VERTIV.

Case Study

Watercooled precision air conditioning solution

Critical control room cooling for a leading steel manufacturer in Orissa, India

Industry: Steel manufacturing
Region: Orissa, eastern India
Startup: April 2026



Executive summary

India's one of the leading steel manufacturers required a precision thermal management solution for critical control rooms and PLC rooms within its captive power plant facility in Orissa, eastern India. These rooms operate under sensible heat loads exceeding 90 percent, generated by industrial electronics and control equipment, with minimal human occupancy.

The ambient outdoor environment at the site eliminated air-cooled condenser configurations as a viable option. The customer had already invested in centralized cooling tower infrastructure, making a water-cooled system the technically appropriate approach. Vertiv partnered with its established thermal solutions partner in India, to design and deliver a localized water-cooled precision air conditioning system based on the Vertiv™ PDX PX platform. The Phase 1 commissioning has been completed, and units are operating within specification.

Background

Company profile

The customer is one of India's leading steel manufacturer, operating an integrated steel production complex in the state of Orissa in eastern India. The organization operates multiple production lines, raw material processing facilities, and captive power generation assets.

Challenge

The outdoor environment at the Orissa facility was incompatible with air-cooled condenser technology due to high ambient temperatures, dust level from steel production operations, and proximity of industrial heat sources. Customer does have adequate amount of water that being used in water cooled version of condenser.

Solution

Vertiv's Solution Approach

Vertiv selected the Vertiv™ PDX PX precision air conditioning platform and engaged with its thermal solutions partner who brought sector-specific knowledge, familiarity with the facility, and established relationships within the project supply chain. Vertiv initiated a localization program for the Shell and Tube condenser subassembly, encompassing design development, vendor qualification, prototype fabrication, performance testing, and design validation. The complete localization cycle was executed within four months.

Critical path summary

Phase	Activity	Timeline / milestone
1	Enquiry and commercial engagement	Weeks 1 to 2: technical and commercial proposal submitted
2	Design and localization	Weeks 3 to 10: condenser design, vendor qualification, prototype fabrication and testing
3	Prototype and testing	Weeks 6 to 10: prototype fabricated, performance-tested and validated
4	Unit manufacturing and commissioning	Weeks 8 to 17: PDX PX units assembled; factory acceptance test; site delivery; Phase 1 commissioning completed
5	Startup	April 2026: full system startup with both orders on Vertiv's India-developed water-cooled condenser

Technical specifications

Water-cooled Shell and Tube condenser details

The localized Shell and Tube condenser was developed specifically to meet the thermal rejection requirements of the Vertiv™ PDX PX units under Orissa site operating conditions. The Vertiv™ PDX PX platform was selected for its suitability to high-density electronics cooling environments with predominantly sensible heat loads and for its native support of water-cooled condenser configurations.

Parameter	Description
Condenser type	Shell and Tube heat exchanger, localized design manufactured in India to Vertiv's specification
Cooling capacity	Sized to PDX PX heat rejection requirements at Orissa site operating conditions
Design conditions	Sized to site-specific inlet water temperature and flow rate; validated at Orissa operating envelope
Validation process	Prototype fabricated, performance-tested, and validated by Vertiv's India application engineering team prior to production release
Localization timeline	Design to validated production-ready unit completed within four months

Implementation and results

Delivery performance

The project was delivered within the four-month enquiry-to-commissioning schedule established at the outset. Concurrent execution of condenser localization and Vertiv™ PDX PX unit manufacturing was critical to maintaining this timeline. First-phase units are commissioned and operating at the customer's facility in Orissa.

Commissioning outcomes

Phase 1 units are operating within specified temperature and humidity set points for the control room and PLC room environments. The localized Shell and Tube condensers are performing to design specification under operational cooling tower water conditions at the Orissa site.

Lessons learned and best practices

- **Localization strategy:** The Shell and Tube condenser localization program demonstrated that a validated, production-ready localized subassembly can be developed within four months, reducing dependency on imported components and improving both lead time and cost competitiveness for India-based Vertiv™ PDX PX water-cooled deployments.
- **Partnership approach:** Engaging with a thermal solutions partner provided sector-specific knowledge and customer proximity that directly supported proposal development and order conversion. Specialist partner engagement is applicable to other industrial sector opportunities in India where customer relationships are a differentiating factor.
- **Rapid deployment:** The four-month enquiry-to-commissioning schedule was achievable because condenser localization, unit manufacturing, and logistics planning were executed as overlapping workstreams. Identifying parallelization opportunities at project outset is a necessary condition for compressed programme timelines.
- **Customer focus:** Application engineering involvement throughout the localization cycle, from design specification to prototype testing and production validation, was a necessary condition for delivering a fit-for-purpose product within the project schedule and within customer performance requirements

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