NEWSLETTER

Vol. 6: Issue No. 4 May 2008

2002, 2004-06

Please remember to re-new your 2008 INCOSE membership this month.

UPCOMING EVENTS

INCOSE-LA/AIAA-LA Joint Speaker Meeting
System Engineering Challenges and Results for Mars Reconnaissance Orbiter

Particulars

SPEAKERS: Todd J Bayer, Chief Engineer, and Glen G. Havens, Mission Operations System Engineer
WHEN: May 22, 5:30 p.m. to 9:00 p.m.
WHERE: Crowne Plaza Hotel (LAX)
COST: Members: $28.00 including dinner
(non-members: $33.00)
Presentation only: $5.00
See page 2 for more information

For registration and more information go to:
http://www.aiaa-la.org/dinnermtgs.html

A Tutorial
System Resilience: Beyond Challenger, Katrina and Chernobyl

Particulars

SPEAKER: Scott Jackson, INCOSE Fellow
WHEN: Saturday, May, 17, 8:00 a.m. to 5:00 p.m.
REGISTRATION DEADLINE: May 14, 2008
WHERE: National University (near LAX)
5245 Pacific Concourse Drive, Suite 100
COST: $50.00: INCOSE members
$60.00: guests
See page 3 for more information

For registration go to:
www.incose-la.org

SPECIAL EVENTS:

Monday, June 16
Opening Ice-Breaker Reception
Tuesday, June 17
Exhibit Hall Social Hour
Wednesday, June 18
Reception & Banquet

18th Annual International Symposium, *6th European Systems Engineering Conference*

INCOSE 2008
Systems Engineering for the Planet
The Netherlands
15-19 June

Keynote Speakers

"Crossing borders by applying Systems Engineering"
Bert Klerk

"Using Life Cycle thinking to disseminate LCM"
Ana Quiros

"The Future of Technology and Humanity: Exploring Vision and Action"
Dr. Shun-Jie Ji

"Aerospace and the Environment – a Global Systems Innovation Challenge"
Dr. Jean J. Botti

For more information go to: http://www.incose.org/symp2008/

System Engineering Challenges and Results for Mars Reconnaissance Orbiter
A joint meeting with the AIAA

May 22 INCOSE-LA/AIAA-LA Joint Speaker Meeting
Todd J. Bayer, Chief Engineer, and
Glen G. Havens, Mission Operations System Engineer
The Crowne Plaza Hotel (LAX)
5985 Century Boulevard,
less than one mile east of the LAX terminals

Reception: 5:30 p.m.
Dinner: 6:30 p.m.

Presentation: Following the dinner ~ 7:15 p.m.
Cost: AIAA and INCOSE Members + Dinner: $28
Non-members + Dinner: $33
Presentation only: $5

Abstract: Mars Reconnaissance Orbiter (MRO) began its journey to Mars on August 12, 2005 with a spectacular launch on an Atlas V launch vehicle. As with any deep space mission, the journey for MRO systems engineers began many years earlier with the design and development of the MRO spacecraft and its plan for operations. This is the period in the mission's evolution from concept to reality, where high-level requirements transform into an integrated system ready for flight. This presentation will highlight some of the key systems engineering challenges faced by MRO systems engineers, including the preparations to manage in-flight anomalies. Now, with almost three years of flight experience, MRO engineers have had the opportunity to watch the performance of the system they designed, managing real-life flight anomalies along the way. The MRO mission has been a tremendous success, returning over 50 Tbits of data so far, and greatly increasing our scientific knowledge of Mars.

Biography: Todd J. Bayer
Chief Engineer, Mars Reconnaissance Orbiter Project, Cal Tech/JPL

Mr. Bayer earned his B.S. in Physics at the Massachusetts Institute of Technology in 1984. He has worked in various aerospace systems engineering roles since then, most of them at NASA/Caltech's Jet Propulsion Laboratory. He started his career as a project officer in the U.S. Air Force, during a four-year tour of duty at Space Division in El Segundo, California. Following his military service, Mr. Bayer joined the staff of JPL as Launch Vehicle Integration Engineer for Mars Observer. After MO's successful launch, he became the Lead System Engineer for development of Cassini's Engineering Analysis Software. From 1997 to 1999, on a leave of absence from JPL, Mr. Bayer worked as a systems engineer on Europe's next-generation weather satellite at the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), in Darmstadt, Germany. After his return to the U.S., he joined JPL's Deep Space 1 mission as Lead Operations System Engineer, where he led the recovery of the mission from the failed star tracker and the successful return of spectacular science from Comet Borelly in 2001. He then moved on to become the Spacecraft Systems Engineering Manager for development of Mars Reconnaissance Orbiter (MRO). After MRO's successful launch in August 2005, he assumed the role of MRO Chief Engineer.

Biography: Glen G. Havens
Mission Operations System Engineer, Mars Reconnaissance Orbiter Project, Cal Tech/JPL.

Mr. Havens received his B.S. in Aerospace Engineering from the Pennsylvania State University in 1988 and his M.S. in Aerospace Engineering from the University of Southern California in 1993. He gained 13 years of systems engineering experience at Hughes Space and Communications between 1988 and 2001, working on a multitude of commercial communications satellite projects, most significantly managing the launch vehicle integration for numerous 601/601HP spacecraft and leading early mission operations development for the first 702 spacecraft to be launched. Since joining JPL in 2001, he has led the mission operations systems engineering and "verification and validation" efforts on the Spitzer Space Telescope and Mars Reconnaissance Orbiter projects. In 2008, Mr. Havens joined the GRAIL mission's systems engineering team in preparation for 2012 launch of twin lunar orbiters to discover internal structures of the earth's moon.

SPEAKER MEETING WEBCAST INFORMATION:
There will be no webcast of this meeting.

RESERVATIONS:

- Dinner RSVP deadline - 11:30 a.m. on Tuesday, May 20, or call (310) 699-7906 after RSVP deadline.

Register Online at AIAA-LA website at
http://www.aiaa-la.org/dinnermtgs.html
or by email: westcoast@aiaa.org
or call the AIAA reservation line at 1(800) 683-AIAA (2422).

- Please indicate your meal selection when you RSVP: beef, chicken, or vegetarian.

If you plan to attend only the presentation, please do not arrive before 7:15 p.m.

- INCOSE-LA members should register in the same manner as American Institute of Aeronautics and Astronautics (AIAA) members.
- CANCELLATION POLICY:

If you cannot attend, please cancel your registration within 72 hours of the event via email or phone using the contact information listed above. Otherwise, you are still obligated to pay for the reserved meal.

DIRECTIONS TO THE CROWNE PLAZA LAX:
http://www.ichotelsgroup.com/h/d/cp/1/en/hotel/laxap/

What makes for effective pedagogy? Well, first you avoid words like "pedagogy."
John Vlissides in forward to "Object Design"

Architecting of Resilient Systems: Beyond Challenger, Katrina and Chernobyl
A Tutorial Presented by Scott Jackson, INCOSE Fellow

Particulars:

WHEN: Saturday, May 17, 2008, 8:00 a.m. to 5:00 p.m.

WHERE: National University (near LAX)

5245 Pacific Concourse Drive, Suite 100

Los Angeles, CA 90045-6905

COST: INCOSE members $50.00

Guests: $60.00

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

Registration deadline: May 14.

For detailed directions to the National University campus go to: http://www.nu.edu/Locations/SouthernCalifornia/LosAngeles.html

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.

Mr. Jackson will also present 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 the INCOSE International Symposium 2008, go to: **http://www.incose.org/symp2008/**

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's involvement, the University is a node of the Resilience Engineering Network.

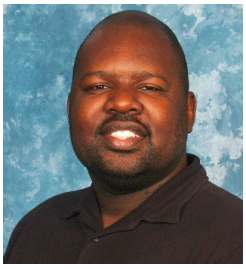
The Board of Directors wishes to welcome the following new members in the Los Angeles Chapter of INCOSE:

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
Jonathan Dorny	Principal Systems Engineer	Control Point Corporation
Charles Hymowitz	Managing Director	AEi Systems, LLC
Kevin Harbuck	Chief Architect	Lockheed Martin
Tamra Johnson		NGST
Mehrdad Moshir	TM	Jet Propulsion Laboratory
John Rodwig	President	JR Government Systems
Douglas Sersun	Lieutenant Colonel	United States Air Force
Edward Tellis	Systems Engineer	Northrop Grumman
Andrew Zillmer	Student	University of Southern California

Stephen Guine
Our First Representative to the Engineers' Council of San Fernando

(The following is a letter from David Boyd, President, INCOSE LA Chapter to Robert Tarn, Trustee and Secretary of theEngineers' Council of San Fernando Valley)



On behalf of the Los Angeles Chapter of the International Council on Systems Engineering (INCOSE), it is a great honor to recognize and support one of our own members, Mr. Stephen Guine, in his appointment as Board Member at Large for the Engineers' Council of San Fernando Valley. In this capacity, we are pleased that Mr. Guine will represent our Los Angeles Chapter. Our Board of Directors (BoD) will work with Mr. Guine to determine the best way to foster and promote a mutually rewarding representation and partnership between our Chapter, our parent organization [INCOSE] and the Engineers' Council. In the interim, we will ask Stephen to keep you informed of our events (local and international). Local chapter events include offerings such as monthly speaker meetings, quarterly tutorials and joint events with other local area technical societies. We would also like to hear about your technical needs, events and activities.

State Analysis Tutorial: A Report

On March 26, sixty engineers gathered at Caltech for a tutorial on State Analysis for Systems Engineers (a model-based systems engineering methodology) by Dr. Robert Rasmussen and Dr. Michel Ingham from NASA JPL. It was a fast-paced, eight-hour introduction to the topic, reviewing over 300 slides and addressing many relevant and timely questions from the audience.

State analysis is based on a control architecture that has the notion of state at its core, where state is a representation of the momentary condition of an evolving system and models describe how the state evolves. State analysis provides a common language for software and systems engineers to bridge the traditional gap between requirements and software implementation.

The State Analysis Tutorial included a presentation of the process for capturing system and software requirements in the form of explicit models of system behavior, and for defining a state-based architecture for the control system.

The tutorial presented model capture, state representation, goal/constraint/definition, goal-based planning, scheduling and execution, and fault management/recovery.

The state analysis methodology was developed in the context of JPL's Mission Data System project, and has been used to develop control systems for multiple hardware platforms at JPL. It has also been applied in several simulation-based capability demonstrations, including an early Entry, Descent and Landing system prototype for the Mars Science laboratory spacecraft.
The State Analysis tutorial slides are available at:
https://pub-lib.jpl.nasa.gov/docushare/dsweb/View/Collection-91

Additional papers are available at
https://pub-lib.jpl.nasa.gov/docushare/dsweb/View/Collection-63

INCOSE-LA members interested in a repeat of the tutorial, please send email to **shirleytseng@earthlink.net**.

Basics of System Engineering (BASE) Free Course Offering Coming in September

The Basics of Systems Engineering program is offering a free introductory course in the fundamentals of systems engineering. This course will be offered under the Department of Labor/Wired grant. The course is sponsored by the California Innovation Corridor. The course has been developed jointly by the Aerospace Corporation and the California Polytechnic University San Luis Obispo and will be given on the university campus in San Luis Obispo on September 9 and 10, 2008.

The course objectives are to:

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

The course is open to degreed engineers who are:

- Currently employed and who
- Have serious intentions of pursuing the program and who
- Have a need or desire to know systems engineering

Pre-registration is required. For more information contact: Joel Shrater at (310) 336-7755 or Michelle Bell at (310) 336-2832 or go on line to:
http://www.csewi.org/programs.html#CIC

Did you attend CSER in March? If you did, please share you experiences by sending a write-up to our editors, Edie Ung at edie@raytheon.com or Jorg Largent at Palmdalejorg@aol.com. Thank you for your support.

!CHECK YOUR MAIL BOX IN JULY!

The next Newsletter published by the chapter will be for the month of July.
There will be no Newsletter for June due to commitments to the International Symposium.

Systems Engineering and Architecting Doctoral Research Network (SEANET)
The Tale of Two First-Time Attendees

By Mary Bone, Iowa State University, and Jennifer Maxwell, University of Southern California/JPL

A group of 30 systems engineering Ph.D. students and faculty members met at USC Davidson Conference Center on April 3. We were attracted to the day-long workshop because we hoped to learn a few tips on how to successfully complete our Ph.D. program. By the time the event was over, we had picked up a few tricks, and, more importantly, we came away feeling a part of a dynamic and growing community of engineers.

Fellow students, themselves studying at various stages of the doctoral process, gave personal and inspirational talks, while esteemed faculty members, including Professor George Friedman of the University of Southern California and Professor Larry Head of the University of Arizona explored the Ph.D. education process and degree requirements in great detail. Lynne Cooper, a soon-to-be USC graduate, gave a talk titled "From Inspiration to Dissertation," during which she stressed that intellect without passion and determination was not enough to see you through to the defense of your thesis.

The day provided an invaluable opportunity to learn about research being done at other universities. The most valuable part of the conference was time between sessions, during which students and faculty from around the world were able to share ideas and discuss current issues in our field. This downtime allowed students to establish common interests and to discuss ideas for future collaboration, despite being from different cultures and programs.

During her closing address, Donna Rhodes — leader of SEANET, past INCOSE President, research scientist and senior lecturer at MIT — posed the question "How can we get more universities to participate in this workshop?" It was easy to see why she would ask, since only ten universities were represented at the event. Money was clearly not a deterrent — beyond travel costs for non-local students, the attendance fee was minimal.

Systems engineering research does not always provide a traditional, linear means toward acquiring a degree. You would think that those of us pioneering this academic road would quickly sign up to participate in collaborations such as these, because they are essential to forming research initiatives across institutions — initiatives that can make a real impact on the systems engineering field.

A day after SEANET, INCOSE-LA hosted the CSER conference. At the CSER closing address, INCOSE President-elect Samantha Brown unknowingly provided insight into Dr. Rhodes' question. Ms. Brown invited those in attendance — students, academics and industry experts — to enter what she referred to as the "Valley of Death," the wide-open abyss of essential research that is both relevant to industry and inspiring (motivating) to academia.

In addition to the networking opportunities that students had with each other at SEANET, one of the biggest connections that SEANET, CSER, and INCOSE could forge is the connection between the industry leaders (with the complex systems engineering problems but without the resources to perform long-term research), and the academic world (with the research expertise but lacking the insight and funding support into the relevant problems in industry). Systems engineering is ultimately a response to the growing complexity of engineering today. Systems engineering research must respond in a similar manner to solve these complex problems by growing its academic programs beyond their traditional boundaries. Collaborative initiatives like SEANET and CSER are the perfect venues to begin cultivating these relationships between industry, academia, and professional societies like INCOSE. We hope that at next year's SEANET, there will be representatives from industry, as well as from all universities with systems engineering research programs, to discuss the major problems plaguing systems engineering and how we can best distribute the research needed to solve these problems across the academic enterprise.

Interested in taking the INCOSE Certified Systems Engineering Professional (CSEP) exam?

Tutorial on the INCOSE Systems Engineering Handbook in Preparation for Systems Engineering Certification

This tutorial will provide an overview of the International Council on Systems Engineering (INCOSE) Certified Systems Engineering Professional (CSEP) process and will complement Systems Engineers' preparation for the INCOSE SE Certification exam by providing an overview of each section of the INCOSE SE Handbook (v3.1). The one-day session will cover the CSEP process and the management and technical sections of the SE Handbook.

INSTRUCTOR: John Clark, Northrop Grumman
LOCATION: Northrop Grumman E2 Presentation Center (in tall building off of Entrance 2, formerly TRW)
2299 Marine Avenue, Redondo Beach, California
DATE and TIME: Monday, May 12, 2008, 8:00 a.m. to 5:00 p.m.
RESERVATIONS: email shirleytseng@earthlink.net with tutorial and your name in email subject.
RESERVATION DEADLINE: May 5, 2008
COST: $200 fee for 8-hour session; cash or check payable to "Hampton Roads Area Chapter — INCOSE"
NOTE: Limited capacity; first come, first serve; lunch not provided but available for purchase in the cafeteria

INCOSE LA Chapter NEWSLETTER

Vol. 6: Issue No. 4 May 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 co-editors:	Edie Ung, Jorg Largent	edie@raytheon.com	or	Palmdalejorg@aol.com
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:	Denise Nelson	Denise.J.Nelson@boeing.com		
San Fernando Representative:	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.