

Natural Frequency Resonant Amplification Problem

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There are several important clues to diagnosing a natural frequency resonant amplification problem.

- 1) Natural Frequencies are Non-Synchronous
- 2) Natural Frequencies do NOT have Harmonics (unless we are talking musical instruments)
- 3) Resonant Response is Very Directional (A, H, V)
- 4) A Phase Shift of 90 degrees ALWAYS accompanies a Natural Frequency.
- 5) Natural Frequencies MUST be excited by another frequency to become resonant.
- 6) Resonance problems tend to confuse Balance Programs (phase shift).
- 7) Lots of Damping creates a blunt-wide resonance response in the spectrum (less amplification).
- 8) Very Little Damping creates a sharp resonance response in the spectrum (more amplification).
- 9) A ring-down in the Time Waveform indicates a natural Frequency.
- 10) A successful Bump Test on a Large Structure requires a large softer impact source (hammer).
- 11) A successful Bump Test on a Small Structure requires a small harder impact source (hammer).
- 12) For Fluid Film Bearings, elongated elliptical Prox Probe Orbits indicates a potential resonance.
- 13) Roll Barring issues usually have a resonance contribution to the overall problem.

As with any sure-fire clear-cut guidelines - variations do exist and will occur. Testing is the key to resonance detection.

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