RELIABILITY ENHANCEMENT OF ROTARY EQUIPMENT USING VIBRATIONAL ANALYSIS AS A TOOL

Aditya Phadtare¹ Praful Thokale² Suraj Temghare³ Akshay Sonawane⁴ Prof. Ganesh Jadhav⁵

¹Student,Saraswati College Of Engineering,India,adityaphadtare5@gmail.com

² Student,Saraswati College Of Engineering,India,Pthokale123@gmail.com

³ Student,Saraswati College Of Engineering,India,temgharesuraj98@gmail.com

⁴ Student,Saraswati College Of Engineering,India,akshaysonawane107.as@gmail.com

⁵ Professor,Saraswati College Of Engineering,India,ganeshjadhavgi89@gmail.com
Abstract: In recent years, failure due to rotary equipments is a major issue that has drawn increasing industrial interest to overcome it through different methods and technology. In this research, it has shown how major problems can be neglected from the root by root cause analysis method. This increases the reliability and mean time between failure (MTBF) 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 dependent 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:


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.

References:


