



Case Study

Developing and Fine Tuning a Measurement System Saves Over \$1 Million per Year

The Opportunity

A manufacturer of high speed rotating equipment was having a problem with engines failing dynamic responses at the engine test cell. When this occurs, the engine must be completely disassembled and parts replaced. At the outset, the company was experiencing a 30% failure rate. The problem was costing the company in excess of \$1 million per year in additional materials, labor, and loss of throughput.

The Approach

A group consisting of production, maintenance, quality control and engineering personnel was formed to deal with the problem. Under the direction of a QualPro consultant, the project participants began the journey upstream to begin process improvement. The first improvement was accomplished by the development of an intermediate test that allowed the company to test for vibration prior to complete assembly of the engine. When failures occurred, repairs could be made much more quickly. The initial fix took only five minutes but succeeded only 20% of the time. Further adjustments would not work.

The Test

In order to improve results at the intermediate test point, thirteen factors were examined. Using QualPro's powerful MVT™ process, the team quickly ran an experiment. The results were quite surprising.

<i>Idea</i>	<i>Old</i>	<i>New</i>
Balancing	In phase	Out of phase
Turbine Wheel Location	Front	Back
Spring Tension	35	50
Shaft Finish	High	Low
Balance Sequence	Early	Later
Location of Probe	Top	Bottom
Lube	Yes	No
Mag Shaft Pressure	50	15
Double Diaphragm I.D.	Small	Big
Press Shaft Components	No	Yes
Bolt	20 tpi	16 tpi
Prox Probe	A	B
Balance Orientation	Top	Bottom

The Results

Location and type of test probe dramatically reduced variation of the intermediate testing results. This allowed corrections to be made quickly. As a result of the newly developed intermediate test and refinements to the test procedure itself, failures at final testing were eliminated. Savings amounted to over \$1 million per year.