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Six Sigma Quality Enhancement of Spindle Motors in Computer Harddisk Through a Vibration Measuring System

Investigator: Natapong Vutikorn

The 70's & 80's were properous years for the development of technology. Since 1970, production of goods has become more complicated. Production processes have taken less time with smaller production cost. Product life cycles are shorter. In response to customer's satisfaction, production must be more flexible enough to catch up technological changes. Corporation must find different ways to attain customer satisfaction. Motorola corporation realized all these problems and found a new way to guarantee quality so called Six Sigma, developed by Mikel J. Harry. Motorola has become a successful business and was able to develop high quality rapidly. In 1998, this company got a quality award called "Malcolm Baldrige National Quality Award".

In this engineering research, we apply the Six Sigma discipline to solve problems in real production processes at the *Seagate technology* (Thailand) Rangsit, a manufacturer of spindle motors in computer harddisks. The objective of this research is to reduce all unnecessary expenditures and watses in such production processes as much as possible. We have improved quality of its measuring system (See Figure 1) to promote customer confidence. The data is used to build up highly efficient decision making in production processes. We have also investigated motor vibration which should not exceed 150% ACT. Such investigation aims at finding ways to enhance accuracy and precision. There were four steps in our experiment i.e. measuring phase, analyzing phase, improving phase and controlling phase. Cheetah 18LP model was selected for such an experiment. We have found that the vibration measuring system lack of linearity and precision property. (See Figure 2) Bearing is a major component generating the vibration.

Figure 1 Vibration Measuring System for Spindle Motors

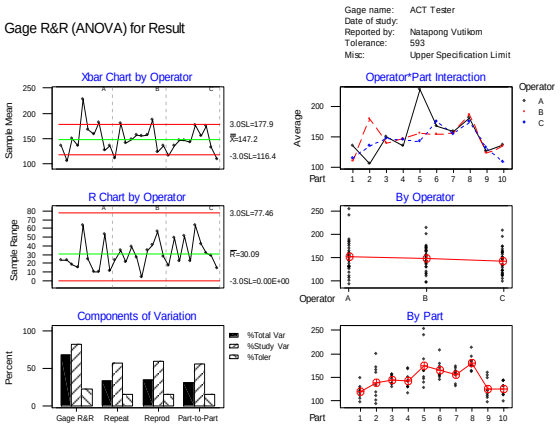

Figure 2 Gage Repeatability and Reproducibility Result

King Mongkut's University of Technology Thonburi Tungkru Bangkok

Address: Suksawasd 48 Bangmod Bangkok 10140 Thailand
Tel. No. +66 (0) 24709691, 4709339 Fax +66 (0) 24709691 http://fibo.kmutt.ac.th