rehlko

Case Study

Powering Singapore's Data Future: Rehlko's Tailored Solutions for a Leading Data Center

Scope of Supply

Exhaust and fuel system

Customer

Co-location data center provider

Power Generator

21 units x KD4000-E

As digital infrastructure becomes increasingly vital, data centers rely on robust and resilient energy solutions to maintain uninterrupted power. When tasked with an important project for one of Singapore's largest Tier 2 data centers, a coloocation data center provider company turned to Rehlko's expertise. The project required the delivery of industrial generators and support systems to ensure continuous, reliable power for this critical facility.

Overview

Generator and Enclosure Design

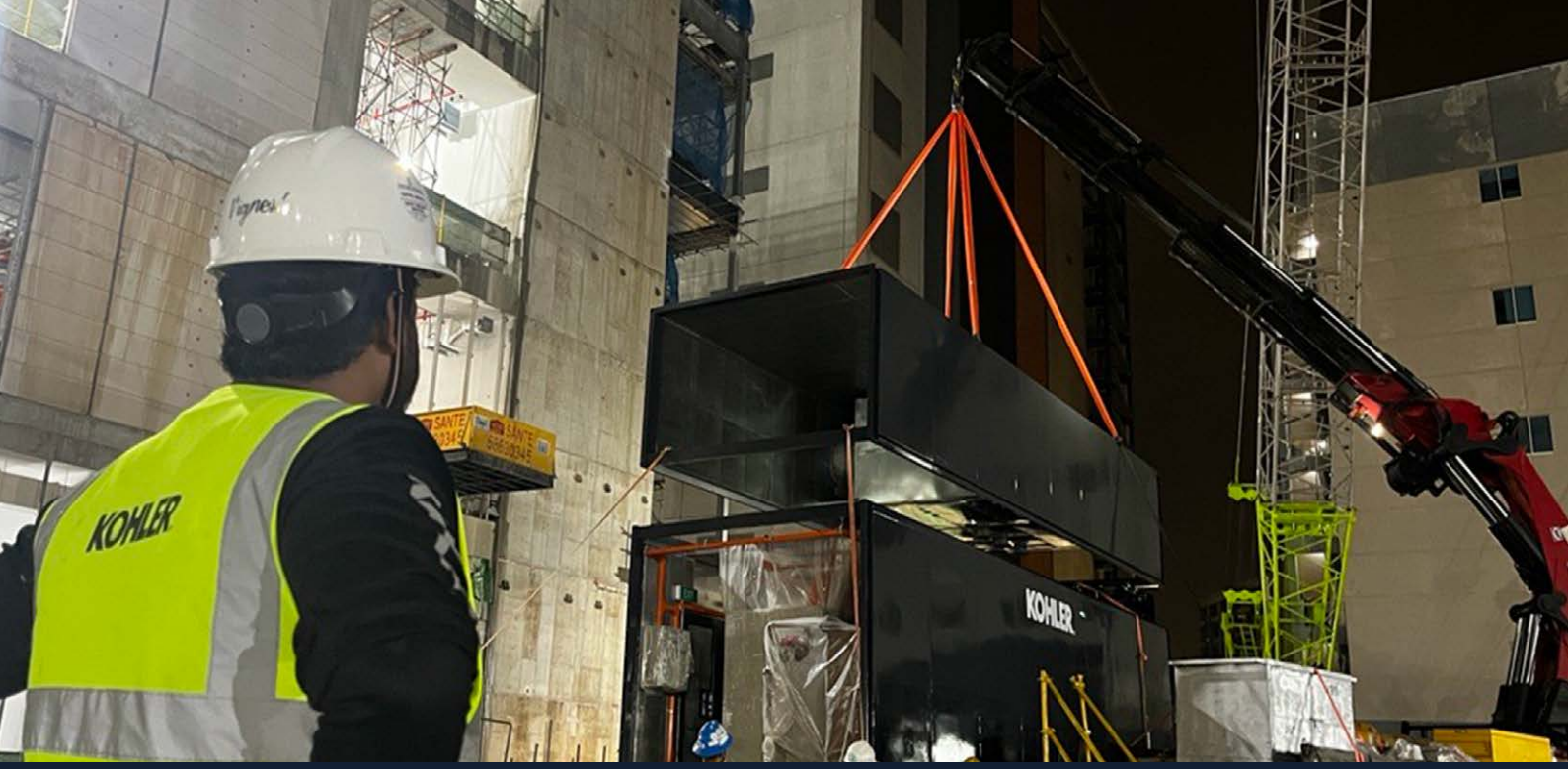
For the project, Rehlko took charge of supplying and installing 21 sets of KD4000-E generator units, each housed in specialized six-sided fire-rated enclosures with certified doors and frames. These enclosures are fortified and coated with a textured industrial finish for heavy-duty durability in hours of extreme heat. This ensures safety and compliance with stringent standards.

Testing and Validation

Rehlko also carried out rigorous testing to guarantee the reliability of all 21 sets of KD4000-E generators. This included both FAT (Factory Acceptance Testing) at Rehlko's testing facility as well as SAT (Site Acceptance Testing) at the project site.

FAT Testing: The testing varied according to the end client's specifications and requirements. The first generator that arrived at the site underwent 12 hours of continuous 100% load testing. Additionally, the remaining 20 units were tested for durations tailored to the end client's stringent requirements and specified testing scopes.

SAT Testing: Full-load SAT was conducted on-site with temporary fuel systems and load banks, replicating FAT conditions to ensure the generator sets performed flawlessly before installation.



Challenges Faced and Our Solutions

Delivering reliable energy solutions for a Tier 2 data center presented several unique challenges

1. Concurrent Construction and Tight Timelines

As the building was under construction during the generator installations, the team had to work in tandem with the project's phased progression. Each generator had to be delivered and installed as new levels were constructed. However, with careful coordination and prompt responses, the Rehlko team aligned installation timelines with construction milestones. Work permits, site closures and equipment hoisting were managed with precision to minimize disruption.

2. Customised Fuel Systems

Uninterrupted power is critical for a data center, where even brief outages can lead to significant operational disruptions. To guarantee the reliability of their power solutions, the team designed a fuel system split into two interconnected sides to offer built-in redundancy, ensuring that if one side encountered an issue, the other could seamlessly take over.

3. Transportation of Equipment

Transporting the generator units, fuel systems, and enclosure modules presented a significant logistical challenge. To overcome this, the team opted to assemble and disassemble the components to ensure safe and efficient transportation.

At Rehlko's testing facility, the modules were divided into two sets of three. The first set was stacked to house the generator units, with the second set stacked on top. Once Factory Acceptance Testing (FAT) was completed, the modules and generator units were decoupled for transport to the project site. They were meticulously reassembled and installed, ensuring seamless integration and reliable operation.

4. Structural Constraints

The scale and complexity of the project required a robust and intricate exhaust system to ensure efficient operation and safety. Given the multi-level design of the data center, the system had to span from the ground level up to the rooftop, covering several floors. However, this also meant that the system needed to be durable and lightweight to avoid putting excessive strain on the building's framework.

Rehlko proposed a bolted, lightweight stainless steel design, allowing the system to meet the necessary strength requirements while also reducing the load on the building's structure. This solution ensured that the exhaust system could safely traverse the building's multiple levels but also adhered to stringent safety standards for durability under extreme conditions.

Delivering Tailored Power Solutions for Critical Digital Infrastructure

Rehlko's successful delivery of 21 customized generators and supporting systems highlights the company's ability to provide reliable power solutions for high-demand environments. By navigating complex logistical challenges, structural limitations, and strict timelines, the project ensured reliable power solutions for one of Singapore's largest Tier 2 data centers, a vital asset in the digital ecosystem.

This project underscores the importance of bespoke engineering and collaboration in meeting the unique energy demands of modern data centers. With a focus on energy resilience, Rehlko remains committed to delivering innovative, reliable power solutions that support the growth of digital infrastructure and shape the future of energy.

Visit us today to learn more about what we do at Rehlko.