Vol. 12, Issue 2: April – May 2014

NEWSLETTER

2002, 2004-12 | 2003

2008, 2012 President's Award for Most Outstanding Chapter

THE 2014 INTERNATIONAL WORKSHOP

This edition features reports from IW14

A large number of members of the Los Angeles Chapter participated in the many workshops, networking events, and plenary. Their inputs are the bulk of this edition of the Newsletter. —The Editor

A Report from the 2014 International Workshop

By Richard F. Emerson

The opening plenary session made quick work of the business of INCOSE, handing out awards and recognition, introducing retiring and incoming officers, and setting the tone for the workshop and the coming year.

From the summary and statistics presented at the closing plenary, this was the biggest and best International Workshop yet. It was certainly an event at which one could drown in information. A quick look at the program for the sessions left me wanting to clone myself many times over. An in-depth look made choosing which to attend an even greater a dilemma. I finally settled on two working groups to visit, promising myself that I would switch midstream should I become bored. I didn't.

The first working group that interested me was the "Chapters/Working Groups Coordination Meeting." I only spent a short time with this group—just enough to realize that the problems plaguing INCOSE are the same ones plaguing all of the other groups and institutions of my experience. There seem to be three groups of actors:

1) those who talk and complain that nobody is listening,
2) those who expected to be informed and complain that

(See "IW14 Report" on page 7)

Another Report from the 2014 International Workshop

Member Josh Sparbar attended the IW and participated in the Systems Science Working Group (SSWG) and the Infrastructure Working Group (IWG). He was favorably impressed.

While participating in the SSWG Josh learned many new things about Dr. Len Toncale's System Pathology (Dr. Troncale, a co-chairman of the working group, is a professor at Cal Poly Pomona and an active member of the Los Angeles Chapter). The group shared many ideas, came up with new ones, and engaged in engrossing conversations. It was a learning experience for Josh; the group is leading the ethereal study of and definition of theoretical systems engineering while trying to keep the ethereal rooted in reality with Dr. James Martin being the "reality coordinator."

The Infrastructure Working Group proved to be equally educational. The IWG is developing a manual for systems engineering for infrastructure. The group evaluated the use of the latest Model Based Systems Engineering (MBSE) application from Atego to build a target project: a drawbridge. Building Information and Modeling was discussed in the

(See "Report from the IW" on page 8)

Inside This Edition

Systems Engineering for Very Small Entities

While most systems engineering applications occur in the world of large organizations such as the Department of Defense and major corporations with dedicated systems engineering personnel, protocols, and documents, INCOSE appreciates the fact that the value of systems engineering is independent of size. Toward this end, the "SE for VSMEs" Working Group (Systems Engineering for Very Small and Micro Entities) was formed to assist in the application of systems engineering for product development in very small/micro enterprises or small projects. "Very Small and Micro Entities" are enterprises (or organizations or departments) that have 25 or fewer members. In Europe, over 92 percent of enterprises have nine or fewer employees, according to research done for a paper that was submitted to the 2014 International Symposium. Data presented to the Los Angeles Economic Development Corporation suggests a similar proportion in the United States and in Southern California particularly. Most products are produced by and most workers work for comparatively small organizations—the bulk of the economic engine of a vibrant economy.

Toward this end, the Very Small Entities (VSE) Working Group (VSE WG—a name change was proposed during the workshop) is working to develop schemata by which small enterprises can leverage the benefits of the systems engineering process without the encumbrances of complicated and broad-based procedures—and the attendant staff.

From this comes the purpose of the VSE WG. The VSE WG is creating Deployment Packages (DPs) for the benefit of and critical to the success of a VSE. These DPs are intended to provide systems engineering process information tailored and scaled for use by the VSE, and systems engineering tasks and activities for quick and efficient implementation. These DPs are being derived from ISO standards (15288, 29110, 12207) and the INCOSE Systems Engineering Handbook. In the context of very small and micro enterprises and small projects (VSEs), these concepts can be used directly or tailored to improve product development efficiency (including costs and delays) and product quality. Tailoring the inclusive systems engineering process to meet the needs of a VSE within the personnel and time constraints is a daunting but achievable task.

The goals of the VSE WG reflect its purpose:

- To make product development within VSEs more efficient by using systems engineering concepts.
- To elaborate on tailored guidance to apply for the benefit of VSEs, in the context of either a prime or subcontractor role to small projects.
- To contribute to standardization in the context of systems engineering.

The VSE WG, in keeping with the practices of the INCOSE Working Group concepts, is working to spread the benefits of systems engineering. To learn more about systems engineering for very small entities, come to the International Symposium, join the working group, or visit the working group's Connect site at https://connect.incose.org/tb/vsme/default.aspx.

The February Speaker Meeting—"Too Risky": Systems Engineering Teams and the Social Construction of Risk

The Tuesday, February 11, 2014, Speaker Meeting was held at the Aerospace Corporation facility in El Segundo, and featured Dr. Lynne Cooper speaking on risk and dealing with risk from a different perspective.

Perceiving, understanding, and managing risk are inherently social processes that benefit from discussion, debate, and evaluation from multiple perspectives. While tools and techniques can help translate data and perceptions into quantitative measures of the amount of risk, determining whether that amount of risk is acceptable (i.e., whether it is "too risky") is a judgment call. Engineering teams make hundreds of these types of judgment calls throughout the course of a project. The impact of these assessments, particularly those made during the early phases of project formulation, can have a huge effect on the performance of the project—and the ultimate success of the product being developed.

In her presentation, Dr. Cooper shared results from field research on real teams working on real, risky projects. She identified the different components that fed into an assessment of risk, how these interact to lead to a judgment on the degree of and acceptability of risk, how team processes influence perceptions and assessment of risk, and ways teams mislead themselves. Dr. Cooper also suggested ways in which systems engineering as a discipline can capitalize on team social processes to improve a project's understanding of risk.

Dr. Cooper discussed the "classical" risk analysis process and the familiar five-by-five red-yellow-green risk chart. After discussing the decision-making part of risk management, she proposed considering "risk" from a different perspective, one that includes:

- Emotions
- Intuition
- Relationships
- Collective belief

"Pre-quantitative risk" was a descriptive phrase.

Dr. Cooper described a research approach that studied real-world teams working on high-risk, high-technology projects. The research analyzed, over time:

- What they said
- What they wrote
- Team processes
- Actions they took

Dr. Cooper included a definition of risk:

RISK = FAILURE TO MEET GOAL(S).

She noted that without goals, risk does not exist, and added some observations with respect to goals:

- They are not always explicit
- They can interact and conflict with one another
- They can often be modified

(See "Too Risky," continued on page 8)

The Biomedical and Healthcare Working Group: An Update from IW14

By Jorg Largent

The Biomedical and Healthcare Working Group (BHWG) is working to bring together systems engineers and systems thinkers from within the biomedical and healthcare industries to identify, develop, and tailor best practices for application in the improvement of healthcare delivery. The working group's goal is to aggregate information (via INCOSE and external sources) that articulates the value and application of systems engineering to healthcare and to provide an infrastructure members (and interested non-members) can use to share information. The BHWG's scope covers medical devices, biomedical engineers, healthcare providers, academic institutions, regulatory agencies, pharmaceuticals, and advocacy groups. The group presented three papers and hosted a roundtable at the 2013 International Symposium. Co-chairman Dr. Chris Unger participated in a cross-industry panel discussion on "How to Tailor Effectively," and co-chairman Tom Fairlie gave a presentation titled "Applying Systems Engineering to Healthcare" to the Association for the Advancement of Medical Instrumentation (AAMI) Conference and Expo in June 2013.

During the 2014 International Working Group meeting in Torrance, the group established clearly defined roles and responsibilities for its leadership team, which consists of:

- Technical Director (Chris Unger)
- IT/Communications Director (Greg Campeau)
- Outreach Director (Mike Celentano)
- Group Coordinator (Tom Fairlie)

Sound bites from the BHWG

In the midst of all these systems the real stakeholder, the patient, is becoming the equivalent of an LRU (line replaceable unit) in aircraft systems. Systems engineering might be able to re-center us on the patient.

Also during the IW, the group set out to clearly define work products and a funnel of new ideas, buttressed by a steering committee with regular meetings. The working group is developing a near-term plan to develop

- Measures of group success
- Sub-teams behind group leaders
- A succession plan

Other BHWG activities envisioned for 2014 include addressing the model-based systems engineering (MBSE) healthcare challenge and safety assurance cases for medical devices. Agreed-upon new work products include creating a library of biomed/healthcare case studies and best practices, publishing an AAMI/MBSE position paper, defining systems engineering value for biomedical and healthcare organizations, and mapping regulations to INCOSE products.

The Biomedical and Healthcare Working Group's activities at IW14 included a planning session to help prepare for a successful 2014 International Symposium. Members reviewed plans for their roundtable activity and other activities that would make the symposium a worthwhile event for the working group. In addition the BHWG worked to determine its goals for 2014 and beyond.

The working group considered some potential products they could create, including the aforementioned systems engineering practice library for biomedical healthcare and MBSE regulatory position paper, as well as a discussion of systems of systems and interoperability for medical devices.

Communicating the value of systems engineering to the shy was discussed. It was noted that the Transportation Working Group was in the process of developing a small tri-fold brochure, and that one member of the BHWG has experience in selling to the top level of government. The working group discussed the need to look at collaborations with chapters, asking, "How do we reach out to chapters with our products, and collect and diffuse the healthcare-specific topics in the chapters and local healthcare working groups?"

Sound bites from the BHWG

Need to quickly sell the value of systems engineering… the words *systems engineering* scare doctors and nurses

The background for this article is from the INCOSE website and communications from Tom Fairlie and Chris Unger, co-chairmen of the Biomedical and Healthcare Working Group (also known as the Biomedical Working Group). More information about the working group can be found at their Connect site: http://www.incose.org/practice/techactivities/wg/details.aspx?id=biomed.

Mr. Fairlie is a Senior Systems Engineering Manager with Medtronic in Farmington, Minnesota. Medtronic's products include neuromodulation products for the medical industry. Dr. Unger is a Technology Manager, Technical Design Reviews with GE Healthcare in Brookfield, Wisconsin. GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality, and more affordable healthcare around the world. —The Editor

Chapter First Quarter Strategic Planning Meeting

The INCOSE-LA Chapter Board of Directors, students from the Student Divisions at the University of Southern California (USC) and Loyola Marymount University (LMU), and interested members at large participated in the first-of-the-year strategic planning meeting. The February 8, 2014 meeting, held at Northrop Grumman's Space Campus in Redondo Beach, was called by Chapter President Mike Wallace to transition to the new Board of Directors, to summarize the Chapter's activities in 2013, to review the lessons learned at the January town hall meeting (see the February–March 2014 edition of the *Newsletter*), and to plan activities and goals for 2014.

After opening the meeting and attending to the amenities of introductions and the agenda, the President quickly delved into the meat of the meeting. Obligatory activities included addressing changes in leadership personnel, training officers, and planning the budget for 2014. In addition to a successful transition to the new board, President Wallace also wanted to provide strategic guidance and planning for the Chapter in 2014 and beyond. The Board of Directors was particularly interested in the value of the Chapter to the members and what can be done to sustain and improve that value.

Interested in learning more or in being a part of the action?

Come to the next strategic planning meeting on Saturday, April 26, 2014, starting at 9:00 a.m. There is no cost and a buffet luncheon will be served. The meeting will be held at the Northrop Grumman Space Campus in Redondo Beach.

Watch for a Reflector Notice in your email for details.

Discussions of Chapter-sponsored activities in 2014 included the continued gamut of monthly speaker meetings, bi-monthly networking events, and tutorials. And as in 2013, the Chapter is planning to expand its topic and focus from the traditional aerospace-oriented matters to systems engineering perspectives from other industries. The Chapter is also investigating joint meetings with other professional organizations, such as the American Institute of Astronautics and Aeronautics (AIAA) and the Institute of Electrical and Electronics Engineers (IEEE), as a way to maximize opportunities and benefits to our Chapter members.

Fred Lawler from the IEEE Communications Society and Orange County Computer Society did a presentation on the Science, Technology, Engineering, and Math (STEM) program, and proffered an idea for a JPL-sponsored meeting, perhaps a show-and-tell on the Mars Rover, for the Chapter. This complemented President Wallace's goal of engaging with local non-profit organizations on systems engineering projects to include offering educational opportunities to K-12 students.

The report from the student divisions reflected a dedicated and competent group of leaders on both the University of Southern California campus and the Loyola Marymount University campus. The student divisions tend to have the same sort of issues as the Chapter, such as budget, retention, leadership, and meeting planning. One thought was that the two divisions might collaborate on their activities. A goal for the Chapter is to continue to develop mutually beneficial relationships with local universities via Student Divisions.

An ongoing vexation for the Board has been outreach: providing value and communicating value to the membership. Paul Cudney noted that many individuals join INCOSE (and, by default, the Chapter) for only a year, a statistic that suggests that few members see true value in continued membership in the organization. It was noted that, in addition to the Chapter website and email communications, the Chapter has a Connect site on the INCOSE website, a Facebook page (https://www.facebook.com/groups/INCOSE.LA/) and a LinkedIn group (at http://www.linkedin.com/groups?gid=1456737&trk=my_groups-b-grp-v). While the Connect site is limited to INCOSE members as part of the members-only portion of the INCOSE website, all systems engineering professionals and anyone interested in the systems engineering profession are welcome to visit the Facebook and LinkedIn pages.

The Chapter website (http://www.incose-la.org/) was a subject of some lengthy discussion as those in attendance brainstormed ways to make the website the go-to Internet site for systems engineers in the Los Angeles area.

Attendees at this meeting included:

Karen Grothe, LMU Student Division President
Ron Williams, LMU
Terry Rector, CSER lead
Paul Cudney, Ways and Means Director
Mike Wallace, President
Dick Emerson, past conference chairman
Shirley Tseng, Systems Engineering Director
Phyllis Marbuck
Scott Birtalan, Secretary
DeAnna Regalbuto, past Director of Communications
Edwin Ordouahan, USC Student Division
Eric Belle, Immediate Past President
Fred Lawler, IEEE Communications Society and Orange County Computer Society
Stephen Guine, Vice-president
Tawfik Hebrara, USC Student Division President
Wajih Daah, USC Student Division Secretary
Jorg Largent, *Newsletter* Editor
Dana Samuel, Networking/Communication
Karen Miller, LMU
Matthew Covington, E-Solar
Ron Williamson, OC
Kiran Jotwani, Website volunteer
Mark Jean, Avem/JPL
Dan Johansen, Carpinteria

NETWORKING EVENT UPCOMING:

Professional Networking Social Event in the Pasadena Area
Presented by the INCOSE-LA Board of Directors

Thursday, April 17, 2014, 5:30 pm – 8:00 pm

Bar Celona Modern Spanish Tapas Bar, 46 E. Colorado Boulevard, in Pasadena

Phone: 626-405-1000; website http://www.barcelonapasadena.com/; valet parking available.

Join the INCOSE Los Angeles Chapter for an evening of socializing and networking with members of the Chapter and the Board. Enjoy some tapas and the company of other systems engineering professionals.

Chapter members and guests are welcome and encouraged to attend!

Cost: No-host bar. The Chapter will provide the appetizers.

Registration is required to attend this event, because of space limitations.

Please register at www.incose-la.org by April 15, 2014.

Look for this event in the "Upcoming Events" section on the home page, and click on the link for Registration.

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

The point of contact for this event is Scott Birtalan, phone: 424-217-0743, email: scott.birtalan@incose.org

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A PAST NETWORKING EVENT
INCOSE-LA GOES
FULL METAL JACKET

The March 2014 networking event was hosted at Bravery Brewing in Lancaster. Bravery Brewing is of note not only for its ambiance and wide variety of quality beers; it is graced with memorabilia of R. Lee Ermey, a co-owner and one of the toughest Marines around, best known as the star of "Full Metal Jacket" and a variety of other movies and television shows.

Sixteen members participated in the event, sharing camaraderie, experiences, and a war story or two.

Who's Who at the Strategic Planning Meeting

Clockwise from top left:
Immediate Past President Eric Belle relaxing;
Chapter Secretary Scott Birtalan and Edwin Ordoukhanian of the USC Student Division;
President Mike Wallace at the podium;
Vice-president Stephen Guine and Director of Ways and Means Paul Cudney; and
Shirley Tseng, the hard worker who has made so many Speaker Meetings and tutorials happen

("IW 14 Report," continued from page 1)

nobody is telling them anything and they don't know what is going on, and

3) those who take action to either find out or force understanding.

This is not an engineering problem (unless you want to think of it as an impedance mismatch). It is odd that, though the speakers are articulate and the listeners are perceptive and the channel is not noisy, the overall communications is faulty.

When I considered the working group communication situation I noticed that there are several audiences and purposes for communicating and consequently there is a need for several different approaches to get the message through. Regardless of importance of the message, listeners will select what they want to hear and the detail in which they need to hear it. One might think that the speaker, therefore, must send the message in multiple ways and at multiple levels to try to match the aggregate audience needs. Alternatively, the speaker must only send to the audience he or she is most interested in influencing and forget the others.

Using these approaches neglects an essential part of the system of communication: feedback. If the speaker truly needs to communicate to the whole audience, he or she will have to listen to the audience. Much of this feedback is not verbal, and it is difficult to acquire with our current electronic, one-way systems. Face to face meetings like the IW and IS are necessary, just as are periodic chapter meetings. By listening to the feedback, speakers educate themselves about the capabilities of the audience to hear their message and can adjust accordingly.

It just might be true that a conversation begins with listening, not talking.

Memorable quote

"I'm a systems engineer and proud of it."

The second working group was "Systems Science." I have been struggling with the problem that so many of our designed systems end up creating more problems than they solve. I had looked into systems dynamics and systems thinking as possibilities for minimizing this, but could not figure out how these methods could be used to inform or guide the systems engineering methodology. Therefore, I selected systems science as a potential link (or more accurately as a potential higher-level structure to link the disciplines) and joined the working group sessions. Most of the time there were two parallel groups, and I selected the one run by Dr. Len Troncale (a professor at Cal Poly Pomona and an INCOSE-LA member) on Systems Process, Linkages Propositions, and Pathologies (SP^3). This group is attempting to define elements of the three items that apply to both natural and engineered systems. Although the group is relatively young, entering cold as I did is like jumping into the middle of a game where you don't know the rules, objectives, players, or what your position is. But by the end of the four days I was hooked. I came away with a better understanding of the similarities and differences between natural and engineered systems; their properties and pathologies; and the interactions that drive the behaviors. For example, the development of galaxies can be likened to evolution in biology, which has similarities to modularization in engineered systems. (I sure hope I got this correct, but I now know who can help me straighten it out.) The more I sleep on the subject of systems science the more interesting things to think about pop up.

The 2015 International Workshop will be held in Torrance, January 24–27. For those who might be interested in attending here are few of the working group titles: Affordability Architecture, Complex Systems, Defense Systems, Knowledge Management, Requirements, Model Based Conceptual Design, Infrastructure, Transportation and Resilient Systems. There are over 40 working groups. And that is only the technical part of the IW. There are also groups working to improve the administration, communications, operations, certification, and many more aspects of the "business" of INCOSE.

To a certain extent it is unfortunate that there are formal working groups. They take too much time from the informal and chance meetings at lunch and the social events. These chance meetings really promote the sharing of ideas over the multiple disciplines of systems engineering application. The relaxed atmosphere at these events helps in the sharing of ideas as well.

The Working Group Bazaar was not really effective, as most of the charts said the same thing, only changing the name. I would have much rather seen one result, in summary form, per chart that would entice attendees to become involved.

The disadvantages and advantages of the IW are the same: too much to see, do, and be involved in and too little time. Many of the sessions were recorded and will be made available on the INCOSE website for more leisurely review. Keep an eye out for them and spend a bit of time seeing the other sides of our profession.

Perhaps the greatest advantage of the IW is that if you haven't settled on your "passion" within systems engineering, you can sample many subfields to find it. Once you do, there is an established community to feed your need.

See you at IW15.

Dick Emerson is a retired Senior Systems Engineer. Dick worked for the Jet Propulsion Laboratory for over 45 years, primarily on the Deep Space Communications System. Dick is active in the Chapter, especially as a leader of recent INCOSE-LA–hosted conferences. He served as chairman of the 2010 conference and technical chairman for the 2009 and 2013 conferences.

("Too Risky," continued from page 2)

- Success can be measured against goals
- Goals carry different values for different stakeholders, and of course, setting and managing stakeholder expectations is part of managing risk.

In summary, engineers base critical decisions on pre-quantitative conceptions of risk. Unknown unknowns are critical, and "pre-quantitative risk" includes:

- Interactions among goals, design elements, environments, risks, and assessments of riskiness
- Broad view of uncertainty
- Ability to influence and accessibility of solutions impact judgments about the amount of risk
- Judgments on acceptability of risk are made qualitatively.

Team discussion can be used as a diagnostic as well as for interventions, Dr. Cooper noted, and visualization techniques can help develop shared understanding of risk.

Dr. Cooper concluded her presentation with some systems engineering implications.

- Acknowledge that risk is messy and takes time to understand
- Operate based on qualitative assessments
- Manage based on relative risk
- Ask what makes it "less risky" vs. "more risky," or more or less acceptable
- How team actions change the elements of the "sliders"
- Use "dysfunctions" as cues for interventions
- Circular meetings as opportunities for intuition building
- Same old discussion as an opportunity to create a story
- Familiarity, in which perception of risk changes without an actual change to system
- Quantifying as another perspective is a means, not an end
- Build shared mental models of the system and its risks
- Identify the components that contribute to risk and their interactions
- Model to quantify, make explicit
- Use graphics to capture and share views of interactions
- Understand "success" and "failure" from multiple stakeholder perspectives.

Dr. Cooper closed by quoting Peter Bernstein: "The revolutionary idea that defines the boundary between modern times and the past is the mastery of risk: the notion that the future is more than a whim of the gods and that men and women are not passive before nature."

Dr. Cooper has been an engineer at NASA's Jet Propulsion Laboratory for 26 years. Prior to joining JPL, she served as a Captain in the U.S. Air Force and worked in the Aerospace Industry. She currently leads the JPL Proposal Center, most recently serving as the Proposal Manager for the Mars Helicopter Scout proposal.

Overheard

"Systems Engineering does not need to be didactic"
(as in make moral observations).

Overheard

"Take action and volunteer: you get a chance to learn things you never knew you needed to know."

Dr. Cooper received her doctorate in Industrial and Systems Engineering from the University of Southern California, where she is a member of the Industry faculty. As a practitioner and researcher, she implements and studies systems to support knowledge sharing, innovation, and risk characterization, and has worked on multiple Mars missions. Her research has been published in *Management Science*, the *Journal of Engineering and Technology Management*, and the *International Journal of Knowledge Management* (IJKM). She reviews for multiple journals, serves as a track co-chair for the IEEE Technology Management Conference, and is a member of the editorial board for the IJKM. At the root of even the most quantitative assessments of risk lies human judgment.

("Report from the IW," continued from page 1)

working group; Josh used some ideas from this discussion in a recent research report.

In terms of accomplishments, the IWG:

1) advanced the state of its manual, "Systems Engineering and Infrastructure."

2) settled on an MBSE application to help build the model and made initial refinement attempts of the model (they needed about a week to work on this as a team to really progress).

3) learned about infrastructure systems engineering in the Netherlands and Australia, based on a presentation by representatives from those countries.

Josh did not have much time for networking but did join a tableful of attendees from the Los Angeles Chapter, an event in its own right with good company, good food, and an interesting conversation about the amygdala—right-brain versus left-brain based people. In response to the question, "what did you take away?" Josh wryly answered, "It's what I left behind: my book." Josh did appreciate the takeaway of growing friendships with colleagues.

Josh concluded that INCOSE is an exceptional organization, in which a member can perpetuate his or her professional growth—a great promoter of both diversity and unity. Josh's recommendation about the IW or INCOSE for those who did not attend? "Find your team or teams—the ones that are a completely natural fit for you. Settle in, stay involved, and never quit. Keep a consistent commitment to the team's goals and never give up."

Joshua "Josh" Sparbar is a longtime member of the Los Angeles Chapter of INCOSE. Hailing from Orange County, Josh has worked for the Defense Contract Management Agency and has been an active member, frequently participating in both Chapter activities and INCOSE Working Group meetings and INCOSE symposiums. Josh has contributed previous articles to the Newsletter. —The Editor

The Board of Directors wishes to welcome the following new members to 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 or Organization**
Marjory Bernard	Terminal Engineering Lead	Leidos
Raymond Hill	Naval Aviator / Officer	United States Navy
Timothy Haile		Michael Baker Jr., Inc
Charles Weissman		Los Angeles Metro
Kevin Ruble	Student	Cal Poly Pomona
Dr. Shokoufeh Mirzaei	Assistant Professor	California State Polytechnic University, Pomona
Isaac Oh	Junior Engineer	Booz Allen Hamilton
Helayna Roberts	Systems engineer 1	Northrop Grumman
Gintaras Snipas	Systems Engineer	Capstone Turbine Corp.
Dr. Gail Baura	Professor, Medical Devices	Keck Graduate Institute of Applied Life Sciences
Laura Monterey	Sr. Technical Writer	Lockheed Martin
Jim Booher	Engineering Fellow	Raytheon Systems Company
Nick Crossley		IBM
John Dong		Boeing
Arbi Karapetian		JPL
Douglas Terry		Aegis ITS
Geoffrey Rosenthal	Technical Sales Specialist	IBM
Philipp Stadler	Student	
Anas Almajali	Grad Student	Information Sciences Institute/USC
Devin Norrell	Aerospace Systems Engineer	USAF/AFRL
Kathy Kha	consultant	Galorath Inc
Robert Noel	Engineer	The Boeing Company
Dr. Neil Siegel	Sector Vice-President & Chief Technology Officer	Northrop Grumman Corporation

Stay Connected

Get the latest on INCOSE-LA happenings in the Reflector e-mails

If you wish to be placed on our e-mail distribution, contact Susan Ruth at *susan.c.ruth@aero.org*

The Los Angeles Economic Development Corporation

The Los Angeles Economic Development Corporation (LAEDC) hosted a meeting on Wednesday, March 19, 2014. The LAEDC is a variegated consortium of interest groups from governments, corporations, and academia working together to bring new jobs to the LA area and to protect those that exist.

Randy Garber gave a presentation to the meeting on the California Aerospace Industry Economic Impact Study conducted by A. T. Kearney. A brief report on the comprehensive study cannot do it justice; however, Randy made some telling points and provided some insights into the economics of aerospace in California. Commented Randy, "California's best kept secret: the impact of aerospace on the California economy."

A key insight is that California generated approximately $62 billion in aerospace revenues, representing 9 percent of the global aerospace market and 21 percent of the U.S. industry. The "aerospace market" includes the space industry (launch services, satellite manufacturing, ground equipment, engineering services, and satellite services) and the aircraft industry (aircraft; engines and parts; search, detection, navigation, guidance, and nautical [SDNGN] instruments; and maintenance, repair, and overhaul).

The statistics reflect a shift we have seen in Long Beach, Hawthorne, Burbank, and Palmdale: "aircraft" is a $182.4 billion market worldwide, but California has captured only 1 percent of the market ($1.8 billion). In terms of how the California pie is sliced, the 3 percent attributed to "aircraft" ranks eighth of the ten markets. The dominant market in California is "satellite services," weighing in at $29.5 billlion, and representing 49 percent of the pie. The closest second is SDNGN instruments, an "aircraft industry," with $7.3 billion in business and representing 12 percent of the California pie.

Keeping the aerospace business base we have and helping it grow poses some challenges. California continues to enjoy several sources of competitive advantage: companies with a strong global position, a highly skilled workforce, leadership of major segments, and a concentrated ecosystem of companies that enable opportunities for innovative collaboration. However, the industry also faces some competitive challenges and weaknesses: an anticipated decrease in government spending, tax and regulatory constraints, a rising cost of living for the workforce, and a high real estate cost that deters commercial investment.

California—ranked forty-eighth in terms of its "state business tax climate"—is one of the most expensive states for aerospace firms to conduct business in.

Randy's presentation included recommended actions and advocacies that could grow the aerospace industry—actions and advocacies that complement the goals and efforts of the LAEDC.

Randy Garber is a partner with A. T. Kearney Public Sector and Defense Services, LLC, in El Segundo. A. T. Kearney is "a global team of forward-thinking, collaborative partners that delivers immediate, meaningful results and long-term transformative advantage to clients." A. T. Kearney's offices are located in major business centers in thirty-nine countries.

2014 Board of Directors

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INCOSE-LA Chapter NEWSLETTER
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The International Council on Systems Engineering (INCOSE) is a not-for-profit membership organization founded to develop and disseminate the interdisciplinary principles and practices that enable the realization of successful systems. INCOSE's mission is to share, promote, and advance the best of systems engineering from across the globe for the benefit of humanity and the planet.
The Los Angeles Chapter meets several times per year for speaker meetings and, in addition, sponsors tutorials, mini-conferences and other activities of interest to those in systems engineering or related fields.

UPCOMING EVENTS

For more details on Chapter-sponsored events and registration, go to http://www.incose-la.org

Speaker Meeting
Date: Tuesday, April 8, 2014
Time: 5:30 p.m. – 9:00 p.m.
Ken Cureton speaking on network architecture
Cost: Free for members; $10.00 for non-members
See Reflector Notice in your email for details

Networking Event in Old Town Pasadena
Date: Thursday, April 17, 2014
Time: 5:30 p.m. – 8:00 p.m.
Bar Celona, 46 East Colorado Boulevard
Pasadena, California 91105
See details on page 5

Strategic Planning Meeting
Date: Saturday, April 26, 2014
Time: 9:00 a.m. – 3:00 p.m.
Location: S Café at the Northrop Grumman Space Campus
Redondo Beach
Cost: None; a buffet luncheon will be served
See Reflector Notice in your email for details

Speaker Meeting
Date: Tuesday, May 13, 2014
Time: 5:30 p.m. – 9:00 p.m.
Panel on Model Based Systems Engineering
Cost: Free for members; $10.00 for non-members
See Reflector Notice in your email for details