



THE EQUIPMENT RELIABILITY SPECIALISTS

RELIABLE. ACCREDITED. INNOVATIVE.

www.envibe.com | **888.473.5222**

## EnVibe Eight-Year PdM Program Case History – Single Plant Overall Data

Over a period of eight years, EnVibe's reliability group developed a **Vibration Survey and Condition Based Predictive Maintenance Program (PdM)** for the ABC Foods Houston Plant. ABC personnel played an integral part in setting up the program and implementing the repair procedures when machinery faults were detected. Critical to the success of the program was that the maintenance and operations departments were on board with the procedures and goals we were striving to achieve with the vibration surveys, analysis and repairs. Several training seminars were given to the ABC personnel to increase their knowledge of vibration analysis, lubrication techniques, alignment procedures and mass balance procedures of rotating equipment. With each success we had diagnosing problem machinery and correcting the issues before any damaging failures occurred, the more ABC personnel believed in the program and accepted the technologies as valuable tools.

Since each equipment area had people responsible for a set number of machinery, the program eventually created friendly competition between the different areas and each area strived to keep the exception machinery to a minimal in their areas. **Along with less exceptions, the program also produced less down time, maintenance cost and repair cost.** On the next two pages, you will find two graphs which contain the overall vibration data from the entire period. Supporting data tables are found next to each graph displaying the vibration levels from all the different units which made up the plant. **Graph #1** shows all data measured in Velocity Pk while **Graph #2** shows data from the same machines measured in Acceleration Pk. The Velocity data are used to evaluate the low to midrange frequency responses associated with unbalance, misalignment and structural issues. The Acceleration data are used to evaluate the high frequency responses associated with bearing deterioration and gearbox faults.

**Prior to implementing the plant PdM program, machine faults went undetected by existing in-plant Preventative Maintenance practices and were only**

**repaired when a problem became obvious or after a catastrophic failure. General equipment unreliability was the norm.** However upon implementing EnVibe's program, we made significant improvements and combated expensive outages and down-time by reducing vibration levels and predicting faults so that machine outages could be coordinated and managed. Through the eight year period we evaluated each piece of machinery and established baseline vibration standards and parameter sets. This trend knowledge of the machinery helped us determine when to repair the equipment and also let us develop alerts and alarms; thus, preventing unnecessary and premature repairs which often result from a Preventative Maintenance Program.

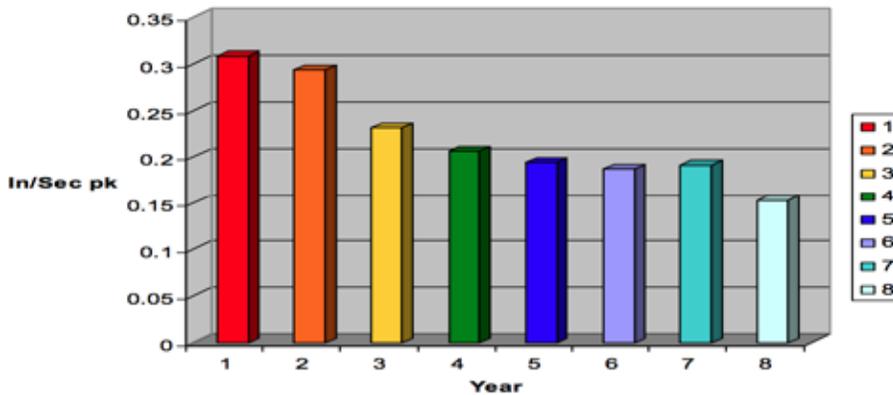
Periodically, as part of the PdM program, we generated a vibration index report that allowed us to calculate an overall average amplitude of each machine, each area and for the total plant. This report was designed to provide management with a general indication of how the Predictive Maintenance Program was performing. The report gave—in one number—the amount of “overall” vibration in the plant for a specific period. As you may suspect, a lower number demonstrates a healthier plant, which was the result we achieved.

As you review the graphs and tables on the following pages, you will see that vibration levels drop dramatically in the first years of the program as a “wave” of major “condition based” repairs, machine improvements and modifications are made. This decrease indicates that problem machines are identified and repaired. After the initial major decreases, the average vibration amplitude levels rate of reduction begins to level off indicating that the point has been reached where equipment is not only optimized for smoother operation but problem machines are fixed early in their failure cycle and operating faults are diagnosed and failures are predicted and prevented. Corresponding with the drops in vibration year over year, plant uptime and equipment reliability increases.

**For more information about EnVibe's customized Preventative Maintenance Programs, please contact us at 888.473.5222.**

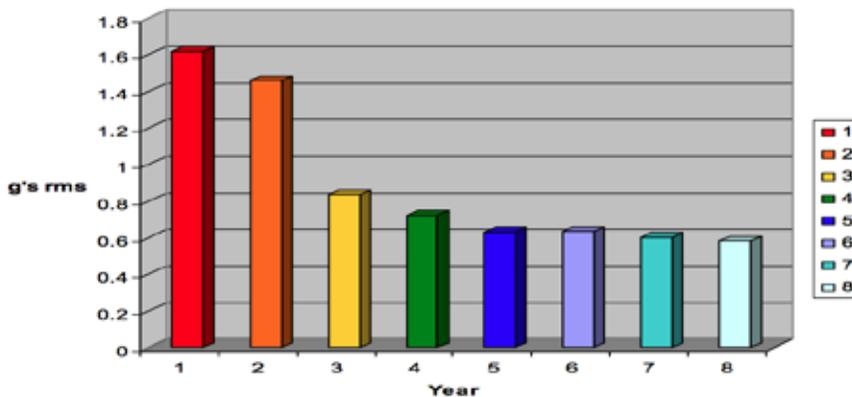
## ABC Foods – Eight Year Evaluation of EnVibe’s Vibration Predictive Maintenance (PdM) Program, Using Index Averaging Calculations

**GRAPH 1** (measured in Velocity Pk)



Year	Average Velocity - In/Sec pk
1	0.308
2	0.293
3	0.231
4	0.206
5	0.194
6	0.187
7	0.191
8	0.153

**GRAPH 2** (measured in Acceleration Pk)



Year	Average Velocity - In/Sec pk
1	1.62
2	1.46
3	0.837
4	0.724
5	0.632
6	0.635
7	0.602
8	0.582