Steam Turbine & Generators

Vacuum balancing facility

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Vacuum balancing facility

Why do operating-speed balancing?

An investment that pays well!

Operating-speed, or high-speed balancing of flexible rotors is an important aspect to your turbomachinery repair.
It's being not only requested or recommended by international standards (API, ISO), but also necessary to reduce the risk of vibration problems, which can cause damages, or increased wear of components. This will in turn affect the machine's design efficiency, reduce reliability, and increase operation & maintenance costs, or cause even worse.

Dangers of unbalanced rotors,

- Increased vibration amplitudes in operation
- Higher load on the equipment
- Shorter service life of the components possible
- Rotor mechanical integrity tests (overspeed / spin check of new blades/blade locks/sealings strength) are possible also only in a high-speed balancing machine

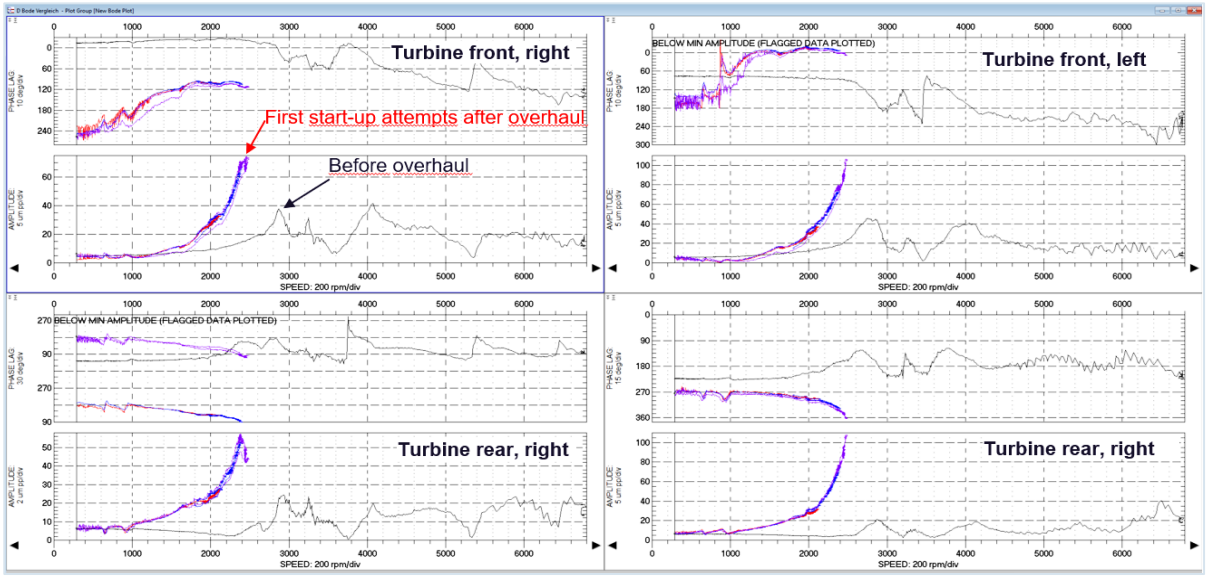
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What happens if we don’t do it?

Example: No HSB done during overhaul

Year:	2022
Turbine Type:	Condensing turbine with geared turboset operating at 26 MW @6800 rpm
Siemens Energy Recommendation:	Overhaul to include HSB 1st resonance ~3600rpm 2nd resonance ~7500rpm
What happened?	Overhaul was done by the customer by their own. They only had LSB on site. Bringing the turbine to operating speed was not possible. The rotor had to be sent to Nuremberg for HSB by plane from Latin America



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Balancing Process

1. Low speed balancing
   (ISO21940 or other)

2. **Overspeed test**
   Done up to 121% of the design operating speed, if necessary

3. Complete Visual Rotor Check
   Inspection takes place in a vacuum chamber or on lathe. Re-work is done in case of any abnormalities

4. High Speed Balancing
   Test runs to determine the influence coefficients of each balancing planes
   The calculated correction weight set is being installed

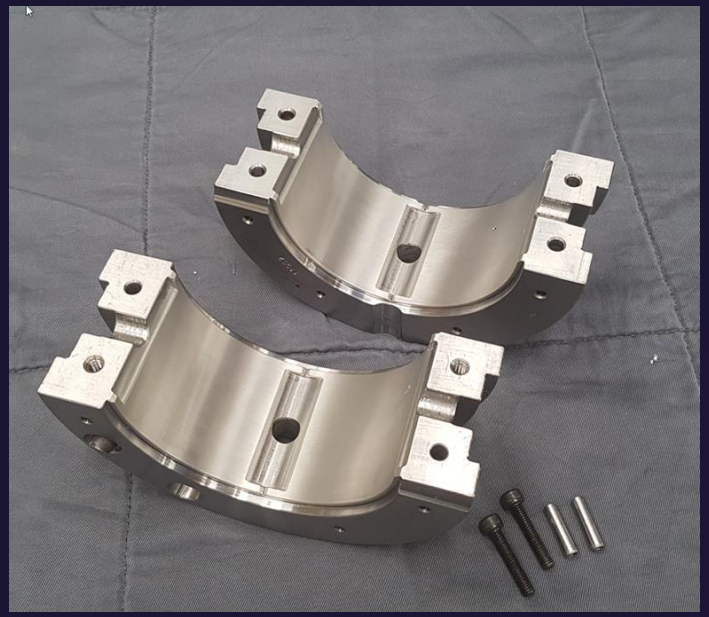
5. Final (acceptance) run
   (ISO, API standards or other)
   After limits were reached
   If required with customer or remote acceptance

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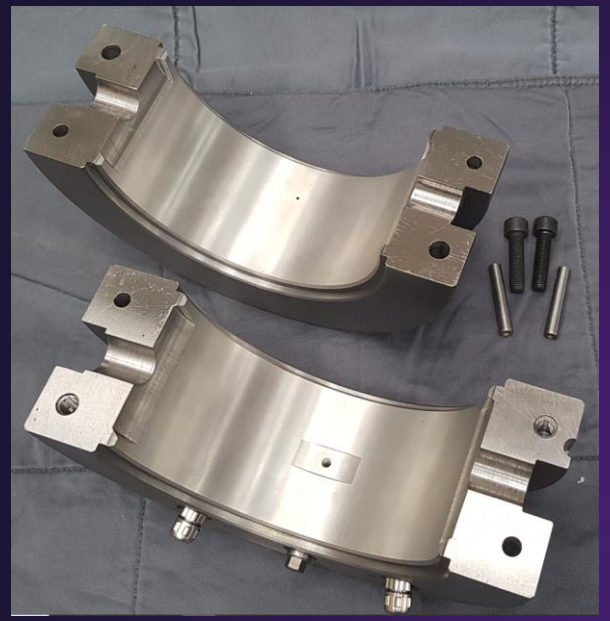
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Examples of Bearing types available in stock for rotor balancing

Four-wedge Bearings



Lemon Bearings



Tilting Pad Bearings



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Examples of standard balancing weights used in rotor balancing

Special weights are available on request.





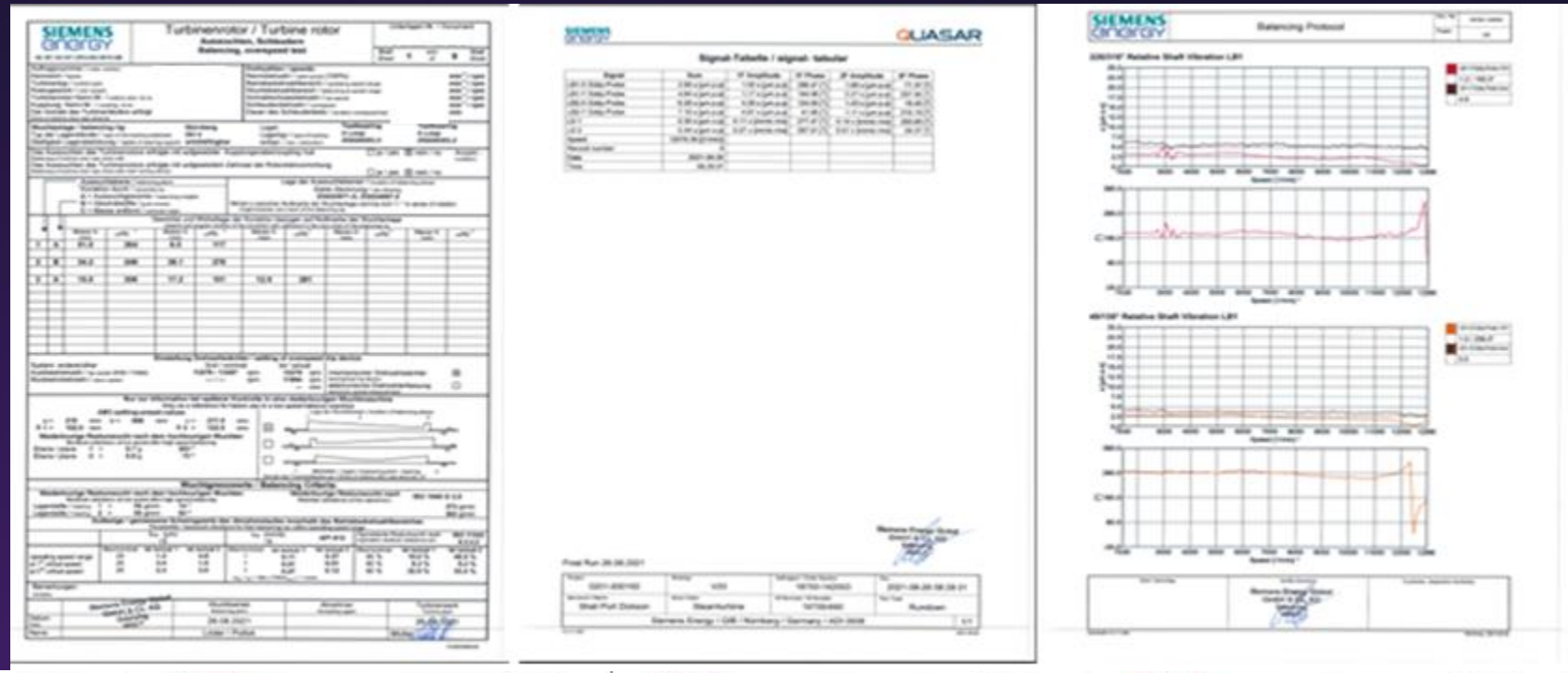


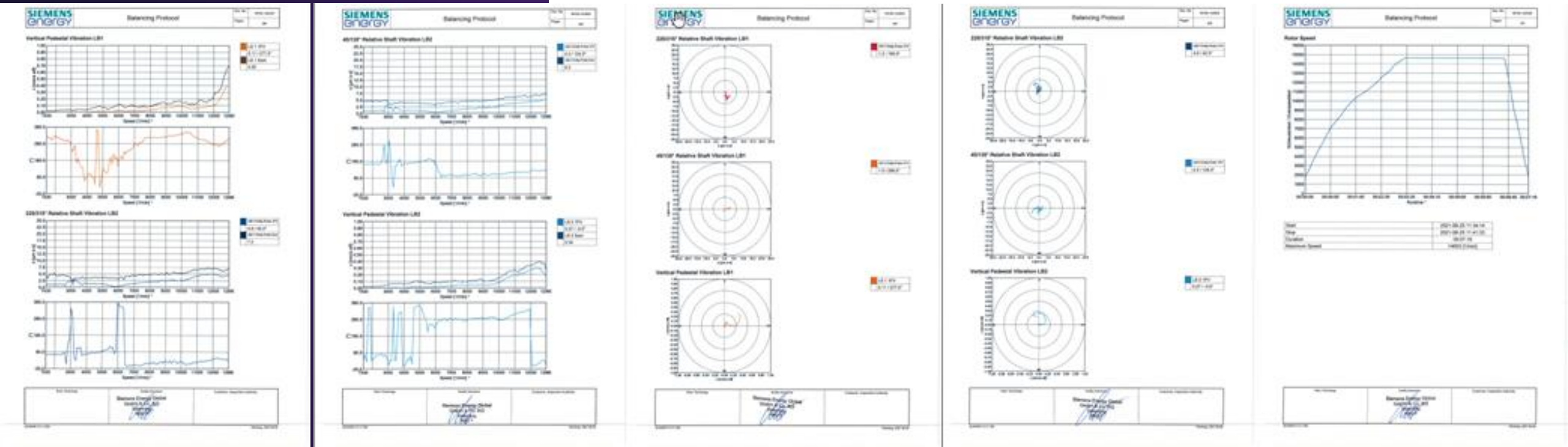
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Clear documentation of the tests

Builds trust and help our customers run their equipment worry free!





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NBG F Facility Technical Characterstics

100	Average # rotors balanced each year
8 tons	Maximum load capacity
Ø1.7 m	Maximum rotor diameter
4.8 m	Maximum length
21,000 rpm	Maximum speed



Live Presentation

Low Speed Balancing



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