

Los Angeles Chapter of INCOSE
www.incose-la.org

COMING EVENTS

**Saturday, June 8
 Mini-Conference**

Theme

Systems Engineering a Global Discipline

Keynote Speaker

Dr. Paul MacCready

Location

Boeing Facility
 Long Beach

**July 28 - August 1
 INCOSE International Conference
 Riveira Hotel, Las Vegas NV**

Theme

Engineering 21st Century Systems:
 Problem Solving
 Through Structured Thinking

**Tuesday, September 10
 Dinner Meeting**

Theme

Panel Discussion
 University programs on Systems Engineering

**Location
 Aerospace**

**Saturday, October 12
 Tutorial**

Tutorial Leader

John Velman

**Location
 Los Angeles Airport Radisson Hotel**

**Tuesday, November 12
 Dinner Meeting**

Guest Speaker

To be announced

**Location
 van Karman Auditorium
 JPL**

Issue No. 4

May, 2002



**From the President
 Hearing from our members
 Michael E. Krueger**

The LA Chapter is publishing featured articles on appropriate Systems Engineering topics in our newsletter, written by our members. If you would like to provide a brief article on a systems engineering topic areas please send it to me and we try to get it published into one of the upcoming newsletters.

Also, our one day Mini-Conference is just next month June 8, 2002 and registration closes at the end of this month. If you have not registered please do so as early as possible.

Scott Jackson has provided this month system engineering article.

Michael E. Krueger

HOW BIG IS SYSTEMS ENGINEERING?

One frequently heard debate is over the question: How big is systems engineering? What is "inside" SE? What is "outside" SE? If systems engineering is the collection of processes to realize a system, then it can be very big indeed. My personal view is that SE is a "global" discipline, which is the theme of the June 8 Mini-Conference.

From its inception, SE has been on an expansionist path. It was realized, from the beginning, that systems were not just products, but also included people and processes. The SE process itself could be considered a system. The pilot is an integral part of an aircraft system. INCOSE has a working group now called the Intelligent Enterprises Working Group devoted to the idea that organizations are systems.

Such recent standards as EIA 632 and the draft ISO 15288 both recognize the concepts of "enabling" systems, such as production, support and development systems. Hence, it is possible to develop the requirements for these systems just as much as operational systems, such as aircraft. The system of engineers that develops the system is a system itself. SE grows bigger and bigger.

SE is like a sponge, getting fatter as it absorbs other processes and tools, which were invented with no idea that they would eventually be part of SE. One such tool is Quality Function Deployment (QFD). QFD utilizes the "house of quality" to covert customer needs into requirements, and then into design features and then in to concepts. Invented in Japan, the inventors of QFD at Kobe shipyards may have never heard of SE. Nevertheless, systems engineers were quick to see the agreement between QFD and SE principles. QFD is now an accepted part of SE and appears in many SE textbooks.

Similarly, the DoD inventors of the Integrated Management Plan / Integrated Management Schedule (IMP/IMS) method of project planning probably never had SE in mind. Systems engineers saw in the IMP/IMS methodology the direct mapping to the layered system and phased development philosophies of SE. Thus, another tool gets absorbed into SE.

Dr. Eberhardt Rechtin, the distinguished author and lecturer, has created a discipline which he calls "Systems Architecting (SA)." SA focuses on those aspects of the creation of a system which center on the "soft" needs of a customer. Initially, Dr. Rechtin relegated SE to the "hard" requirements. Recently, Dr. Rechtin has allowed that SA can be considered either way, either inside or outside SE. With all due respect, I suggest that we invite SA to be part of SE. That will make things much simpler.

On a larger scale, the popular Integrated Product and Process Development (IPPD) process bears a remarkable resemblance to SE. That is because there is hardly any difference at all. IPPD focuses on phased development and on the integration of production and support into the development process, ideas that SE has espoused for years. The one unique idea that IPPD brings to the table is the Integrated Product Team (IPT), the idea that the program organization should map directly to the Product Breakdown Structure (PBS). Systems engineers have found that this idea is so compatible with SE principles that they are happy to welcome it into the fold and give the IPPD gurus the credit they deserve.

An older idea is Concurrent Engineering (CE). CE is concerned with developing things fast. The CE experts have concluded that it is possible to develop the operational system, the production system and the support system concurrently. Once again, SE gives CE full credit for this idea. But since it is one of many ideas that are part of the realization of a system, it is best to bring it together with the rest of these ideas and give them all a single name - SE.

More recently two more terms have entered the system development lexicon, namely, Lean Engineering and Six Sigma. As before, they bring valuable insight into the development process. Lean Engineering focuses on the use of modern tools, such as three-dimensional electronic drawings and simulations, to reduce cycle time and increase accuracy. Six Sigma is a collection of processes focused on achieving extremely high manufacturing accuracies. Can anyone argue that these are not part of SE? Is system synthesis not a basic component of SE? Does not SE address the production system just as much as the operational system? Are not system tolerances valid requirements parameters?

So, there we are friends. Let's cease these debates. There is no value in drawing lines and playing one process off against another process. Let's give credit to where credit is due for contributing great ideas to the tapestry of ideas for realizing systems. Let's agree that there is one process which includes all these ideas, namely, systems engineering, a global discipline.

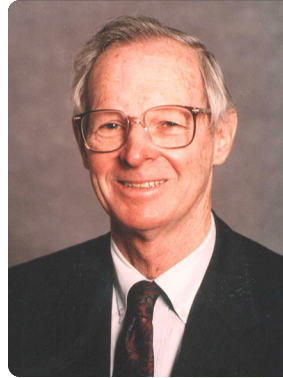
Scott Jackson:

Associate Technical Fellow in Systems Engineering at Boeing in Long Beach. He teaches in the master's program in Systems Engineering at USC. His book *Systems Engineering for Commercial Aircraft* was published by Ashgate Publishing Limited in the UK (1997).

Los Angeles Chapter Mini-conference
Saturday June 8, 2002

Theme:
Systems Engineering a Global Discipline

Key Note Speaker is
Dr. Paul B. MacCready
Chairman, AeroVironment Inc.



Dr. Paul MacCready, Chairman/Founder of AeroVironment Inc., is known as "the father of human-powered flight." He leads growing teams at AeroVironment to create products that push the frontiers of efficiency – that "do more with less." Examples of his work include the solar-powered Sunraycer and battery-powered Impact cars for General Motors; advanced power electronics systems for stationary and mobile energy, regenerative fuel cells, and fast charge; and several aircraft ranging from tiny 6-inch

span, 2 ounce surveillance fliers to the 247-foot span solar-powered Helios aimed at 6-month flights as a station keeping stratospheric telecommunications relay. Dr. MacCready is dedicated to causing rapid change in institutions, technologies, education, and public understanding that can help meld humans, technology, and nature into a desirable, sustainable world.

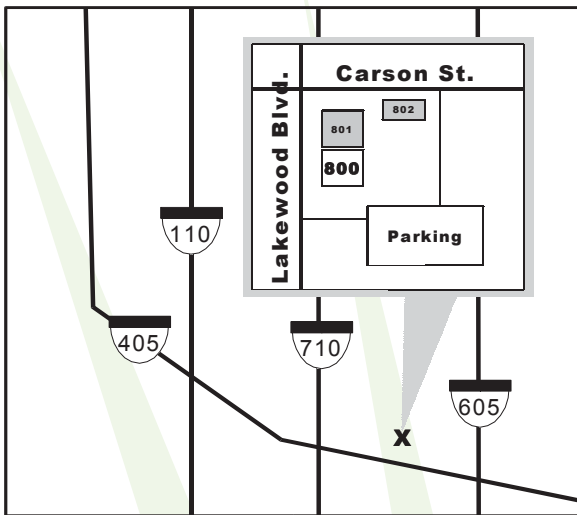
Dr. MacCready's address will focus on the achievement of quantum improvements in performance for air, land and sea devices. The huge energy savings potential that efficient mechanical and electrical systems/devices can provide will be addressed. Examples will be given for fixed and mobile devices operating on air, land and water. The presentation will take a look at system efficiency engineering for a variety of devices while paying particular attention to unmanned aeronautical devices. Education and global consequences will also be briefly addressed.

The Los Angeles Chapter of the International Council on Systems Engineering (INCOSE) is sponsoring a one-day technical mini-conference. The conference will include a keynote speaker, numerous technical presentations, and a panel discussion.

The keynote presentation, "Achieving Quantum Improvements in Performance for Air, Land and Sea Devices," will address system efficiency engineering for a variety of devices with particular emphasis on unmanned aeronautical devices. The presentation will be provided by Dr. Paul MacCready, Chairman/Founder of AeroVironment Inc., a diversified company headquartered in Monrovia, California.

Four technical tracks comprised of up to eight presentations each will be offered. Presentations will tentatively address the following areas of systems engineering: education and research, measurement, modeling and tools, processes and materials, applications, initiatives, management, and standards.

Invited panelists from industry and government will provide their views on Systems Engineering (SE) for Space Systems as it is practiced today. Remarks will focus on those aspects and implementations of SE that are unique to space systems. The panelists will also convey their thoughts on the important issues to be addressed as SE for space systems evolves. The panel discussion will be moderated by David Durham of JPL and Susan Ruth of The Aerospace Corporation.



MINI-CONFERENCE

Saturday, June 8: 8:30 am — 5:00 pm

Registration Begins at 8:00 am

LOCATION

Boeing Division Conference Center

Building 800
3855 North Lakewood Boulevard
Long Beach, California 90846
(562) 496-9633 [Boeing Security Front Desk]

REGISTRATION FEES

Early Registration (before May 24)	
INCOSE Members	\$60.00
Nonmembers	\$70.00
Nonmembers w/ 2002-2003 INCOSE Membership Fee	\$150.00
Registration (after May 24)*	
INCOSE Members	\$70.00
Nonmembers	\$80.00
Nonmembers w/ 2002-2003 INCOSE Membership Fee	\$160.00

* Due to security requirements, persons who are not US citizens must register prior to May 24 (i.e., use early registration).

Conference Registration includes attendance at the keynote address, panel discussion, and technical sessions, as well as a continental breakfast, lunch, and afternoon snack.

MINI-CONFERENCE OFFICERS

General Chair:
Secretary:
Master of Ceremony:
Technical Program
Chairs:
Venue Chair:
Food:
Registration:
Finances:
Publicity:

John Hsu
Scott Jackson
Mike Krueger
Gina Kostelecky-Shankle
Christopher Taylor
Samuel Son
Bill Barksdale
Marsha Weiskopf
Marsha Weiskopf
Saul Miller

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MINI-CONFERENCE LAST CALL FOR REGISTRATION!!!!!!!

IF YOU HAVE NOT REGISTERED PLEASE EMAIL TO MARSHA WEISKOPF - AT :

marsha.weiskopf@aero.org

LET US KNOW THAT YOU WILL BE COMMING

AND

PAY ON-SITE

IMPORTANT INFORMATION TO INCLUDE IN YOUR EMAIL:

NAME, COMPANY, INCOSE MEMBERSHIP NUMBER (IF APPLICABLE)
CITIZENSHIP, CONTACT INFORMATION - PHONE NUMBER, EMAIL ADDRESS

DON'T MISS OUT IT WILL BE A GREAT MINI-CONFERENCE

SEE YOU THERE!

INCOSE News

Return Address:
899 E. Mango St.
Brea, CA 92821

#4

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2002

May

The International Council of Systems Engineering (INCOSE) is an organization formed for the purpose of advancing the art and science of systems engineering in various areas of the public and private sectors. The Los Angeles Chapter meets several times per year for dinner meetings, and additionally sponsors tutorials and other activities of interest to those in the systems engineering field or related fields. L. A. Chapter Officers are as follows:

President:	Michael E. Krueger – michael.krueger@ase-consult.com
Vice-President:	Katy Kuey – katy.kuey@lmco.com
Past President:	Dave Beshore – David_G_Beshore@raytheon.com
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Ways and Means:	Thomas Kudlick – synchrocubed@aol.com
Tutorials/Education:	Saul D. Miller – saul.miller@aero.org
Communications:	Ronald Williamson - ronald.w.williamson@aero.org

Those interested in INCOSE membership please contact contact Susan Ruth.
Those interested in working on a committee please contact the appropriate Director.