



Engineering Management

NEWSLETTER

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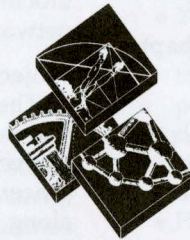
Boston Section EMS Chapter Earns Recognition Award for Outstanding Revitalization Effort

Your EMS Board of Governors is committed to supporting our Chapters and helping them achieve their important local management objectives. We particularly want to promote "cross-fertilization" of our many chapters, to help you all know what other groups are doing and how they've been successful in serving their local membership. To this end Chapters Coordinator Cinda Voegtli and your EMS Member Services Team under VP David Kemp, is planning to present chapters with recognition awards throughout the year, to both publicize and reward the efforts and results of improved EMS Chapter activities.

Our first recognition award goes to the Boston, Massachusetts, USA chapter. After being fairly dormant for several years, local EMS member, Harry Heflin, took it upon himself to revitalize the chapter. He and his officers (Jim Britt - AT/Com <jimwb@channel1.com>, Debasish Mallick - Boston College <mallickd@hermes.bc.edu>, Gene Bridgers - M/A COM <gbridgers@aol.com>, Dave Greenburg - TIAC (The Internet Access Company) <dgrnbrg@tiac.net>, and Gene Lambert - M.P. Dumont Associates <elambert@delphi.com>) lined up an outstanding array of local programs for the 1995-1996 program year. Their efforts made available to members in the Boston area some very interesting management education and excellent opportunities for meeting and exchanging ideas with between 20 and 60 colleagues at each EMS Chapter meeting.

In Harry's words, "These meetings are all pretty free-wheeling, and we encourage a spirited dialog between the presenter and the audience. We also usually have a dinner with the presenter before the meeting to get to know them better."

"This year (96/97) we are going to do a series intended to train engineering managers who work in small companies and startups that do not have internal professional development programs for their managers. The objective is to pro-



ENGINEERS
Turning Ideas
Into Reality.

mote excellence in engineering management and develop networking."

"We do have a Boston EMS Web page (see URL at end of this article) and that seems useful in spreading information about the meetings. We collect E-mail addresses at each meeting and then send meeting announcements directly to those persons a few days before the meetings as a reminder."

"All things considered, I'm pretty happy with the way last year went, and excited about the prospects for this coming year!"

In recognition of these efforts, the Boston chapter is being presented with a \$500 recognition award from the EMS Board of Governors that they may use to fund a program this year, help with a speaker's expenses or fund a special seminar offering, or provide something in the way of celebration of their recognition, such as a special dinner at one of their meetings. Great work, Harry and the rest of the Boston chapter, and we hope to get more great ideas and inspiration from your future efforts!

With more than twenty five years experience in the high-tech industry, this Chapter's sparkplug, Harry Heflin, holds a M.E.E. from Colorado State University and a B.E.E. from Purdue University. He has held positions as Technical Director of Reliability Engineering, Director of Display Products Operations, Director of Customer Satisfaction, R&D Section Manager, Production Manager, and Manufacturing Engineering Manager, and is currently a principal at INTERSYS, a consultancy focused on excellence of the new product development process.

For further information about the Boston Engineering Management Society activities, contact Harry Heflin at (508) 486-4068, E-mail a specific question to <h.heflin@ieee.org>, or you can point your Web browser to <<http://www.ultranet.com/~hheflin/ems.htm>>. A recap of Boston Section EMS Chapter activities can be found on page 2.

Boston Section EMS Chapter Activities Summary 1995-1996

The newly revitalized Boston EMS Chapter is pleased to share with you some ideas for the coming year, and a summary of the topics of the meetings it held this past year, in the hope that you can use some of our ideas in your own Chapter activities.

Engineers are the most vital human resource in technology companies. Hardware and software engineers define and develop new products, support manufacturing, support the sales staff, install and maintain products in the field, and support customers who have problems using the products.

No one has ever contended that engineers are easy to manage, and some even say that the term engineering management is actually an oxymoron — the two words just naturally fight each other. Engineers do in fact have a unique perspective on life and work, and engineering (mis)management can certainly be a major problem leading to project delays, cost overruns, quality problems, and in the worse case even crucial staff resignations.

But engineers are very responsive to the right set of management practices and philosophies. Harry Heflin's talk to the Boston Section Chapter of the EMS on "Engineering Management — The Keys to Excellence" will present the best practices in topics like creativity, innovation, performance evaluation, objective setting, work environment, project scheduling and checkpointing, recruiting and hiring, and staff professional development.

Topics of other successful Boston Section EMS Chapter Engineering Management Series include:

September 19, 1995 — T. Capers Jones

Software Productivity Tools; what works and what doesn't

October 17, 1995 — Jerome B. Brightman

Leadership and the Learning Organization

November 21, 1995 — Stephen C. Wheelwright

Building Consistently Effective Project Teams

December 12, 1995 — David C. Walden

The Systematic Development of Engineering Skills

January 16, 1996 — Michael T. Anthony

Preparing to Move from Project Management into Functional Management

February 20, 1996 — Thomas H. Lee

Rationalizing the Plethora of Management Tools

NEW CHAPTERS FORMING!

The following new chapters are starting or in the middle of the formation process and welcome your participation at the local level. Please contact those listed below:

Austin, Texas: Darius Samani

at <samani@uts.cc.utexas.edu> or (512) 795-6176.

Detroit (Greater Michigan): Prakash Srivastav

at (810) 986-2206.

Oakland/East Bay, California: Khoy Nguyen

at <kdnguye@pacbell.com> or (510) 823-2886.

If other members are interested in forming chapters, please contact Cinda Voegtli at (415) 966-1650 or <cvoegtli@infoserv.com>.

March 19, 1996 — Harry Heflin

Forging a World-Class New Product Development Organization

April 16, 1996 — Bradford I. Goldense

Metrics For Measuring Product Development

May 21, 1996 — Shiela Mello (first speaker)

Concept Engineering; a method of better understanding the customers' true needs

May 21, 1996 — Ben Holmes (second speaker)

Engineering and Engineering Management at HP

ProjectWorld 1996 Project Management Conferences

ProjectWorld Summer '96

Here's what EMS Chapters Coordinator Cinda Voegtli has to say about our participation in Project World Conferences. IEEE EMS had a booth at the 2-day ProjectWorld Summer '96 exhibition in Washington, DC, August 5-9, 1996 and appreciates the help of members of local IEEE Consultants' Network members Peter Soltesz and Bill Westcott who assisted in Booth duty.

Our EMS booth again had great traffic. We gave away 75 membership brochures, around 100 copies of the Engineering Management Review, and 75 copies of the Transactions. IEEE Press management books were on display, we provided people with IEEE Standards catalogs, IEEE Financial Advantage brochures, a flyer on EMS, a directory of the consultants' network in the DC area, and the DC section publication.

ProjectWorld Winter 1996

The Winter ProjectWorld Project Management Conference and exposition will be held again this year at the Santa Clara Convention Center, from December 9-13, 1996. The IEEE Engineering Management Society is a co-operating society, along with other professional organizations such as Project Management Institute, Society of Women Engineers, and the Product Development and Management Association.

ProjectWorld Conferences are designed to provide information on the latest advances in project and program management for technical professionals and other executives who work in technology-supported organizations. ProjectWorld Winter will include 14 pre-conference workshops; an exhibition with 80 booths highlighting state-of-the-art developments in project management, groupware, consulting, and training; and 8 paper tracks presented by experienced industry practitioners, covering the following subjects:

- leadership and team building,
- reducing time-to-market,
- implementing project management,
- project management in software design and systems integration,
- strategies for coping with super-urgent demands,
- business process re-engineering,
- establishing and maintaining a project management culture,
- managing megaprojects and programs.

Special Discount for IEEE Members

IEEE members will receive a \$100 discount off the conference fee. To obtain more information about ProjectWorld, including a full catalog of conference workshops and paper sessions and exhibitors, call toll-free (888) 943-4444, E-mail to <admin@projectworld.com>, or check out their Web site at <<http://www.projectworld.com/projectworld/>>.

President's message

Virtual Organizations: Implications for Engineers and Engineering Managers

Times of change are times of anxiety and stress except for those who cannot live without change. At the same time these times of change are also times for exploiting opportunities, opportunities both personal, collective, and organizational. Identifying and exploiting those opportunities requires developing some new insights.

The Engineering Management Society has just completed a conference in Vancouver, BC on the virtual organization. Researchers and the media may suggest that this change to design virtual organizations is due solely to the indiscriminate actions of industry in downsizing, rightsizing, or whatever term you wish to apply. While this may be true in some instances, I suggest that the rapid rate of change of technology was bound to change organizational structures in one way or another. The process will continue. Many other factors in addition to technology have driven this change. To mention a few:

- Competitiveness
- Globalization
- Changing social structures
- Lower expectations
- Too much emphasis on self-esteem—not enough on personal responsibility and accomplishment which are the basis for self-esteem

The virtual organizational model of the CEO located somewhere on a mountain top or in the Mediterranean and managing the activities of thousands of people located at thousands of different points on the globe is science fiction.

Organizations will continue to evolve and will include the more or less vertically structured type to the more fluid type where people with the specific required competencies are focused on a particular problem. I suggest some companies have been organizing by competencies long before the word "virtual" made the business headlines.

The functional organization, as we know it today, will not go away entirely because it is the one way to maintain the critical mass of talent so necessary for effective performance.

Peter Drucker who has been a prolific author and advisor to management for over 50 years raises an interesting issue. How will we manage when the retirement age is 75?

He raises this issue in the context of why people choose early retirement and then spend 25 to 30 years dangling a fishing line or chasing a little white ball or both. Not that there is anything necessarily wrong with either. What are some of the reasons for early retirement when the life span is heading for the 80's?

- Lack of interesting and challenging jobs
- Jobs that do not add value
- Jobs that do not force the individual to think, to stretch, and expand horizons
- Managerial work that has been downgraded over the last two decades to administration

These broad categories pertain to us as engineers and engineering managers. In the mid-70's engineering managers and executives began managing paper rather than performing the role and function of the chief engineer. The technology



Gus Gaynor

became secondary. Instead of increasing their breadth of knowledge and understanding of engineering, too many became comfortable with the minutiae. Unfortunately many were rewarded for it.

As members of the Engineering Management Society we have an important role to play in this transition period. Not only in relation to engineering management but to the engineering profession. Our approach to engineering and engineering management not only will, but must change, both from an individual and organizational perspective. We can no longer sit on the sidelines and direct our attention solely to our limited technology interests.

Making a transition to the virtual organization requires that we make some changes as we cope with an ever expanding world:

- We need a new mental model
 - We need much more real learning and intensive thinking
- What do we need to do as engineers and engineering managers to participate on this road to virtual organizations?
- We need more maverick engineers and engineering managers and I use the word "maverick" in a very very positive sense — creative and constructive mavericks — people who look beyond-the-box so to speak — people dedicated, positive, skillful in many areas, knowledgeable, and forward thinking — people willing to look to the future and to accept responsibility for results.
 - People who prefer to ask for forgiveness rather than permission.
 - People who can work in high levels of uncertainty.
 - People willing to take calculated risks.
 - People willing to function as collaborators and build a sense of collegiality.

These are the requirements for being a successful engineer and engineering manager in the future.

The point we need to keep in mind is that the word management goes beyond application to people who hold the title "manager." Engineers from newly minted to the highest levels must at least manage their own activities in the context of their organizational infrastructure. The new graduates often make technical decisions with very little experience, but they understand the new technology.

We welcome all engineers to join us in this pursuit of determining and working on the issues that will transform working relationships in the future.

I firmly believe that a dynamic global society requires that engineers and their managers respond in a proactive manner not only in their particular discipline but with an extended focus on the business realities. That requires foresight, breadth of knowledge and experience, continuous learning in many different forms, and not only accepting challenges, but creating them — creating opportunities — opportunities that require vast amounts of creativity.

Gus Gaynor is your 1996-1997 President of the Engineering Management Society, and can be reached via E-mail at <g.gaynor@ieee.org>

You Lost Your Job — Now What?

By: Scott Shepard, Scott Shepard Associates

You lost your job. As is the case with so many today, you find yourself confronted with the question of what to do now.

Maybe the timing is right. You may have been thinking of retiring within a year or two anyway. So, you just move your plans up and launch your retirement earlier than originally planned. That's all right if your original plans took into consideration that we are all living longer. Early retirees may be facing twenty years or more of active retirement. Will your finances hold out? Do you have anything in mind to avoid lapsing into a vegetative state? You might want to consider doing some volunteer work or doing some consulting on a limited basis.

If the timing isn't right for retirement, do you want to seek employment with another company? If so, should it be a large firm or a small firm? Large firms tend to be more structured and bureaucratic in their way of doing things. Small firms usually are less structured with a much more hands-on environment. In a small company the employee that finds a job to be done is much more likely to be the one who ends up doing the than would be the case in a large company. If you have been working in a large company, make sure you can adjust to the smaller company's life style.

On the other hand, perhaps now is the time to go into business for yourself. Here there are several options. You might want to try your hand at consulting. In this case we're not talking about consulting for your former company. When you decide to work for your old company on a consulting basis, you haven't lost your job, you've just been debenefitted.

Before you decide that consulting is for you, there are a few things to consider. First, can you sell as well as deliver the service you will be offering? Consulting assignments can be great, but they eventually come to an end. You'll need to develop contacts that can lead to new assignments. If selling isn't your thing, you might want to team up with someone who is good at sales. Second, if you are the kind of person who needs to be around others to stay energized, be careful to avoid consulting assignments that lead to long periods of isolation. Otherwise, you'll find it increasingly difficult to get going in the morning and depression may set in. Third, as a consultant you will need to stay current in your field. Subscribe to a couple of trade journals in your field and become active in the local chapter of your trade association.

If consulting isn't your thing, maybe you want to start your own business. You can start from scratch, or you can buy an existing business or buy into a franchise. Whichever of these options you are thinking of, the key is research, research, and more research. Take advantage of outsiders who can challenge your thinking. Network with others who already are pursuing the course you are considering. Often they may help you learn from their mistakes.

Losing your job does not have to be the end of the world. It can just as easily be the start of a whole new world.

These practical ideas are from Scott Shepard, Principal of Scott Shepard Associates. Scott was one of the presenters of the EMS sponsored session on "Downsizing" that was chaired by EMS BOG- member Vivian Carr. Vivian reminds you that you should also prepare for downsizing and job changes, voluntary or unexpected, by active participation and networking in your local IEEE Sections and EMS Chapters.

Engineers Give Their Managers Feedback

By Joseph Bellfeuille, Member EMS BoG

Kouzes and Posner point out in their book "Transformational Leadership" (1987) that transformational leaders pay attention to customers, actively foster employee participation, and solicit ideas and many alternatives to keep from "boxing themselves in." Companies provide "upward feedback" to train managers to be leaders and employees to be ideal followers. The term upward feedback, in this article, depicts a process in which managers receive feedback from those who report to them. The author of this article has considerable experience as an upward feedback process developer, as well as, in giving and receiving upward feedback in a variety of processes and situations.

There are three compelling reasons for utilizing upward feedback as a learning tool. First, employees are a valid source of information because they are in the best position to observe managerial and leadership behaviors of their bosses. Second, gathering data from several, if not all, of the employees improves the accuracy over a single source. Third, a formal upward feedback system is compatible with employee empowerment, commitment and involvement (Bernardin & Beatty, 1987). The first two reasons benefit the manager who receives the upward feedback. The third helps enhance organizational culture changes.

In a study of IBM, RCA, Syntex, Libbey-Owens-Ford and a state highway patrol department, Bernardin and Beatty (1987) show that systematic approaches to upward feedback improve: managerial effectiveness, evaluation and promotion of personnel, implementation of strategic planning and the cost of promotion decisions. While there is variation in their approaches, there are many similarities to the AT&T and Chrysler experiences. Some of these organizations have been using upward feedback for several years.

Bernardin and Beatty conclude that there are some guidelines that increase the probability of acceptance and effectiveness of upward feedback. Here are the guideline highlights:

The program objectives should be carefully and meticulously articulated. Questions to be asked should include: "Why do we want to use upward feedback?" "What will we do with the results?" "Who will have access to the information?" There needs to be tight administrative controls and monitoring by the human resource department. Employee (feedback provider and receiver) anonymity and confidentiality must be absolutely protected. Make the items to be rated as specific as possible. Be careful not include two or more behaviors in a single statement. Field test and get feedback on the system as it is developed and once it is complete. Be careful when interpreting data. Use only the manager's own data as a context to point out strengths and areas for improvement. Leverage strengths to help effect improvements.

Fast turnaround is essential. Feedback data "ages" very rapidly.

Vital to the success of upward feedback programs is third party facilitation. (Bernadin and Beatty do not specifically spell out the use of third party facilitators in their guidelines. Chrysler uses process facilitators and the author's experience at AT&T clearly points to the use of process facilitator as a strong success factor.)

Letters to the Editor

E-mail comes from an Engineering Business Analyst for a major corporation: "Part of my job involves analyzing business objectives and selecting appropriate CAD and CAM systems to meet these needs. I am, however, unfamiliar with some of the terminology and issues related to CAD/CAM systems and CAE in general. Any educational resource recommendations?"

EM Transactions Editor Dr. Dundar F. Kocaoglu who is also Director of the Engineering Management Program at Portland State University <kocaoglu@emp.pdx.edu> responded: "There is a wide range of research activities and educational resources on CAD/CAM. You might want to start with two contacts for your information needs:

Dr. Donald Gerwin <dgerwin@carleton.ca> at Carleton University in Canada, department editor for the management of manufacturing systems in IEEE Transactions on Engineering Management, knows what is happening in the field with more authoritative knowledge than most people. He can direct you in the right direction.

Dr. Ann Majchrzak <majchrza@rcf.usc.edu> is a professor at USC in Los Angeles. She was the guest editor for a two-volume special issue that we published on Social Implications of CAD/CAM Systems a few years ago."

Another E-mail, from Marco Forcone, refers to some strange things that seemed to happen on his job that raised some interesting ethics and professional questions for him. Basically, an engineer that left the company (moving back to Ireland) left many skeletons in the closet, many of which came to light in the midst of selling off a \$30 million dollar trainer to the government. Including: bad designs, bad documentation/drawings, and outright fraud (lying about hardware working). The story had a happy ending as his team were in a mad rush to fix everything, but could it happen on your watch?

A senior engineer we'll call "Max", who left the company, also left a big mess behind. For weeks we had all been wondering what went wrong. What would cause an seemingly conscientious engineer to go completely "FIGMO". Personally, I believe there was more involved than just leaving the company. I've changed jobs twice before, and while there definitely is a certain amount of "FIGMO" before leaving a company, I could never see leaving behind the mess that we found. Even if you're mad at the company you're leaving, it's your co-workers that end up paying the price.

I think a big contributing factor was the under utilization of engineering talent in our group. While there is always a ratio of grunge work to good work in any company, my group has a lot more grunge work than it should. In a creative and thinking field (like engineering) doing thankless, monotonous, unrewarding tasks day in and day out will inevitably cause some degree of lack of caring for the tasks. Checking production board assemblies, prints, and documentation are all tasks which should be relegated to a technician, and only in the event of a problem should the engineer become involved. Unfortunately, our group leader is of the mentality of "if you want to do it right, do it yourself". We've had several discussions over this, I've never been able to get my point across. I'll talk more of him later. In my opinion, an engineers time is better spent reading up on trade magazines, demo'ing software, or 'playing' in the lab than buzzing a board (I think that progressive companies tend to realize this). How can a professional keep up their motivation when confronted with seemingly endless mindless tasks?

Another anti-incentive that exists in our group is that the better you do your job, the less likely you'll be moved onto something different (you've become too valuable... unless of course you're into politics). Again, this is contrary to an "engineering mentality" which is challenged by new (even if not necessarily better) tasks. I bring this up, because this has just happened to me in the last week. Sigh.

And then there's "Kris", our hardware group leader. He is a very nice guy, very conscientious, but unfortunately he's a terrible engineer/manager. Don't get me wrong, he's very smart, but he's ultra conservative. Totally living in the past and afraid of anything new. He's at least 10 years behind in technology. I've fought uphill battles every step of the way trying to get new ideas introduced in the trainer. It shouldn't have to be this way. A group leaders position should be fight FOR the engineers and new ideas, not to be an impediment.

Unfortunately for the engineer (and fortunately for the company), jobs are scarce now (particularly in hardware engineering). In good times (mid-eighties), the underutilized engineer in a dead end position need only send out a few resumes and be on their way. Now however, one of the analogies I've heard being used is "being in a life boat". No one likes being in one, but your not going to jump out until there is another boat waiting. That's what I believe happened to "Max" (the guy that left), while he was in the life boat, he didn't want to expend anymore energy than needed to stay afloat."

Your 1996 EMS Board of Governors

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Los Angeles Times Interviews EMS Past-president Willis

Paul Willis, BoG member and former EMS president, was interviewed by the LA Times Tech Careers in the Cutting Edge Section (9 Sept 96 issue) on the topic "What should engineers interested in moving into engineering management be doing, studying or what questions should they be asking their current bosses, or what should they be telling their current bosses?" Paul spoke as a member of the Engineering Management Society, but not for the Society.

Paul essentially said that engineers with such desires should let their bosses know, should watch what their supervisors do in performing their supervision and to broaden their reading into human resources topics, the administrivia of work breakdown structures, budgets, schedules to 5 levels, controlling the work so it follows the schedule or fixing the schedule to reflect actual progress. He strongly endorsed both of our EMS journals and also recommended the Harvard Business Review, glancing at PMI journals, and reading the Personnel journals. I also mentioned Aviation Week, Manufacturing Engineering, Chemical Week, and the Wall Street Journal. He pointed out that in 1994 the US had about 105 universities offering degree programs in Engineering and Technology Management under various titles in 1994. The worldwide figure (covering about 20 countries) was 166 in 1994. That number is probably closer to 200 now with a similar ratio existing today. Most of the activity is at the M.S. level (about 140 of the 166 institutions were offering M.S. in 1994), with an increasing Ph.D. education (about 35 in 1994), and a steady figure of about 30 at the Bachelors level. Clearly, an aspirant should look at their curricula offerings for clues as to broadening their readings.

Paul told her that we had just had the IEMC, explaining (bragging) about the international attendance and mentioning the PICMET next year. Then he told her that our BoG had become more sensitized as to the need for information, courses, seminars aimed at answering the questions she raised, and that we had started a prototype short course on exactly this topic.

She asked Paul if he thought an MBA would be "better" than an MSEM; he said any broad education is helpful, but the MSEM appeared to be better suited to education Engineering Managers. She asked should Engineers take accounting Courses and he replied that he thought that the overview of what accounting is and how to read the balance sheets that were covered in most MSEM courses were better suited since very few (any?) engineering managers require the skills in accounting that an accountant does, mentioning that we go to physicians for medical advice and should go to accountants for accounting advice.

Paul mentioned that we (EMS) were trying to do our short course in two versions — one for the engineer employee who wants to become an engineering management employee and another aimed at the engineer employee who wants to learn to manage his own company, or at least a small company.

Now that he's promised all this we need to get to work!!

**Want to help out? Your EMS is always looking for
a few good volunteers.
Contact EMS president Gus Gaynor,
g.gaynor@ieee.org**

PICMET'97

The Venue

PICMET'97 will be held in the beautifully remodeled Portland Hilton. It is right in the middle of downtown at the center of activities. Niketown, Saks Fifth Avenue, Nordstrom, Pioneer Courthouse Square, Pioneer Place, Portland Center for the Performing Arts, Portland Art Museum, Oregon History Center, Arlene Schnitzer Concert Hall, the Waterfront Park, the movies and dozens of upscale restaurants where you can taste the best of Northwest cuisine are within walking distance. Hilton has special rates for PICMET participants but space is limited. Although the cut-off point for the special rates is June 1, 1997, we recommend that the reservations be made much earlier than that. Portland is at its best in July and August and it attracts an extremely large number of people from all over the world. Hotel space is at a premium during those two months. There is a high probability that no rooms will be available in the proximity of the conference once the blocked space at Hilton is sold out. Reservations can be made by mailing or faxing (1-503-220-2565) the attached form to the hotel, by calling Hilton's central reservation number (1-800-HILTONS) or the Portland Hilton (1-503-226-1611) and specifying that you are a PICMET participant.

The Portland Hilton Welcomes you to PICMET'97 Phone: 1-800-HILTONS

Portland Phone: 1-503-226-1611 Portland Fax: 1-503-220-2565

Please note: Rooms may not be available for check-in until after 4:00 p.m. Earlier occupancy subject to availability. All reservations must be accompanied by first night's deposit (Room rate plus tax). Payment or deposit can be made by check or accepted credit card number (American Express, Carte Blanche, Diners, VISA, MasterCard, Air Canada, Eurocard, JCB, Hilton). Guests checking out prior to the confirmed departure date will result in a \$50.00 administration fee. Up to two children, regardless of age, may stay free when occupying the same room as their parents. Limited number of handicapped rooms are available upon request. Special PICMET rates shown below are effective until June 1, 1997. After that date reservations will be on an availability basis.

Name: _____

Please check preference

SINGLE (one person, one bed) \$129

DOUBLE (two persons, king bed) \$139

TWIN (two persons, two queen beds) \$139

TRIPLE (twin plus one add-on) \$174

QUAD (twin plus two add-ons) \$209

Deposit Enclosed \$ _____

For suites please contact the Portland Hilton directly.

or Accepted Credit Card # _____

(9% City room tax will be added).

Expiration date _____

HHonors # _____

PICMET '97 REGISTRATION FORM

Send to PICMET, Engineering Management Program, Portland State University, Portland, OR 97207-0751, USA
Phone: 1-503-725-3525, Fax: 1-503-725-4667, E-mail: <picmet@emp.pdx.edu>, URL: <http://www.emp.pdx.edu>

Please check the appropriate boxes in each column and show the cost on the right column	Participant	Spouse	Student ⁽¹⁾	One-day ⁽²⁾	Costs
Regular Registration	\$625	\$135	\$135	\$295	_____
Early Registration ⁽³⁾	\$525	\$100	\$100	\$270	_____
Author/Chair/Member Registration ⁽⁴⁾	\$525	N/A	\$135	\$295	_____
Early registration-Authors/Members/Chairs ^(3,4)	\$425	N/A	\$100	\$270	_____
Sunday Wine & Cheese Ice Breaker	Included	Included	Included	\$35	_____
Monday Reception	Included	Included	\$45	\$45	_____
Tuesday Banquet ⁽⁵⁾	Included	Included	\$55	\$55	_____
Wednesday Dinner Cruise	\$65	\$65	\$65	\$65	_____
Conference sessions and breaks	Included	N/A	Included	Incl'd. for the day registered	_____
Proceedings (Book)	Included	\$125	Included	\$125	_____
CD-ROM	Included	\$125	Included	\$125	_____
Proceedings & CD-ROM together	_____	\$175	_____	\$175	_____

Tutorials on Sunday July 27	<input type="checkbox"/> Please send information	Total	_____
Pre and Post-Conference Trips	<input type="checkbox"/> Please send information		_____
Tours in and around Portland	<input type="checkbox"/> Please send information		_____

Notes:

(1) If you are registering as a student, obtain your professor's verification of the student status.

Professor's name: _____ Professor's signature: _____

(2) If you are registering for one-day, please indicate which day: Mon. Tue. Wed. Thu.

(3) Early registrations must be postmarked by March 1, 1997.

(4) Indicate if you are Author/Co-author, Session Chair or a Panelist at PICMET'97

Member of IEEE Member of INFORMS Member of JSSPRM

(5) Please indicate your preference for the banquet dinner: Salmon Steak Vegetarian

Name: _____ Phone: _____ Fax: _____

E-Mail: _____ Spouse's Name (If attending PICMET'97): _____

Address: _____

Payment by Check enclosed Purchase Order No.: _____

American Express Diners Club Discover Master Card Optima Visa

Credit Card Number: _____ Expiration date: _____

Signature: _____ Today's date: _____

PICMET'97

July 27-31, 1997 Portland, Oregon, USA

Cooperating Societies: IEEE Engineering Management Society; IEEE - Oregon Section; INFORMS Technology Management Section; JSSPRM (Japan Society for Science Policy and Research Management)

Corporate Sponsors: PICMET'97 is pleased to acknowledge the support of the following Corporate Sponsors: Tektronix, Inc.; Intel Corp.; OCATE (Oregon Center for Advanced Technology Education); Wacker Siltronic and Merix, Inc.

Plenary Speakers

Plenary sessions are scheduled every day. The plenary speakers are listed below:

- Daniel Berg – Professor and Former President, RPI -USA
- Joseph Bordogna – Acting Deputy Director, NSF - USA
- Hans Danielmeyer – Vice President, Siemens AG - Germany
- Robert Davis – Vice President of Technology, Boeing Corp. – USA
- Gunnar Hambræus – Director, Swedish Royal Academy of Engineering–Sweden
- Eiichi Maruyama – Exec. Director & Gen'l. Director of Research Center, Angstrom Technology Partnershi–Japan
- Steven McGeady – Vice President, Intel Corporation–USA
- Graham Mitchell – Asst. Secr. for Technology Policy, Dept. of Commerce–USA
- Thomas J. Murrin – Dean, School of Business, Duquesne University
- Tsuneo Nakahara – Vice President, Sumitomo Electric Industries–Japan
- Judith A. Ramaley – President, Portland State University–USA
- Yasutsugu Takeda – Senior Executive Managing Director, Hitachi Ltd.–Japan
- Curtis J. Tompkins – President, Michigan Tech. University
- Michiyuki Uenohara – Executive Advisor, NEC Corporation–Japan

Authors from more than 40 states and 48 foreign countries have submitted more than 550 paper abstracts and 42 panel and session proposals (approximately 700 papers) which are being reviewed for acceptance. About 2/3rds of these will become the actual paper sessions and panel discussions at PICMET'97. Parallel tracks will address technology management on a wide range of issues including the following topics listed in alphabetical order: Collaborative Issues; Concurrent Engineering; Cultural Issues; Decision Making; Educational Issues; Emerging Technologies; Engineers & Scientists; Entrepreneurship; Health Technologies; Information/Knowledge; Innovation Process; International Issues; Manufacturing; Organizations; Policy Issues; Products; Productivity; Projects/Programs; Quality; R&D; Resources; Service Technologies; Strategic Issues; Technology Market'g; Technology Transfer

Tutorials

Over 40 tutorial proposals, on a wide range of topics, have been received and about 15-20 of these will be presented by experts on Sunday, July 27, 1997. Most of the tutorials are half-day long (8:00-12:00 or 13:00-17:00). Some are full-day (8:00-17:00). Lunch is included for guests registering for a full-day tutorial or two half-day tutorials.

Proceedings

PICMET'97 Proceedings will include the refereed papers, some as full-length papers, some as expanded summaries. In addition, a CD-ROM containing full-length of all papers accepted for presentation at the Conference will be provided. Both the book version and the CD version will be available as part of the registration packet.

Registration

You can register for PICMET'97 by mailing or faxing the Registration Form on Page 7 to PICMET (Phone: 1-503-725-3525, Fax: 1-503-725-4667), by sending an e-mail to PICMET <picmet@emp.pdx.edu>, or by visiting the PICMET homepage at <<http://www.emp.pdx.edu/picmet>>. Members of the IEEE-EMS will receive a \$100 discount.

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Newsletter Deadlines

Month of Issue	Quarter	Deadlines
October 1996	Fourth	16 December
January 1997	First	22 January
April 1997	Second	16 April
July 1997	Third	14 June
October 1997	Fourth	13 August



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