



PLANT ENGINEERING & MAINTENANCE

From Outgoing Chair

—PATRICK HARNETTY—

Welcome to the 2003 Plant Engineering & Maintenance Division (PEMD) newsletter! I hope everyone's making time to enjoy the Summer weather with family and friends and maybe get in a little work between outdoor activities.

Let me begin by saying that volunteering with ASME and PEMD has been educational, interactive and entertaining for me. Being surrounded by enthusiastic and intelligent volunteers and staff has made the task of guiding PEMD very enjoyable. To give you an idea of the caliber of your Division: We have almost 17,000 members; We're represented in 108 countries and every state in the USA; Our average age is 52 along with 21 years of membership in PEMD; We're fortunate to have 110 ASME Fellows among us. We are plant engineers, maintenance engineers, managers, consultants, retirees keeping current with our industry, reliability engineers, product designers, educators and students just to name a few!

Hopefully you had a chance to attend at least one of our sponsored conferences: International Joint Power Generation Conference (IJPGC) or the National Manufacturing Week (NMW). Both are very well attended trade shows with expositions and technical presentations to keep abreast with latest technologies and best practices. PEMD hosted 12 technical sessions at NMW03 in Chicago ranging from practical rotating equipment case study discussion panels to life cycle cost discussions.

Sharing of ideas, interests and developments within our engineering

community is critical in achieving PEMD's goals. Our intentions are to offer you practical training at sponsored conferences, provide a network for you to ask questions to other engineers, create a stage for mentorship and guidance of our young engineers and offer a scholarship fund to students pursuing an education pertaining to the Plant Engineering and/or Maintenance profession. If you would like to become involved with PEMD at a national level feel free to contact me at harnetty@asme.org or any contacts on our website <http://www.asme.org/divisions/pemd/>.

What can you do to participate in your professional society? Consider the following:

- Attend one of our conferences to learn about new technology to assist you to do your job better and to network with PEMD leadership;
- Organize an event (meeting, tour, technical exchange) for your local ASME chapter
- Volunteer to participate on a hot topic discussion panel at one of our sponsored conferences;
- Write a brief case study article for publication in our next newsletter;
- Submit a case study presentation for use at National Manufacturing Week or one of our other sponsored conferences throughout the year;
- Become a technical resource in PEMD's Technical Committees.



These are only a few examples of how our volunteers participate within PEMD. Please contact any member of the PEMD Executive Committee with your willingness to volunteer in growing your division and profession. Let's work together to communicate new ideas and learnings within Plant Engineering & Maintenance! ●

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Message from the Incoming Chair

—MEHERWAN BOYCE—

I am very pleased to be the incoming Chair of PEMD, and look forward to working with you for the next year to implement an aggressive agenda of meetings and projects that should serve our large and diverse membership.

As members of the Plant Engineering and Maintenance Division our activities cover the traditional manufacturing, processes and maintenance. In the post 9/11 era we have to also be constantly vigilant to protect our plants from those who desire to create havoc. I propose that we form a Technical Committee that would address this area, which would help develop new techniques and instrumentation to guard our infrastructure. We welcome anyone of you to lead and organize such a committee.

Presently we have four technical working committees:

1. Discrete Manufacturing
2. Petro - Chemical
3. Reliability/Condition Monitoring
4. Power

Your active participation in each of these committees will be greatly appreciated. However, PEMD wishes to institute an additional series of technical working committees with committee chairs that are aggressive and who can get our members to actively participate. If you would like to create a new technical committee and chair such a working committee please do contact me and I will help to facilitate you to do so. The division wants to be active in serving your needs.

We also would like to expand our website, and appoint a Webmaster. A quarterly newsletter is also being planned. For these goals to be successful your input, ideas, and participation are needed.

Please see the chart on page 00 that PEMD will actively be taking part in.

Our organization should be serving you—our members—and provide you with the tools you need to develop your professional needs. To be successful in



doing this we need your full participation in chairing committees, organizing paper sessions, presenting papers on the latest technology, all of which would help your industry.

Thank you for having me as your chair and I promise that I will work hard, and with your help we will make this an active and successful division. Please do contact me or any member of your executive committee, and volunteer to advance our division and your professional development. ●

ASME Staff Changes

—EDISON AULESTIA—

I am pleased to announce that **Noha El-Ghobashy** joined the Engineering Programs department as an Engineering Programs Manager on Monday, May 5, 2003. Effective immediately she will be supporting the Manufacturing Technical Group.

Noha comes to us from the telecommunications sector, where she was a design engineer and project manager. She brings with her a good balance of analytical experience coupled with good technical skills. Her experience in developing business strategies, website development and engineering practices will serve her well in these times of change at ASME.

Noha obtained a Bachelor of Science degree from Columbia University. She later obtained a Masters of Science from Columbia as well.

In addition, **Angela Buonvicino**, administrative assistant will support Noha and your division. Angela has been with ASME for 3 years and brings a wealth of information to help with the division's growth and goals. She received her bachelor's degree in Political Science from Pace University. Her work experience and her education will help solidify your team.

Please join me in welcoming both of them not only to Engineering Programs but also to ASME. Noha can be reached at 212-591-7787 and Angela can be reached at 212-591-7103.

B.C. Industrial Expo ASME Technical Conference Program

Wednesday, October 1st, 2003

- 9:00 am Exhibition and Registration Opening
- 10:00–11:15 pm **"World Class Reliability Management"** —Dennis Van Oene, General Manager - Tim Tabor, Process Reliability Specialist - Lincoln Technology Corporation
- Lunch/Exhibits
- 1:30–2:45 pm **"Design: Going online to accelerate products to market"** —Robert McGill, Director, Manufacturing Network, SolidWorks Corporation

Thursday, October 2nd, 2003

- 9:30 am Exhibition and Registration opening
- 10:00–11:15 am **"Making the Transition from Engineer to Manager: Lessons Learned Along the Way"** —John T. Bozewicz, Department Head, Navel Surface Warfare Center
- Lunch/Exhibits
- 1:30–2:45 pm **"Using Current Best Maintenance Practices Audits as a Tool to Evaluate Your Maintenance Function, Educate Your Organization and Drive Reliability Improvement"** —Michael K.F. Lippig, Business Development Manager, IDCON, INC.

ASME members discount available. For updated information and registration go to www.exposition.com.

Optimum Maintenance Cost

—JAY GERMAIN—

In early March of this year at National Manufacturing Week in Chicago several technical sessions sponsored by ASME addressed the subject of optimizing plant maintenance costs. One of the sessions was a two and a half hour panel discussion of the subject that included highly experienced panelists from both the manufacturing and the service sectors as well as an audience made up of plant maintenance engineers and managers, with a few consultants sprinkled in for good measure.

The format of this particular technical session was to be question and answer, and the panelists and moderator came armed with a list of thirty-six questions on the subject of maintenance cost optimiza-

tion to which they had all given significant thought and research for the preceding several weeks. All were hopeful that, with audience participation, they had enough material to fill the allotted two and a half hours.

The session began with the usual welcome and introduction of panelists and then the moderator threw out the first question. Naturally, it was define what you're talking about. What is "optimum maintenance cost"?

Well, there was talk about "mission" and talk about "goals". There were graphs of equipment condition decay over time intersecting availability requirements, overlaid by maintenance cost growth.

There was discussion about running equipment to failure. Many in the room in addition to the panelists had their thoughts on the subject.

An hour later the session moderator was feeling pretty good. The panel had arrived at an answer to its first question. What was even better was the fact that they had thirty-five questions left to address for the remaining hour and a half.

(By the way, the answer to that first question was summarized as follows – Optimum maintenance cost is that level of cost required to support the achievement of both the long term and short term goals and objectives of the organization or enterprise.) ●

Lean Manufacturing's Impact on Plant Engineering and Maintenance

—DENNIS STAMM— Manufacturing Consulting Practice, Lockwood Greene's Atlanta office

Lean manufacturing has transitioned from being the wave of the future to become the reality of the present in the United States. Most successful major companies have either adopted lean practices in their manufacturing operations or they are in the midst of attempting to do so. As a part of the effort to achieve just-in-time logistics, those companies who are well along the road to lean manufacturing have now realized that if the full benefits of lean practices are to be realized the entire enterprise must make the transition to lean.

To many, this means moving outside the four walls of the factory to integrate the supply chain and streamline business practices to bring them into alignment with lean. While this is necessary, it overlooks several other important elements within the four walls. Primary among these elements is reliability – reliability of buildings, equipment and systems. In the lean operation, safety stocks are no longer available. The reductions in raw materials, work-in-process and finished goods

inventory makes the manufacturing operation equally vulnerable to late deliveries if equipment fails or parts are not delivered on time. Therefore, equipment malfunctions are intolerable because they interrupt the smooth flow required in a lean manufacturing, or "pull", system. Prior to the adoption of lean practices, if a piece of equipment went down, the process would have continued using excess parts or materials from inventory. In the lean operation, downstream operations from the point of failure, including deliveries to customers, shut down also. In fact, one of the very reasons for having excessively large inventories in the past was to compensate for a lack of reliability in the process, equipment and systems.

This leads to the point that plant engineering and maintenance operations must help to insure reliability in a lean manufacturing environment. The question is how to do so. Nearly everyone agrees that Preventive Maintenance must be implemented in order to prevent, or at least limit, machinery damage due to

mechanical or process malfunctions. Machines that are critical to critical parts of the plant's operations should have the most complete monitoring systems available. Conventional monitors and computers should be used in tandem to provide absolute limit alarms, monitor rates of change and compare measured variables with others on the same machine. Monitors, and historical data collected by them, can be used to identify likely causes of potential breakdowns and correct them before they occur. Periodic preventive maintenance on production equipment and systems such as compressed air should be incorporated into the production schedule.

This is a necessary and fairly traditional approach in any environment; however, in the lean environment some fundamental non-traditional approaches are also necessary. A pull production system produces dramatic impacts on the nature of the workforce and organization. Companies that have successfully transitioned to the

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Lean Manufacturing's Impact

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lean paradigm have introduced self managed work teams that are organizationally aligned by core process and known as Integrated Product/ Process Teams (IPPT) for each product family. The makeup of these teams varies but typically a team can include representatives from a broad cross section of functions. IPPT teams make use of specialty engineering disciplines that specifically relate to systems effectiveness and affordability. Specialty engineering normally integrates the "ilities" of the system design process such as *maintainability*, *reliability*, *affordability*, *supportability*, *testability*, *availability* and *producibility*. Maintainability Engineering deals with maintainability measures, life cycle, analysis methods, design reviews and evaluation, definitions, and requirements. The purpose of this type of organization is to create focus on customer value, eliminate silos, and promote more effective product delivery.

Other teams are organized in manufacturing cells. The logic of team-based management in manufacturing is described in the book *Lean Thinking* (Womak and Jones, 1996, p. 215). They note, "Workers should be focused horizontally on a linked set of activities along the value stream and perform many of the "indirect tasks" associated with managing their work, including quality assurance, *machine maintenance* (author's italics), tool changes, development of standard work, and continuous improvements" within the product family for which the team is responsible. The horizontal organizational structure takes the place of reporting up a chain of command through many layers of a steeply vertical hierarchy.

A goal of such teams is for every worker to be able to perform every function required by the team. In turn, this leads to the need for a multi-skilled workforce. Generally, the people within the team rotate to maintain multiple skills and relieve the boredom associated with single-task responsibilities associated with more traditional operations. Team members should be given training, education and the support necessary to perform the tasks required of them. The number of job classifications

might be reduced. Typically, adjustments in compensation are also made to reflect the fact that workers are now even more valuable to the enterprise. This is offset by the need for fewer workers in the lean manufacturing environment.

Professional engineers, technicians, quality experts, schedulers and others who previously performed these tasks are now available to guide the teams and provide technical assistance. They are then free to concentrate their efforts and skills to the design and optimization of the manufacturing enterprise as a total system.

The existing organizational structure is probably a legacy of the mass-production mentality that typically has a vertical, or "silo" orientation with various units defined according to traditional functions. The silo mentality is incompatible with "value stream flow," a

fundamental aspect of the lean enterprise. It is structured to support long production runs of large batches with long flow times and minimize machine and worker idle time at the expense of excessive inventory levels, cluttered shop floors, high scrap rates and high obsolescence rates.

It does not support one-piece flow and pull production that is structured to minimize response time and maximum flexibility. Changing to a horizontal, team-based organizational structure requires changes in mindsets. Old paradigms must be set aside. This is the most difficult aspect of the transition. It requires pervasive training throughout the organization, planning, careful change management and more training. Making the transition is, frankly, difficult, but it is necessary in a successful lean enterprise. ●

ASME Conferences & Expositions

B.C. Industrial Expo and Conference

October 1–2, 2003

Pacific Coliseum, PNE, Vancouver, B.C., Canada

12th International Process and Power Plant Reliability Conference • Courses • Exhibition

InterContinental Hotel, Houston, TX

Courses: October 20–21, 2003

SMRP Certification Examination for Maintenance and Reliability

Professionals: October 21, 2003

Conference: October 22–23, 2003

Exhibition: October 21–23, 2003

National Manufacturing Week 2004

February 23–26, 2004

McCormick Place, Chicago, Illinois

Electric Power Conference and Exposition

co-locating with the

International Joint Power Generation Conference

March 20 – April 1, 2004

Baltimore, Maryland, Chicago, Illinois

For additional information please visit the PEMD website at

<http://www.asme.org/divisions/pemd/events/index.html>

or <http://www.asme.org/events/>

for a complete listing of Conferences.

Call for Response —WALLY WALEJESKI—

ASME's Plant Engineering Maintenance Division by charter was conceived to be focused on engineering and maintenance issues related to plant operations. In my opinion, that's a lot of territory to cover. Regardless, it seems to make sense that our organization latch onto a critical issue(s) within this broad area for which PEMD could provide some direct benefit. It has been suggested that we, as an organization of extremely competent-knowledgeable-experienced practitioners, identify a critical subject that PEMD work on to provide a solution to and/or direction for.

There are many societies that have taken a lead in addressing certain issues from which many have benefited. Examples include: MIMOSA (Maintenance Information Management Open Systems Alliance) which has developed methodologies for data & information interchange as related to condition monitoring, SMRP (Society of Maintenance & Reliability Professionals) which has developed a certification program for persons actively engaged in mainte-

nance and reliability practices, ASME's own other committees which are actively involved in critical industry issues, as well as numerous other associations & their activities. I think PEMD should be engaged in this type of focused activity as well. The critical issue PEMD might pursue could be related to standards, operational practices, methodologies, guideline development, training, or any similar subject that generically affects us and our activities. PEMD's leadership is seeking your feedback as to what critical issue(s) PEMD should pursue. Then, as you may surmise, once an issue is decided on, PEMD would need some of you, our practicing experts, to help address this issue and work on providing an end product. So while we need your ideas first, we will then soon need some involvement of our members to tackle the issue. Therefore, as you think of items that could become part of PEMD's focus, also consider offering insight into addressing the issue and/or how you might participate in the solution and end product.

Now you may be thinking that there are so many other organizations and companies which have or are already working on a variety of issues providing too much direction and/or potentially self serving solutions, that why should PEMD engage in this type of activity? Good point! Although I think you'll agree, there are still plenty of significant issues that need some solid direction or well conceived & pertinent solution. And, what better way to address an issue than with expert practitioners truly focused and actively involved in the subject area.

PEMD's leadership is thinking of pursuing some of the good ideas suggested in the 2002 membership survey results to further improve PEMD's offerings. Some of these ideas may become realized soon. Even with these efforts, providing a solution to a common and/or critical industry issue would even better position PEMD as a valued organization. Let us know what you think. ●

PEMD Technical Committee

Plant Engineering & Maintenance Division 2003–2004 Executive Committee

Outgoing Chair

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National Manufacturing Week

—VANESSA LANE—

The Plant Engineering & Maintenance division of ASME was back this year at National Manufacturing Week (March 3-6, 03; McCormick Place - Chicago). The division sponsored the track on "Plant Engineering & Maintenance Management" organizing a panel on *Condition Monitoring*, a discussion group on *Best Machinery Purchasing*, as well as sessions on *best practices in CMMS Implementation, Maintenance Cost Optimization and Lean Manufacturing and Lean Maintenance*.

The program was a great success and attendees commented on the practical information they gained from these sessions as well as the invaluable opportunity of discussing their professional challenges with experts.

A networking meeting was organized on Tuesday night for PEMD members attending the conference and exhibition to make new contacts, trade experiences with long-time colleagues, and explore the perspectives of engineers from different companies, industries, and countries.

With more than 1,500 exhibits, 100 conference sessions, over 29,000 visitors, and over 320 conferees, NMW 2003 proved once again to be America's #1 Industrial Marketplace to explore the latest industry issues, ideas, trends and solutions. ●

If you would like to submit a presentation for National Manufacturing Week 04, please email your abstract and bio to Vanessa Lane at: lanev@asme.org.

PEMD to Participate at 2003 B.C. Industrial Expo Conference

—JAY GERMAIN—

PEMD is the sponsor of this year's B.C. Industrial Expo Technical Conference to be held in Vancouver, B.C. on October 1 & 2 and the organizer of two sessions. This will be the first year in its history that this show has included a technical conference.

In one of the sessions representatives from IDCON, Inc. will present a

baselining process maintenance organizations can utilize in applying and evaluating maintenance best practices. In the other session representatives from Lincoln Technology Corporation will discuss world class Reliability Management. Both sessions should prove valuable to plant engineering and maintenance management personnel.

Other sessions will focus on Design and Management.

For complete conference program and registration information visit <http://www.bcindustrialexpo.com/>

For other PEMD events visit the PEMD calendar of events at <http://www.asme.org/divisions/pemd/events/index.html>. ●