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VIB3000 & CM500 for Hydro Power Plants

Our Condition Monitoring System delivers enhanced safety and availability

The Challenge

Due to the increased demand of renewable energy, operators of hydro power plants are facing a major change. While hydro power plants were designed for continuous base load operation, they now need to be prepared for partial load operation.

New hydro power plants are exposed to numerous stops and starts, and availability on demand is particularly important. Due to the changing operating conditions hydro turbines and generators are faced by extraordinary stress which can cause potential failure.

For safe operations preventive maintenance is necessary, and condition monitoring and vibration are key to mitigate the risk of unplanned outages.

The Solution

Siemens Energy machinery protection solutions allow insights into asset's health. The solutions protect, forecast and increase the asset availability. They provide hydro power plants with the capability to deliver electricity rapidly when it is needed, store excess power and reestablish energization to grid. **VIB3000 & CM500** support reliable power generation for hydro power plants.

Your Benefits

- **Early warnings** before protection limits are reached
- **Cost reduction** thanks to comprehensive monitoring & analysis of all operating modes
- **User-friendly** vibration diagnostics for machine sets
- **Modular system set-up** with low spare part complexity

VIB3000 Machinery Protection

Safe operation and high availability are crucial for the economic success of a technical asset. In order to maintain its safety and availability it is necessary to continuously obtain and assess information on a machine's current condition. The VIB Machinery Protection System was carefully designed to offer security for the machine and its environment from the consequences of machine failure and security against uneventful tripping and thus supporting maximum availability.

Notable Features

- Uses latest technologies and is at the cutting edge in vibration instrumentation
- Minimizes outages caused by faults within the protection system and provides the full information
- Reduces the hardware, cabling, and engineering effort and simplifies spare part stocking
- Can be operated directly from the control room and permits a system status analysis

What differentiates VIB3000 from competitor systems is the variety of available redundancy options. Depending on customers' redundancy philosophy and needs, VIB3000 can be configured to use redundant sensors, redundant signal processing, redundant voting and redundant connections to the control system. Apart from redundancy, VIB3000 also supports SIL-1 (Safety Integrity Level 1) approved by German TÜV signal processing and control system communication.

CM500 Condition Monitoring

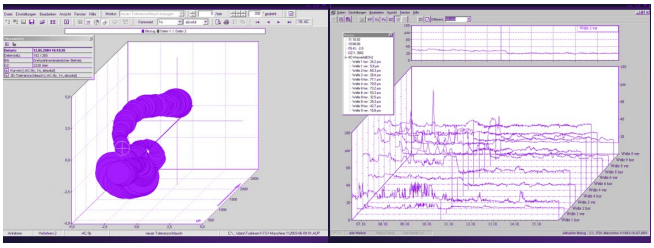
The optional VIB330 Analysis Module extends VIB3000 Machinery Protection to become a full-blown vibration diagnostic system. VIB330 pre-processes vibration samples into vibration indicators, which are the basis for the CM500 software. The VIB330 also handles the diagnostic monitoring of the machine by continuously comparing current characteristics to reference values derived earlier. CM500's online condition monitoring features and vibration analysis toolkit have matured for more than two decades.

Today, CM500's sophisticated high-sensitivity diagnostic monitoring features and vibration analysis package comprises expert tools for all types of rotating equipment, from turbo sets to balance-of-plant machinery.

Notable Features

- Maximum possible measurement accuracy through rotor-triggered data acquisition
- Maximum sensitivity to changes, using up to 1,000 automatically derived limit values per vibration measuring point (machine learning)
- Comprehensive condition monitoring for current and historic machine health at constant and transient operation
- Unique archiving concept with event-oriented storage of complete data sets and tools for automated data interpretation
- Numerous additional data analysis functions including statistical assessments or transient recorder functionality

With CM500 online condition monitoring, once alerted the severity of a problem can be actively monitored, and the operator can for example account for the problem by avoiding critical operation modes. The condition monitoring system enables maintenance engineers to analyze the machine's condition and thus generate valuable information for decision making and overhaul preparation. CM500 Condition Monitoring enhances machine availability, makes plant availability more predictable and cuts maintenance costs.



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