SERIOUS SERVICE®
Professional Machinery Health Care
(Fan Doctor®)

VIBES Corp® est. 1967

Vibration **I**ndustrial **B**alancing & **E**quipment **S**ervices, Corporation
720 - 999 W. Broadway, Vancouver, BC V5Z 1K5
www.vibescorp.ca email: info@vibescorp.ca
Phone: 604 - 619 - 9381 (24/7)

SERIOUS SERVICE®

It is not about our trademarks or meaningless words but only the beginning of the commitment to our clients for the last 50 years in business.

We dedicate our experience and resources so you don't have to worry about machinery vibrations and get back to what really matters.

"PEACE OF MIND AT WORK, MORE TIME WITH YOUR FAMILY, FRIENDS AND NATURE"

Garrett Sandwell, *MET, CVA, ASNT 3*
CEO

ContractorCheck Alcumus® Appruv™ Avetta COMPLYWORKS Vendorpm

Vendor Compliant for International Firms, Property Owners & Managers of Commercial Towers, Hospitals, Industrial Plants & Infra-Structure Facilities

Introduction to **VIBES Corp®**

Why work with us? Serving Canadian Industry for over 50 Years.

VIBES Corp's reputation was built and established on thousands of promises fulfilled over 50 years in business across Canada. Superior quality service, sales and training courses provided on the intelligent specialist level has been the standard and always will be since our vibration and balancing business was formed in Calgary, AB, in 1982. (Formerly Industrial Balancing Ltd. Est. 1967) In the final real-time analysis VIBES Corp will deliver more value and peace of mind.

What do we do? Expert technical services and preventative maintenance programs using advanced instruments and tools to solve various vibration, balance and mechanical noise related problems.

Factory trained and repair specialists on HVAC, fans, blowers, cooling towers, pumps, motors, industrial rotors. FlaktWoods Varofoils and Aerofoils, Sheldons Axico, Aerovent, Novenco, New York Blower, Chicago Blower, Canadian/Buffalo Blower, CML Northern Blower, Joy Axivane, Twin City, Alphair, Allied Blower, Markhot Varivane, Loren Cook, BAC, Evapco, Marley, Hoffman, Spencer, Baldor, Reliance, Trane, Carrier, Eng.Air, Haakon, WEG, Leeson, GEC, GE, Emerson, Westinghouse, Toshiba, Siemens, US Electric, Delhi, PennBarry, Armstrong, Westcan, Bell & Gossett, and most types of rotating, diesel engines & reciprocating machinery.

What do we sell, supply, install & service?

- WEG Electric Motors.
- Canada Support - AZIMA/DLI a FLUKE Reliability Company - Engineered Vibration Solutions & Client Training
- COOLBLUE - Inductive Absorbers & Chokes = VFD any motor shaft current bearing damage protection
- DRIVE SYSTEM PARTS: Fans, Bearings, Sheaves, Couplings, Belts, Shafts, Misc
- VIBRATION CONTROL, Isolation & thrust spring mounts, monitoring, trending, alarm/trip switch 24/7 machine protection
- EASY LASER - Portable Laser Alignment tools for all requirements
- CTM - Cooling Tower (all makes) Parts, Inspections & Repair Services
- MIRUS International - Inversine AUHF Inverter Sinewave Filters

The machinery under our professional health care program = **VIBES-GUARD PdM Program®** are treated as if our own. We use proven technologies and methodologies along with our multi-technical and electro-mechanical (VIV, ASD, VPM, CPM, VFD, EIBD, EDM, Shaft Currents, etc.) training, skills, and experiences for total overall analysis and evaluations. When the total analyzed facts about a machine, motor or engine are known we formulate an accurate condition report and recommend the best possible solutions. We work with clients to organize necessary actions in order of urgency or budgets.

Where do we work? (Commercial Towers, Infrastructure Facilities, Industrial Plants, Lumber Processing & Marine Ports, etc.)

Our service area is mainly BC Lower Mainland and Vancouver Island. If requested we can service other areas.

Who have we worked with?

VIBES Corp service capabilities have been used and accepted by high-ranking officials in:

- other service companies
- manufacturing and processing
- engineering firms
- universities
- colleges
- hospitals
- cold storage
- power plants and dams
- sewage and water treatment plants
- government infrastructure facilities
- oil and gas
- biogas energy systems
- transportation and construction
- commercial towers
- agricultural
- mining
- ski hills
- marine-terminals & ships
- asphalt and cement
- saw mills
- pulp and paper
- research and development
- machining / fabrication
- chemical plants
- restaurants
- skytrain tunnels

VIBES Corp accepts: EFT, VISA, Mastercard, Discovery, Debit & SWIFT

EFT Payment Electronic Funds Transfer | VISA | MasterCard | DISCOVER NETWORK | Interac Debit | SWIFT

We take due diligence to the highest level on all projects regardless of size or budget.

Learn About Articles

You can download educational articles from our home page at www.vibescorp.ca. Here are five:

1) Learn About Vibration Volume 1: Basic Understanding Of Machinery Vibration.
2) Learn About Vibration Volume 2: Advanced Vibration Analysis.
3) Learn About Electrically Induced Bearing Damage & Shaft Currents.
4) Failure Prevention Of Variable Pitch in Motion Axial Fans and Controllable Pitch In Motion Axial Fans.
5) Learn About Agricultural Machinery Vibration Solutions.

The photos below show typical projects that we have completed.

Fig 1. The failure was due to defective bearing.
Fig 2. The stainless steel guard helps prevent moisture contamination in cooling tower fan bearings (a very common problem).
Fig 3. A new fan was installed due to a complete failure of the original.
Fig 4. Shows a 200HP motor and fan repair/replacement.

Fig. 1

Solution to Fig. 1 Replaced both Fan Bearings & New Motor Required.

Solution to Fig. 2 The Guard has prolonged the Life Span of the Fan Bearings from 3 years to over 14 years.

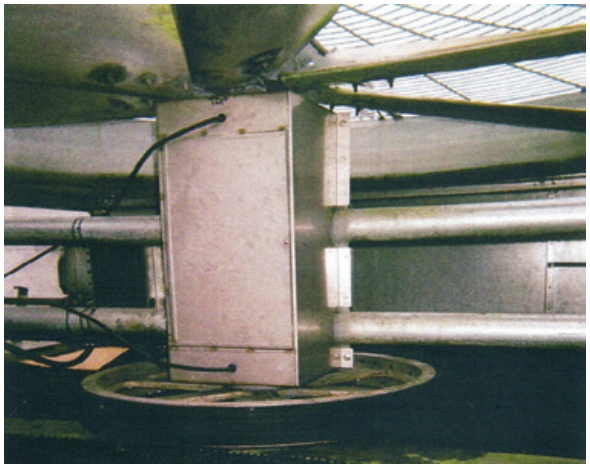


Fig. 2

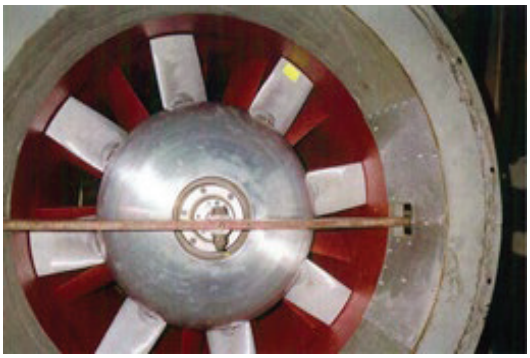


Fig. 3

Solution to Fig. 3 Installed Brand New Controllable Pitch Fan & Repaired Motor.

Solution to Fig. 4 Replaced the Old Motor based on 20 years of running time and Completed Variable Pitch in Motion Fan Maintenance.

Fig. 4

For more information & quote please visit our website www.vibescorp.ca

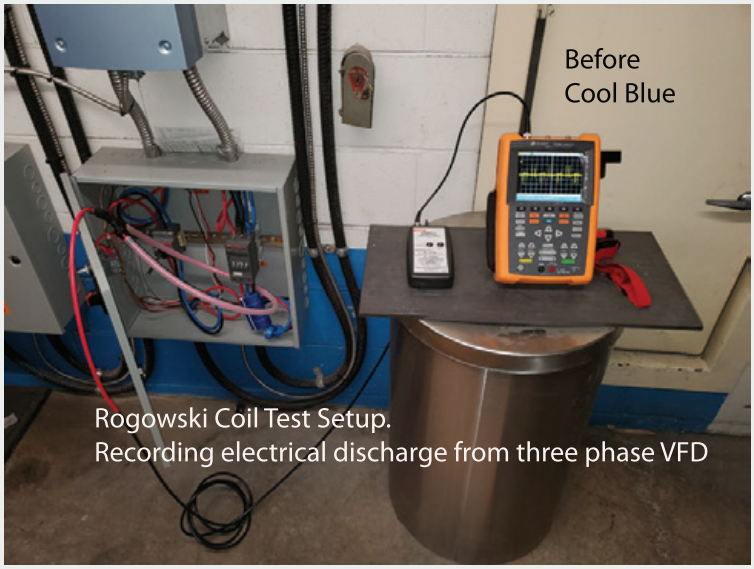
WEG Low Voltage Motors

WEG Generators

WEG Larger Electric Motors and Machines

CoolBLUE® Inductive Absorbers

Absorb the energy caused by the VFD'S at the source...before getting the mottor.



Rogowski Coil Test Setup.
Recording electrical discharge from three phase VFD

Rogowski Coil Test Setup.
Recording Electrical Discharge Levels from VFD.

Cool Blue Inductive Absorbers installed at Pump Station

Elimination of Shaft Currents that were causing consistent motor bearing failures at this site.

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Projects completed at these locations

Onsite Balancing on 1,000 HP Grinder

Custom Cooling Tower Rebuild

Woods Varofoil - 125 HP Major Overhaul 2024

Woods Advanced Varofoil Fans - Installation & Maintenance 1995 - 2024

Tug Boat Twin Diesel Engines Vibration Analysis

Asphalt Kiln Exhaust Fan Balance Job

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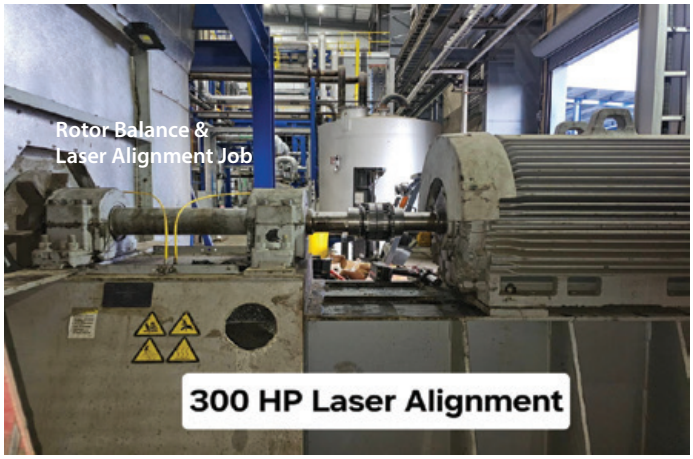

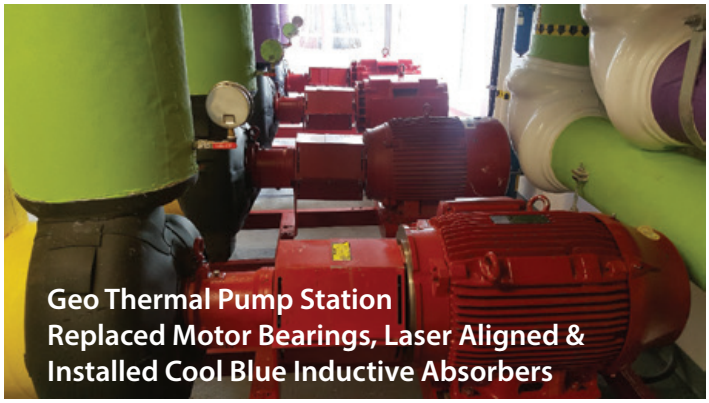

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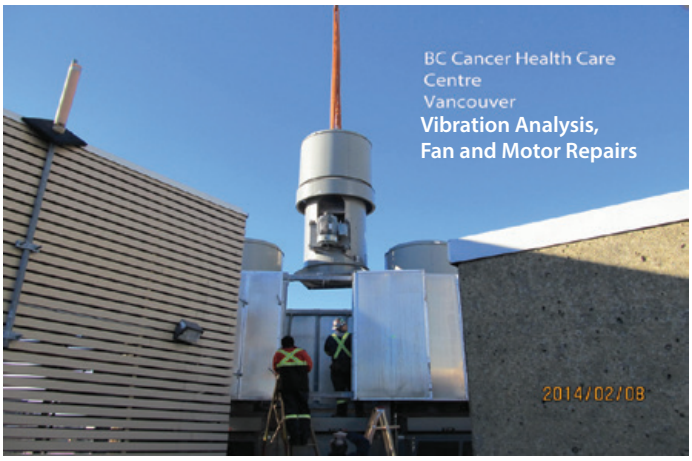

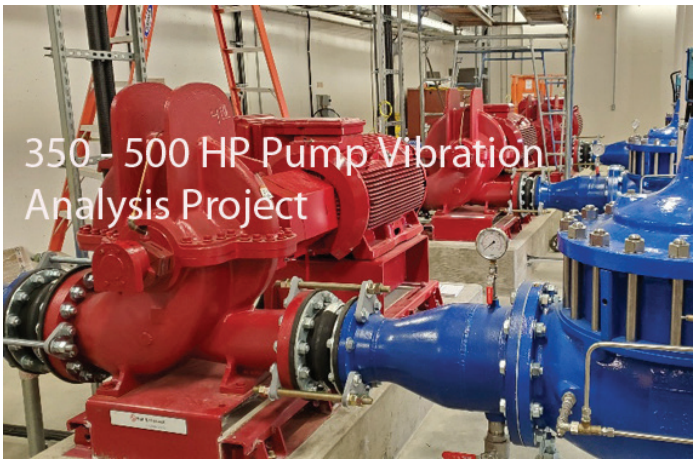

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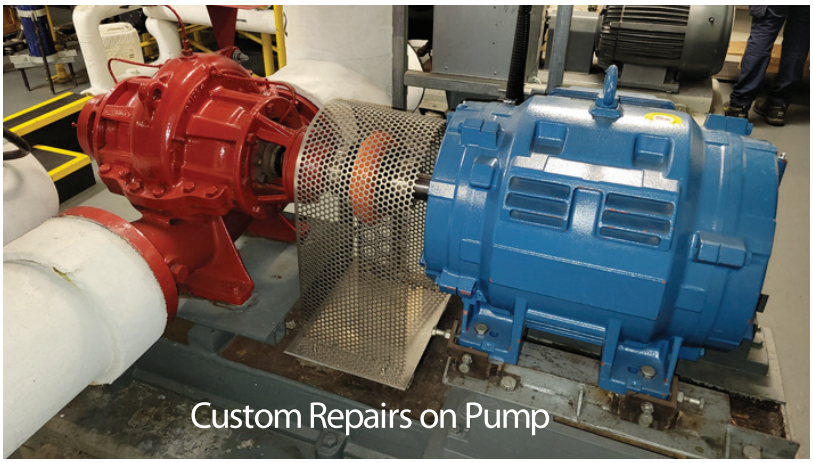

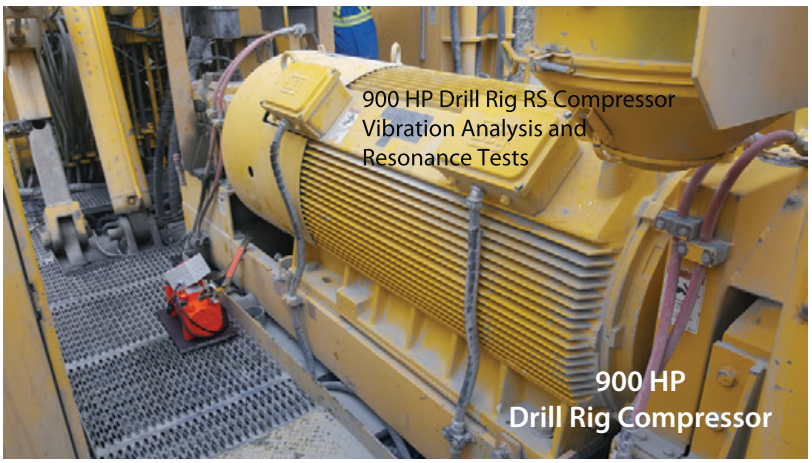

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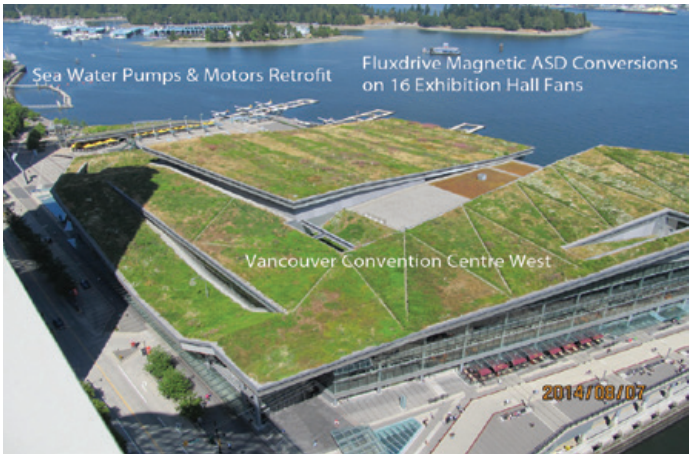

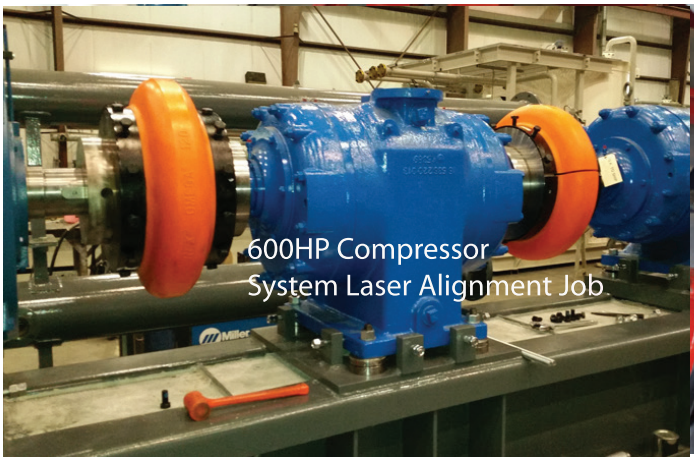

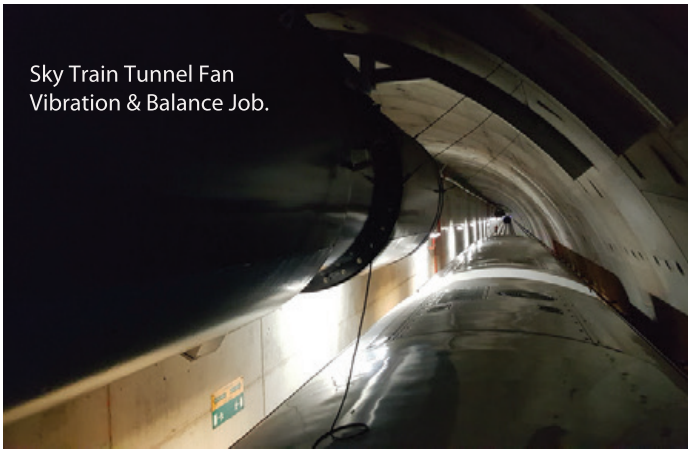

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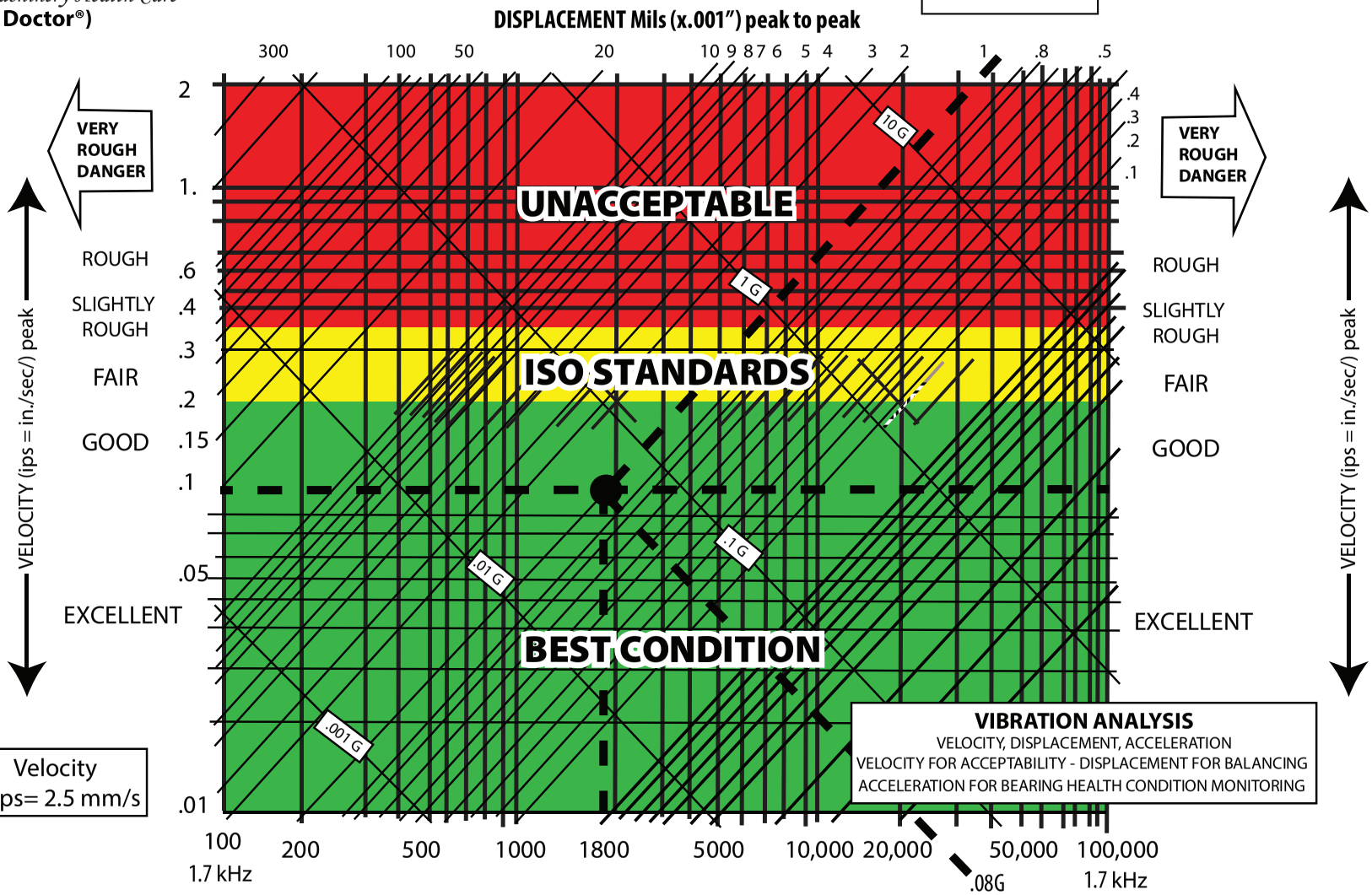
VIBRATION SEVERITY GRAPH FOR GENERAL ROTATING MACHINERY

This Chart is based on ISO 10816-3

AMPLITUDE

Displacement
1 mil = 25 microns



VIBRATION ANALYSIS
VELOCITY, DISPLACEMENT, ACCELERATION
VELOCITY FOR ACCEPTABILITY - DISPLACEMENT FOR BALANCING
ACCELERATION FOR BEARING HEALTH CONDITION MONITORING

Velocity
.1 ips= 2.5 mm/s

REFERENCE POINT ● = 1800 rpm machine/ motor exellent condition

ACCELERATION or FORCE OF GRAVITY "G" (ips^2 = in/sec^2 for simplicity)
ACTUAL G = 32 fps/s = 9.8 m/s/s

Note: the yellow area on chart represents issues that often can't be resolved due to time and cost.

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Vibration Sources Identification Guide

CAUSE	FREQUENCY	AMPLITUDE	PHASE	COMMENTS
Unbalance	1 x RPM	Highest in Radial Direction- Proportional to Unbalance	Single Mark (Steady)	A common cause of vibration.
Defective Anti-Friction Bearings	Very High-Often From 10 to 100 x RPM	Use Velocity	Unstable	Velocity readings are highest at defective bearing. As failure approaches, the amplitude of the velocity signal will increase and its frequency will decrease. Cage frequency is approximately 0.6 x RPM x number elements.
Misalignment of Coupling or Bearing	1, 2 or 3 x RPM	High Axial Axial 50% or more of Radial	Often 2, Sometimes 1 or 3	Use phase analysis to determine relative movement of machine or bearings. Use a dial indicator if possible. Often diagnosed as a bent shaft. Can be caused by misalignment of V belts.
Sleeve Bearing	1 x RPM	Not Large Use Displacement Mode Up to 6000 CPM	Single Reference Mark	May appear to be unbalanced. Shaft and bearing amplitude should be taken. If shaft vibration is larger than the bearing, vibration amplitude indicates clearance.
Bent Shaft	1 or 2 x RPM	High Axial	1 or 2	Similar to misalignment. Use phase analysis.
Defective Gears	High No. Gear Teeth x RPM	Radial	Unsteady	Use velocity measurement. Often affected by misalignment. Generally accompanied by side band frequency. Pitting, scuffing and fractures are often caused by torsional vibrations. Frequency sometimes as high as 1 million CPM or more.
Mechanical Looseness	2 x RPM Sometimes 1 x RPM	Proportional to Looseness	1 or 2	Check movement of mounting bolts in relation to the machine base. Difference between base and machine indicates amount of looseness.
Defective Drive Belts	1 or 2 x Belt Speed	Erratic	Use Strobe to Freeze Belt in OSC Mode	Calculate the belt RPM using: $\text{Belt RPM} = \frac{\text{Pulley Diameter x 3.141}}{\text{Belt Length}} \text{ x Pulley RPM}$ Look for cracks, hard spots, soft spots or lumps. Loose belt. Changes with belt tension.
Electrical	1 or 2 x Line Frequency (3600 or 7200 CPM for 60Hz Power) May appear at 1 x RPM	Usually Low	1 or 2 Marks Sometimes Slipping	Looks like mechanical unbalance until power is removed. Then drops dramatically.
Oil Whip	45 - 55% RPM	Radial Unsteady	Unstable	Caused by excessive clearance in sleeve bearings or by underloaded bearings. Will change with viscosity of oil (temperature).
Hydraulic-Aerodynamic	No. Blades or Vanes x RPM	Erratic	Unsteady	May excite resonance problems.
Beat Frequency	Near 1 x RPM	Variable at Beat Rate	Rotates at Beat Frequency	Caused by two machines, mounted on same base, running at close to same RPM.
Resonance	Specific Critical Speeds	High	Single Reference Mark	Phase will shift 180° going through resonance (90° at resonance). Amplitude will peak at resonance. Resonance in frame can be removed by changing rotor operating speed or by changing the stiffness of the structure.

There are several additional detailed articles that identify more complicated vibration sources at www.vibescorp.ca titled:

1) LEARN ABOUT VIBRATION VOLUME 1: BASIC UNDERSTANDING OF MACHINERY VIBRATION
2) LEARN ABOUT VIBRATION VOLUME 2: ADVANCED VIBRATION ANALYSIS
3) LEARN ABOUT ELECTRICALLY INDUCED BEARING DAMAGE & SHAFT CURRENTS
4) FAILURE PREVENTION OF VARIABLE AND CONTROLLABLE PITCH IN MOTION AXIAL FANS
5) LEARN ABOUT AGRICULTURAL MACHINERY VIBRATION SOLUTIONS

Cover Art Title "Head in the Clouds" by Arnie Nouwens www.thedutchmaster.com