

Design verification and Trouble shooting by Vibration exciting test in actual operating condition.

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ABSTRACT

Recent progress of turbomachinery performance requires the compact design and small clearance of rotor system. High energy density rotor bearing system introduces the vibration instability problems. Recent analysis technology enables the estimation of the instability. However, in actual machines the vibration problems occurs and much money and time are consumed to solve the problems. Then the adequate method to verify the design and trouble shooting is required.

The special method to evaluate the stability of actual machines have been developed and applied. This paper presents the effectiveness of this methods using following actual examples.

- (1) Oil whip problem for large steam turbine.
- (2) Subsynchronous vibration free high pressure centrifugal compressor.
- (3) Special instability problem of large generator.
- (4) Blade-disk-rotor coupled torsional vibration of large steam turbine.

These problems have clearly solved and demonstrated stability after applying countermeasure.

The method is composed by following points.

- (1) Development of High performance vibration exciter
- (2) Test procedure and signal processing.
- (3) Evaluation of stability and adequate countermeasure