NEWSLETTER

Vol. 6: Issue No. 3 **April 2008**

UPCOMING EVENTS

CSER 2008

CONFERENCE ON SYSTEMS ENGINEERING RESEARCH

Location and Date

Crowne Plaza Hotel, 300 N. Harbor Dr.
Redondo Beach, California
April 4-5, 2008
See page 5 for more information

RELATED SYSTEMS ENGINEERING EVENTS

Basics of Systems Engineering (BASE)

Location, Time and Date

The Aerospace Corporation
2401 E. El Segundo Blvd.
El Segundo, CA 90245
Bldg. 9, Room 522
8:00 a.m. to 4:30 p.m.
April 1-3, 2008
Eligibility and registration requirements — page 3

Next-Generation Synthesis of the Spiral Model and Other Leading Process Models into the Incremental Commitment Model (ICM)

Location & Date

SPEAKER: Dr. Barry Boehm, USC
WHEN: Wednesday, April 2, 2008 at 5:30 p.m.
WHERE: Redondo Beach Crowne Plaza Hotel, 300 N. Harbor Dr. near Beryl / Portofino and Catalina
COST: Free, but there is a charge for parking
For more information see page 3 and contact the GSAW website at: http://csse.usc.edu/gsaw/

A Tutorial
System Resilience: Accident Avoidance and Survival and Recovery from Disruptions

Location & Date

SPEAKER: Scott Jackson, INCOSE Fellow
WHEN: Friday, April 18, 8:00 a.m. to 5:00 p.m.
WHERE: National University (near LAX)
COST: $50.00
See page 2 for more information
For registration and more information go to:
www.incose-la.org

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
Steven Paulsen	Principal Electrical Engineer	Raytheon SAS
Benjamin Haas	Senior Consultant	Booz Allen Hamilton
David Pierre	Systems Engineer	Northrop Grumman
Scott Selberg	Manufacturing Engineering	Agilent Technologies
Howard Neely	Research Project Manager	HRL Laboratories, LLC
Tony Thompson	Architect, Technical	WMG
Joseph Bidwell	Sr. Systems Engineer/Architect	Northrop Grumman

System Resilience: Accident Avoidance and Survival and Recovery from Disruptions A Tutorial Presented by Scott Jackson

Scott Jackson, INCOSE Fellow, will be presenting a tutorial on Friday, April 18 at National University.

Particulars:
WHEN: Friday, April 18, 8:00 a.m. to 5:00 p.m.
WHERE: National University (near LAX)
COST: $50.00
For registration and more information go to:
www.incose-la.org.

Abstract: This tutorial provides a framework for the creation of systems, both human and product systems, that avoid major accidents and survive and recover from disruptions. This tutorial will explain the process for creating a system that will avoid accidents and will be most likely to survive and recover from a disruption. In resilience the emphasis is on anticipation of the accident and taking steps to prevent it.

This tutorial is also comprehensive with respect to the kinds of systems of interest. It discusses, for example, human systems such as hospitals and emergency infrastructures. It also discusses large and complex hardware and software systems, such as space systems and commercial aircraft.

Survival and recovery from disruptions are central to the study of system resilience. In order to define a system capable of avoiding an accident or surviving and recovering from a disruption, it is necessary to define the disruptions that may occur. These disruptions fall into three major categories: degradation of input; degradation of function, capability, or capacity; and unexpected changes in environment load. The most robust systems will be resilient to all three types of disruption.

The creation of resilient systems is dependent on creating resilient attributes of the system, of which adaptability is one of the most important. The creation of adaptability relies on advanced systems approaches utilizing the principles and heuristics of adaptability.

This tutorial also discusses many of the cultural barriers to avoiding accidents and recovering from them. It presents a survey of promising methods to deal with these barriers.

Another subject of interest is whether the propensity to accidents can be inferred from statistical analysis of defects and near misses. This tutorial summarizes some promising research on the subject that suggests that it is possible to do this.

Biography: Scott Jackson, M.A., M.S., is an Adjunct Associate Professor in Systems Engineering Theory and Practice in the University of Southern California (USC) graduate program in Systems Architecture and Engineering. He is the author of *Systems Engineering for Commercial Aircraft*, Ashgate Publishing Limited, 1997. He is an INCOSE Fellow.

At USC he is the principal investigator in system resilience, for which he represented the University at the Resilience Engineering Symposium in 2006. Through Scott, the University is a node of the Resilience Engineering Network.

Mr. Jackson will also be presenting this same tutorial at the INCOSE International Symposium on Monday, June 16. The International Symposium will be held in Utrecht, the Netherlands. For information on this presentation, go to **http://www.incose.org/symp2008/.**

The Board of Directors Working for You

Your Board of Directors meets weekly to discuss issues and to plan activities for the chapter. Their goal: to meet the needs and professional interests of a large number of systems engineers spread over a large area. We are the fifth largest INCOSE chapter with a little over 5% of the membership (the largest, Washington Metro, has over 10%). The chapter supports members throughout the Los Angeles metropolitan area and the Antelope Valley with interest having been expressed as far north as China Lake.

The Board of Directors plans professional activities such as our speaker meetings, tutorials, and other chapter activities. Working in the background, Board members work to set up venues, logistics, handouts, and refreshments as appropriate. This month's speaker meeting and tutorial on "State Analysis for Systems Engineers" is a recent example. Planning for future activities of interest to the membership covers a broad spectrum. A joint meeting with the AIAA is one possible activity being considered for May. The Board of Directors oversees the chapter's website, keeping it up to date and loaded with technical information. In addition, when permissible, the presentations used in our speaker meetings are loaded onto the chapter's website. Board members have attended INCOSE meetings such as the International Workshop and have shared information from those meetings to the benefit of those of us who could not attend. The Board of Directors coordinates the remote sites for the speaker meetings, thereby enabling greater participation on the part of those who cannot attend at the primary site. One of our Board members supported an INCOSE display at an Engineering Week event at Boeing.

If you have any suggestions for future chapter activities or on how the chapter might better meet the needs of the professional systems engineering community, please contact one of the Board members listed on the last page.

A prescriptive heuristic:
avoid hidden interactions

Next-generation Synthesis of the Spiral Model and Other Leading Process Models into the Incremental Commitment Model (ICM)

Dr. Barry Boehm of USC will be speaking to a joint meeting of the Ground System Architectures Workshop (GSAW2008) and the Southern California Software Process Improvement Network (SPIN). This special event is being held in the evening to allow those who cannot usually come to the usual day-time meetings to attend. The meeting is being held Wednesday, April 2, 2008 at 5:30 p.m. at the Redondo Beach Crowne Plaza Hotel. Directions to the hotel are available at: **http://www.ichotelsgroup.com/h/d/cp/1/en/hotel/redcp?&cm_mmc=mdpr-_-GoogleMaps-_-cp-_-redcp.**

Attending the meeting is free, but there is a $16.00 charge for parking. Please note that Dr. Boehm's presentation is a part of a larger, three-day event, which is not free (up to $500.00 for the entire event).

This talk will present a next-generation synthesis of the spiral model and other leading process models into the Incremental Commitment Model (ICM) being piloted or considered for adoption in some parts of DoD. The ICM emphasizes architecting systems to encapsulate subsystems undergoing the most rapid change and having them implemented by agile developers; and architecting the incremental development process by having agile systems engineers handling longer-range change traffic to rebaseline the plans for future increments while largely plan-driven teams develop and continuously verify and validate the current increment. Further information on the ICM in the context of integrating systems and software engineering can be found at **http://csse.usc.edu/events/2008/ARR/pages/material.html.**

Dr. Boehm is the USC TRW Professor of Software Engineering and Director, Center for Software Engineering, University of Southern California. He has served within the U.S. Department of Defense (DoD) as Director of the DARPA Information Science and Technology Office, and as Director of the DDR&E Software and Computer Technology Office. His current research interests focus on value-based software engineering, including a method for integrating a software system's process models, product models, property models, and success models called Model-Based (System) Architecting and Software Engineering (MBASE). His contributions to the field include the Constructive Cost Model (COCOMO), the Spiral Model of the software process, the Theory W (win-win) approach to software management and requirements determination, the foundations for the areas of software risk management and software quality factor analysis, and two advanced software engineering environments: the TRW Software Productivity System and Quantum Leap Environment. He has also served as Chair of the Air Force Scientific Advisory Board's Information Technology Panel; Chair of the NASA Research and Technology Advisory Committee for Guidance, Control, and Information Processing; and Chair of the Board of Visitors for the CMU Software Engineering Institute. For more information about GSAW, please see the GSAW website at: **http://csse.usc.edu/gsaw/**. For more information on SPIN, see their website at **http://www.uces.csulb.edu/spin/flyer040208.htm.**

Basics of Systems Engineering (BASE) Free Course Offering

Sponsored by the California Innovation Corridor (CIC).

From April 1-3, the Aerospace Corporation will be hosting a free introductory course in Basics of Systems Engineering. This program has particular requirements regarding eligibility and registration. The program is set up for degreed, working engineers only. Full-time students are not eligible for the program.

Registration is a must and can be accomplished by contacting:

Joel Shrater, 310.336.7755, or
Michelle Bell, 310.336.2832

This systems engineering introductory class is sponsored by and financed by state and Federal grants. The class is intended to design and execute an outreach program that will be attractive to degreed engineers in California who are currently employed, who have serious intentions of pursuing the program, and who have a need or desire to know systems engineering.

The program starts the students by providing them a free, three-day introductory course of our own design. The first two days are a technical course covering short lessons in the various disciplines of systems engineering. The third day is an orientation to the rest of the program, explaining how to use the catalog of systems engineering resources and how to determine areas of concentration for the participant's systems engineering interest and needs. The third day also includes presentations (and breakout time for one-on-ones) by the various resource providers included in the catalog. More information is available at: **http://www.csewi.org/programs.html#CIC.**

March 25 Speaker Meeting Goes Thousands of Miles

The March 25 speaker meeting was another excellent presentation in a continuing series of discussions on topics, and this one, credit Chris Delp and David Boyd, took our outreach to a new level. Our remote sites have grown in popularity, first in the Los Angeles basin and then Palmdale. This meeting included a remote site at the Naval Air Weapons Station, China Lake plus Ball Aerospace in Boulder, Colorado and NASA Goddard Space Flight Center in Greenbelt, Maryland.

A descriptive heuristic:
Tools should be driven by the tasks to be accomplished, not the other way 'round

A descriptive heuristic:
state analysis and functional analysis are complementary techniques

Systems Engineering It is More than Aerospace

The tremendous technological advances in the aerospace industry necessitated the recognition of systems engineering as a process — a process needing definition and the rigors of academia. Regardless, systems engineering, as a discipline, is a process that can be and has been applied to successful projects throughout the ages. Consider three examples from outside the world of aerospace engineering:

A popular example is the pyramids. Requirements development was simpler, "Pharaoh said…" being the top-level requirement. The producibility aspect of building was a massive undertaking involving logistics and the development of systems to quarry the building material, move it to the site, and then to assemble the pyramids themselves. A subset of the processes was a challenge dealing with the properties of materials and, according to some analyses, figuring out how to finish the blocks so that they would not fail under load.

In another example of "beyond-aerospace" systems engineering, representatives from Southern California Edison spoke to our October 2007 speaker meeting and described their application of the systems engineering process to proposed improvements.

A third example is the Burlington Northern Santa Fe Railroad $90M project to increase capacity in the San Bernardino Mountains. The BNSF route through Cajon Pass is one of the busiest rail routes in the United States, connecting southern California with two major arteries: one to Utah and then to the northern Midwest and the east, and the other to New Mexico and thence to the central Midwest and the east. This work was accomplished with minimal impact to the ongoing traffic.

Railroads have a history of de facto systems engineering and being one of the first "systems of systems." An article in *Trains* magazine (Kalmbach Publishing, April 2008, written by David Lustig) described the project in concepts that reflect the systems engineering process.

The project in the San Bernardino Mountains was done in three segments — an incremental life cycle.

The most visible aspects of the project were civil engineering — earth moving and grading, tunnel removal, etc. However, other disciplines were involved in designing the track work, the signaling, and the control and communications network; diverse disciplines and their respective subsystems functioning together. According to the article, a key element to success was the planning and coordination: "One of the reasons… the project has gone so smoothly is the tremendous amount of planning before physical construction began." Civil engineers and environmental consultants were among the many disciplines consulted. A major consideration was traffic flow, the analysis of which resulted in identifying the need for crossovers, their number and location. Rephrased: up-front requirements development and management and team building.

Railroads are concerned about environmental impact, and the from-the-beginning involvement of environmental experts was risk management. One member of the leadership team was quoted as saying, "If we can avoid potential environmental impacts…." He then described a series of "if-then" scenarios with the final alternative being "looking at how the impacts can be mitigated: risk analysis and mitigation. According to the article, "...the U.S. Army Corps of Engineers indicated that the typical timeframe for a linear transportation project of this sort was 6.4 years. BNSF obtained its permit from the Corps in 14 months." In systems engineering words: managing cost and schedule.

The term "systems engineering" per se may not have been used by either the pharaohs or the railroad, but the success of their respective projects reflects the process and its benefits.

Jorg Largent

A descriptive heuristic:
No problem can be solved from the same level of consciousness that created it

A descriptive heuristic:
A diagram is no substitute for the real model

CSER08 Announcement

Conference on Systems Engineering Research 2008 (CSER08)

Submitted by Scott Jackson, CSER 2008 Conf. Cont. Chair

Everyone interested in the more advanced aspects of systems engineering will want to attend this conference in the L.A. area on Friday and Saturday, April 4 and 5. CSER08 is hosted by USC in collaboration with Stevens Institute, with Dr. George Friedman, an INCOSE Founder and Fellow and INCOSE-LA member, as General Chair. INCOSE-LA is managing the conference with Dr. Malina Hills of the Aerospace Corporation as Conference Management Chair. Dr. Azad Madni, INCOSE Fellow, Intelligent Systems Technology, and INCOSE-LA is Technical Chair. There will be approximately 100 presented papers plus panels and plenary speakers and a banquet on Friday night.

You can find out more about registration and the technical program by going to **www.incose-la.org/events/conferences/cser-2008.html**.

The registration deadline is March 27.

Banquet speakers will include William F. Ballhaus, Sr., President Beckman Instruments (ret); William F. Ballhaus, Jr.; and William L. Ballhaus, President, BAE Network Systems. For more information contact Scott at **jackessone@cox.net**.

A descriptive heuristic:
What systems engineers want can be hard to express what software engineers build can be hard to understand

Conference Announcement

Sixth Annual Conference on Systems Engineering Research

April 4-5, 2008 Los Angeles, California
Crowne Plaza Hotel, Redondo Beach
http://www.incose-la.org/cser2008/

CSER 2008

CONFERENCE ON SYSTEMS ENGINEERING RESEARCH

An International Conference

CSER Collaboration

Professor Stan Settles; Director of Systems Architecting and Engineering Program, USC
Professor Dinesh Verma; Dean of Systems Enterprise School, Stevens Institute of Technology

CSER 08 Management Team

Dr. George Friedman, USC, General Chair
Dr. Malina Hills, Aerospace Corporation, Conference Management Chair
Dr. Azad Madni; Intelligent Systems Technology, Technical Chair
Scott Jackson, USC, Program Liaison

Plenary Speakers

Dr. Pat Hale; MIT, INCOSE President
Paul Gartz, Boeing, IEEE Systems Council president
Prof. Barry Boehm, Director of Center for Systems and Software Engineering, USC
Prof. Andy Sage, Editor in Chief, *Systems Engineering*, George Mason University
Dr. Azad Madni, CEO Intelligent Systems Technology, Inc
Dr. Donna Rhodes, MIT, Director SEANET and SEARi
Samantha Brown, BAE, INCOSE director: Technical Leadership Team
Dr. Elliot Axelband, Rand Corporation, Chair, Executive Round Table.

Banquet Speakers

William F. Ballhaus, Sr., President Beckman Instruments (ret)
William F. Ballhaus, Jr., CEO Aerospace Corporation (ret)
William L. Ballhaus, President, BAE Network Systems

Breakout Speakers

Over 70 presented papers plus poster sessions from abstract reviews and PhD candidates from the April 3 SEANET meetings.

Technical Program

Dr. Azad Madni, Chair, Conference Technical Program
Chief Executive Officer
Intelligent Systems Technology, Inc.
12122 Victoria Ave.
Los Angeles, California 90066

Tel: 310-581-5440, ext. 101 **cser08@IntelSysTech.com**

SEANET

SEANET is an INCOSE sponsored network of doctoral student researchers working in the field of systems engineering and architecting. A SEANET workshop will be conducted on Thursday April 3. More information is available at http://www.incose.org/practice/research/seanet.aspx .

The University of Southern California in collaboration with Stevens Institute of Technology presents the 6th annual Conference on Systems Engineering Research.

The primary conference objective is to provide practitioners and researchers in academia, industry, and government a common platform to present, discuss and influence Systems Engineering research with the intent to enhance Systems Engineering practice and education.

Organized by the University of Southern California (USC) *in collaboration with* Stevens Institute of Technology, *managed* by the Los Angeles Chapter of the International Council on Systems Engineering (INCOSE).

CSER 2008 also welcomes the INCOSE Board of Directors on Tuesday and Wednesday, April 1 and 2.

General Information

For information about registration, hotel, location, financial support and other subjects, see the web site above or contact cser08registrations@incose-la.org.

Registration fees (after February 29) are as follows:

- INCOSE Members - $400
- Non-INCOSE members - $450
- Students (full time) - $300

INCOSE LA Chapter NEWSLETTER

Vol. 6: Issue No. 3 April 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
Communications:	Lee-Ann Seeling	lsseeling@aol.com	or	communications@incose-la.org

Appointed Positions

Newsletter Editor:		
Newsletter Production Manager:	Communications Director	
Reflector Manager:	Susan Ruth	susan.c.ruth@aero.org
Industrial Relations Manager:	Jose Garcia, Jr.	jose.s.garcia-jr@boeing.com
Technical Society Liaison:	Edmund Conrow	info@risk-services.com
Chapter Recognition Manager:	Michael Maar	michael.c.maar@boeing.com
Lead Site Coordinator:	Anna Warner	anna.warner@boeing.com
Webcast Event Manager:	Chris Delp	cldelp@jpl.nasa.gov
Website Content Manager:	Communications Director	
Website Technical Manager:	Benjamin Luong	Benjamin.Q.Luong@boeing.com
CSER 2008 Management Chair:	Malina Hills	malina.m.hills@aero.org
CSER 2008 Continuity Chair:	Scott Jackson	jackessone@cox.net
Venue Chair:	TBD-Vacant	TBD-Vacant

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.