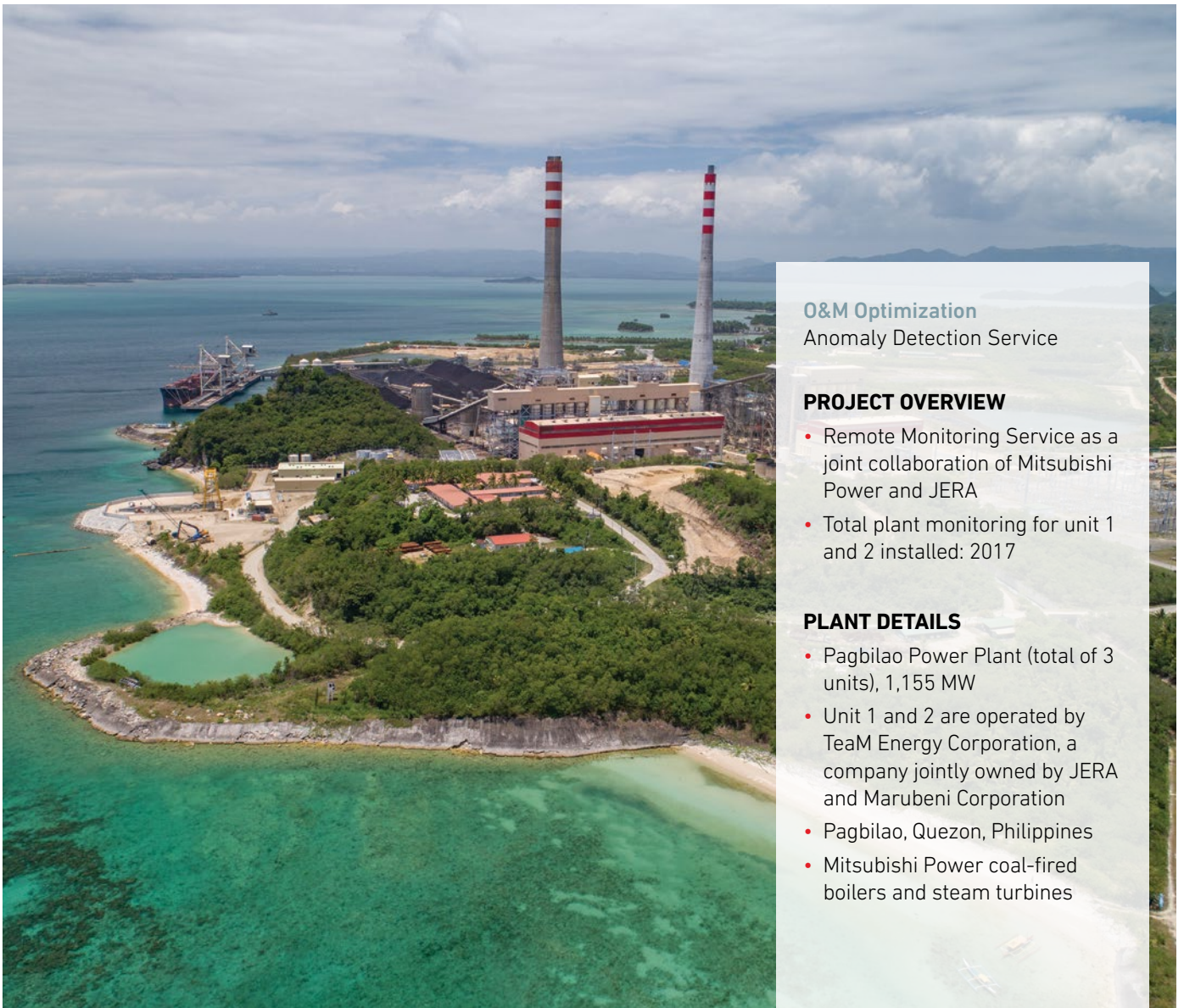**CASE STUDY:**

TOTAL PLANT MONITORING OPTIMIZES PAGBILAO'S O&M, SAVES OVER $3 MILLION USD.

O&M Optimization
Anomaly Detection Service

PROJECT OVERVIEW

- Remote Monitoring Service as a joint collaboration of Mitsubishi Power and JERA
- Total plant monitoring for unit 1 and 2 installed: 2017

PLANT DETAILS

- Pagbilao Power Plant (total of 3 units), 1,155 MW
- Unit 1 and 2 are operated by TeaM Energy Corporation, a company jointly owned by JERA and Marubeni Corporation
- Pagbilao, Quezon, Philippines
- Mitsubishi Power coal-fired boilers and steam turbines

CHALLENGE

The Pagbilao Power Plant uses three coal-fired units to generate power for the Philippines' growing economic and development needs. Units 1 and 2 were installed in 1996 and are owned and operated by TeaM Energy Corporation, a partnership between JERA and Marubeni Corporation, which sought to reduce unplanned downtime and maintenance costs. Units 1 and 2 are critical resources, which cycle between 35 and 100 percent load daily, and are rarely offline.

JERA Data Analyzing Center

Pagbilao Control Room

Mitsubishi Power Global Service Center

SOLUTION

Mitsubishi Power and JERA jointly implemented a comprehensive anomaly detection service that monitors the entire plant, implementing monitoring and diagnostics technology from the Mitsubishi Power Global Service Center (GSC) in the Philippines and from JERA's Data Analyzing Center (DAC) in Japan.

The anomaly detection service identifies pattern changes using approximately 1,500 sensors mounted on plant equipment for each unit, including the boiler, steam turbine and generator, and focuses on any anomalies that might result in a forced outage or load or performance reduction, such as boiler tube leaks, vibration of rotating equipment and gradual changes of process data.

Equipment and system experts evaluate the analytical results and create anomaly reports that build on experience at other plants to identify the likely root causes and provide a recommendation of further action for the operators at Pagbilao.

This total plant anomaly detection service was already proven by Mitsubishi Power and JERA at JERA's Hitachinaka Thermal Power Station in Japan prior to the installation at Pagbilao Power Plant in 2017.

RESULT

In the first three years, the anomaly detection service identified 138 anomalies that needed remedial action:

• 18 prevented unplanned outages or load reduction

• 11 identified thermal performance deterioration

• 109 identified other developing issues in very early stages, so they could be addressed on a planned basis at minimum cost

In the initial three-year period, the anomaly detection service prevented up to 35 days of unplanned downtime, which in the Philippines market can be valued at over $3 million USD. It also identified thermal performance losses that were increasing fuel costs by over $100,000 USD annually.

"Remote monitoring engineers from the Mitsubishi Power GSC and JERA DAC are a vital extension to our team at Pagbilao. We were already using our own data to determine action at our plant, but the additional support from Mitsubishi Power's expert knowledge and JERA's O&M experience is invaluable. We're able to prevent more unplanned outages, increase efficiency and reduce maintenance costs, which makes our plant more profitable and extends the life of our investment."

— Operation Manager, TeaM Energy

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