edgeSV
NTEK SYSTEM

USE CASE

Power quality monitoring

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

OVERVIEW

Pumps and blowers driven by VFDs can trip because of power disturbances. In this scenario SV500 measures the three-phase voltage and current of pumps and blowers to monitor power quality and motor and VFD condition together.

PROBLEM

Power disturbances can lead to the shutdown of treatment equipment.

- **Power disturbances and VFD trips** - At the Commerce Township wastewater treatment plant in Michigan, USA, frequent power disturbances after VFDs were installed forced operators to reset process equipment manually, resulting in several hours of unplanned shutdown and damage to two VFDs.
- **Difficulty identifying the cause** - Only after installing a voltage monitor did the same plant confirm that the timing of voltage disturbances matched the VFD overvoltage trips, and it used this data in discussions with the utility.

EXPECTED OUTCOMES

Power quality events and equipment condition can be recorded together so abnormalities can be handled in advance.

- **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

Inflow pumps | Aeration blowers | VFD

SOLUTION

01 VFD Status Diagnostics

Analyzes VFD input/output voltage and current waveforms to assess rectifier diodes, DC-link capacitors, IGBTs, and the condition of the power supply and power quality.

02 Motor Status Diagnostics

Analyzes motor voltage and current signals without additional equipment-mounted sensors, screening mechanical faults (cavitation, bearings, vibration), electrical faults (stator, cable connections, heat), and load fluctuations.

03 Power Quality Diagnostics

Records and analyzes voltage, current, interruptions, sags, swells, harmonics, and trends to identify power quality abnormalities.

04 Edge AI Device

Performs diagnostic analysis and stores waveforms and results locally. The built-in web interface provides real-time measurements, equipment diagnostics, power quality, events, and reports.

Operational Impact of edgeSV

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

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

Indicative ranges only; actual results depend on site conditions and corrective actions.