

edgeSV
NTEK SYSTEM

USE CASE

Boiler and steam systems

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

OVERVIEW

Boiler and steam systems run together with motor-driven auxiliaries such as feed pumps and combustion fans. In this scenario SV500 analyzes the voltage and current signals of these auxiliary motors to support predictive maintenance.

PROBLEM

It is hard to see the real-time condition of auxiliaries between periodic inspections.

- **A feed pump motor failure case** - At the Turkey Point nuclear plant in the US, an internal fault in a 7,000 HP feed pump motor tripped the pump on overcurrent and lowered the steam generator level, so the reactor was shut down manually.
- **Unplanned shutdowns** - A sudden auxiliary failure can affect boiler operation.
- **Gaps between inspection intervals** - There is little means of checking equipment condition between periodic inspections.

EXPECTED OUTCOMES

Abnormalities in auxiliary motors can be identified early 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

Boiler feed pumps | Exhaust fans | Combustion fans | Condensate pumps

SOLUTION

01 VFD Status Diagnostics

Analyzes the VFD's voltage output and current waveforms to diagnose faults in rectifier diodes, DC-link capacitors, and switching semiconductors (SCRs or IGBTs). Also analyzes the condition of power supply and power quality of the VFD.

02 Motor Status Diagnostics

Without installing additional sensors on the equipment, analyzes the voltage and current waveforms supplied to the motor to diagnose mechanical faults (Cavitation, Soft Foot, Bearing, Vibration, etc.), electrical faults (Stator, Cable connection, Heat, Noise, etc.) and Load fluctuation fault.

03 Power Quality Status Diagnostics

For power quality diagnosis, saves power quality indicators such as voltage, current, interruptions, sags, harmonics, etc. in trend data.

04 Edge AI Server

Performs all diagnostic analysis directly on the edge device. Built-in memory and storage—2GB DDR, 8GB eMMC, and SD card support up to 256GB—enable long-term storage of diagnostic data and waveforms without transmitting them to a server. The built-in web-based UI/UX provides access to real-time data, diagnostic result of the equipment, diagnostic data of the power quality, alarm events, reports and etc. without a separate server.

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.