

edgeSV
NTEK SYSTEM

USE CASE

Sewage lift stations

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

OVERVIEW

Inflow pumps and lift pumps raise sewage to the treatment facility. In this scenario SV500 measures and analyzes the three-phase voltage and current signals of the pump drive motors with PTs and CTs in the control panel to diagnose the condition of the pumps and motors without attaching sensors to the pump body underwater.

PROBLEM

Submersible pumps sit underwater, so it is hard to check their condition directly during operation.

- **Equipment where sensors are hard to attach** - Yorkshire Water in the UK regards submersible sewage pumps and screw pumps as critical equipment on which ordinary vibration sensors are hard to use, and monitors them with electrical signals read at the motor control panel.
- **Faults not visible until the pump is lifted** - At Northern Ireland Water, a submersible pump in which electrical signal analysis detected an abnormality was lifted and found to have its connection to the discharge pipe secured with only 1 of 8 bolts.

EXPECTED OUTCOMES

Abnormalities in underwater pumps can be identified early without lifting them, 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

Inflow pumps | Submersible pump drive motors | Lift pumps

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.