh environmental conditions pose unique challenges to the air quality and equipment operating temperatures. This can ultimately affect the longevity and critical operation of the IT equipment.

Furthermore, oilfield-based data centers need to be compliant with the highest industry standards in terms of resiliency. Loss of E&P data can result in catastrophic cost impacts on the business as a whole.

Building a solution off-site in a factory environment can eliminate the added layers of cost and unpredictability that come with traditional construction methods. This also enables the factory to test and validate the data center infrastructure and configure the management and control systems prior to delivery.

Prefabricated Solutions Meet the Challenge

Prefabricated data center modules solve many of the potential pitfalls for these implementations. Schneider Electric's modules are pre-engineered, assembled, and tested in a factory environment, then transported and installed on-site with minimal electrical and mechanical expertise required. The SmartShelter Container system – heavily modified ISO shipping containers often used in O&G deployments – is ideal for applications that require ease of transportation for delivery anywhere in the world. Prefabricating the data center in a factory mitigates the risks associated with on-site assembly, installation, and integration, such as human error, resulting in a faster and more reliable deployment. In fact, when compared to traditional stick-built facilities, the use of pre-assembled data center modules and standardized designs can be 60% faster to deploy.

Customer Profile

A global producer of oil and energy was challenged with the need to upgrade their IT systems in a site in Angola, Africa. The production facility had aging IT equipment spread across four different computer rooms with inadequate critical infrastructure. The site did not have dedicated data center backup systems, such as generator or UPSs and no remote monitoring to identify failures.

The facilities management team searched for a cost-effective way to build a reliable and predictable data center to withstand the harsh environment of the Angolan oil field. They needed a solution that could manage IT demand 24 hours a day with an integrated management and control system to minimize maintenance and allow for remote monitoring and alerts.

Schneider Electric provided a prefabricated solution that consisted of 3 SmartShelter™ IT Containers ganged together on-site to create a single IT room. Two prefabricated power modules with switchgear and UPS units provided a resilient 2n power solution connected to a containerized generator unit. To protect the IT equipment from the dusty air, the units were jointly connected with a common vestibule to allow for isolated entry and access to all the modules. A prefabricated chiller skid provided chilled water to 6 specialized CRAC units within the IT modules designed to maximize space and provide the most efficient cooling solution for the environment. The entire solution was monitored by the Schneider's Netbotz environmental and security system and Wonderware interface to manage and control all of the electrical and mechanical systems.

As the completion of the units drew near at the Schneider Electric facility in Barcelona, the customer was invited to the plant to witness and confirm the testing. Once everything was approved by Schneider and the customer, the entire system was disassembled for shipment and deployed expediently in Angola.

Benefits of Prefabricated Data Centers to O&G operations

- Optimizes installation and deployment by minimizing the need for many different construction disciplines on-site

- Reduces design and construction complexity and ensures reliability as a factory-built and tested data center

- Shortens delivery cycle time; factory lead-time is projected at16-20 weeks and is capable of being shipped anywhere in the world.

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