

World's Longest Cross-Sea Road-Rail Bridge to Reshape Area Economy Using Vertiv Solutions



A Vertiv Case Study



Background

The Pingtan Strait Highway-Railway Dual-Use Bridge is 16.34 kilometers (over 10 miles) long. It starts from Songxia Town, Changle District, Fuzhou City, and ends at Upper Pingtan Island in Su'ao Town. The upper layer of the bridge is designed as a six-lane expressway with a speed of 100 kilometers per hour (kmph). The lower layer is designed as a two-track Grade I railway with a speed of 200 kmph (124.27 miles per hour).

The Pingtan Strait Bridge is the first cross-sea, highway-railway, dual-use bridge in China. In the truest sense, it is the first of its kind but has been touted as the longest cross-sea road-rail bridge in the world. The completion of the bridge will help Pingtan, a comprehensive experimental zone, integrate together the three national strategies of "Free Trade Zone + Experimental Zone + International Travel Island" to end its history of having no railway access. The bridge is very significant in terms of promoting economic development for the west side of the Taiwan Strait.

As one in a series of important supporting construction projects of Pingtan Strait Bridge, the Pingtan Comprehensive Experimental Zone's International Digital Economic Port - Second Bridge Second Line Channel Project is the channel guarantee for the smooth operation of the bridge based on effective information and data processing.

The informatization of the Second Bridge Second Line Channel Project includes accessing and integrating Pingtan customs clearance data and information from other supervision systems, including the business data display system, intelligent gate system, and intelligent customs clearance inspection and release platform.

The availability of these systems that are essential to the continuity of bridge operations requires support from critical digital infrastructure solutions.

Challenge:

Deploy intelligent infrastructure solutions that protect critical business systems and support optimal bridge operations.

Solution:

- Vertiv™ SmartAisle™ 2 micro-module solution
- Vertiv™ APM uninterruptible power supply (UPS)
- Vertiv™ Liebert® DataMate and CRV4 thermal management systems

Results:

- Rapid deployment of critical infrastructure
- Enhanced equipment protection for ensured system availability

Challenge

Due to the environment of this unique application, the customer put forward strict demands regarding the reliability of the products to be used. And considering the complexity of the project construction, the customer also required the infrastructure provider to have strong local service capabilities with technicians who could respond at any time in order to meet the Second Bridge Second Line Channel Project requirements.

Pingtan Strait is as famous as Bermuda and the Cape of Good Hope when it comes to being some of the windiest areas of the world. As the name suggests, the wind and the waves are strong, the water is deep, the current is fast, and the sea environment is harsh.

There are more than 200 days of strong winds at Pingtan Strait in a year. During the summer season, there are also typhoons from time to time. The wave height can reach more than 9 meters, while the wave force is more than 10 times that of the Yangtze and other inland rivers. Additionally, the salt mist content in the atmosphere of coastal areas is very high, which can lead to component or equipment corrosion.

It was the conditions of this complex marine environment that caused the customer to have such high standards in terms of protection and adaptability — standards that called for a hardened, high-quality solution with proven performance.

Solution

During the construction of the project, the customer chose to deploy the Vertiv™ SmartAisle™ 2 micro-module solution, as well as installing Vertiv™ thermal management and UPS systems in important business units such as the land access data center of the bridge, the monitoring center, and the land vehicle channel.

These solutions offer guarantees in terms of high reliability. In fact, Vertiv™ UPS units have all passed comprehensive and rigorous testing to ensure their ability to effectively operate in harsh environments like those surrounding the Pingtan Strait Bridge. Even with unstable main utility power in the early stages of the project, Vertiv products still operated in a stable manner.

Not only does the SmartAisle™ 2 solution have high reliability, it also offers excellent energy efficiency features. With intelligent integration of cabinets, thermal management, cabling, monitoring, and power supply and distribution on the same platform, there is no weak point on the whole. The solution's modular design enables quick deployment and operation.

In the case of the Pingtan Strait Bridge, the SmartAisle 2 modules cover reliability grades from Tier 2 to Tier 4 and keep the new channel lighting system in use. Therefore, a lights-out scenario would quickly indicate a faulty module.

Results

With excellent performance and quality, the Vertiv solutions used in this project have successfully passed customer inspection and have been put into operation.

"The reliability, stability, overall aesthetics, and other details of Vertiv products are among the best in the industry," the customer said.



Vertiv™ SmartAisle™ 2 Features

- Intuitive control panel
- High-efficiency precision cooling technologies and environmental controls
- Modular, scalable high-efficiency power
- Flexible power distribution
- Cold-aisle containment
- Fire suppression
- Water leak detection
- Comprehensive remote data center infrastructure management

Go online for more about integrated infrastructure solutions like the Vertiv™ SmartAisle™ or to see more on the Pingtan Straight Bridge.