

STEAM TURBINE MONITORING FOR ELETRONUCLEAR IN BRAZIL



Eletronuclear S/A (Eletronuclear), a subsidiary of the Brazilian state owned power company Eletrobrás, recently selected OPENpredictor™ for its Angra 1 nuclear power plant. It is located at the Admiral Álvaro Alberto nuclear power station in Angra dos Reis at the East coast 200 km South of Rio de Janeiro. Angra 1 operates with a pressurized water reactor (PWR) and has generating capacity of electric 657 MW.

Information to ensure safety & reliability

Eletronuclear's management recognized that advanced condition monitoring will help them reveal potential risk, which facilitates their planning of corrective actions at the scheduled production stops for safety inspections. The main goal is to increase the reliability of the production by identifying machinery problems in an early development stage and by providing the organization with dedicated information to further increase safety.

An international tender was issued early 2007, and among four well respected bidders Rovsing Dynamics' local partner Marubeni Brazil was awarded the contract for an advanced OPENpredictor™ condition monitoring system. Rovsing Dynamics has previously supplied the system to monitor steam turbines, pumps etc. at nuclear power plants in Lithuania, Russia and Ukraine.

Integrated monitoring

The system is going to monitor the nuclear plant's Westinghouse steam turbine generator line. OPENpredictor™ will measure shaft and bearing vibrations, absolute and relative expansions as well as bearing and oil temperatures. The system will import main steam turbine parameters such as pressures, flows and temperatures from the control system together with main generator parameters such as load and reactive load, cooling parameters and winding temperatures.

OPENpredictor's unique architectural design permits the use of a one-server concept, which will minimize future system maintenance. Condition monitoring data and information is integrated with the plant's process control system. This allows defining actions by operators for fast interaction for unexpected phenomena. Based on the information the maintenance group will plan long term actions.

Automatic fault diagnosis

The built-in AutoDiagnosis™ will automatically interpret all condition monitoring data to reveal and warn the staff about potential faults under development. Specialists have access to all data for validation of the system's automated conclusions in order to recommend action. This condition monitoring concept is similar to those used in other nuclear and thermal power plants, and minimizes operation risk due to its high level of automation. It also

facilitates remote monitoring as all data monitoring, reduction and evaluation is executed automatically and locally, so only identified changes need to be transferred to a remote monitoring centre.

Eletronuclear's new predictive maintenance information system will be installed by Marubeni Brazil in connection with a planned overhaul of Angra 1.