nvms.com.au

Case study:

Using continuous monitoring systems to avoid shutdowns

NewGen Power Kwinana Pty Ltd.

"The 1900/65A picked up the vibration so it didn't trip the plant. It gave us enough information to safeguard the plant and keep it running."

Tim Harrison, Maintenance and Outage Supervisor, NewGen Power Kwinana

Knowledge is power

The NewGen Power Kwinana operations team used the full capabilities of their protection and condition monitoring equipment to help avoid a shut down of their steam turbine at their power plant.

Knowledge of early vibration issues on an essential pump alerted operators to the issue and helped them single out the equipment responsible, taking it out of service before damage or a trip occurred.

Challenges

NewGen Power Kwinana operate a power generation facility with a small staff of maintenance and operations personnel.

With limited condition monitoring equipment installed on their essential equipment, they rely on protection systems and periodic condition monitoring to prevent trips and failures that would shut down their plant.

The plant generates 327 MW of electricity for the Perth grid and comprises of a gas turbine, steam turbine and the associated balance of plant.

NVMS Solutions

What is a 1900/65A?

GE's 1900/65A is a self-contained monitor designed to address critical and less critical assets that require continuous machinery protection, but do not warrant the cost of larger, more sophisticated rack-based monitoring systems like the 3500 Series. 1900/65A monitors provide a simple and cost-effective way to apply machinery protection on selected machines or points and are designed to operate as stand-alone units with the ability to connect to a control system and GE's System 1.

The 1900/65A provides:

- Continuous monitoring
- Trip protection
- Overall vibration levels
- Enveloped acceration port channel
- Dedicated temperature channels
- Trip multiplier
- Remote reset
- Detachable display

Using the full capability of the 1900/65A continuous monitoring unit

High overall vibration levels were noticed on a motor driving the main seawater cooling pumps for the steam turbine condenser. The 1900/65A protection system alerted operators to the high vibration, prompting them to inspect the equipment. Low pressure on the discharge line was also observed, indicating one of the pumps was not operating correctly.

Tim Harrison said the common discharge line shared by the two pumps made it difficult to tell which one was causing the issue. However, because of the vibration levels recorded by the motor's 1900/65A system, operators were able to confidently identify which pump was at fault.

"The vibration alarm alerted operators to a problem with one motor on the pump and they used that information to know which pump to look at. When they got there they found the coupling had sheared and the pump was running backwards," Tim Harrison said.

"The operators shut down that motor and the discharge valve closed and therefore restored full system pressure. At the rate we were losing pressure we would have lost the steam turbine."

Keeping plant running

Keeping the main seawater cooling pumps running is essential to keeping the steam turbine and the entire plant operating. Tim Harrison said the timely discovery of the pump issue saved them from a trip.

"If the turbine tripped it would be 50% of our production and it would have taken hours to turn back on. We could have been offline for up to 12 hours."

"The 1900/65A picked up the vibration so it didn't trip the plant. It gave us enough information to safeguard the plant and keep it running."

Tim Harrison said the early warning meant a manageable reduction in capacity rather than a total interruption to supply.

"Instead of going down with a total loss of power for a couple of hours we were able to switch to single pump operation, which took us to 65-70% capacity."

"If that vibration alarm hadn't gone off allowing my guys to choose which pump to shut down, then we could have potentially lost 160 MW production capability and possibly the whole plant."

GE's Bently Nevada monitoring and protection systems are designed to address all levels of asset criticality and can be customized for your plant requirements.

NVMS Solutions

To find out more about NVMS and GE's Bently Nevada products, contact
Michael Casserly: +61 (8) 9380 6933 michael.casserly@nvms.com.au