Brüel & Kjær Vibro

Application Note

Monitoring strategy – Runout compensation

Brüel & Kjær Vibro

Application Note

Monitoring strategy – Runout compensation

ABSTRACT
Time, resources and planning for delivering rotating machinery can be saved by measuring and compensating for runout.

Task

The observed gap between the probe tip and the shaft is not just a function of the dynamic motion of the shaft, but also a function of the shaft surface irregularities. The "measured gap" resulting from shaft irregularities is called runout, and includes:

- **Mechanical runout** – Caused by out-of-roundness, dents, eccentricity and flat spots
- **Electrical runout** – Non-uniform electrical properties of the observed material shaft surface such as residual magnetism and non-uniform shaft material

The combined mechanical and electrical effects of runout can be measured and compensated without investing in additional test equipment. The solution can be integrated with the normal monitoring system.

Measuring runout

Runout is measured and recorded during **slow roll** to minimize the unbalance effects of rotation (i.e. no dynamic shaft movement) so only the combined mechanical and electrical runout is seen.

Compensating for runout

Obviously degaussing, sleeving, machining and/or polishing the shaft surface can minimize the causes of runout, but it is time-consuming and not always physically possible or practical. In such a situation it is more cost-effective to simply subtract the recorded slow roll runout from the actual vibration. This is possible since runout never changes, no matter what speed the machine is running.

Since runout compensation is a static value, it does not influence the dynamic response of the measurement.

Conclusion

It is possible to measure and compensate the signal from the displacement sensors for runout not only during a shop test, but also when the machine is installed on site (without having to remove the rotor). On-site monitoring can then be done without being influenced by shaft surface irregularities.

Moreover, the runout measurement and compensation solution can be done as an extension to the existing monitoring system. Additional test equipment is not needed.

Brüel & Kjær Vibro GmbH
Leydheckerstrasse 10
64293 Darmstadt
Germany
Phone: +49 6151 428 0
Fax: +49 6151 428 1000
info@bkvibro.com
www.bkvibro.com

BAN 0035-EN-12
Date: 08-06-2015