edgeSV
NTEK SYSTEM

USE CASE

Cooling towers

SV500 by NTEK SYSTEM | ESA-based condition monitoring & predictive maintenance

OVERVIEW

Cooling tower fans release the heat of the cooling water to the atmosphere. In this scenario SV500 analyzes the voltage and current signals of the motors and VFDs that drive cooling tower fans to detect abnormalities in the fans and motors early.

PROBLEM

Cooling tower fans sit in hard-to-reach places such as rooftops, so checking each one is difficult.

- **Impact of losing cooling** - In November 2025 a cooling equipment failure at a CyrusOne data center pushed room temperature above 38 °C, and futures trading at CME Group was halted for about 10 hours.
- **Limited visibility of distributed equipment** - It is hard to see in real time the condition of cooling tower fans installed in several places such as rooftops.

EXPECTED OUTCOMES

Abnormalities in scattered cooling tower fans can be identified early and remotely so maintenance can be planned.

- **Early detection of potential failures** - Detects potential failures early to minimize unexpected incidents and risk.
- **Optimized maintenance schedules** - Diagnostic data helps predict and optimize maintenance schedules.
- **Lower cost and downtime** - Higher operating efficiency helps reduce energy consumption, maintenance cost and downtime.

TARGET EQUIPMENT

Cooling tower fans | Fan drive motors | VFD

SOLUTION

SV500 uses ESA to analyze the electrical signals of fan drive motors and VFDs and diagnose abnormalities in the fans and motors.

- **Fan diagnosis** - Detects fan mechanical unbalance, blade and vane damage and flow turbulence.
- **Motor and drive diagnosis** - Detects bearing problems, broken rotor bars, static and dynamic eccentricity, shaft misalignment, soft foot and load-related problems.
- **VFD operation diagnosis** - For fans driven by a VFD, SV500 analyzes voltage, current and frequency signals on the VFD secondary (output) side at 8 kHz to predict and diagnose potential faults.
- **Adaptive thresholds** - Machine learning learns the normal state of each asset and judges condition with thresholds that adapt to load. Criteria matched to each asset and load condition are applied instead of fixed thresholds.
- **Web dashboard and data integration** - The equipment web server dashboard shows status per diagnostic parameter in real time, so condition can be checked without a site visit, and data can be integrated with upper-level systems over Modbus RTU, Modbus TCP, MQTT and RESTful API.

Operational Impact of edgeSV

Continuous monitoring and early detection support availability, maintenance and energy efficiency.

20~40%	10~25%	5~15%	10~20%
Reduction in unplanned downtime	**Maintenance cost savings**	**Energy savings**	**Longer equipment life**

Illustrative ranges, not verified SV500 results. Actual outcomes depend on site conditions and corrective actions; PoC validation is required.

NTEK SYSTEM © 2026 | www.nteksys.com | ntek@nteksys.com