

## **What Makes This Thing Shake?**

Misalignment-couplings/bearings and bent shafts; why do motor bearings fail? which one fails first?

Bad bearings

Eccentric journals--think of it as being off-center

Bad gears or shafts, bent or chipped teeth, normal wear and more

Mechanical looseness

Bad drive belts; when replacing one gear on chain drive, always replace both (same for sheave)

The mark on the belt; with unit properly locked out, place a chalk mark across multiple V belts, and rotate the unit by hand; observe what happens to the marks as the belts rotate at different rpm's

## **Electrical**

Rotor not round

Eccentric armature journals

Rotor and stator misalignment - unequal air gap

Elliptical stator bore - egg-shaped barrel

Open or shorted windings

## **Aerodynamic or Hydraulic Forces**

Blade pass - in water or air

Why fan housings vibrate opposite the rotating blades

## **Reciprocating Forces/Pistons/Engines**

Back and forth, stop and go the other way

## **Resonance**

Everything runs smoothly until the second dryer is started

A machine's "natural" beat

A great way to bring down the Golden Gate Bridge

By the way....is air a liquid, solid, or gas?