



NEWSLETTER

Vol. 6: Issue No. 5

July 2008



Please remember to renew your 2008 INCOSE membership — time is running



UPCOMING EVENTS

Speaker Meeting The Systems Engineering Factory

Particulars

SPEAKER: Dr. Joel C. Sercel, PhD.,
 WHEN: July 22, 5:30 p.m. to 8:30 p.m.
 WHERE: Jet Propulsion Laboratory's
 von Karman Auditorium
 Remote sites will be available
 COST: Members: free, non-members: \$10.00
 RSVP by July 18 — required for JPL
 See page 4 for more information

For registration and more information go to:
registration@incose-la.org

Tutorial: Architecture Frameworks and Modeling a one-day event presented twice

Particulars

SPEAKER: Dr. James N. Martin, Ph.D.
 DATES: Friday, July 18, repeated Saturday, July 19
 TIME: 7:30 a.m. to 4:30 p.m. both days
 WHERE: July 18 at Boeing in Huntington Beach
 July 19 at National University near LAX
 COST: \$195.00 for members; \$225 for non-members
 Continental breakfast and lunch included
 RSVP by July 16 — required
 See page 3 for more information

For registration and more information go to:
registration@incose-la.org

Watch your email for messages from the INCOSE-LA Reflector and check the INCOSE-LA web site www.incose-la.org for up-to-the-minute details!

The Board of Directors wishes to welcome the following new members in the Los Angeles Chapter of INCOSE:

Note: The information listed below is from the member directory and is based upon your initial membership application. If the information is not correct or complete, then please access the member directory (at www.incose.org) to update your information.

Name	Title	Company
Andrew Whiting	Systems Test and Evaluation	The Boeing Company
Gerald Nadler	IBM Chair Emeritus in Engineering Management	University of Southern California
Wesner Louissaint	Associate	Booz Allen Hamilton
Jisha Kattakayam	Design Engineer	ITT Radar Systems
Julian Breidenthal	Program Manager	Jet Propulsion Laboratory
Wilhem Perez	Student	Naval Post Graduate School
Aalap Shah	Senior Consultant	Booz Allen Hamilton
Andrew Hall	Systems Engineer 5	The Boeing Company
Bruce Riggins	Affordability Analyst	The Boeing Company
John Brewer	Principal	JCB Consultants
Carolyn Boettcher	Sr. Principal Multi-discipline Engineer	Raytheon
Tammy Fujii	Cassini Deputy Ground System Manager	Jet Propulsion Laboratory
Thomas Connare	Systems Engineer	Northrop Grumman

A Mid-year Update from L.A. Chapter President David Boyd

July is at hand, and a mid-year update is in order – a review of where we have been and a look ahead at the chapter activities planned for next year. This year, our chapter has led or participated in the following:

- **January:** John O. Clark, of Northrop Grumman and a past president of the Hampton Roads Area chapter of INCOSE, made two presentations, “Systems of Systems Engineering and Family of Systems Engineering from a Standards Perspective,” (a speaker meeting) and “Systems Engineering Stand on Standards.” The latter presentation was a tutorial presented as a part of a joint technical symposium with SPIN, the Software Process Improvement Network.
- **February:** “Systems Engineering for Project Managers” was presented by James Manson III, a past president of our Los Angeles chapter and a Project Management Professional. This presentation was a part of a dinner meeting held jointly with the local chapter of the Project Management Institute.
- **March:** “State Analysis for Systems Engineering” was presented by Robert Rasmussen and Michel Ingham of the Jet Propulsion Laboratory. Mssrs. Rasmussen and Ingham discussed their topic as both a speaker meeting topic, with several remote sites, and as a tutorial.
- **April:** The Conference on Systems Engineering Research (CSER) 2008, a two day event, was held in Redondo Beach. A three-day course on the “Basics of Systems Engineering” was held at the Aerospace Corporation in El Segundo.
- **May:** Todd Bayer and Glenn Havens presented a discussion entitled “Systems Engineering Challenges and Results for Mars Reconnaissance Orbiter” in a joint meeting with the AIAA. INCOSE Fellow Scott Jackson conducted a tutorial, “Architecting Resilient Systems: Beyond Challenger, Katrina and Chernobyl.”

The topics addressed a wide spectrum of systems engineering topics, and the forums ranged from informal speaker meetings to formal dinners, joint meetings with other professional organizations, and structured, multi-day training.

We had no chapter activities during **June**, in deference to the International Symposium, but are resuming our activities dedicated to strengthening the fraternity and providing opportunities for professional growth. The following list reflects our current vision for the rest of the year:

- In **July** Dr. Joel Sercel is presenting a speaker meeting on “The Systems Engineering Factory,” and Dr. James Martin is presenting a tutorial on “Architecture Frameworks and Modeling.”

Activities being considered for the rest of 2008 include:

- A discussion based on technical working groups led by members of the INCOSE-LA chapter
- “Systems Engineers – the Wizards of Modern Society”
- “Requirements Dilemmas, SysML and ICM: Everything You Wanted to Know but Were Afraid to Ask”
- Model Based Systems Engineering
- Complex Systems Modeling, SysML

These activities reflect the efforts of the Board of Directors and their supporting volunteers to provide the members of the Los Angeles chapter with opportunities to network with other systems engineers, to meet professionals from other organizations and to strengthen and expand their own skills as systems engineers.

Want to help and get more involved? We are a volunteer organization and are always looking for help. Here are a few ways that you can become involved:

- Attend and participate in our speaker meetings, either at the host site or via webcast.
- Prepare a presentation for a speaker meeting.
- Participate in our tutorials and workshops.
- Volunteer to help with our speaker meeting, tutorials, workshops and mini-conference.
- Contribute articles to *INSIGHT* magazine, *Systems Engineering* magazine. or to our chapter’s newsletter.
- Present a paper at an INCOSE mini-conference, symposium, workshop or conference.
- Join an INCOSE Technical Working Group – several are chaired by members of the L.A. Chapter.
- Let your Board of Directors know! If you have feedback on an event or suggestions for future activities, please send it to me at john.boyd@incose.org.

In closing, the BoD looks forward to your continued participation, support. and membership. It is your knowledge and contributions that help keep our Chapter active and able to deliver quality material.

INCOSE-LA Collaboration with the San Fernando Engineers' Council by Stephen Guine

As the INCOSE-LA representative to the San Fernando Engineers' Council, my role is to identify opportunities for collaboration and then facilitate the communication between the appropriate members of each organization.

The San Fernando Council is the largest in the United States. Its mission is to advance the art and science of engineering, to advance the welfare of the general public through the creative resources and abilities of the engineering professions, to inform the general public of the advantages and capabilities of engineering in advancing human welfare, and to provide suitable public recognition of engineering achievement. Based on this mission, there are obvious similarities to the goals of INCOSE-LA and therefore opportunities for our organizations to work in tandem on certain events. While the Council is based in the San Fernando Valley, it represents engineers throughout the greater Los Angeles area. An overview of this organization can be found at <http://www.engineerscouncil.org/history.html>.

Having participated in Engineers' Council board and planning meetings for over six months, I see two clear avenues of opportunity: cross-industry membership expansion and academic outreach. The Engineers' Council is looking to encompass engineers working in the bio-med and nanotech industries located in the greater Los Angeles area. Correspondingly, there may be an opportunity for INCOSE-LA to partner on potential activities to expand our membership in those industries as well.

In terms of academic outreach, the Council provides annual support (monetary as well as membership participation) in several local science and math competitions. Again, there may be opportunities for INCOSE-LA to also participate in these activities as well as glean some lessons learned that can be applied to developing our own similarly constructed activities.

I will continue to present these opportunities and findings to our INCOSE-LA BoD for their consideration and planning while also conveying their thoughts and ideas to the Council.

Architecture Frameworks and Modeling
A one-day tutorial presented twice,
July 18 and again on July 19
Presented by
James Martin, Ph.D. INCOSE Fellow

Abstract: Architecture frameworks and modeling are tools developed to meet the challenges of architecting modern systems.

DoDAF is a methodology which facilitates distillation of complex systems into a model with one independent variable, the OV-1 framework product, and 25 dependent variables

In particular, DoDAF, the "Department of Defense Architecture Framework," is an architecting tool that has been mandated by the DoD for large-scale systems. "Mandated" is easily understood, but some of

the affectations of DoDAF are not so easily understood. The framework "...describes how the architecture for a system... should be documented. The framework breaks that documentation into three major views: operational, system, and technical, and one associated view, the all view. Each view contains one or more graphic, tabular, and descriptive representations of the system. Because using any framework for the first time can be difficult..." (news@sei website). According to the *DoD Architecture Framework Version 1.5* (DoD document at defenselink.mil website), "Architectures within the Department of Defense are created for a number of reasons. From a compliance perspective, the DoD is compelled... to develop architectures. From a practical perspective, experience has demonstrated that management of organizations employing sophisticated systems and technologies in pursuit of joint missions demands a structured, repeatable method for evaluating investments and alternatives, implementing organizational change, creating new systems, and deploying new technologies."

"Because using any framework for the first time can be difficult..."

The tutorial is of interest to systems engineers, system architects, program managers and project engineers who need to develop DoDAF or other architecture framework products or who need a refresher on the fundamentals behind DoDAF

This tutorial provides an overview of the architecture frameworks and models with an emphasis on DoDAF. The tutorial will show how a system's architecture serves as the basis for development of the system. This approach leads to a more model-driven systems approach and allows the systems engineers to "discover" the essential attributes of the problem space that must be addressed by the system solution. Architecture models define these essential attributes and facilitate their evaluation. The architecture provides the unifying structure (or roadmap) for exploration of the problem space and for characterization of the solution space such that better decisions can be made. This tutorial will describe an approach for the flow down from the system purpose or mission need, down through operational requirements and concept of operations, and finally into

the operational, system, and technical views of the architecture. The 26 products in the DOD Architecture Framework will also be described while highlighting the essential features of each.

The biggest mistake is to skip to step 5 and to think that the DoDAF products have been properly developed.... (April 2006 tutorial)



Biography: Dr. James Martin is an internationally renowned writer and lecturer on systems engineering. He wrote one of the most widely read books on systems engineering, *Systems Engineering Guidebook*. His experience includes twenty years in systems development of telecommunications products (most with Bell Labs) as program manager, systems engineering manager, system architect, requirements manager, and lead systems engineer. His experience with technology includes mobile wireless, fiber optics, satellite broadband wireless, reconnaissance sensors and distribution networks, and airborne hubs. He led the development of ANSI/EIA 632, the national standard defining the processes for engineering a system.

He teaches at The Aerospace Institute and at seminars around the world. Dr. Martin graduated with an M.S. from Stanford and a B.S. from Texas A&M. His Ph.D. research at George Mason University was on "Enterprise Architecture Modeling Using Knowledge Modeling." He is an INCOSE Fellow.

WHEN: Friday, July 18 and Saturday, July 19, 7:30 a.m. to 4:30 p.m. both days.

RSVP by July 14: online at www.incose-la.org or by email to registration@incose-la.org.

COST: \$195.00 for members or \$225.00 for non-members; pay by Paypal where registering on line or by check made out to INCOSE-LA.

WHERE: The Friday tutorial will be held in the Boeing facility on Bolsa Avenue in Huntington Beach. The facility is in the Westminster-Huntington Beach area. Exit the 405 at the Goldenwest Street/Bolsa Avenue exit and go west about 1.5 miles on Bolsa. Check www.incose-la.org for the exact location.

The Saturday tutorial will be held at National University, 5245 Pacific Concourse Drive. That is near LAX and just southwest of the 405/105 interchange. Coming from the south on the 405, exit at El Segundo, turn left, go under the freeway and then take an immediate right on to La Cienega. Go north about three quarters of a mile and turn left on to Pacific Concourse. Coming from the north on the 405 follow the signs for the exit to Imperial Highway, staying on the off ramp underneath the 105. The off ramp dumps on to La Cienega. Turn left on to La Cienega, go south about 100 yards and turn right on to Pacific Concourse. Coming from the east on the 105 exit on to Hawthorne, turn left and go south over the freeway to Imperial Highway. Turn right on to Imperial and go west a little over a mile, passing under the 405/105 interchange, and turn left on to La Cienega. Go south on La Cienega about a third of a mile, again passing underneath the 105, and turn right on to Pacific Concourse.

Once on Pacific Concourse Drive go past the construction and the Court House. Turn right in to parking area. Enter through back entrance. Take elevators to third floor.

July Speaker Meeting
The Systems Engineering Factory
Presented by:
Dr. Joel C. Sercel, Ph.D.

"...each generation of programs implements more systems engineering and we still see more issues." [An elephant in the living room of comfortable systems engineering?]



Abstract: Issues: unplanned cost and schedule growth, overruns, and technical failures are more common than not in today's large acquisition programs. Failure boards, program review panels, and Nunn-McCurdy boards claim again and again that many of these problems are due to inadequate systems engineering. The response? Implement more systems engineering! And so, each generation of programs imple-

ments more systems engineering and we still see more issues. Yet a review of the great defense and aerospace programs of the late 20th century (the SR-71, the U-2, Apollo, et al) shows success with virtually no systems engineering, if systems engineering is defined by today's processes such as those described in the SMC Systems Engineering Handbook, INCOSE, or Mil Standard 499. How can we explain this paradox and what are we to do about it in implementing today's programs?

In this presentation Dr. Joel Sercel will offer a simple and plausible explanation of this paradox of modern acquisition based on a simple program assessment model he calls D2S (for *depth, disruption, and scope*). In the context of this model it becomes very clear that certain cultural changes have taken place that mandate a change in our acquisition philosophy from a one-size-fits-all systems engineering process, to a tailored approach that adapts to the needs of individual programs. For large, operationally-driven programs, Dr. Sercel advocates an efficient yet disciplined system he calls the Systems Engineering Factory.

Come to this meeting for an overview of the D2S model, an assessment of the new cultural norm of large acquisition programs, and a brief outline of Systems Engineering Factory and how the concept is based on lessons learned in the NASA Con-

This presentation will be of particular interest to systems engineers, system architects, program managers and members of the acquisition community.

stellation Program, and on-going programs of record.

Biography: Joel C. Sercel is a member of the research staff in Controls and Dynamical Systems at the California Institute of Technology and is the founder and principal engineer of ICS Associates Inc., a small business specializing in systems engineering, consulting, and training. Previously Dr. Sercel held a senior position at the Air Force Research Laboratory (AFRL)

assisting in the establishment of a network of innovation centers, and prior to that he was the Chief Systems Engineer of the Air Force's TSAT Program. Dr. Sercel taught at the graduate level at the Caltech campus for 12 years and was the Director of Caltech's Laboratory for Spacecraft and Mission Design for four years. Dr. Sercel has over 20 years of experience developing and utilizing advanced technology to increase cost effectiveness of aerospace and advanced technology ventures. He has been an analyst, a technologist, a program manager, a project manager, technological innovator, software developer, and successful entrepreneur.

During a 17-year career at NASA's Jet Propulsion Laboratory (JPL), he worked in diverse areas including space technology development, systems engineering, software development, and management. He led the conception, proposal, and definition of the NSTAR ion propulsion system, the first deep space application of ion propulsion technology.

Among the companies that have developed and utilized software and processes designed by Dr. Sercel are JPL, Boeing, Raytheon, and United Technologies. Dr. Sercel has consulted for or provided training or engineering services for more than 20 companies and government organizations, including the Advanced Technology Institute, Alliance Space Systems, Boeing, DARPA, ITT Gilfillan, the Office of the Secretary of Defense, NASA, Northrop Grumman, Raytheon Systems, Space Systems Loral, the United States Air Force, and United Technologies. He routinely serves on technical and managerial review boards for space mission projects and advanced technology programs. Sercel received his Ph.D. and Master's degree in Mechanical Engineering from the California Institute of Technology.

WHEN: This speaker meeting will be held on Tuesday, July 22, 2008, beginning with networking at 5:30 p.m. The speaker will be introduced at 6:20 p.m., and the presentation will begin at 6:30 p.m. The presentations generally run about an hour, and the discussion afterwards is open-ended, but generally the meeting is over by 8:30 p.m.

RSVP by July 18: For those attending at the host site, JPL in Pasadena, it is imperative that you RSVP so that your name will be on the list of people to be admitted.

RSVP online at www.incose-la.org

RSVP by email to registration@incose-la.org (please include "INCOSE-LA July 22 Mtg" in subject line)

COST: Free for members; suggested donation of \$10.00 for non-members. Light refreshments will be provided.

WHERE: The host site for this speaker meeting is the von Karman Auditorium at the Jet Propulsion Laboratories in Pasadena. Remote sites will be available.

HOW to get to JPL: From the 210 FWY toward La Canada, take the Berkshire/Oak Grove exit (there are signs for JPL), go east, turn left on Oak Grove and follow Oak Grove until you enter the JPL complex. Park in visitor parking on your left, just before the guard gate. Cross the street and go back down the sidewalk to the von Karman auditorium. Bring a government-issued photo identification. The JPL guards will need to see proper identification before they can admit you to the facility.

Learn about the Systems Engineering Factory D2S (depth, disruption, and scope) program assessment model

A FREE introductory two-day course in Fundamentals of System Engineering will be offered under the Department of Labor/WIRED Initiative

The course has been developed jointly by The Aerospace Corporation and California Polytechnic University San Luis Obispo and will be given on the beautiful CalPoly SLO campus on September 9 and 10, 2008.

The course objectives are to:

- ***Improve awareness of SE relevancy to business goals and industry norms***
- ***Improve understanding of SE practice, processes, and objectives***
- ***Increase awareness of SE roles and responsibilities***
- ***Identify targets for more in-depth learning opportunities***

You will hear from educators and practitioners as they address a wide spectrum of system engineering topics at various levels of breadth and depth, including:

- ***Introduction to Systems Engineering***
- ***Project Management***
- ***Risk Management***
- ***Mission & Requirements Development***
- ***Synthesis, Verification, and Testing***
- ***Manufacturability, Reliability, Availability, Maintainability***
- ***Human Factors***
- ***Decision Making / Trade Studies***
- ***Interface Management / Configuration Management***
- ***Design of Experiments***
- ***Simulation and Optimization***

There will also be panel discussions and a reception to meet providers of follow-on educational opportunities. The course is open to degreed engineers who:

- ***Are currently employed***
- ***Have a need to know more about systems engineering***
- ***Have intentions of pursuing systems engineering training or education***

Pre-registration is required. For more information and registration contact:

Joel Shrater at 310.336.7755 or
Michelle Bell at 310.336.2832

Funding provided by Department of Labor, Employment & Training Administration: WIRED Initiative

INCOSE LA Chapter

Vol. 6: Issue No. 5

NEWSLETTER

July 2008

Return Address:

**PO Box 490341
Los Angeles, CA 90049**

Forwarding Address Requested

The International Council on 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:

2008 Board of Directors and Appointed Positions

Elected Officers

President:	John David Boyd	john.boyd@incose.org	or	president@incose-la.org
Vice-President:	Eric Belle	eric_c_belle@raytheon.com	or	vicepresident@incose-la.org
Past President:	James Manson III	james.manson@incose.org	or	pastpresident@incose-la.org
Secretary:	Beth O'Donnell	elizabeth.l.o'donnell@boeing.com	or	secretary@incose-la.org
Treasurer:	Marsha Weiskopf	marsha.weiskopf@aero.org	or	treasurer@incose-la.org

Elected At-Large Directors

Membership:	Paul Cudney	paul.cudney@incose.org	or	membership@incose-la.org
Programs/Speakers:	Jack Elson	jelson@nu.edu	or	programs@incose-la.org
Tutorials/Education:	Shirley Tseng	shirleytseng@earthlink.net	or	setraining@incose-la.org
Ways and Means:	Dana Pugh	dana.pugh@incose.org	or	waysandmeans@incose-la.org
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Appointed Positions

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Website Content Manager:	Communications Director			
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CSER 2008 Management Chair:	Malina Hills	malina.m.hills@aero.org		
CSER 2008 Continuity Chair:	Scott Jackson	jackessone@cox.net		
Venue Chair:	Denise Nelson	Denise.J.Nelson@boeing.com		
Representative to San Fernando Engineers' Council:	Stephen Guine	Stephen.Guine@ngc.com		

Those interested in INCOSE membership please contact Paul Cudney - paul.cudney@incose.org. If you wish to be placed on our E-mail distribution, please contact Susan Ruth - susan.c.ruth@aero.org.