



Innovative vibration monitoring system moves to predictive maintenance

Client Department of Planning,
Transport and Infrastructure

Project Jet Fan Vibration Analysis
(SCADA and PLC control
system)

Location South Australia

Tunnels around the world are fitted with jet fans and sensors that clear and monitor fog and smoke. They are especially important in peak hours or during emergencies such as bushfires. These jet fans can be costly to replace when they fail, so a sound maintenance program is a must to ensure longevity.

The twin Heysen Tunnels, located on the South Eastern Freeway between Adelaide and Crafers have adopted an innovative solution that leads the way in predictive fan maintenance.

SAGE Automation configured the SCADA and PLC components of the fan vibration monitoring system.

The system detects wear and tear before it occurs. How? Sensors installed at 12 points on each fan more accurately monitor the status of the fans and mounting brackets, via vibration trends. The system alerts users of required maintenance before damage occurs, thus increasing the life of the fans and reducing long term costs.





Pictured: 1. An example of fan blade wear and tear. 2. Installation in progress. 3. Screen monitor shows sensors (green) on the fans.

Capabilities Demonstrated

- PLC code installed to read 32 vibration values and send 64 points of data to each vibration unit
- SCADA program adapted to include additional 32 reverse direction set points for each of the 16 jet fans.
- Test each set point and actual value
- Simulate refresh conditions
- Smooth handover of system controls

Technology Utilised

- SCADA
- PLCs
- Communication network

Project Highlights

- Smooth integration with existing SCADA System
- Delivery of project under live traffic conditions
- Innovative and collaborative project between SAGE and DPTI

Background

The vibration monitoring system is the latest innovation to be added to the tunnels. In 2000 SAGE Automation supplied and installed the control system for the Heysen tunnels. The tunnels have 16 fan turbines and various types of sensors to monitor environmental safety and report on CO, NO, temperature and visibility levels.

"We are monitoring the mechanical integrity of Jet Fans in real-time to make sure they are ok. With the data captured we know if a bolt may be coming loose in the foundation, we know if a bearing is failing."

Yanyan Xiao, ITS Asset Manager, DPTI



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