Electric Motor Reliability

Reliability is the key. Understanding all the elements of electric motors & predictive maintenance is the challenge

Are you interested in increasing the reliability of your electric motors and the systems they drive? Then you have come to the right place. In the article that follows, we talk about what reliability means and then provide you with a host of proven tips and hints for improving reliability and what needs to change in your culture to support better reliability.

What is Electric Motor Reliability?

If we say a person is reliable, we mean that we can depend on them -- that they won't fail us. The same is pretty much true when we talk about electric motor reliability: when an electric motor is reliable, that means there is a high-probability of failure-free performance during a certain time-frame or over its useful life. Another way of putting it is that a reliable electric motor provides consistent performance.

MTBF: Measuring Reliability

There is a measurement related to reliability: mean time between failures, or MTBF. It is the average amount of time between failures for a machine or component, and that includes electric motors. An electric motor that is reliable will have a long MTBF (a long time between failures). This value can also be predicted for equipment.

Techniques for Improving Reliability

So how can you improve reliability when it comes to your electric motors and the drive systems they power? Here are some tried and true methods.

Vibration Analysis

One of the most proven technologies that can help you prevent failures is regular vibration analysis, usually on a monthly or quarterly basis (or, if your budget can't handle that, many companies have it performed just once or

twice a year as a “pre-outage” study). You can find trained vibration analysts to perform the analysis for you, or you can set up your own equipment and do it yourself if you are willing to invest in some training. There are also a lot of sensors available in today’s marketplace that can collect this data for you.

Spares Management

Never underestimate the importance of spares management. Just having a spare motor on hand does not mean it will be operational when you need to use it. These motors need to be stored in an environment that will not cause them to degrade (i.e., moisture, extreme temperature changes, dust) and they need to be maintained just like your other motors. You can sub-contract the storage of your spares so you can be sure they have been maintained and stored appropriately.

Repair Specifications

Another good way to improve the reliability of your electric motors is to prepare a repair specification (which can be a simple one-page document or much longer, depending on your requirements) and require that anyone that performs repairs on your motors follows your repair specifications. This helps you ensure the consistency of repairs that are performed on your electric motors.

New Motor Purchasing Specifications

Repairs are not the only things that you should have specifications for. When you purchase an electric motor, you should have a new equipment specification in place that you use to guide that purchase. Don’t purchase whatever the vendor decides to sell you -- if you want to make sure your purchase is reliable and a valid replacement, then you can require that it be a direct model number replacement or meet some other type of requirements. Also, your specifications should be a reflection of the unique goals and requirements of your plant or industry.

Tracking Software

A great way to recognize and fix recurring problem areas is the use of asset tracking software. It can be used to track failures, location of equipment, and other key factors that can serve to highlight areas that need to be investigated.

An overview, such as tracking software provides, can often point you to a solution that case-by-case analysis cannot. Many EAM and CMMS systems can accomplish this but there are also standalone programs like HECO's TracRat.

Lubrication Program

Lubrication is vital to the life and reliability of your equipment, including your electric motors. If you want to increase the reliability of your motors, then institute a lubrication program.

The Industrial Internet of Things (IIoT)

A newer development in reliability (and especially in predictive maintenance and condition- based maintenance) is the use of IIoT (the industrial internet of things) to track and analyze the performance of electric motors and other machines/components. Many of the IIoT solutions that are applicable to electric motors are fairly simple to use and install and can provide a quick payback by improving reliability.

Take Advantage of Predictive Technologies

Another area of technology related to electric motor reliability is predictive technologies. This includes thermal imaging, vibration, ultrasonic, oil testing, motion amplification, motor current evaluation, etc.. The wise use of such tools can greatly aid in predicting failure before it happens.

Be Willing to Change

A final tip for improving reliability is the need for change. If your current approach is not working, then find a different approach. Just because something has been done a certain way for many years doesn't automatically mean it's still the best way.

Maintenance Culture and Electric Motor Reliability

If you want to see the reliability of your electric motors increase, then it is time to take a look at your maintenance culture. There is a quick and easy way to determine what type of maintenance culture you have: do you focus on the

“what” aspect of electric motor failure, or on the “why” aspect? If you settle for what failed, you will never be able to really improve your electric motor reliability. If you instead focus on **why** something failed, then you can prevent that failure from happening again and improve the overall reliability of the electric motor.

EASA Accreditation and Reliability

One of the driving forces behind EASA accreditation was the need to dispel the myth that electric motors were not reliable after they had been repaired. However, using proven repair techniques and quality control process, a repaired electric motor can be even more reliable than a brand new one. That is why it is important to seek out an electric motor repair shop that is EASA accredited -- then you can depend on the reliability of any electric motor you have repaired there.

Conclusion

HECO is an EASA accredited electric motor repair and maintenance provider. We would enjoy the opportunity to work with you to develop a plan to increase the reliability of your electric motor powertrains. We have the state-of-the-art tools needed to assist you with predictive maintenance and we know how to use those tools to your best advantage. Contact us today!