Vibration Analysis in the 21st Century

By Scott Dow of Vibe-Assist LLC

During the last 25 years (and more), the vibration industry has seen some major advances in technology. Software and hardware now provide powerful tools for analysis. The tools are not necessarily new it's just that the newer technology does it faster or better or easier. And the cost is often less than the older technology was. One thing hasn't changed much the need to understand not only vibration theory but also how to apply it to solve machinery (and other) problems.

So what does the future offer in further technology advances? Well, for one, outsourcing of programs much more economically than is currently possible. Although there will be virtually endless possibilities for making the program more effective and less expensive, the most interesting will be the ability to collect data automatically and transmit it to specialists very easily without that specialist having to travel to the plant. That specialist will be free to visit that program remotely and change parameters as the need arises to collect different, more specialized, data. That capability already exists but the necessity to wire them makes them relatively expensive. The inevitable development of economical wireless transducers will make it a no-brainer for many future programs.

Larger companies will want to keep a program in the hands of internal personnel. For these people, the same situation arises (as far as sitting in an office and analyzing data) and pricing will probably determine the choice being wireless and having a wired program.

But the need for well trained, competent analysts will remain a constant. I have little faith in the advent of 'expert' systems for one simple reason the number of variables is too high for it to be done perfectly and if it can't be done perfectly, the analyst will still need to solve at least some of the problems presented using their own minds.

That, to me, is the definition of the term 'analyst'. An analyst is a person who can use vibration data to aid in the protection of machinery as well as the correction of machinery problems. The flexible, questioning mind will always be a more powerful tool than rules based program or even a software program capable of learning. The latter is also happening software capable of learning. That will help but it is still only a tool it can't be counted on in every case (hence the term 'learning').

A good analyst is someone who understands not only vibration theory and software but someone who understands machines and can process vibration data as information that they can relate back to how the machine is behaving and moving. That information, plus the analyst's machinery experience, can then be used to apply appropriate field-testing to pinpoint a problem to the point where appropriate corrective actions are taken.

So what advances will take place in training? Well again the Internet will be a key component. Distance learning (Internet based) capabilities will improve to the point where they can replace much of the current theory training that takes place. That's not to say that working with an instructor face to face will not still be beneficial but the effectiveness of distance training with computer generated graphics, animations, sound bits and movies will improve dramatically.

Enhancements in the training process and techniques will also occur due to the improved technologies. Analysts can supplement their training by testing themselves (or be tested) by administering computer based case studies for analysts to solve. This ability tests their ability to actually apply the theory in problem solving, adds to their experience base and allows them to

gain confidence and learn in a safe environment. Since it is the practical application side that falls short in many current training classes, this capability will supplement the theory training and provide a more effective education.

Sitting at a computer station and participating in training class 1000 miles away is another future possibility again an Internet-based enhancement. And I'm sure there are numerous innovative developments that I don't see but that others are already working on.

In the future, although our physical jobs may continue to get easier and the software will help us analyze the data better, the need for knowledgeable analysts will not diminish. Although the number of people collecting data could conceivably go down due to technological advancements, the number of people analyzing data will not. That’s a skill with which you won't have to worry about being ‘downsized’ in the world economy of the new century.

Bio: Scott worked in the power and printing industries for 10 years before moving full time into the vibration analysis field in the early nineties. In 1993, Scott co-founded **Vibe-Assist**, a service and training company in the Mid-Atlantic region. Vibe-Assist has been primarily a vibration analysis service provider since its inception. Those practical experiences have lead to Scott's development of innovative courses, learning aids and teaching methods that focus on practical application of the theory for the end user in the plant. These include the unique InterActive Training class and the V-Trainer training system (named a winner of Plant Engineering’s ‘Product of the Year’ competition for 1999).