Summer is just around the corner which means the 2012 – 2013 fiscal year will soon be wrapping up for PEMD. Administratively, we’ve had a busy year and our new executive committee has jumped right in to continue driving our strategic plan. Progress has been made on exploring partnership activities for delivering webinars or conferences to you. Our internal networking efforts have identified additional volunteers to help with maturing our technical committees. We greatly appreciate the growing enthusiasm!

As we like to point out, we exist to serve our professional community and our membership. If you would like to volunteer please contact anyone on the executive committee. You can find our contact information at http://divisions.asme.org/PEMD/Executive_Committee.cfm.

I will also take this opportunity to point out that a new version of the ASME.org website is soon to be available that will offer several new features including some professional networking. Stay tuned . . .

In this issue of our PEMD Newsletter you will find articles addressing pump vibration analysis and the ASME organizational structure. I hope you find them relevant and informative. Maybe these articles will spark an interest in you to contribute some content in one of our future issues. If so, let us know.

Once again, we thank you and remind you to: Get Active and Get Involved by Volunteering!

Executive Committee Update

The Executive Committee for the Plant Engineering and Maintenance Technical Division (PEMD) held a face-to-face meeting in St. Louis on March 1. Many topics were covered including the PEMD organization structure and responsibilities, upcoming goals, and the conducting of a survey. PEMD will be issuing a survey in the upcoming months to members. This will be the first since one was conducted in 2010. The focus will be to find out how members use PEMD, and what they would like
to see PEMD focus on in the future. If anyone has any suggestions on other topics to include in the survey, please contact Greg Coil, PEMD Secretary.

Mechanical Engineering Request for Articles
David Christiansen, PE, PEMD Vice Chair/Treasurer

Mechanical Engineering has made request to PEMD members for brief articles that look at current research or recent developments in the field, or issues that are under study. We are also interested in case studies that illustrate an unexpected solution or the wisdom of experience—perhaps a new solution to an old problem, or an old solution dealing with a new problem. We are not necessarily looking for feature-length articles. Shorter, anecdotal pieces will also be welcome.

Articles for the magazine are conversational discussions rather than technical papers and are intended to introduce the ideas of specialists to engineers working in other areas. Each author of an article would work with an editor.

Anyone interested in contributing an article should feel free to get in touch with David Christiansen (christiansend1@asme.org) . Interest in the division’s work is of course not confined to the September issue, and the editors are eager to talk about ideas for articles at any time.

Trending Revelations in Vibration Analysis
Dr. Lev Nelik, P.E., APICS
Pumping Machinery, LLC
www.pumpingmachinery.com

In my experience, there are three types of maintenance philosophy with regard to vibrations program:

1. No philosophy at all
2. Utmost attention with zeal
3. Attention to particularly problematic units

The first group simply does not know any better. Such plants may have pumps repaired every 12 to 18 months, and consider it normal. Some of their vertical pumps may have pumps pulled to alignment with a come along - wrecking couplings, leaking seals and failing bearings in the process. I have seen vertical pumps sitting on soleplates with no anchor bolts, and the soleplates not even having holes drilled for the anchor bolts to match the support head bolts.

Figure 1: This pump needs help, and so does the plant.

To explain the benefits of the vibrations analysis to a maintenance manager of such organization is usually futile. The questions such organizations ask is not what a vibrations analysis program can do for the plant in order to stretch a mean time between repair (MTBR) from 18 months to 18 years, but which repair shop can repair the failed pumps cheaper – every 18 months. The only way to make a difference with such organization is to convince management to at least review the cumulative costs of the repair work orders, and compare these costs to the cost of the proposed implementation, with clear correlation to the payback time.

The second group is the enthusiasts. They typically have high energy, high speed rotating equipment, and still have some remnants of the previously strong reliability department/group, with a vibrations...
specialist, let’s call him Bob, a few years from the retirement. They have an ample database of the field success stories at Bob’s plant, ready to be buried, along with Bob’s computer, in a few years upon his retirement. The management accounting system continues to decimate such groups in response to the cost cutting initiatives, regardless of the needs of the machinery and vanishing expertise. Still, there are pleasant exceptions, and vibrations analysis is alive and well at many such companies, with a full spectral analysis of critical or problematic units and supplemented periodic overall vibrations routes, to monitor and weed out such problems.

The third group, similar to the second, does understand (or has heard of) the benefits of the vibrations analysis and real savings it offers, but, due to limited or reduced budgets, can only implement it in rare cases, when a particular piece of equipment begins to fail too frequently, and a quick touch-and-feel troubleshooting no longer identifies the root cause.

Overall, however, all three types are united by the ever-increasing costs of operation, and a need to justify any investment, in any technology, with a clear and simple, easy to understand program. Unfortunately, the technology experts, including vibrations professionals, cannot digest the often impressive knowledge of Fast Fourier Transform functions and phase angles into a clear and understandable message, relating the cost of the program to the real savings it offers to the plant.

When a plant considers implementation of vibration analysis, the questions that arise are:

1. Why do it?
2. Which equipment to monitor?
3. How often to monitor?
4. To what limits criteria to monitor?
5. What to do when limits are exceeded?

The answer to question of “Why” is to save money. The “Which” question should be, at least initially, the most critical 5% of the pumps population. This is simpler to get going and easier to measure the results, building confidence by evolving progress and success of the program. “How often” – once per quarter, or, if budgets are truly skimpy, twice a year. The limits: set 0.30 in/sec vibrations velocity (rms, overall) as a warning limit, and 0.30 in/sec as an alarm. Do not initially get into sophistication of the type of a pump, height to the measurement position (such as for vertical turbine pumps for example), but keep it as simple as possible. When the limits are exceeded – act. This may mean a more detailed spectral analysis, involving operations, engineering and maintenance groups, and ultimately deciding on a specific corrective action.

The most important thing to watch is trends, as this is often even more important than the vibration level per se. Consider the two examples:

![Fig. 2 Vibrations trend steadily increases with time](image-url)
In the first example, vibrations steadily increase over time, and cross the warning and eventually alarm values. Continuation of the trend will likely cause catastrophic failure of the unit, and corrective action is critically important. In the second example, however, vibrations fluctuate from one visit to another, ranging from a low acceptable value to exceeding the alarm value. In this case, different products are pumped by the pump, and critical frequencies are excited by insufficient damping and stiffness characteristics of a certain product upon the clearances. Identification of this issue clearly could not be made in one visit only.

Also, get maintenance and operations involved in helping with the solution. Taking ownership in the plant is often the key to its success, and the opposite is true as well.

**The ASME Organization: Part I of a Series**

*Greg Coil, PE, CEM, PEMD Secretary*

**Preface:** To help our membership understand more about ASME and the value of membership, we are introducing a series of articles in our newsletters about the organization. The following is part II:

The Knowledge and Communities Sector of ASME, of which the PEMD is a part, is organized as per the chart below.
In the Technical Communities are governed by an operating board (TCOB), and there are a set of affiliated boards with whom the TCOB operates. The two charts below provide a breakdown of the TCOB and the affiliated boards:

TCOB Committees (in addition to the executive committee):
- Board on Technical Knowledge Dissemination
- Committee on Administration and Finance
- Committee on Division Operations and Training
- Committee on Honors
- Congress Steering Committee
- Interdisciplinary Councils Committee
- Strategic Planning Committee

Affiliated Operating Boards:
- Board for Research & Technology Development (BRTD)
  - Center for Research & Technology Development
  - Technology Policy Committee
- Board on Technical Knowledge Dissemination (BTKD)
  - Conference Planning Committee
  - Publications & Communications
  - Congress Steering Committee
  - Strategic Planning Committee
  - Interdisciplinary Councils Committee
- Board on Division Support (BDS)
  - Committee on Administration & Finance
  - Committee on Division Operations & Training
  - Committee on Honors
- Group Operating Boards (GOBs)
  - Basic Engineering Group
  - Energy Conversion Group
  - Engineering and Technology Management Group
  - Environment and Transportation Group
Within the Affiliated Operating Boards, the Group Operating Boards comprise the Technical Groups which are further broken down into Technical Divisions, of which PEMD is one, under the auspices of the Manufacturing Technical Group. The Technical Groups are organized as follows:

**BASIC ENGINEERING TECHNICAL GROUP (BETG)**
- Applied Mechanics
- Bioengineering
- Fluids Engineering
- Heat Transfer
- Materials
- Tribology

**ENERGY CONVERSION GROUP (ECG)**
- Internal Combustion Engine
- Nuclear Engineering
- Power
- Advanced Energy Systems
- Solar Energy

**ENGINEERING & TECHNOLOGY MANAGEMENT GROUP (ETMG)**
- Management
- Safety Engineering & Risk Analysis
- Technology & Society

**ENVIRONMENT & TRANSPORTATION GROUP (ETG)**
- Aerospace
- Environmental Engineering
- Noise Control Acoustics
- Rail Transportation
- Materials & Energy Recovery

**MANUFACTURING TECHNICAL GROUP (MTG)**
- Manufacturing Engineering
- Materials Handling Engineering
- Plant Engineering & Maintenance
- Process Industries
- Nondestructive Evaluation
- Pressure Vessels & Piping

**SYSTEM & DESIGN GROUP (SDG)**
- Computers & Information Engineering
- Design Engineering
- Dynamic Systems & Control
- Electronic & Photonic Packaging
- Fluid Power Systems & Technology
- Information Storage & Processing Systems
- Microelectromechanical Systems