Vegam
Making Factories Smarter

CASE STUDY
COOLING TOWER
PREDICTIVE MAINTENANCE KIT

CUSTOMER PROFILE

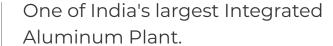One of India's largest Integrated Aluminum Plant.

Captive Power Plant with rated capacity of **1740** MW.

62 Cooling Tower Fans spread across **6** units.

40 Fans with Double Stage Reduction Gearbox.

22 Fans with Single Stage Reduction Gearbox.

CHALLENGES

Cooling tower located in remote locations pose challenges for continuous monitoring.

Frequent breakdowns of gearbox, shaft and fan in cooling tower.

Prolonged shutdown time after breakdown causes loss of productivity.

Replacement of bearings in gear box incurs high maintenance cost.

Safety concerns restrict the access of equipment inside cooling tower.

COOLING TOWER PREDICTIVE MAINTENANCE KIT

- ✓ Predictive Maintenance Kit was installed on **62** fans by the plant team quickly without any additional infrastructure or resources.

- ✓ Robust IP68 water and dust proof wireless sensors worked seamlessly in the harsh environments of the plant.

- ✓ Low spectral noise sensors captured data on wide range of fault frequencies including low frequencies up to 0.8Hz associated with fan RPM and output bearing.

- ✓ Advanced machine learning algorithms analyzed vibration data (acceleration, velocity, and FFT spectrum) to generate critical alerts for multiple remote assets.

- ✓ Long-term trend analysis identified machines with deteriorating health, enabling timely corrective actions and preventing failures.

KEY BENEFITS AND ROI

- ✓ Increased uptime and reduced maintenance costs resulted in **$700,000** revenue increase over the year.

- ✓ Achieved **120% ROI** within first **3** months by preventing 6 fan breakdowns.

- ✓ Early detection of shaft misalignment and gearbox issues, preventing damage and part replacements.

ROI

BREAKDOWNS PREVENTED — 7, 6, 5, 4, 3, 2, 1, 0

DOLLARS — 800K, 700K, 600K, 500K, 400K, 300K, 200K, 100K, 0

ROI Breakeven

DOWNTIME REDUCED BY 80%

Q1 · Q2 · Q3 · Q4

■ Breakdowns Prevented   ━ Cost Saving (in Thousand $)