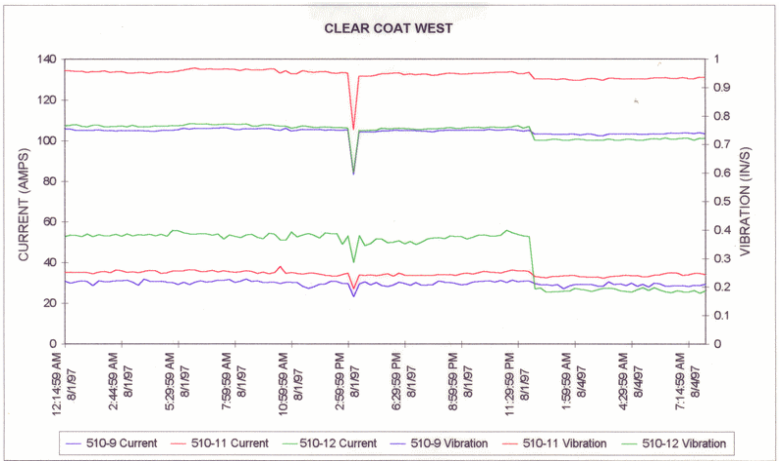
Case Study#3: Energy Savings by Maintaining Fan Vibrations within Specs

Problem:
In industrial environment, it is a common observation that the equipment picks-up dirt, grime, grease and other particulate matter. This is more so with the air handling equipment associated with processes such as paint booths and ovens, dust collectors, stamping and welding operations, etc. As the blades of these fans get dirty, they start generating vibration of the entire fan system. Lack of scheduled cleaning can result in excessive vibrations and eventual fatigue failure of the equipment. **Though, it is not a common knowledge that continuous vibration of equipment also comes at cost of excessive electricity consumption!**

Solution:
At an automotive paint facility, we observed excessive vibrations on the fans associated with spraybooths. We added real-time vibration monitoring equipment on the spraybooth exhaust fans, as a tool for preventive and predictive maintenance. Data was monitored by the Human Machine Interface (HMI) with real-time and historical trending of vibrations as a tool to schedule cleaning of fans. Along with vibrations, we also monitored energy consumption by the fan motor.

The trend chart shown below shows the vibration levels for fans and current drawn by the fan motors. The drop in current draw, for the motor for fan # 510-12 after reducing vibration level from 0.38 inch/sec to 0.18 inch/sec is evident. Annual electrical savings from three exhaust fans were $3,188 (typical facility has anywhere between 25 to 60 such fans). Other benefits include: alleviate possibilities of premature failure of the exhaust fan and thus production losses and extending the life expectancy of the equipment.



Exhaust #	510-9	510-11	510-12
Vibration Before	0.22	0.27	0.38
Vibration After	0.2	0.25	0.18
Current Before	105	134	**107**
Current After	103	130	**100**
Kilowatts Saved per Year	11557	22109	37184
Dollars Saved per Year*	520	995	1673
Total Dollars Saved (based on $0.045/kW)	**3188**		