Centrifugal Pump Vibrations:
THE CAUSES: Part-1

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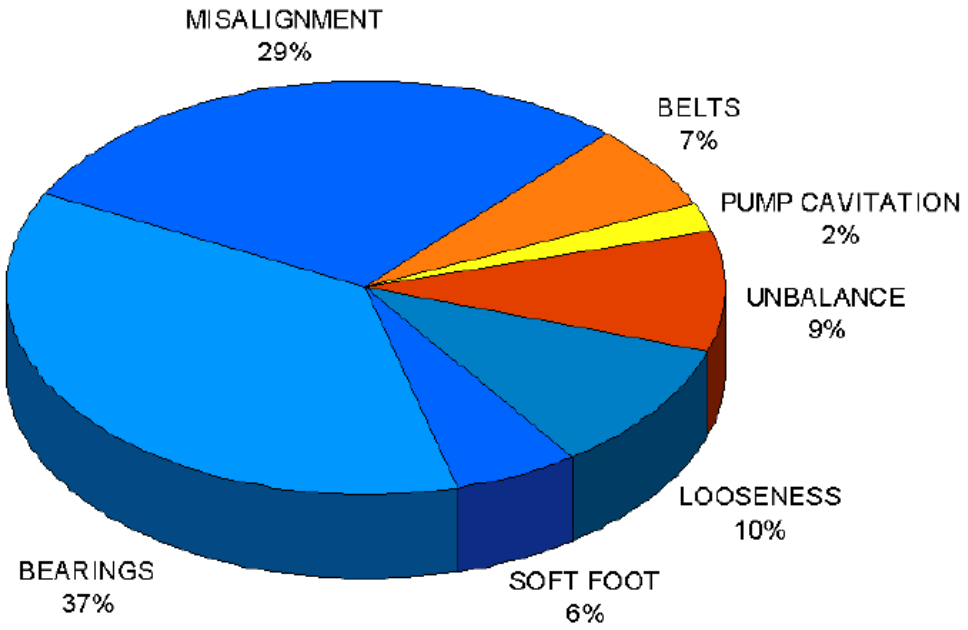
hallmark of *EXCELLENCE*

Vibration Monitoring Fault Data reported over three years:



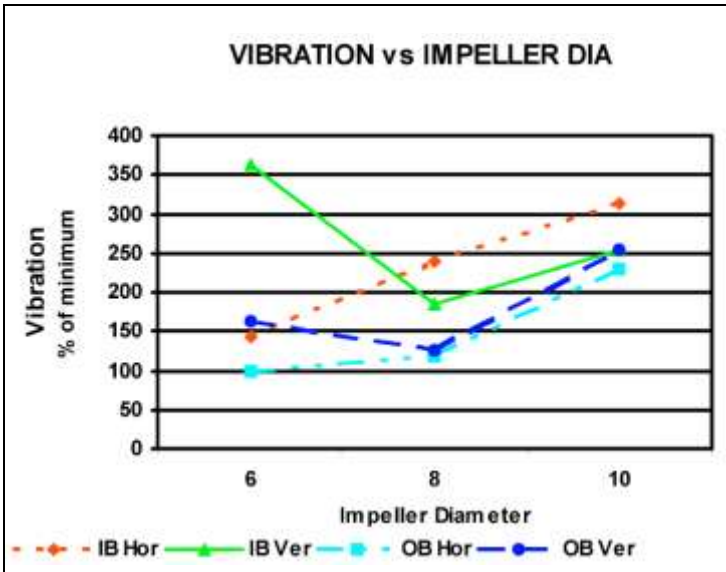
Vibration: *A measure of reliability!*

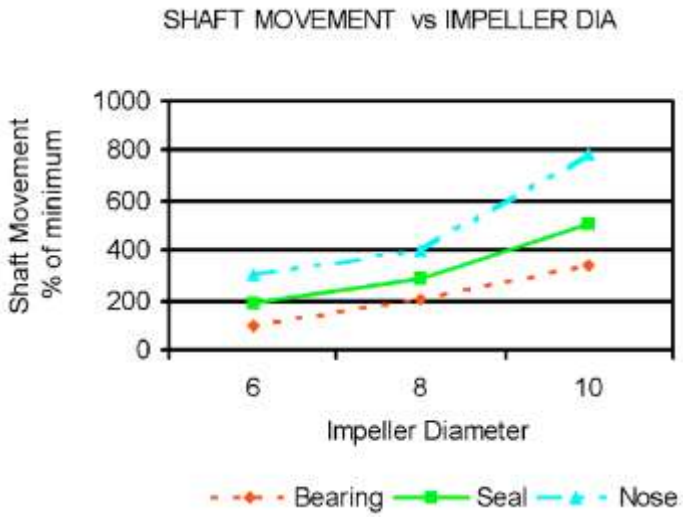
- Poorly installed and operated pumps Average - 0.178 in / Seconds overall vibration and have 6 months life.
- Properly installed pumps Average – 0.071 in / Seconds overall vibration and have 60 months life.

Three Basic Causes of Pump Vibration:

1. Mechanically Induced

- Bad Bearings
- Bent Shaft
- Unbalanced Rotor
- Check Valve Installed Backward
- Mis-Alignment
- Looseness
- Soft Foot
- Maximum Impeller Size

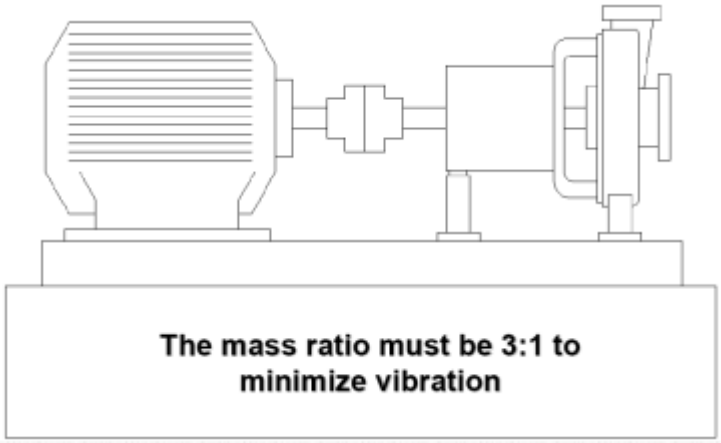


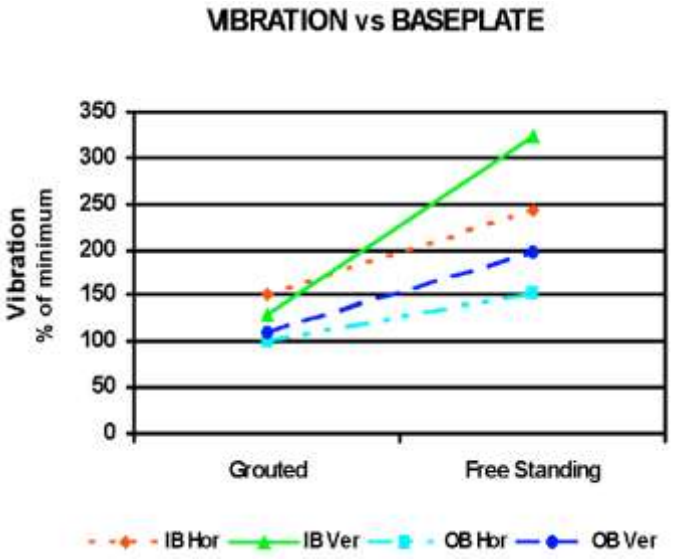


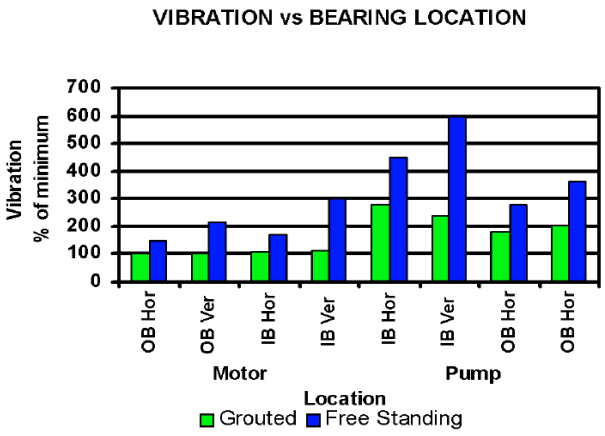
2. System Induced

- Partially / Plugged Strainer
- Clogged Impeller or Suction Line
- Installation / Piping

Foundations & Baseplates:

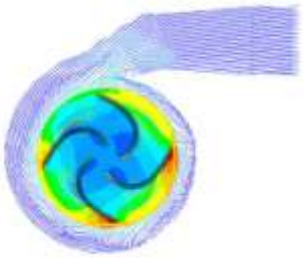




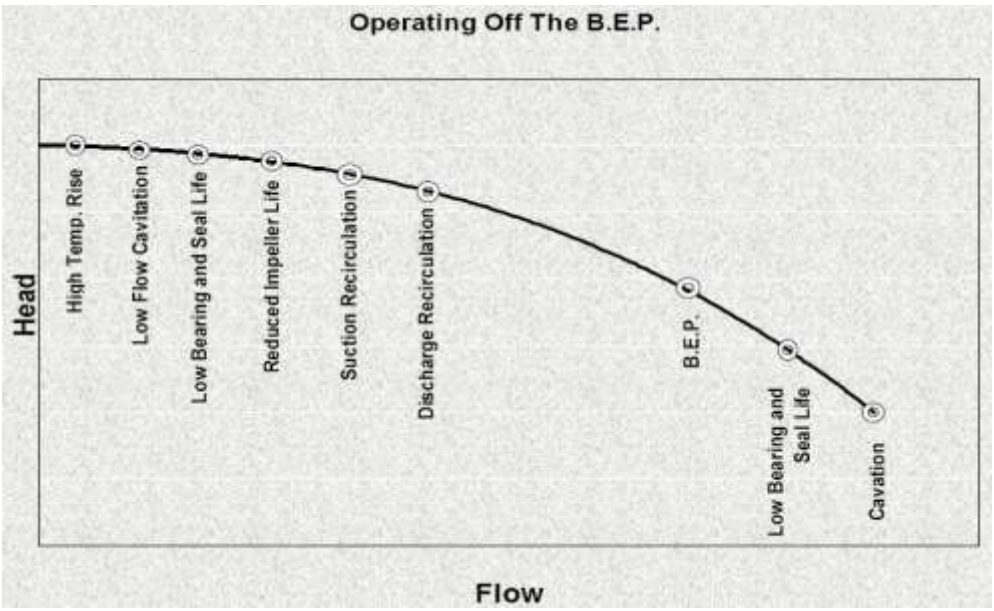


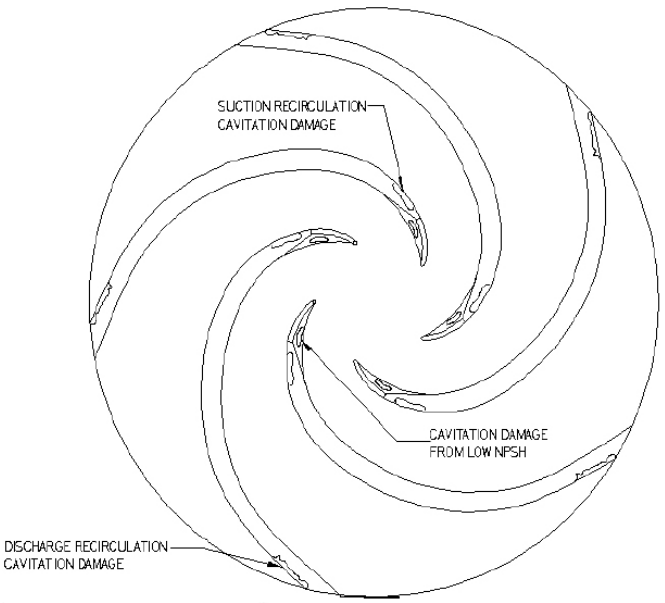
3. Operation Induced

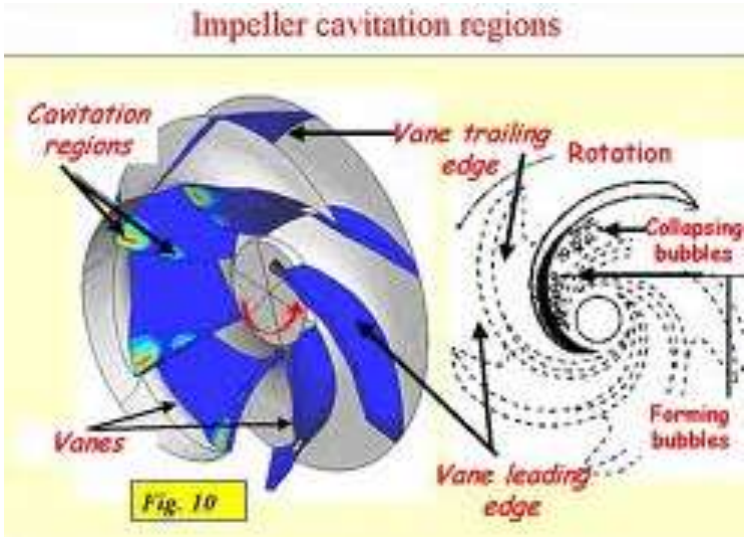
- Cavitation
- Flow
- Speed
- Insufficient Immersion of Suction Pipe or Bell



Cavitation & Flow:







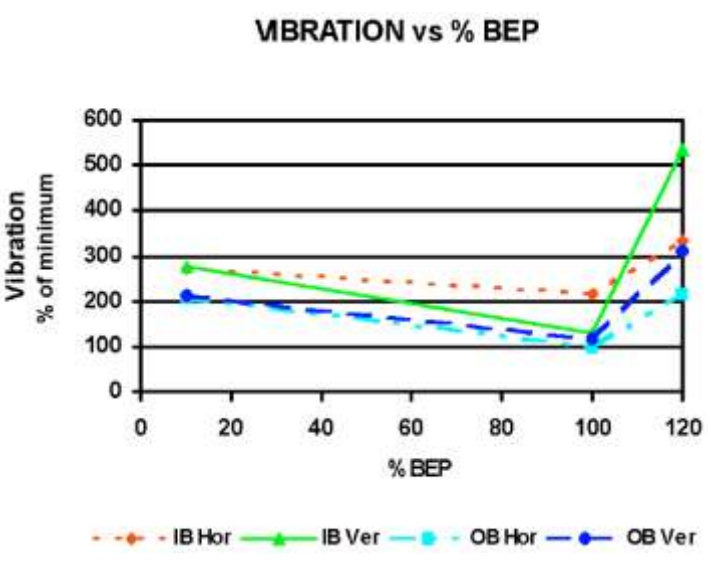
You Can't Run a Pump with Suction or Discharge Valve Closed

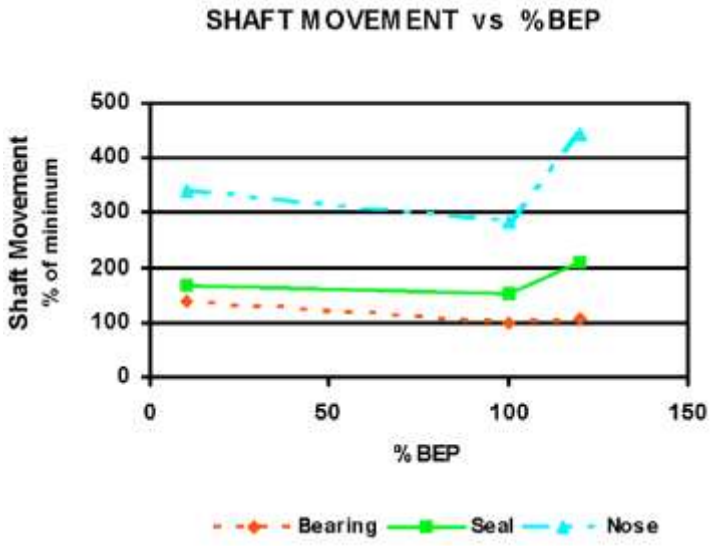
Minimum Flow:

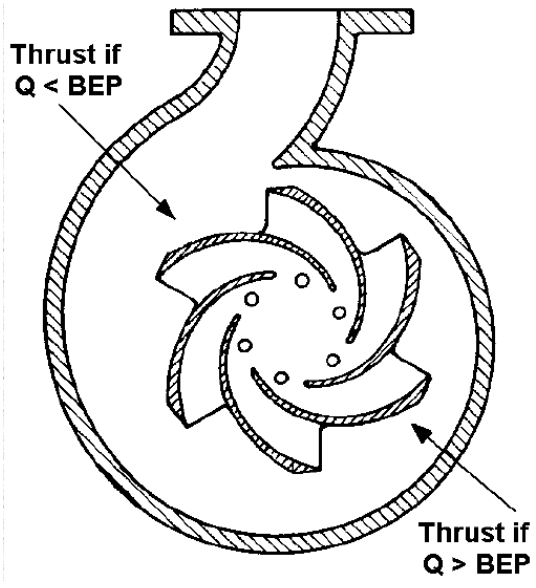
- *1750 RPM 15% - 20% BEP Flow*
- *3500 RPM 30% - 50% BEP Flow*

Maximum Flow:

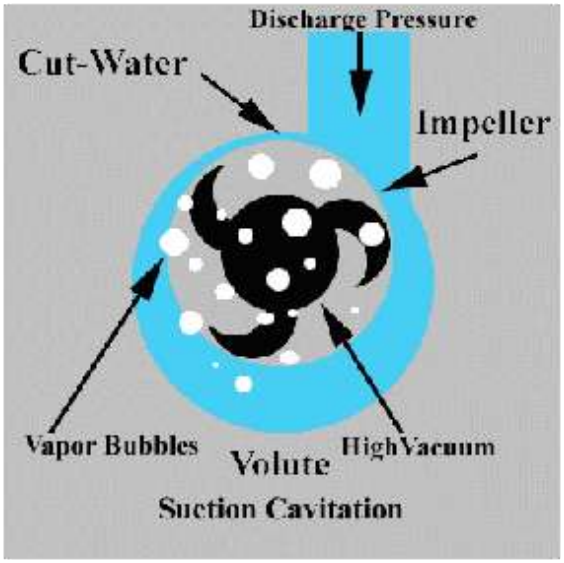
- *110% - 115% BEP Flow*
-



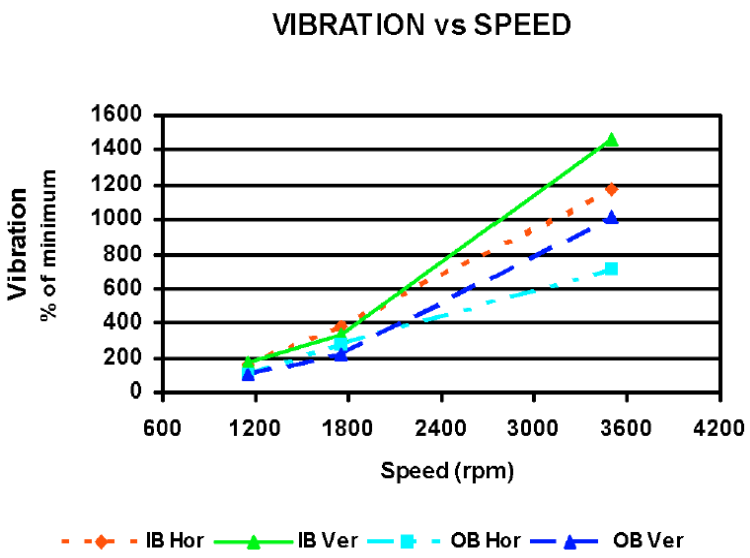


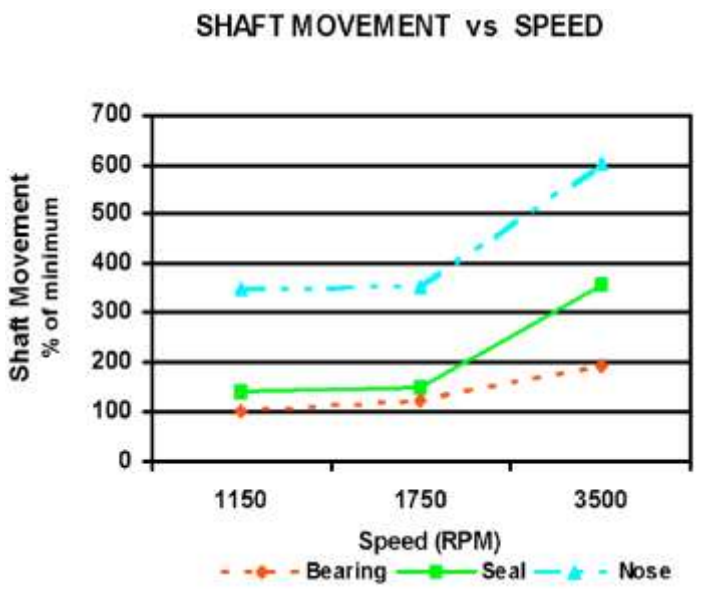


Low Presure/High Vacuum

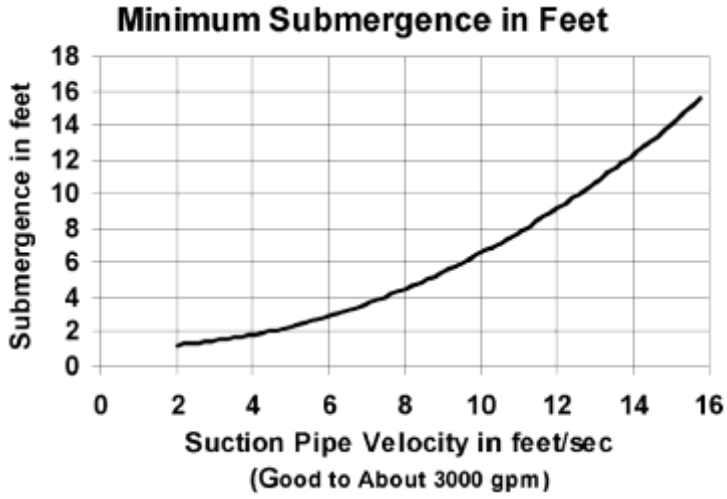


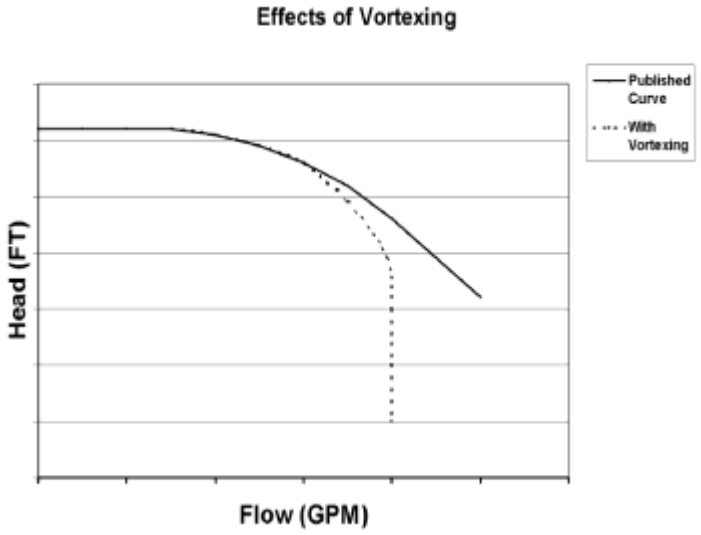
Speed:





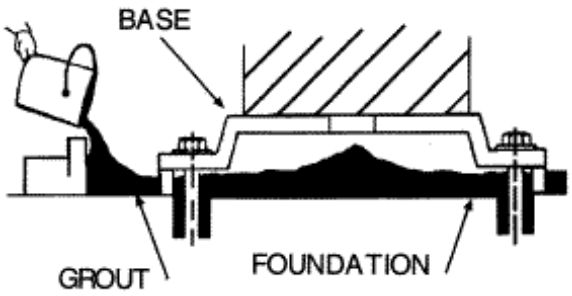
Suction Piping & Emersion:





CONCLUSION:

- Avoid Maximum Size impeller
- Keep Speed to Aprox. 1750 RPM Maximum
- Keep Flow in Design Range
- Grout your Baseplates
- Use Proper Piping
- Avoid hydraulically induced problem like Cavitation, Suction & Discharge re-circulation, Submergence



We look forward to being of assistance in your process equipment requirements

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