



Pacific Gas and Electric Corp. troubleshoots mechanical issue using dynamic motor analyzer



SKF Dynamic Motor Analyzer – EXP4000

- **Capabilities:**
 - Load condition analysis
 - Power condition analysis
 - Determine mechanical vs. electrical issues in machine systems
 - Torque signature analysis
 - Continuous monitoring
 - Vibration analysis
 - VFD monitoring
 - Motor efficiency assessment

Typical applications

- **Troubleshooting/root causes of:**
 - Thermal overloads
 - Excessive loading
 - Motor stressors

SKF's portable EXP4000 finds root causes of problems with a critical motor at Diablo Canyon Power Plant

Electrical and mechanical maintenance staff often find themselves at odds over what they believe the problem is with a given motor. Is it a mechanical problem, or an electrical one? The answer can lead to different outcomes that range in cost from relatively small to excessively high.

When maintenance technicians at Pacific Gas and Electric Corporation's Diablo Canyon Power plant noted that a critical screen refuse pump motor was running hot and drawing excessive current, they needed to determine whether the problem was one or the other: electrical or mechanical.

They used standard analog instrumentation to check for excessive voltage and current, but found nothing that could account for the abnormally high current draw and thermal condition. Short of more information, the best solution appeared to be motor replacement.

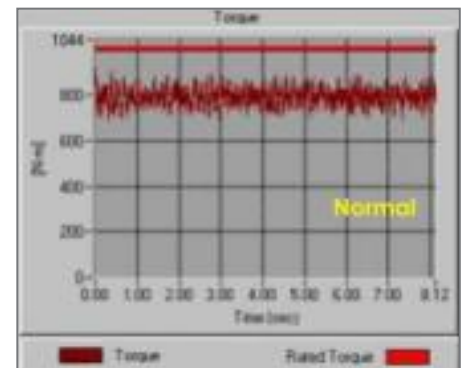
Torque issues revealed

One of the PG&E electricians dealing with the problem decided to gather more information about the motor/machine system before advocating motor replacement. Using an SKF EXP4000 dynamic motor analyzer, the electrician was able to assess torque behavior against the rated torque of the motor. The torque signature displayed by the EXP4000 clearly indicated the 125 hp motor was operating in an overloaded condition.

The results led the technician to review maintenance records of the motor, which revealed that the screen refuse pump attached to the motor had

undergone an impeller replacement just a few months earlier. Closer review showed that the installed replacement impeller was actually larger than the impeller it replaced (17 in v. 15.75 in).

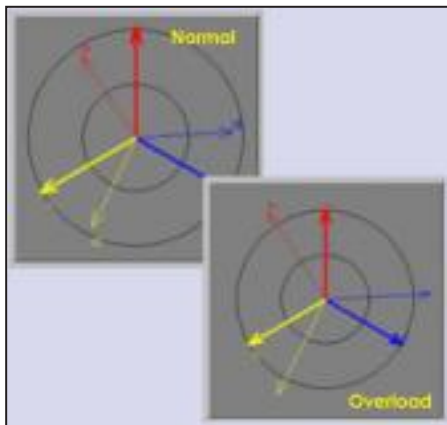
The pump underwent scheduled downtime, and the oversized impeller was replaced with the correct part. Once up and running, the motor was tested again. Torque values were properly aligned with rated torque for the motor, and there were no longer any excessive heat or overcurrent issues with the motor.



EXP4000 torque signature analysis. Normal torque (top image) compared to a torque overload condition signature (bottom image).



The SKF Dynamic Motor Analyzer – EXP4000 provides PG&E with proof of mechanical problem, saving downtime and motor replacement costs



The EXP4000's phasor analysis of the pump motor. Normal torque (left) compared to torque overload condition (right).

PG&E's use of the EXP4000 to compare rated torque of the suspected problem motor with the torque imposed upon the motor by the oversized pump impeller saved the company US\$23,000 in motor replacement costs alone. Had technicians not figured out the impeller issue, the new motor would have become suspect as well, since the root causes were not accurately identified.

The company now uses dynamic monitoring to troubleshoot other motor-machine issues as in integral part of its motor maintenance program.



SKF electric motor test and monitoring solutions are used in power generation, oil and gas, and a variety of other traditional energy applications in companies all over the world.

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