

RELIABILITY ENHANCEMENT OF ROTARY EQUIPMENT USING VIBRATIONAL ANALYSIS AS A TOOL

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Abstract: In recent year failure due to rotary equipments is an major issue that has drawn increasing industrial interest to overcome it through different methods and technology. In this research it has showed that how major problems can be neglected from the root by root cause analysis method. Which increases the reliability and mean time between failure(mtbh)of the rotary equipments. In this analysis we have done the monitoring of rotary equipments in running condition by root cause analysis method to increase reliability and mtbf of equipments.

KEYWORD: Vibration analysis, Condition monitoring, Reliability enhancement

1. Introduction

Reliability is defined as the probability that a device will perform its required function under stated conditions for a specific period of time. Predicting with some degree of confidence is very dependant on correctly defining a number of parameters. For instance, choosing the distribution that matches the data is of primary importance. If a correct distribution is not chosen, the results will not be reliable. The confidence, which depends on the sample size, must be adequate to make correct decisions. Individual component failure rates must be based on a large enough population and relevant to truly reflect present day normal usages. There are

empirical considerations, such as determining the slope of the failure rate and calculating the activation energy, as well as environmental factors, such as temperature, humidity, and vibration. Lastly, there are electrical stressors such as voltage and current. Reliability engineering can be somewhat abstract in that it involves much statistics; yet it is engineering in its most practical form. Will the design perform its intended mission? Product reliability is seen as a testament to the robustness of the design as well as the integrity of the quality and manufacturing commitments of an organization. This paper explains the basic concepts of reliability as it applies to power supplies manufactured by Vicor.

As the topic ‘CONDITION MONITORING OF ROTATING MACHINERY’ suggests, this project involves monitoring the condition of various high speed & low speed rotating machinery. Statistics show that 38 out of 100 major accidents are caused by mechanical failures. These failures occur as a result of poor maintenance practices. The most well known maintenance techniques are Breakdown Maintenance, Proactive Maintenance, Predictive Maintenance, Preventive Maintenance, Reliability Centered Maintenance and Condition Based Maintenance. Out of the above mentioned techniques, Condition Based Maintenance (CBM) has become very popular over the years and is widely used in various industries. There are various modules in CBM with the help of which accurate information about the particular machine can be obtained. These include vibration monitoring, thermography, tribology, wear debris analysis, visual inspection and other techniques. Vibration monitoring gives accurate information about the mechanical condition of the machine and enables to capture the change in condition in very small

magnitude and time. Reliability is defined as the probability that a device will perform its required function under stated conditions for a specific period of time.

2. Literature Survey :

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Tandon And Choudhury Et Al[16] It Provides Important And Effective Approach To Analyse Unit. The Fault Signal High Frequency Impact Vibration, It Has Been Applied To The Fault Diagnosis Of Rolling Bearing Successfully. Meiru Liu Et Al [17] It Has Obtain That Natural Frequencies Of Flywheel And The First 10 Orders Of Vibration Modes. Using Spectrum Analysis For Vibration Monitoring Of Flywheel Is Emphasized. Dario Buono Et Al [18] The Result Obtained Demonstrated Feasibility Of Applying Vibration Based Cavitation Detection Techniques To Pump Under Investigation And Result Have Been Obtained From Experiment. Rati Kanta Mohanta Et Al[19] It Is Found That Monitoring Is Essential For Shaft And Bracket In Turbine, Low Frequency Is Used To Monitor Vibration Of Bearing. This Techniques Increase Reliability Of Plant. Pankaj Gupta Et Al[20] They Have Developed several Techniques For Measuring Vibration And Are Still Attempting To Improve Signal Processing Techniques.

Rugiang Yan Et Al[21] To Detect Defect In Rotary Equipment, This New Technology Has Reduces And Decomposed Vibration Which Is Occurred Repetatively Due To Machine Excitation And Improve The Robustness In Signal Analysis. Fan And Zvo [22] Analyse Result Showed That The Method Was Effective To Extract Signal And Help To Detects Fault In Gear Box. Halit Aslanci Et Al [23] Vibration Analysis Plays Important Role In Predicting And Diagnosing Machine Faults. Maniram Tarar [24] It Has Help To Plan Scheduled Maintenance When Required Through RCM And Its Benefits By Repairing Equipment Before Failure. Vikas Sharma Et Al [25] Statistical Indicator For Gear Fault Diagnosis, Over Past 2 decades Much Time For Research Has Been Devoted To The

Development Of Condition Based Fault Diagnosis Techniques.

Conclusion :

This paper has summarized Vicor's view on power supply reliability. We hope it has provided some insight into the details behind calculated MTBF numbers. Reliability numbers can vary greatly between suppliers and only by understanding the assumptions and methodology used, can meaningful comparisons be made. In summary, when properly applied and operated in accordance with Vicor's Applications Manual, Vicor Power Components are some of the most reliable products available.

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