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10 Components of a Successful VIBRATION PROGRAM

by Alan Friedman

Right People and Right Leadership

Part 2 of this series on the components of a successful vibration program describes the skill sets and attitudes that are most appropriate for those who want to run successful vibration monitoring or condition monitoring (CM) programs.

Read Part 1: Right Goals

Figure 1: 10 components of a condition monitoring program

1. Right Goals	**Having clearly defined and achievable goals that may evolve over time.**
2. Right People	**Having the right people in the right roles with the right training.**
3. Right Leadership	**Inspiring continuous improvement.**
4. Right Tools	**Having the right tools and technology to help reach the goal.**
5. Right Understanding	**Equipment audits, reliability and criticality audits, FMECA, maintenance strategies, etc.**
6. Right Data Collection	**Collecting the right data at the right time to detect anomalies, defects or impending failures.**
7. Right Analysis	**Turning data into defect or fault diagnoses.**
8. Right Reporting	**Turning data into actionable information and getting that information to those who need it at the right time and in the right format.**
9. Right Follow-up and Review	**Acting on reports, reviewing and verifying results, benchmarking, auditing and improving, etc.**
10. Right Processes and Procedures	**Tying together: people, technology, information, decision-making and review.**

Right People

ISO18436-2, which covers training and certification of vibration analysts, recognizes four levels of certification that roughly translate into different roles in the program. Category I certified analysts are typically involved in data collection and simple alarm checking on pre-defined routes. Category II certified analysts are responsible for the day-to-day running of the program, including data analysis, reporting and general database management. Category III analysts are usually responsible for the initial program setup and overall management of the program. This includes everything from choosing which assets to test to defining test points, test setups, determining which monitoring technologies to use, developing baselines and alarms, etc. Category IV people are a rare breed and their focus is more on rotor dynamics and monitoring large process equipment. The different roles involve different skills and different pay scales, thereby making a division of labor a more cost-effective way to manage a program.

Certification from an accredited organization is important. It ensures that personnel have at least a minimum degree of understanding of the subject matter. Certification is also important for compliance and liability reasons. But does having certified personnel on staff ensure the program will be a success? Is certification enough?

There is a difference between a condition monitoring program and a guy with a tool. CM technologies are often used for troubleshooting known problems. This is considered reactive maintenance and it is the worst possible use of the technology. The whole point of having a CM program is to reduce emergency or reactive work. The difference here implies that the people running the program will need a program management mind-set and skill set, rather than a troubleshooting mind-set. The skills required to analyze data or troubleshoot a mechanical problem are often different than the skills required to run a program.

> The best person for any job is someone who loves the work

Some people suffer from the "hero complex," whereby a maintenance professional sees himself or herself as the person who gets called in an emergency situation to solve a difficult problem. He or she uses vast troubleshooting skills to save the day and keep the plant running. But after the celebration and parade in the person's honor subsides, one should stop to reflect that although it is much less exciting, the goal of having a CM program and other reliability measures in place is to avoid having this emergency situation arise in the first place!

To give an example, a great mechanic who loves fixing cars drives an old VW bus. When you go on a road trip with him, you are glad he is such a great mechanic and is able to keep the bus running. Compare this to someone who drives a new car, in particular a model that is a much more reliable vehicle. When you go on a road trip with this person, you don't worry about the car breaking down or requiring a mechanic. Likewise with the plant, the broader goal is to evolve it into a much more reliable state rather than just keep repairing things all the time.

Vibration analysis works best when data is trended over time. For trends to be meaningful, the data must be collected the same way every time. This means the same test conditions (e.g., speed and load), test points, test configurations, sensor, sensor mounting, etc. Data collection must be a well-defined, well-documented procedure that anyone can follow. Because trending is essentially looking for change, you can get your software to do most of the work if it is set up correctly. This involves creating good alarms or baselines and utilizing all the alarm and reporting features of the software. The trick here is to essentially tweak the software until it gives you the diagnosis that you want. As you get better at tweaking the software, assuming it has advanced alarm capabilities, and refining the alarms and baselines, you begin to trust the reports the software generates and spend less and less time doing manual analysis. This makes the program more efficient and the diagnoses more accurate. What this implies in terms of personnel is that they need to have good computer skills and enjoy spending a lot of time in the office tweaking the software.

A barrier to creating a program with well-defined processes and procedures and getting the software set up to do most of the analysis work is the "expert complex." The expert is the one who wants to make the plant reliant on him or her, or wants to hide or keep secret what he or she is really doing. The main cause of this is usually fear: Fear that if other people can do the job, this person might get fired, or fear that if anyone actually looked too closely at what he or she is doing, it may be discovered this expert is not much of an expert after all. Even if the expert does provide accurate results, the truth is that many programs fail when the so-called expert leaves. This isn't because the person is so great that he or she cannot be replaced, rather it's because there is no documentation of what the person did. Therefore, no one knows how to test the machines in the correct way to keep the baselines and trends meaningful. No one knows which machines in the database match the machines in the plant, or which alarms and baselines are set up correctly, that is, if there even are baselines and alarms configured in the system.

The expert complex is also common in consultants. When looking for an employee or a consultant, it should be clear that you are not hiring to become dependent on the person. You are hiring the individual to help you set up a program that can eventually be run in this person's absence. You are hiring the individual to be transparent, to teach and to share. An employee or consultant who does this will never lack work. There are always more problems to solve. In the case of a consultant, make it clear in the contract that you own the data and the database. It should be noted that a large part of the program is defining repeatable test conditions and creating alarms or baselines around them, in other words, defining procedures and setting up a database. This is what you are investing in, not just a monthly report.

Right Leadership

What is condition monitoring and proactive maintenance really about? It's about changing how you make decisions and solve problems. It is about getting out of a run to failure, reactive mind-set and ultimately, it is about organizational and cultural change. Nobody likes change, which is one reason so many programs fail. In terms of personnel, this means the program is going to need a champion; a leader. Someone who believes that change is possible and is willing to put up a fight, document both the financial and technical benefits, and make the case over and over again that these efforts are benefiting the company's bottom line.

When employees keep getting pulled away from their work setting up the condition monitoring program to react to machine failures and put out fires, it takes a strong leader to rein them in and keep them focused on the goal. Right leadership is all about keeping your eyes on the prize and keeping your team focused on the work that is the most beneficial, not the work that is screaming for the most attention.

> Right leadership is all about keeping your eyes on the prize and keeping your team focused on the work

The best person for any job is someone who loves the work. Vibration analysis is not an easy technology to master, nor is it something people can master in the little bit of free time they have between putting out fires and completing their other work. Running a vibration program requires a diverse set of skills (although they can be divided among the group), a large commitment of time, resources and expertise to get a program up and running, and consistency to keep it going over time.

But people and leadership are only part of the puzzle. To have a successful program, one needs to have all 10 components in place: Right goals, right people, right leadership, right tools, right understanding, right data collection, right analysis, right reporting, right follow-up and review and right processes and procedures.

Alan Friedman *is the founder and CEO of Zenco, a provider of vibration monitoring program audits and training. Alan has more than 24 years experience in helping people set up and manage vibration monitoring programs. Alan is the author of the book, "Audit it. Improve it! Getting The Most from Your Vibration Monitoring Program" (www.mro-zone.com).*
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