Fitting Your CBM Program to Your Facility

by Tim Goshert, CMRP & Andy Page, CMRP

Introduction

As the strategic value of condition based monitoring (CBM) programs becomes more apparent to manufacturing and operations leaders, the need to quickly source the CBM talent for staffing these programs becomes urgent. With this urgent need comes a search, sometimes even a frantic one, for viable staffing options. The options vary in their ability to produce short term and long-term results effectively and efficiently. Considerations are the company culture, the sales forecast, the long-term profit strategy, the management/labor relationship and the current state of the assets deployed. All of these become significant factors when deciding which sourcing strategy best fits a company's needs.

CBM Sourcing Strategies

When considering options for sourcing your condition-monitoring program, there are essentially three options from which to choose. Each has unique advantages and limitations inherently however; best practices results may be achieved no matter which option is selected. The probability of success of any of these programs may fully depend on factors that will be outlined in detail later in this article Options you may consider are: in-house, outsourced and hybrid programs. In-house programs employ your company's people (supervisors, engineers and craft people) to complete the work of the CBM program. Outsourced programs employ an external supplier to complete the CBM program. Hybrid programs employ a CBM supplier, which provides the on-site leadership of the CBM program, while the company provides the people to staff the program or some other combination.

In-house programs offer some advantages that appeal to the very core of most people's desire for self-reliance. Developing your CBM program in-house allows your employees to create a significant feeling of ownership of the program. This can be very advantageous when the findings and results that come from a CBM program are challenged within the organization.

A substantial limitation can be the difficult work in creating and sustaining a vision for the future of the program, especially if no one has done it before. Additionally, if the company's core competency is typically NOT condition based program operation then the organization typically has little familiarity of many of the available condition monitoring tools and processes. Often, a reliability engineer (or another manager) is in charge of the development of a CBM program when he/she has no experience and the task is just an addition to their current responsibilities. They may even attend one or two training classes on a particular technology and then try to develop a comprehensive program. A situation is created when understanding the technologies, their applications and how that information is layered into the daily work practices quickly become overwhelming for the reliability engineer. Additionally, having little or no previous experience with developing a program can turn into a very powerful force when push comes to shove and can hinder progress and confidence in the program. A third significant limitation is that many companies starve the CBM program over time by not providing the most up to date tools, software,

training, and other needs of the program mostly under the guise of cost control. CBM analysis can become a casualty. Analysts begin struggling to complete their needed CBM work because their efforts are diverted away from CBM tasks and focused on reactive urgent work. Essentially they become part time CBM analysts. Finally, there is a lack of knowledgeable mentors who are able to share significant information on important issues and questions. Very often CBM analysts are addressing daily issues with limited access to CBM mentors and experts to help them with questions.

CBM programs that are outsourced certainly have their specific advantages. In general, there is no quicker way to get a program off the ground and producing results quicker than outsourcing it to a dedicated CBM supplier. The development and implementation phases of the process are usually extremely efficient because suppliers are selected based on their experience in building programs from the ground up.

Outsourcing your program has its own limitations. When the CBM programs are not done by in-house personnel, it can become challenging to create the natural checks and balances that are required for effective and efficient use of the information coming from the CBM program. Essentially, the CBM supplier could be producing excellent results in terms of identification of component defects. However, when there isn't anyone internally to own the program, the information sits idle and the CBM data begins to spoil because it has a limited time span during which it is useful.

In theory, hybrid programs have the potential to offer "the best of both worlds". These types of programs combine the on-site leadership of the CBM supplier and the company's internal manpower to staff it or some other combination. This hybrid program overcomes many of the limitations of both in-house and outsourced scenarios when both internal company personnel and external supplier leaders are involved at the lowest level. Unfortunately, management attitudes toward the CBM program can limit how successful hybrid programs can be. Many plant supervisors don't see the CBM program as valuable and necessary, instead viewing the reassignment of "their" crafts people as the equivalent of "losing" them. A competition for the company crafts people develops and the of "stealing" personnel assigned to the CBM program can be a roadblock to the success of the program. When additional resources and people are needed for overtime hours, breakdowns, emergency repairs, plant turnarounds and vacation relief, CBM techs are pulled over to do more "valuable" work".

Ideas on How to Make the Right Choice

How do you decide what program is right the choice for your company? What factors are important to consider? These are great questions.

When making decisions about the right CBM program for your company you must have one overriding purpose and goal: the program must deliver high quality outputs that are an accurate assessment of the known health condition for all the critical assets in the facility and accurate recommendations to correct root cause health defects of these assets.

Fitting Your CBM Program to Your Facility

by Tim Goshert, CMRP & Andy Page, CMRP

The decision starts with how best to deliver on the above purpose. Several factors to take this into account are:

1. Company overall size and complexity
2. Amount of plant locations
3. Diversity of plant locations
4. Diversity of plant size
5. CBM core competency
6. Availability of competent CBM resources in the region
7. Ability to give non-biased view of the health of assets

Company size, amount of plants, diversity of plant locations and diversity of facility sizes are the first four factors to consider. The decision on which option is appropriate for you will depend on these specific situations. Let's use these 3 scenarios as examples of how to select the best program.

Scenario 1 is a company that is a large one or a new facility business somewhere in the world. The size of one or each of these facilities is large, for instance the Replacement Asset Value (RAV) exceeds 100 million US dollars. This equates to normally a large number of equipment in a concentrated area. The plant(s) may be located in remote areas and the ability to find qualified CBM service providers may present a challenge. These factors may force the facility or facilities to be self-sufficient. Possibly the best choice is to commit to leading and managing an In-house CBM program. A second choice may be the hybrid program where the internal people are collecting the data for the CBM program and an external CBM service provider does the analysis, maybe through remote diagnostics. There may be significant challenges to source and keep CBM talent if the entire program is chosen to be outsourced with a CBM expert company.

Scenario 2 is a company that has one, several or many medium to small size facilities in a region or regions of the world. For example, facility sizes are all less than 100 million in RAV. This equates to a small amount of equipment in a less concentrated area or region of the world. The buying of CBM equipment for each of these smaller facilities becomes cost prohibitive primarily due the low utilization of the equipment. It makes little economic sense to own the equipment. The availability of qualified internal CBM analysts at each facility becomes a challenge for the same reason of low utilization of the CBM skills needed. Therefore, these factors eliminate the choice of an in- house program. The best choices may be an outsourced or hybrid program.

Scenario 3 is a company is a very large global company with many facilities in many countries. In addition to the large size of the company, the diversity of size of these plants adds another layer of complexity. Less than 20 % of the plants are greater than $100 Million in replacement asset value with some reaching as high as a billion dollars. Another 40% of the plants range in size from $100 Million down to $25 Million. This leaves the remaining 40% of the plants at less than $25 Million in replacement asset value. The diversity in size, locations and complexity of this situation makes any kind of company-wide CBM initiative a challenge. Additionally, the company's corporate leadership may want a standardized condition monitoring program for each site so consistent comparisons and benchmarking can be done. This example is a blend of the first two scenarios. Several companies in industry with these parameters have

chosen to outsource the program with suppliers who specialize and have a "core competency" in condition monitoring. This allows a consistent quality CBM program to be used in all facilities regardless of size or global location.

However, before final decisions on CBM program approach is decided, it is prudent to consider the last several factors:

CBM "core competency" is a vital decision point. What is core competency? We think Jim Collins, in his book "Good to Great", defines it best by calling core competency the company's "Hedgehog". His definition of Hedgehog is "a simple, crystalline concept that flows from deep understanding about the intersection of three key dimensions:

1. At what you can be best in the world
2. What drives your economic engine
3. What you are deeply passionate about

Therefore, some questions to ask are:
1. Do your company's leaders in business, operations and maintenance have extensive knowledge of all the PdM technologies available? Do you offer your maintenance leadership advanced training or knowledge to successfully lead a best practice CBM program? Do they "eat, sleep and breath" CBM?

2. Does your company have time to learn and experiment with CBM? Companies are faced with implementing many other elements of maintenance and reliability improvement process – are you willing to dedicate manpower to a CBM program? When there is an internal need to build and improve planning and scheduling systems, begin kitting spare parts for job completion, improve RCA systems, improve spare parts inventory control and improve crafts skills dramatically, you can get buried with these other highly important issues that will prevent your doing both simultaneously.

3. CBM technologies are highly technical and the analysts need advanced training and years of experience. It requires the analyst have proper prerequisites (i.e. background education and motivation) before embarking on a career of CBM learning. Many In-house CBM programs do not have the ability to choose the right person for this job due to plant work rules, lack of the proper personnel and generally poor selection criteria. CBM companies that do CBM as a side-line business mirror these problems. Great CBM analysts are developed from people with the proper background and motivation, continuing education, testing, and years of full time experience under a seasoned mentor. Any program must have these elements to be successful.

4. Since CBM may not be a company's core competency, the company may not have a career path for analyst to progress in skills and responsibilities. Additionally they may not respond well when employees need to move from one geographical location to another. Sometimes CBM programs pay people significantly under market value and the aggressive, sharp analysts leave after training and experience are under their belts. Therefore, many programs never mature past novice level since the CBM talent leaves once trained.

A significant factor to consider is the availability to find and retain qualified, certified CBM analysis in varied regions of the world. Our belief today is that this can be a major challenge. There is a shortage of qualified and certified analysts in several regions of the world. This situation has opened up a market for the possibly of unqualified

companies and/or people to fill this void. It is imperative that sourcing decisions are made by evaluating CBM program value, benefits and the quality of deliverables instead of just cost of the services. Buyers need to be educated on the CBM technologies so that costly mistakes are not made by selecting inferior service providers. Decisions based on program cost alone may produce undesired and unwanted results.

The final element to consider is the need for a "3rd party independent review" of a company's and facility's asset health. A company should have a corporate maintenance and reliability organization to develop standards for machinery health by individual PdM technology. This is important so the valid machinery defects can be alarmed by the appropriate technologies and root causes of equipment defects can be identified by CBM analysts. This M&R organization is needed to have consistent asset health report results that are comparable between plants in a company. In our experience, facilities that complete their own asset health reports do so very optimistically and thereby do not recognize equipment defects that exist. Sites fail to face the brutal facts of the facilities' health. This is less likely to happen with a 3rd party review, however outsourced CBM analysts are under sometimes extreme pressure at some companies/facilities to relax the standards or not report in the required way. This causes friction at the facility. Many times though, a 3rd party view of a facility's equipment health is viewed much more positively from outside entities such as Insurance companies, regulatory agencies, and other interested parties.

Trust Based Relationships

Whether in our personal lives or our professional careers, trust is at the heart of all relationship transactions. Trust can act as a multiplier thus increasing the effectiveness and efficiency of an encounter. Mistrust or lack of trust can be the root cause of slow moving and ineffective encounters.

Trust doesn't simply affect how we feel about a person or a company; it in turn affects how we interact with them. Remember, our actions are the results of thoughts which are the results of feelings. Our feelings are the by-product of processing events that happen around us and to us through the mental and emotional filters we all have.

To paraphrase Stephen M. R. Covey from the book *The Speed of Trust*, in all relationships, either personal or professional: as trust increases, speed increases and costs decrease. Conversely, as trust decreases, speed decreases and costs increase.

So what is an example of trust being a multiplier and not a divisor? A personal example might be that as a result of trusting a friend's driving directions, we don't have to waste time double checking their accuracy. Therefore, as a result of trust, the encounter went smoother and quicker than it would if you had received directions from another (un-trusted) source.

A business example might be a CBM solution provider. There are numerous places where a trust based relationship is mandatory for the rapid development of increased effectiveness and efficiency not otherwise possible with an un-trusted solution provider. Some examples include:

Fitting Your CBM Program to Your Facility

by Tim Goshert, CMRP & Andy Page, CMRP

- The ability to co-develop corporate standards requires a great deal of trust. Allowing a solution provider to literally help "decide policy" can only come from a fundamental belief that they have your company's best interest in mind. In terms of CBM, this would manifest itself in the form of allowing the CBM Team to own the technology standards and implement Management of Change (MOC) for modifications to the standards.
- The ability to provide your CBM supplier with access to CMMS and process data requires a tremendous amount of trust – without it, their ability to analyze the data will be severely hampered. Repair and performance history are vital parts of a comprehensive analysis strategy. Preventing a CBM analyst from gaining access sets the tone up front that a level of mistrust exists.
- Being a beta test site for new methods, new process flows and work procedures requires trust – some innovations will fail to deliver the anticipated or even desired results. When this occurs, the absence of trust will readily be seen in the finger pointing session that typically occurs in environments where collaboration isn't encouraged and valued.
- Trust must be at all levels and a trust based relationship requires a "Relationship Zipper" – we can explain, i.e. your CBM provider must also be capable of building trust with the workforce it is not just trust at the corporate level. The CBM analyst has to trust and be trusted by the supervisors and craft personnel. The CBM manager has to trust and be trusted by engineering and management. Without trust at all levels, trust at just one level will carry the day.

In summary, choosing the best CBM option is imperative for a company to be successful in the maintenance and reliability improvement process. Careful evaluation and review of the options and factors need to be understood for your company's situation. No matter which option is selected, in-house, contracted or hybrid, a relationship with a solution provider will be required, even if for a short while. When that happens, it must be a relationship built on trust. And like collaboration, relationships built on trust must be born of mutual respect. Trust based relationship mean that traditional market surveys or cost plus mentality do not apply. It is about mutually agreeing on a goal, negotiating compensation for that contribution and working together to monitor the process, driving unnecessary costs of doing business out, and being open to modifications along the way if the model isn't working.

Fitting Your CBM Program to Your Facility

by Tim Goshert, CMRP & Andy Page, CMRP