

edgeSV

NTEK SYSTEM

USE CASE

ID, FD and PA fans

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

OVERVIEW

Forced draft fans (FDF) supply combustion air to the boiler, induced draft fans (IDF) exhaust the combustion gas, and primary air fans (PAF) send primary air to the coal mills. In this scenario SV500 analyzes the voltage and current signals of the motors and VFDs that drive these fans to detect abnormalities in the fans and motors early.

PROBLEM

Draft fans run for long hours under operating conditions that change with generation output.

- **Operating conditions that change with output** - Airflow and load vary with generation output and VFD drives are increasing, so fan condition is hard to judge with fixed criteria alone.
- **Large distributed equipment** - It is hard to check on site, one by one, the condition of fans installed in several places around the boiler.

EXPECTED OUTCOMES

Abnormalities in scattered fan equipment 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

Forced draft fans (FDF) | Primary air fans (PAF) | Induced draft fans (IDF) | 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.
- **Power quality monitoring** - Analyzes voltage sag/swell, total harmonic distortion (THD) and voltage and current imbalance in real time to identify equipment impact and abnormal conditions caused by poor power quality at an early stage.
- **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.

SUMMARY

SV500 analyzes the voltage and current signals of the motors and VFDs that drive draft fans with ESA and, with adaptive thresholds that follow operating conditions, detects abnormalities such as mechanical unbalance, bearing problems and blade damage early.

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