

# Concurrency



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Strategy, People, Process, Tools, Technology

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By John R. Power, COL, US Army (Retired); PMP

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### **SCPD '02 Aligning Culture to CPD Principles & Practices**

SCPD's seventh annual worldwide conference, sponsored by our Boston Chapter, will be held May 29 and 30, 2002 in Tyngsboro, MA. This year's conference is designed to help organizations implement CPD as an integral part of their business model. Conference Program

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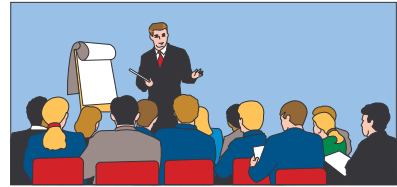
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## Teams, Concurrency and After Action Reviews

By John R. Power, COL  
US Army (Retired)



There are principles and practices that are espoused yet often ignored by development teams. When challenges are tough, time is short, and issues are critical, processes known to work best often fall by the wayside in pursuit of the quick solution. Here is an example where the best practices produced the best results – and under very trying circumstances.

### Background

Mobile Subscriber Equipment (hereafter referred to as MSE) was one of the largest tactical or battlefield communications projects ever attempted by the US Army. It was a project to produce, field and train soldiers for a totally renovated military telephone system. And this was not a telephone system for Fort Swampy. This was a telephone system to support Army divisions and Corps in battle. The system is everything you can think of as part of the telephone system you use every day. Telephone switches, local desktop telephones, transmission cables and radio relay systems, mobile telephones and their access switches, facsimile systems, and even the system management facilities. All of this was mounted on relatively small trucks (the famous HMMWV or Hummer) so that it could be deployed by air any place in the world.

A unique aspect of the project was that it was awarded under a single contract for design and production, deployment and training, and long-term logistical support. The other unique aspect of the program was that the system contracted for was to be a “non-developmental item”. That means that its parts were already in production so it was expected to work right out of the box. And lastly it was for a fixed price. No cost overruns by the contractor would be accepted. The system would be tested and had to work. If not, this key to the Army’s communication would be a cancelled program because the Army had committed that approach to Congress.

### Competing Forces

As in any project of this size (and the contract was for a base price of \$4.35 Billion), there are many agencies with competing agenda. The contractor wants everything to go full speed ahead, while they do the least acceptable effort to accomplish contract goals, and earn a maximum profit. The project management office must oversee the contractor, assuring the program requirements are met, the project is on time, every party is a timely and involved player and the terms of the contract and needs of the Army are met. The sponsor of the project and the contracting agency typically mistrust the contractor, expect they aren’t doing enough, and wish to find ways to make them do more to earn their profits. The Army unit that will get the equipment wants it to work, wants to be ready to roll into combat when testing is finished, and wants the equipment to work in a way they are used to using such equipment. The test agency is focused on finding fault and will home in on any failure. In essence they most often align with the sponsor,

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but often are more objective.

### Test environment

This complex telephone system had to undergo testing by the unit that would use it in combat to be sure it worked satisfactorily and build their confidence in a new system. The first system out of the gate was the crucial test. After two years of preparation, technical testing, production, shipping carloads of material from Massachusetts to Texas, extensive deprocessing, and training of hundreds of soldiers, the system and the Army were ready to roll.

### Results

The first several days of operation went well. Then, several hundred telephone users, from the Commanding General on down, deployed to the training areas to use the system in simulated combat command and control. After a couple of days the system broke down and was unable to consistently process calls! This was a near disaster and all the key leaders converged on Ft. Hood, TX to decide what to do. The senior leadership in the community wanted to play “hard ball” with the contractor and so insisted they fix the problem and tell us when we were ready to retest. We would run a controlled retest before the Commanding General and troops would be asked to deploy again. And so the contractor did its work with minimal interference or dialog with the Army and, after two weeks, went to a controlled retest. That test was moderately successful, and the troops were called out again. The system failed once more.

Once again the leaders converged on Ft. Hood. What to do? This time it was decided that the sponsor of MSE who represented Army needs, The US Army Signal Center and School, would control the retest while the contractor was again exhorted to correct the problems. After another two weeks the controlled retest was done and this time the systems didn't get by that limited and controlled test. Now we were truly in a quandary. The meeting of leaders moved up a notch in rank and importance. The decision was made. The contractor and the user's representative having failed, it was now time to place the onus on the project manager. The possibility of “three strikes and you are out” was real. Another failure and the program would probably be cancelled. I recall the scene well. In a conference room the generals, senior defense civilians and contractor VPs met, and decided to challenge the Project Manager to solve the problem. What a novel concept! They asked what the plan would be. I told them to leave the room and return in an hour and I would have a plan! They tried to hang around and kibitz on the plan. I politely “ordered” them out. To put together a plan in an hour for such a project required real concentration by all parties.

### *The New Approach...*

I had observed the withholding of information from each player with an interest and the “competition” to be right or to have the latest idea. I had personally been approached by a variety of people about their idea of what the problem might be, or what the approach to a solution should be. In

...the ideas and opinions of every participant were to be solicited, respectfully heard, and then addressed on the spot or investigated further.

every case the party that had more and necessary information was not present and little action could be taken. I convened a meeting of the on-site leaders of each group and got their commitment to open interchange and focused effort. We would assign responsibility for each day's work, decide collectively what was to be tested and who would gather what information, and we would convene daily at 5:00 PM to go over results and map the actions for the next day. The following principles of the solution process were established.

- Communications:** The collection of ideas as to what might affect technical system performance were as numerous as the number of people associated with the project. It seemed that these ideas would be discussed in closed groups, and then trotted out at the opportune time to make a point. "Gotchas" were common. It was almost as if there were a constant negotiation amongst the parties. It was agreed that this would end immediately. At the day end after action review the ideas and opinions of every participant were to be solicited, respectfully heard, and then addressed on the spot or investigated further. In that manner every idea was put on the table for honest consideration. No idea that was not shared in that manner would be acted upon.
- Openness:** Each party had their agenda and, it appeared, was unwilling to share knowledge openly. This was particularly true of the contractor, but also applied to testers and government technical personnel. The rule was established that there would be full disclosure of information and actions at the daily update. Rather than assume others would not understand the technical nuances, or already understood, time would be taken to actually explain why an action would or wouldn't be appropriate.
- Delegation of Authority:** Initially it had been assumed that the contractor, being responsible for the outcome, should be left "hands off" to produce the solution. After two unsuccessful rounds of rework it became clear that there were soldier-operators who had a real stake in the success of the project and about 30 or so government engineers who could make a real contribution. While the contractor designed the tests and the specific corrective actions, all players were assigned specific roles. Military operators were trained to take data "dumps" when there were operating problems. These lengthy printouts would be overnight shipped back to the software laboratory for analysis. Other Government personnel would be at selected sites to observe and record specific findings that might provide clues to the problems. In this way the communications and openness became necessities for all participants and the real manpower working on problem solving was doubled.
- Concurrent actions:** Time was extraordinarily important in this case. A US Army Armored Division of 20,000+ soldiers was, in essence, combat ineffective while it waited for its telephone communications system to be operational. Millions of dollars were being held in abeyance until the contractor could deliver satisfactorily and be paid. Presidential and Congressional budget actions wait for no program and continued funding could have been at risk. Careful control was kept of all concurrent activities. Software teams were independently

Every party left the table every evening having had a real voice in the decision process.

working severable problems. Hardware teams were doing the same. Different sites in the test would be testing slightly different packages so that the results could be compared and both problems and potential solutions isolated. The specific configurations and reasons for their change would be discussed and decided upon daily. Each day the objective of the test(s) would be defined.

- Consensus:** The openness and free communications could not be sustained if there were not consensus about the work going on. Decisions had to be made daily about specific matters of configurations, tests to run, objectives, etc. It would have been easy for the Army Project Manager to make those decisions, but it is unlikely that other parties would trust the results. True consensus, not majority rule or unanimity, was the objective. Every party left the table every evening having had a real voice in the decision process and agreeing on the appropriateness of the next day's schedule of work.
- Government control:** In the earlier two corrective action exercises the contractor, who had the contractual authority to control the equipment and software configuration, had exercised total control. This tended to breed a sense of mistrust. "They" could be doing almost anything, but most importantly the MSE system wasn't working! I appointed the Deputy Project Manager for technical matters to run the corrective action project from an operational perspective. We brought in the Government software laboratory to run configuration tracking. In this way the project office took ownership of the problem on behalf of the government, freeing the contractor to focus on the technical side they clearly understood best. This also created a sense of confidence in the Government participants that no one would "pull the wool over their eyes".

### Results

All the above is well and good. It illustrates application of principles and practices that we all know to be right. That it was done in the heat of battle is a bit unique, as often people revert to quick answers when time is on the line. They fail to "trust the process". What happened here?

The corrective action process took a total of three weeks, or about half the time spent in the two prior failed attempts. After those three weeks the consensus of the parties was that, while still imperfect, the MSE system would perform within its objective parameters and should proceed to the next stage – controlled technical testing.

The controlled technical pretest was a great success. Every parameter was met and it was clear that the unit level test should proceed. The soldiers went to the field training sites confident they would be successful. Their work over a week of tough field practice showed they were already expert in dealing with the system and getting it to perform. The knowledge they had gained and the practice they had received during the corrective action cycle was a positive factor. When the Commanding General and senior commanders and non-commissioned officers went to the field locations to conduct their test there was a sense of apprehension. We (the telephone guys) had been confident before. They had brought the system to its

**When time is of the essence, concurrency is the only solution.**

knees. They anticipated similar results. That did not happen. They were critical users, but totally agreed that this communications system was a major improvement in their fighting capability. The contractor was paid and the system went on to an even more critical test – the determination of operational suitability for the whole Army.

The Operational Test and Evaluation was a major event that lasted some four weeks in a field environment with a full load of actual and simulated users (as compared to four days with the division Commanding General and his staff. While the MSE system didn't pass everything with flying colors, it was clear that it was a major improvement that should proceed for the Army overall. The areas still in need of correction could and would be managed (How we did that is another story for another time.)

The ultimate proof of a military system is its performance on the battlefield. In the Gulf War (Operation Desert Storm) MSE was the backbone telephone system for two of the Army divisions, one of which was the division that had done so much testing at Ft. Hood. The system worked so well that a Corps Commanding General, leading four combat divisions, ran most of his operations from an MSE-equipped division command post because of their superior communications. MSE was the telephone system of the division that launched the main attack and conducted many of the decisive engagements in that very brief and violent war.

## *Lessons Learned*

### **Teams**

We've always known that bringing diverse members together around a common goal results in achievements beyond what any individual member could produce. In this case the common goal was overcoming potential failure of the system and program. We all understood what was at risk and that, despite the agenda of our agency or office; the failure would be a very adverse outcome for the Army. The good of the Army was the congealing force that united the team. It is the job of the team leader to discover the common goal and sustain and promote it regularly. Without continued focus on that goal it is very easy to drift back to other agenda and hidden objectives.

### **Concurrency**

When time is of the essence, concurrency is the only solution. To have an effective plan of concurrent work all the parties need to know and understand what each is to do when. There must be continuous communication of progress, frequent coordinating sessions, and a detailed schedule that all have contributed and committed to. The coordination must be active and overt. The assignment of responsibility must be understood and accepted by all parties. The work packages should be of short duration so that adjustments can readily be made without impacting on the other work proceeding in parallel. In the case of this corrective action work the packages were no more than two day long and adjusted daily. In this way some slippage in one piece of work had minimal impact on others and was easily adjusted without much waste of resource.

**It is a process that can be easily done and should be considered as a regular regimen in most organizations.**

### **AAR's**

After Action Reviews are invaluable methods of learning, improving and correcting. They take resources. Our daily meetings involved upwards of 30 people for a couple of hours each day. What they accomplished was an intense exchange of information and a documented learning for everyone involved. All participants learned a great deal about the MSE system, about testing and fault correction, about the capabilities of their team members, and about how a project was run. The AAR was an exceptional tool for team building and coordination. AARs are part of the US Army training regimen today. After every training exercise or training day the leaders and key soldiers at various levels gathered informally to review what they did, what went well, what didn't go so well, what they could do to improve on the experience and what they would do tomorrow. It isn't rocket science. It is simple. It is a process that can be easily done and should be considered as a regular regimen in most organizations. Daily was necessary in the MSE case. Weekly might be useful in other cases. Without an AAR it would be very easy, indeed likely, that adverse history be relived simply because the results were unknown.

*Colonel Power was a US Army Signal Corps officer for almost 30 years, retiring in 1992. He was the Army Project Manager, Mobile Subscriber Equipment, from January 1986 to June 1990. He later worked in the defense industry and in commercial telecommunications. He is a certified Project Management Professional (PMP), and serves as the SCPD Worldwide Vice President for Chapter Development.*

## **Let us hear from you!**

Share your Knowledge • Experience • Success stories • Lessons learned  
Suggestions and opinions.

Concurrency welcomes articles, letters, news items, event notices, book reviews, and other information of interest to product development professionals of all disciplines. For more information or to submit an item for publication, contact Editor, Concurrency, at: [jjcush@ix.netcom.com](mailto:jjcush@ix.netcom.com)

## Concurrency (Long before the term was popular?)

(The publication date below may surprise you. Ed.)

“Attaining excellence in engineering practice is a fairly simple thing. The engineer keeps clearly before him his broad mission or purpose. He relates this mission to each of the details of his work as they arise. An engineer who is able to do this most of the time will be successful.”

### “Good Project Team Practices

- Each member keeps informed on all major aspects of project progress and developments.
- Each engineer takes full responsibility not only for performing his part of the work but also for seeing that it will fit into the rest of the project. He quickly identifies each interface problem between himself and a colleague and works out a solution of the problem with him.
- The status of each element of project work is frequently reviewed by all members of the team assembled together. Interfaces are carefully analyzed and documented.
- All team members measure their individual success in terms of project success.

### “Good Engineering Practices in Relation to Manufacture and Quality Control

- Designers and producers jointly and periodically review the progress of the project from its inception through the attainment of smooth production.
- Designers make adjustment of designs to facilitate manufacture and quality test. They seek information and assistance from production people.
- Designers and producers keep each other informed as early as possible concerning the need for or prospect of design changes.”

Excerpts from “Excellence in Engineering” by William H. Roadstrum, Professor of Electrical Engineering, Worcester Polytechnic Institute. John Wiley & Sons, 1967

# SCPD '02 **Aligning Culture to CPD Principles and Practices**

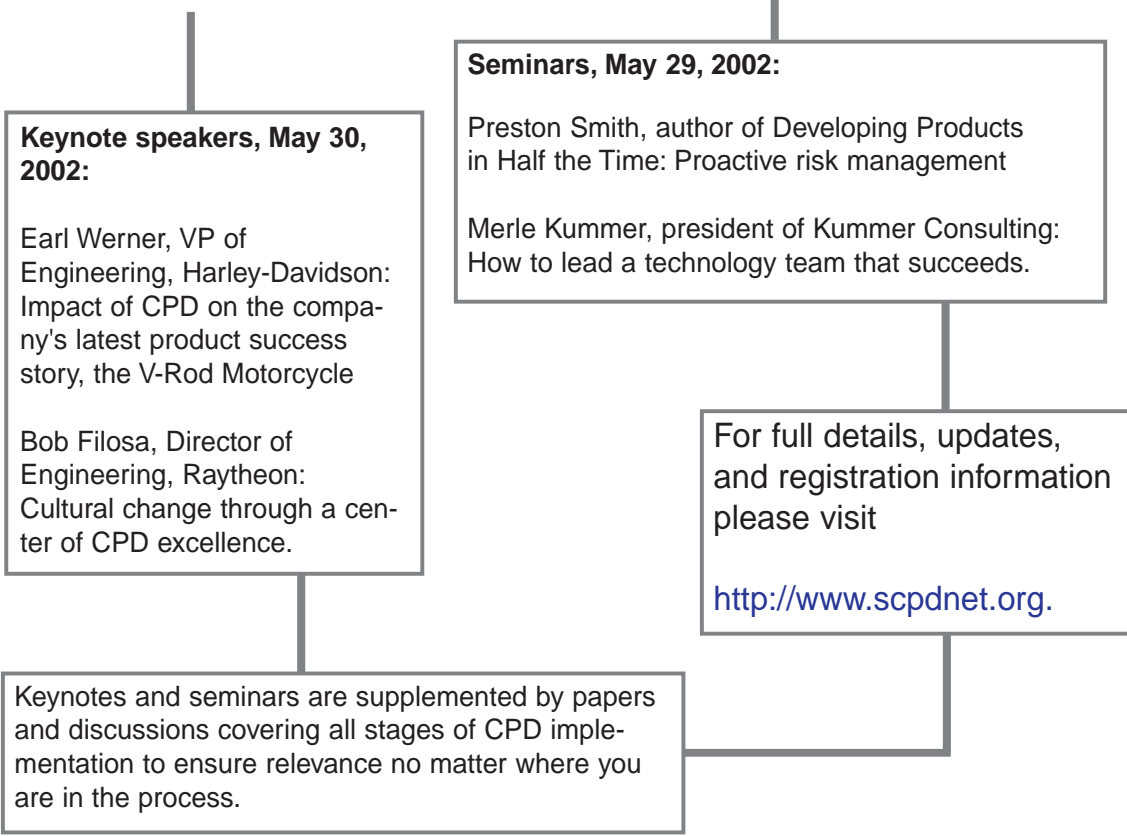
## 7th Annual Conference

May 29-30, 2002

**Boston University  
Corporate Education Center,  
Tyngsboro, Mass.**



Proven principles of Concurrent Product Development often conflict with existing organizational cultures. SCPD '02 focuses on aligning culture to CPD at all stages of implementation as CPD competence matures. SCPD '02 will help you identify cultural issues and use appropriate resources to successfully implement CPD as an integral part of your organization's business model. Our program includes seminars, keynote speakers, papers and discussions:



**Keynote speakers, May 30, 2002:**

Earl Werner, VP of Engineering, Harley-Davidson: Impact of CPD on the company's latest product success story, the V-Rod Motorcycle

Bob Filosa, Director of Engineering, Raytheon: Cultural change through a center of CPD excellence.

**Seminars, May 29, 2002:**

Preston Smith, author of Developing Products in Half the Time: Proactive risk management

Merle Kummer, president of Kummer Consulting: How to lead a technology team that succeeds.

For full details, updates, and registration information please visit

<http://www.scpdnet.org>.

Keynotes and seminars are supplemented by papers and discussions covering all stages of CPD implementation to ensure relevance no matter where you are in the process.

# SCPD '02: ALIGNING CULTURE TO CPD PRINCIPLES & PRACTICES



**7<sup>th</sup> Annual Worldwide Conference of the  
Society of Concurrent Product Development  
May 29 and 30, 2001**

**Boston University Corporate Education Center  
Tyngsboro, Massachusetts**

Sponsored by the Boston  
Chapter, Society of Concurrent  
Product Development  
(formerly SOCE).  
Organizational affiliate: Boston  
Area Semiconductor  
Equipment (BASE) Council

**Wednesday, May 29:  
PRE-CONFERENCE SEMINARS**

- **Proactive Risk Management** *Seminar Instructor: Preston Smith*
- **From Mutually-Assured Destruction to Mutual Accountability: How to Lead a Technology team that Succeeds** *Seminar Instructor: Merle Kummer*

**Thursday, May 30:  
KEYNOTE ADDRESSES AND SELECTED PAPERS, IN 2 TRACKS**

## **About SCPD**

The Society of Concurrent Product Development (formerly Society of Concurrent Engineering) is an international organization dedicated to assisting product developers and companies satisfy their customers through quality products that are delivered faster and at lower cost. Founded in 1992, SCPD has a three-fold mission:

- Disseminate knowledge, concepts, and practices for concurrent engineering and integrated product development.
- Provide a forum for sharing ideas among professionals in all product development disciplines.
- Expand the Body of Knowledge for concurrent engineering and integrated Product development with emphasis on practical approaches.

## **Why attend the conference**

The late twentieth century firmly established the principles and practices of concurrent product development. What is a work-in-progress is implementing CPD. SCPD '02 focuses on the cultural alignment needed to break down barriers to CPD principles and practices. Cultural alignment with CPD uses every resource that is product development: metrics, persuasion, processes, management teams, new product development teams, technology, management directives and company politics, among others. The purpose of SCPD '02 is to help you identify the cultural issues and use the resources needed for its alignment. SCPD '02 includes all stages of implementation so that its topics are relevant, whatever your company's success has been to date.

## **Who should attend**

The Conference is an indispensable source of new ideas and techniques for individuals and teams with responsibility for new product success in competitive markets. This includes general management, product planning and marketing, R&D, engineering, manufacturing, operations, finance, and quality. Concurrent product development techniques have consistently provided sustainable competitive advantages to a broad variety of industries, including semiconductor devices, electronic products, software, automated process equipment, medical products, military equipment, consumer products, pharmaceuticals, and biotechnology.

# SCPD '02: ALIGNING CULTURE TO CPD PRINCIPLES & PRACTICES

## Conference agenda

WEDNESDAY, MAY 29

PRE-CONFERENCE SEMINARS / WORKSHOPS

12:30 PM	Networking, sandwiches, and soda	
1:30 PM  (break from 3:00 - 3:30)	<b>Seminar A</b>  <b><i>Proactive Risk Management</i></b>  <b>Instructor:</b> Preston Smith, President New Product Dynamics	<b>Seminar B</b>  <b><i>From Mutually-Assured Destruction to Mutual Accountability: How to Lead a Technology Team that Succeeds</i></b>  <b>Instructor:</b> Merle Kummer, President Kummer Consulting
5:00 PM	Reception for all Conference attendees	
6:30 PM	End of pre-Conference program	

THURSDAY, MAY 30

KEYNOTE ADDRESSES AND SELECTED PAPERS

7:00 AM	Registration, breakfast, and exhibits	
8:00 AM	Welcome	
8:20 AM	<b>Keynote 1</b> <b><i>The CPD Journey and How it Affected the V-Rod Motorcycle</i></b> Earl Werner, Vice President of Engineering, Harley-Davidson Motorcycle Co.	
	<b>TRACK 1</b>	<b>TRACK 2</b>
9:20 AM	<b><i>Effective Decision Making Across Different Organizational Cultures</i></b> Peter Flentov, Vice President of Client Management Product Genesis, Inc.	<b><i>Creating Sustainable Teams Across Functions and Life Cycles</i></b> Chuck McVinney, President McVinney and Company
10:20 AM	Network break, refreshments, and exhibits	
10:50 AM	<b><i>Implementing CPD: Culture &amp; the Tacit Dimension</i></b> Beebe Nelson, President & Founder Working Forums LLC	<b><i>Decision Support for CPD</i></b> Dr. David G. Ullman Robust Decisions Inc.
12:00 PM	Buffet lunch, update on SCPD Worldwide, and exhibits	
1:40 PM	<b>Keynote 2</b> <b><i>Facilitating Culture Change at Raytheon with the Multidiscipline Resource Center</i></b> Robert Filosa, Director of Engineering, Air/Missile Defense Systems, Raytheon Co.	
2:40 PM	Network break, refreshments, and exhibits	
3:10 PM	<b><i>Harley-Davidson Product Planning Process and the Role of CPD</i></b> Hugh Vallely, Director for Motorcycle Product Planning, Harley-Davidson Motorcycle Co.	<b><i>Subtle - And Not So Subtle - Cultural Factors Drive the CPD Environment</i></b> Tom Merle, Director of Engineering & Technology Design Continuum, Inc.
4:10 PM	<b><i>The Impact of New Skills That Are Useful for Aligning Cultures to CPD</i></b> George Davis, PhD, Principal Davis & Dean Inc.	<b><i>Global Modular Product Platforms—Overcoming Cultural Hurdles</i></b> Ralph Schmitt, former VP and GM for Chiller Products York International
5:20 PM	Closing reception	

## *Share Your Knowledge*

To our readers,

SCPD invites all our readers, members and non-members, to submit information for publication in "Concurrency." We welcome feature articles including tutorials, lessons learned, and CPD implementation cases, as well as other news, features, and announcements.

Examples:

- An article especially for Concurrency.
- An article you or someone else has published in another newsletter, journal, or magazine or on the Internet.
- An adaptation of a presentation you or someone else made at a conference or business meeting.
- An excerpt from a book you or someone else has written or is writing.
- Announcements of future events and reports of past events.
- A periodic column.
- News about product development.
- Book reviews.
- News about your area of responsibility as a Board member.
- Results of an opinion poll or research survey.
- A letter to the editor.

Author bios and required permissions are prominently included for all material published.

Let us hear from you. Share your knowledge and experience with your fellow product development professionals of all disciplines. If you have questions or ideas about proposed content, please contact me and I'll get right back to you.

Sincerely,

John P. Cushman  
Editor, Concurrency  
Phone: 805-373-9945  
Fax: 805-381-1156  
Email: [jjcush@ix.netcom.com](mailto:jjcush@ix.netcom.com)

## *Subscribe to Engineering Management Journal*

Through a cooperative arrangement with the American Society for Engineering Management (ASEM), SCPD members may subscribe, at a special low rate, to ASEM's quarterly Engineering Management Journal (EMJ).

### **Information You Can Use!**

EMJ provides articles and features related to the management of engineering and technical professionals and of the organizations that rely on them. Practical and pertinent articles and reviews help readers gain insight to and meet the challenges of coordinating the design, integration, and use of new technology in the workplace.

**EMJ focuses on** providing new theories and tools, insightful and innovative applications, and clear descriptions of well-known engineering management principles. Articles are classified as research manuscripts, applied engineering management manuscripts such as case studies and overviews of practice, and management tools such as tutorials, critiques, and opinions. Articles encompass all engineering disciplines.

**ASEM, publisher of EMJ**, was founded in 1979 and today is a major professional organization dedicated to the science and art of engineering management. Like SCPD, ASEM transcends many engineering disciplines, supporting specialties, professional affiliations, and sectors of the engineering and technical community in industry, government, private practice, and education in strategic and important roles that advance engineering management.

**As a member of  
SCPD, you may  
elect to subscribe  
to EMJ at a spe-  
cial rate.  
(see page 17)**

## SCPD Vision

To be recognized by industry, academia, and by other professional societies as the best value source to attain the knowledge necessary to achieve advanced product development capabilities and practices.

## SCPD Mission

To further the development of and to promote the application of Concurrent Engineering (CE) and Integrated Product Development (IPD) in companies and organizations worldwide.

## SCPD Values

- **Leadership:** To embrace rapid product realization techniques and to advance our nation's economy, driven by ourselves, our companies and our Sponsors.
- **Member Recognition:** To individuals in our organizations as facilitators of improvement, to our companies and to Sponsors for foresight in fostering environments that lead to the adoption of improved design practices.
- **Learning:** To satisfy our thirst for continuing personal development and renewal and to provide an accessible resource for industry as a whole, bringing new knowledge and skills to the workplace.
- **Networking:** To stay abreast of industry trends, to interact with like-minded professionals and to identify opportunities for business relationships.
- **Friendship:** To make professional acquaintances and to solidify old relationships; taking the SCPD meeting as a professionally rewarding yet enjoyable "time out" from the pace of daily work.

## SCPD Objectives

- Disseminate knowledge to promote understanding of Concurrent Engineering (CE) and Integrated Product Development (IPD) concepts and processes.
- Provide a continuous forum for networking and sharing of ideas among professionals in all disciplines involved in product development.
- Improve enterprise effectiveness by expanding the CE/IPD Body of Knowledge by emphasizing the implementation of practical approaches in industry.
- Participate in the origination and/or refinement of the Concurrent Engineering body of knowledge using both internal capabilities and collaborative relationships.
- Foster a continuous learning organization by maintaining an SCPD Body of Knowledge that remains comprehensive while focusing resources and activities on emerging and leading edge techniques.
- Operate to achieve multi-national and multi-lingual communications and text capabilities.

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