



NEWSLETTER



2002, 2004-08



2003



2008 President's Award for Most Outstanding Chapter



UPCOMING EVENTS

May Speaker Meeting

Securing Cyberspace:

An Integrated Lifecycle Approach

Speakers: Wes Gavins and Judith Hemenway,

Booz-Allen Hamilton

When: May 11, 2010

Where: The Aerospace Corporation, El Segundo

See page 3 for details

Professional Networking Event

When: May 25, 2010

Where: McCormick and Schmick's El Segundo

See page 5 for details

June Speaker Meeting

A Systems Approach to Lower Cost Missions:

Following the Rideshare Paradigm

Speaker: Linda Herrell

When: June 8, 2010

Where: JPL (tentative)

Details to follow in June newsletter

SAVE THE DATE

INCOSE-LA Tutorial—coming in late July

If you have any suggestions for future tutorial topics,

contact Shirley Tseng, Tutorials/Education Director

shirleytseng@earthlink.net or 714-832-5373

INCOSE-LA Mini-Conference

When: October 16, 2010

Watch for more details in upcoming newsletters!

For up-to-the-minute event details:

- ◆ Check future editions of the Newsletter
- ◆ Watch your email for the Reflector
- ◆ Visit the INCOSE-LA website at www.incose-la.org

A Tribute—INCOSE-LA Remembers Betty Largent



The INCOSE-LA Board of Directors is sad to announce that we have lost a cherished friend and valuable contributor to our chapter. Elizabeth (Betty) Largent, wife of newsletter co-editor Jorg Largent, passed away unexpectedly on April 6, 2010. While not an official member of our chapter, Betty often accompanied Jorg to INCOSE and INCOSE-LA events, becoming a friend to many INCOSE members.

Betty, a poet, a technical writer, an editor, a tutor, and an avid student of the language, also dedicated her time and talent to ensuring the quality of our newsletter. Betty's charm and warm disposition will be missed, and her legacy will continue to serve us all.

Our condolences to Jorg Largent and his family in their loss.

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Non-Members Attend for \$5

Speaker Meeting Discounts - May and June

Networking * Learning Opportunities * Refreshments

INCOSE Members Still Attend for FREE

Invite your colleagues to attend the May and June speaker meetings for half off the regular price. Each non-member pays only \$5 to attend the next 2 speaker

MAY SPEAKER MEETING

“Securing Cyberspace:

An Integrated Lifecycle Approach ”

**Presenters: Mr. Wes Gavins and Ms. Judy Hemenway,
Booz Allen Hamilton**

PARTICULARS

When: Tuesday, May 11, 5:30—8:30 p.m.

Where: The Aerospace Corporation
2350 East El Segundo Blvd., El Segundo
Remote sites will be available.

Cost: Members-*FREE*; Non-members-*\$5.00*

Meeting Agenda:

5:30 - 6:20 p.m. Registration, networking, refreshments

6:20 - 6:30 p.m. Welcome and announcements

6:30 - 7:45 p.m. Presentation followed by questions and answers

*Substantial refreshments will be provided at the host site.
(Refreshments may not be provided at remote sites, or may be
provided at no charge. Contact Remote Site POCs for more
information).*

ABSTRACT: To fully realize the power and potential of the cyberspace domain, the Department of Defense (DoD) must adopt a Systems Engineering and Integration (SE&I) discipline that has matured to accommodate change in response to three crucial new goals: (1) the need to achieve interoperability among the inextricably interconnected systems that constitute cyberspace; (2) the need to protect cyberspace from increasingly sophisticated and constantly evolving cyberspace threats; and (3) the need to address not only the technologies that comprise cyberspace but also the elements of the environment that surrounds, influences, and supports cyberspace, which include (a) Policy, Strategy & Planning; (b) Management & Budgeting; (c) People & Culture; (d) Technology & Architecture Development, and (e) Planning and Operations.

The methods, processes and tools to be discussed are needed to accomplish the integration of cybersecurity into all phases of the systems development lifecycle (SDLC): requirements definition and analysis, architectural design, implementation, integration, verification, transition, validation, operations and maintenance, and disposal – adapted from INCOSE best practices. This approach is being used extensively in support of current large-scale space acquisition and development efforts and leverages standard SE&I processes and tools wherever possible. New processes and tools were developed and/or adapted, as needed, with a strong emphasis on achieving practical and cost-effective protection of the system as it operates within the cyberspace domain.

In addition to having a fully integrated cybersecurity capability, the SE&I processes are flexible and adaptable and, as such, can be applied to all three of the acquisition lifecycle timeframes: long-scale acquisition of space systems, intermediate-scale rapid acquisition, and near-real-time response acquisition. The need to address rapid and near-real time acquisition timeframes is critical due to the broad, embedded and diverse nature of cyberspace vulnerabilities that must be mitigated by technology and process developments. Use of the

SE&I model enables the Government to plan, develop and secure both small-scale agile and large-scale complex programs that will be delivered on time, within budget, and with expected performance, all while managing risk within acceptable limits.

Finally, the speakers hope to foster discussions needed to update *INCOSE Systems Engineering Handbook*, which is consistent with the standard ISO/IEC 15288:2002(E) – *Systems engineering – system life cycle processes*, in order to address the need to collectively develop a secure cyberspace architecture.

BIOGRAPHY: Mr. Gavins has over 20 years of experience



in the areas of SE&I, systems security engineering, information assurance, cybersecurity, system certification and accreditation (C&A), program protection planning, enterprise network security, project management, and interoperability analysis. Mr. Gavins currently supports the end-to-end engineering analysis of Air Force space systems for the Space and Missile Systems Center (SMC). Mr. Gavins is trained as a Certified Information Systems Security Professional (CISSP), a Cisco Certified Network Associate (CCNA), and is a Certified Federal Information Security Management Act (FISMA) Compliance Practitioner (CFCP). Mr. Gavins holds an M.S. in Telecommunications Systems Management and is currently a doctoral candidate for a PhD Information Technology with specialization in Information Security.

Ms. Hemenway has over thirty years of technical experience in computer and network information assurance, systems design and analysis, and software and systems development, primarily on DoD systems/acquisitions. Her experience encompasses research and all phases of the system development process. She was the security technical lead for the Blacker system, a multi-level secure (MLS) IP-based network communications system, one of only three systems certified at the A1 (high assurance) level under the Orange Book. She has conducted research in formal methods for the composition of secure systems, and is the author of a number of papers on secure system architecture and composition. For the past six years she has served as the Technical Director for Booz Allen’s Assurance and Resilience team in Los Angeles, providing oversight for the integration of IA into the SE&I construct and IA technical support for the acquisition and development of survivable, secure satellite communications systems for the Air Force. Ms. Hemenway holds a MA in Experimental Psychology and is a Certified Secure Software Lifecycle Professional (CSSLP).



R.S.V.P.: R.S.V.P. by registering online at www.incose-la.org or by sending an email to registration@incose-la.org (please include “INCOSE-LA May Meeting” in subject line). Please be certain to indicate the site at which you will be attending. R.S.V.P. to attend. NO EXCEPTIONS for Aerospace and Boeing sites. If you are uncertain whether or not you’ll be able

(Continued on page 5)

RECAP: INCOSE-LA April Speaker Meeting

Summarized by the LMU\LA team

Mixing expertise with humor, Mr. Kenneth Cureton spoke about “*Network-Centric Architecture and Systems Engineering*” at the INCOSE-LA April 13 Speaker Meeting to a captive audience. Ken described Network-Centric Operations (NCO) as a System of Systems (SoS) or “super-system” comprised of elements that are themselves complex, independent systems which interact to achieve a common goal of getting the right information to only the right people at the right time and place, with understandable and useable content. Net-centric systems are frequently called “collaborative systems” because they are systems built on a partially voluntary and uncontrolled interaction of complex elements in an *ad hoc* environment.



Net-Centricity requires multiple layers of interoperability, as follows: 1) The need for communications interoperability: in order to communicate effectively, communications capabilities must be compatible, otherwise data cannot be exchanged, e.g. listening to an empty can connected to a telephone will not enable communications. 2) The need for the interoperability of data exchange methods, e.g. a fax machine will not effectively communicate with a paper sheet in a bottle even though both convey a message on paper. 3) The need for compatible data representation, e.g. a 3D map and a stone with 3D hieroglyphs are incompatible 3D forms. 4) The need for semantic interoperability. This was illustrated with the classical example of five blind people examining an elephant: touching different body parts of the animal they perceive it as a snake, a wall, a rope, a column. These disjointed perceptions, a common problem in system interoperability, do not add up to an elephant body system.

The additional needs for interoperability include: compatibility of knowledge (understanding of the situation), procedures, operations by the entire team, objectives, and standards. Developed individually for different elements the different standards and their different versions present a particular challenge in network integration.

Ken then discussed the net-centric enablers: which include the applicable analysis tools: Unified Modeling Language and System Modeling Language.

To conclude his talk, Ken finished the lecture with a dramatic statement about the vulnerability of the Internet (a classical example of a Network Centric SoS) to hacking, sabotage and terrorism. Modern civilization relies on the Internet for most banking, financial, commercial, social and military transactions. Presently it lacks many of the assurance characteristics, risking devastating consequences on a global scale.

Ken is a Senior Engineering Manager for Information and Knowledge Systems at Boeing Space & Security Systems, and is an industry lecturer at USC. He is currently serving as the Technical Council Vice-Chair (becoming Chairman on April 1, 2010) in the Network-Centric Operations Industry Consortium. Ken earned a BS in Physics from Cal State University, Los Angeles in 1988.

The speaker meeting was hosted at Boeing, Huntington Beach, and transmitted to several remote locations. Loyola

Marymount University (LMU\LA) served as a new remote site, hosted by INCOSE-LA President Roz Lewis and Bo Oppenheim, with two classes attending. Roz Lewis used the social part of the meeting to introduce the goals and benefits of INCOSE membership to the students.

Membership Renewal Reminder: **SPAM – NOT!**

Your INCOSE membership is in jeopardy, if email from info@incose.org is trapped by your SPAM filter. INCOSE no longer sends renewal reminders by mail, so look for your renewal reminder in your inbox.

Your member record is the key; reminders are emailed only to the first email address in your record. If you are not getting INCOSE E-Notes, then your email address may not be valid, or your SPAM filter may be overly enthusiastic. You can verify your contact information on-line at <http://www.incose.org> - click on “View / Update your Member Record” (left column).

For most of us (over 200 in the Los Angeles Chapter), our INCOSE memberships expire early in June. Renewal reminders will be emailed 30 days and 15 days before your membership expiration date. A drop notice will be sent 15 days after your membership lapses.

2009 Best Product Award Bestowed to Lean Systems Engineering Working Group

The Lean Systems Engineering (SE) Working Group was honored with the Best Product Award at the INCOSE International Workshop in Mesa, AZ, for the product called Lean Enablers for SE. The group was founded and is led by Bo Oppenheim, an INCOSE-LA member from Loyola Marymount University (LMU).

The Lean Enablers are 194 practices formulated as “do’s and don’ts” of SE that focus on a program’s mission assurance or product success and simultaneous program waste and schedule reduction. The group comprised of 14 industry, academic, and government experts and 150 practitioners of SE. It created the Lean Enablers by applying the principles of Lean Thinking, the process of relentless reduction of wasted time and effort coupled with rigorous promotion of customer value, to Systems Engineering. The practices and recommendations of the enablers are organized into the familiar lean principles: Value, Value stream, Flow, Pull, Perfection and Respect for people.

The recognition for this effort is growing. The group’s leaders have been invited so far to offer 20 tutorials, webinars and seminars, including an all-INCOSE webinar that was attended by 147, the Massachusetts Institute of Technology (MIT) Lean Advancement Initiative KEE event, six tutorials in Europe and Israel, lectures at Boeing, Northrop Grumman, Aerospace, Booz Allen Hamilton, and major US universities with SE programs. Tutorials have been scheduled at the EuCOSE Meeting in Stockholm (May 23), the International Symposium in Chicago (July 12-16), and a webinar for the DoD community (May 4).

The entire product has been released on the INCOSE public web site (<<http://www.incose.org>>; click on “Working Groups” and on “Lean Systems Engineering”). It includes a presentation, video lecture, brochure, desktop reference guide, and three articles published in the Journal of SE, Cross Talk Defense J., and INSIGHT. For more information, please contact Bo Oppenheim (boppenheim@lmu.edu).

Sustainable Energy: A Review of Two Lectures

By Josh Sparber

Courtesy of our Educational Director's emails I had the well appointed privilege of attending two consecutive Speaker meetings on sustainable energy, the first particularly dealing with the Smart Grid. The first was given by Dr. Russell Neal of Southern Cal Edison (SCE) at UCI (April 6) and another was given by Dr. Nader Bagherzadeh of UCI at the Doubletree Inn in Santa Ana, courtesy of the IEEE Solid State Circuits Society (April 8).

Being an Electrical Engineer by training, I did appreciate the high electrical engineering content of the information imparted by the both of these highly interactive lectures, which seemed to be populated by the inquisitive end of the engineering spectrum, given the lively discussions that persisted throughout the whole of both lectures.

Dr. Neal lead off by demonstrating how power is distributed throughout the whole Southern Cal Edison system, delineating large numbers served by a system that starts with 500 KV or 800 KV Stations, branches into 116 KV or 66 KV Substations, winds up in distribution branches to neighborhoods on the level of 12 to 16 KV; whereupon, it is converted to the 120 to 240 VAC used by most households. The political reality is that the CPUC forces having SCE to go through a rate review every 3 years; in between profits are held to a certain level and maintained at that level with a balancing fund. This motivates SCE to remain in a public policy orientation favorable to the use of renewable resources, particularly since rates are maintained and cannot be pushed higher or lower for a profit.

He discussed the idea of a Smart Grid by digressing into how little bits of intelligence had always been incorporated into the system, from fuses to power meters on up to microprocessor controls. Protection methods can shut down power by several intelligent methods: automatic relay monitoring, a ring formation in which all load sources intercommunicate or power sensing relays that can automate both shut off and return power. Phasor diagrams on oscopes monitor the AC load variation between major Stations, highlighting a trouble spot or a locale where capacitors need to be added in a system heavily dominated by inductive effects. Between large regions, such as the West and Midwest, 500 KV DC stations act as gateways and monitoring points between the large AC based systems.

California statute now mandates the consumption of 33% renewable energy in the energy mix by 2025, forcing the system to grapple with a lot of unsteady loads, particularly Wind and Solar Energy. The creation of a smarter grid was depicted as two way conference between power users and power senders on local meshes dubbed Field Area Networks (FANs). Several scenarios were mentioned: voluntary monitoring of power by individuals to feed back power to the grid, the use of automatic low frequency low power radio communication to balance loads locally, the possible use of the Internet as an information server, the protective energy safety efforts this requires and the piloting of superconducting transformers into the field. The latter, donut shaped devices sport a thin nitrogen rod as a 'hot' supercoolant internally. They handle overloads better than the magnetics still largely in use. They shunt some of the current, when the

increased load shuts off the super-conductance, through an insulating titanium layer. The state of the majority local transformers was discussed; while paper and oil endure as insulation and coolant, with oil lasting 50 years or more, the current infrastructure might reach a tipping point in which universally underfunded maintenance could cause colossal breakdowns or the inaccessibility of underground power for repair could halt power usage.

Dr. Neal also spoke of the installation of a superconducting transformer at UCI for the faculty housing and also where power lines coming from high level AC sources, such as a 66 KV line coming over the 55 and 91 Highway intersection, could be seen.

Dr. Bagherzadeh, although a researcher into high level digital processors took a bird's eye view of the field of energy technologies that could be applied to create sustainable systems, proving that the System Engineering perspective has a lure for many. In bringing together many specialties together system level engineering can solve a lot of problems that these specialties can't solve severally.

Like the Arthur Miller dance system of four basic routines, he boiled down all sources of energy to basically Solar, since Wind depends on the effect of the sun on our planet. He also mentioned that most power sources, including nuclear, utilize the same principle, boiling water and the use of a turbine, except for wind power which uses a mechanical gearing system and a remote controlled break. Nuclear energy has bounced up in popularity since about the year 2000, although the clean source of fusion, with an input and an output of water isn't well controlled enough to be considered productive. Nuclear power supplies most of France's energy and many countries are on the move to be completely energy independent. For fission, Thorium is seen as a better source than unenriched Uranium; being 95% efficient versus 87% efficient even though the former has a half life of only 700 million years compared to the later whose half life is 5 billion years.

The mix of various sources of power for both Europe and the United States as well as power needs projected into the next few decades were shown. The solution to achieve sustainable energy would require a mixture of all the renewable sources, since any particular one isn't either intense or available enough to bolster the whole output needed. Also, many of the power sources depend on each other. Cost is also a major consideration in designing sustainable systems. Cost would have to undercut the 4 cents per KWh contributed by vast coal reserves in the United States and China. Coal firing plants are being built intensively by China, with sequestration of carbon a prime method of preserving clean output. Oil is finite and not sustainable; carbon release could increase the earth's temperature to 6 to 10 Fahrenheit degrees hotter, which would be spread globally. A 2-5 degree increase is mainly centered on the venerable and vulnerable North Pole.

New electrical engineering ideas were conveyed. Boeing, possessing a research lab on solar substrates, has created a highly efficient conducting film consisting of several layers of Germanium and Gallium. A vast array produced by Global Solar was shown. Apparently, the films are long-lived, with designs successfully accounting for weather degradation through derating of the spec. DC gateways between high power AC

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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
Paul Edney	Director, R&D	
Lauren Greiner	Systems Engineer	Northrop Grumman
Dr. Tanawat Mathurasai	Systems Engineer	Meggitt Safety Systems, Inc
Mayur Patel	Systems Engineer	Northrop Grumman
Yvette Rodriguez	Doctoral Student	USC
Joan Stripling	Senior Systems Engineer	Epsilon Systems Solutions
Brett Underhill		
Adriana Winfield	Multi-Discipline Engineer	Raytheon

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to attend, DO make a reservation Additional requirements for the different locations are below.

The Aerospace Corporation, El Segundo: Please complete R.S.V.P. (U.S. citizens and resident aliens by May 7, foreign nationals by May 4). You MUST and indicate that you're uncertain. Please bring your picture identification (driver's license, passport, or green card) to the meeting.

Boeing, Huntington Beach: R.S.V.P. by May 7. Attendance at this site is limited to U. S. citizens and resident aliens; we regret that foreign nationals will not be able to attend at this site. Please bring your picture identification (driver's license, passport, or green card) to the meeting. Site contact: Beth O'Donnell, phone 714-837-6924 or email elizabeth.l.o'donnell@boeing.com.)

Antelope Valley/Palmdale: Open to all. Contact Mike Wallace, phone: 661-540-0290, email: m.wallace@ngc.com.

Pasadena – JPL: Open to all. R.S.V.P. by one day prior to meeting. Contact Chris Delp, phone 818-319-3251, email: christopher.l.delp@jpl.nasa.gov

DIRECTIONS TO AEROSPACE: From the 405 Freeway head west on El Segundo, left on Douglas, left into the first gate (Gate C) on the left and drive straight past the parking structure and park. Enter through the South Lobby (which is to the north and hard to see). Badge in through the South Lobby (east of the large building ahead on the left as you enter the gate); we meet in Dining Rooms A&B. **Site contact:** Susan Ruth, phone 310-336-6765, email susan.c.ruth@aero.org

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sources, already mentioned by the previous speaker, are used to maintain a steady control of power. At the 800 KV level DC is much more efficient than AC; the only complication is rectifying circuitry. High power rectifying technologies, such as high power thyristors would have Fiber Optic gates to maintain steady control. Such improvements to basic electronic design, coupled with the use of Digital Signal Processors could pave the way to the more intelligent control of power sources. Compact Fluorescent Lights, replacing the traditional light bulb, have improved lighting efficiency by adding ballast and phosphors so

May Professional Networking Event

The Los Angeles Chapter will be hosting another Professional Networking Event on Tuesday, May 25, 2010 from 5:30 p.m. to 7:00 p.m. in the lounge or patio area of the McCormick & Schmick's Seafood Restaurant in El Segundo. The purpose of this gathering is to welcome new members and to provide an opportunity for Chapter members to meet in an informal setting. This is a great way to meet other systems engineering professionals and members of the INCOSE-LA Chapter, and your participation is welcomed.

Appetizers will be provided, compliments of the INCOSE-LA Chapter, and there will be a no-host bar.

McCormick & Schmick's restaurant is located at 2101 Rosecrans Avenue in El Segundo, about halfway between Pacific Coast Highway (which doubles as Sepulveda Boulevard in this area, according to Google maps) and Aviation Boulevard on the north side of the street. The closest freeway exit is the Rosecrans Avenue exit on the 405. The restaurant is about a mile west of the 405. The restaurant provides validated parking.

RSVP by Friday, May 21, 2010 by using the website at www.incose-la.org or by sending an email to Nehal_P1_Patel@Raytheon.com.

Note: No space has been reserved - this will be an informal gathering in the lounge or patio area of the restaurant, pending available space.

that the weak ultraviolet light that is emitted translates into strong visible illumination.

My perception of the both of these Speakers is that the problems of sustainable energy are complex and interactive, containing many Costs as well as Benefits. In order to coordinate the best usage and energy future for ourselves and the rest of the world, it will be necessary to plan carefully, design the components as part of a system while carefully considering the tradeoffs. And do that in a rather limited amount of time. But then, as a System Engineer, you knew that already.

INCOSE-LA Chapter NEWSLETTER

Vol. 8: Issue No. 5 May 2010

Return Address:

**800 S. Pacific Coast Hwy. #8-205
Redondo Beach, CA 90277**

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. . Our mission is to advance the state of the art and practice of systems engineering in industry, academia, and government by promoting interdisciplinary, scalable approaches to produce technologically appropriate solutions that meet societal needs.

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:

2009 Board of Directors and Appointed Positions

Elected Officers

President:	Rosalind Lewis	rosalind.lewis@aero.org	or	president@incose-la.org
Vice-President:	Beth O'Donnell	elizabeth.l.o'donnell@boeing.com	or	vicepresident@incose-la.org
Past President:	Eric Belle	eric_c_belle@raytheon.com	or	pastpresident@incose-la.org
Secretary:	Josh Sparber	joshua.sparber@dcma.mil	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:	John Silvas	silvas_john@bah.com	or	programs@incose-la.org
Systems Engineering Education:	Shirley Tseng	shirleytseng@earthlink.net	or	setraining@incose-la.org
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Communications:	Edie Ung	ma1teez@yahoo.com	or	communications@incose-la.org

Appointed Positions

Newsletter Co-editors:	Edie Ung, Jorg Largent	ma1teez@yahoo.com	or	Palmdalejorg@aol.com
Newsletter Production Manager:	Lee-Ann Seeling	Lee-Ann.S.Seeling@raytheon.com		
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	cdelp@jpl.nasa.gov		
Website Technical Manager:	Michael Kim	kim_michael_l@bah.com		
2010 Mini-Conference Venue Chair:	Harvey Soldan			
2010 Mini-Conference Technical Program Chair:	Rick Cline			
Representative to San Fernando Valley 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.