



NEWSLETTER



2002, 2004-14



2003



2008, 2012
President's Award
for Most
Outstanding Chapter



INCOSE International Symposium 2015

By Edwin Ordoukhanian

The International Council on Systems Engineering (INCOSE) celebrated its twenty-fifth anniversary in Seattle as a part of the annual International Symposium. From a graduate student perspective, being in such symposiums is a great opportunity to learn more about recent advancements and future visions in the systems engineering field. International symposiums give students a great opportunity to see practitioners and academicians from all around the world. It gives students great insight on what is being done and what has to be done in the future.

The keynote speakers brought additional insight and challenge to current development of the systems engineering. INCOSE President David Long's opening speech clearly defined the vision that should be achieved by the next generation of systems engineers. This can happen by supporting graduate students in local universities to actively participate in symposiums and conferences so as to better understand current challenges and further advances the field.

INCOSE-LA was well-represented at this historic event. Among the Chapter members in attendance were Professor Azad Madni, Professor Bo Oppenheim, Marilee Wheaton, Eric Belle, Stephen Guine, Terry Rector, and Phyllis Marbach.

(See "IS2015," on page 10)

August Speaker Meeting System Engineering Competencies for Space System Program Managers Wednesday, August 19, 2015

ABSTRACT:

Space system program managers lead extremely complex development programs and are the ultimate programmatic and technical decision makers. To be effective, they must have sufficient competence in program management, as well as systems engineering, so as to add the right people to the team, direct tasks, understand trades, assess risks, and manage results. To date, a description of systems engineering competencies which are specifically for program managers has not been defined, so it is difficult to develop and assess the systems engineering attributes necessary for program managers. This presentation leverages the Project Management Institute *Standard for Program Management*, the International Council on Systems Engineering (INCOSE) *Systems Engineering Handbook*, and the commercially available *FYI: For Your Improvement, a Guide For Development and Coaching, of Competence*. These publications, along with other research, will be used to define a comprehensive program manager competency model. The resultant competency description provides the competency names, description, and associated behaviors. This work fills a void in literature while unifying related source material and is useful in the selection, assessment, and development of space program managers.

(See "Speaker Meeting" on page 8)

More on IS2015 and pictures elsewhere in this edition!

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The International Symposium: Feedback from Chapter Members

The 2015 International Symposium was the most popular in over a decade with over 900 participants. The symposium featured a wide range of workshops, paper presentations, working group meetings, and an opening sessions each morning. One opening sessions featured an “ice breaker” to test the attendees acumen and their skills at texting. The Tuesday morning “ice breaker” was a challenge to rank five large projects in order of cost. The answers, in order:

International Space Station
Three Gorges Dam
Boston’s “Big Dig” (highway relocation)
Burj Khaliffa, (tallest building in the world, in Dubai)
The Panama Canal

The Los Angeles Chapter was as active as ever at this year’s International Symposium (IS2015). Several members of the Chapter participated in a wide variety of activities.

Awards:

Past Chapter President Beth O’Donnell was awarded an Outstanding Service Award in recognition of her years of distinguished service not only to the membership of the Los Angeles Chapter of INCOSE but also to the profession within industry and INCOSE. In addition to her tenure as Vice-president, President, and Past-president, Beth served two consecutive terms as Secretary. Beth continues to be active supporting the Board of Directors by working behind the scenes, providing invaluable inputs and solution, and by assisting in the production of the *Newsletter*. Beth has championed the systems engineering discipline both at work and in the Huntington Beach area.

Shirley Tseng was also awarded an Outstanding Service Award to recognize her years of distinguished service, not only to the membership of the Los Angeles Chapter of INCOSE, but also as an ambassador to many technical organizations to promote the profession of systems engineering. Shirley has selflessly dedicated himself to the cause of the members of INCOSE-LA, serving in many different positions on the Los Angeles Chapter Board of Directors. As a de facto ambassador, Shirley’s efforts and initiative have resulted in a number of joint efforts and events between INCOSE-LA and the other professional organizations.

Dave Mason, active in the local student divisions, was awarded an Outstanding Service Award to honor his service to the San Francisco Bay Area Chapter and for his accomplishments as Assistant Director for INCOSE Student Divisions. Dave’s passion and active support for Student Divisions has resulted in the establishment and continued vitality of student divisions throughout the Southwest.

The Chapter was awarded another gold circle award.

(See “More IS2015,” on page 4)

Systems Thinking Workshop

By Padman Nagenthiram

An all-day workshop on Systems Thinking was held on Saturday June 20, 2015. The presenter was Dr. James Martin. Dr. Martin is an enterprise architect and systems engineer working for The Aerospace Corporation. His role is developing solutions for information systems and space systems. He is founder and current leader of the INCOSE Systems Science Working Group and his book, *Systems Engineering Guidebook*, was published by CRC Press in 1996. Dr. Martin is an INCOSE Fellow and has received the Founders Award for his long and distinguished achievements. The workshop was on learning how to think about systems in a holistic manner and was aimed at engineers of all disciplines, managers, leaders and decision makers.

System Thinking has been touted as the “Fifth Discipline” in Peter Senge’s famous book by that name. However, this is usually limited to the use of systems coupling diagrams and system archetypes to help understand the nature of feedback and complex system behavior. James went well beyond this, presenting different Systems Thinking frameworks and tools to better see the “whole” solution to complex problems. This was supplemented by exercises after each topic, in which the participants were able to practice the systems thinking skills presented. The topics presented were:

- The Concepts of System and Holism as a Basis for Systems Thinking
- On the Use of Concepts and Principles for Improving Systems Engineering Practice
- How to Conceptualize Systems... Using the PICARD Theory
- Seven Samurai Framework for Holistic Appreciation of the Whole Solution
- Using the Knowledge Pyramid as a Framework for Modern Systems

In the first topic, James discussed “what is Holism”, “what is a System”, and “what is Systems Thinking.” He gave an abbreviated history of systems thinking. He also briefly described the traditional tools of systems thinking such as The Soft Systems Method, Casual Loop Diagrams, Stock and Flow Diagrams and “Systemigrams.” He also discussed the newer tools such as concept mapping, PICARD Theory, Seven Samurai and the Knowledge Pyramid. Dr. Martin then built on these to discuss in detail in the following topics.

In the second topic, “Concepts” and “Principles” were defined and contrasted. Concepts guide thinking and principles provide rules and norms and it was shown how together they provide the know-how to make consistent decisions. Concept mapping was introduced using an example of architectural concepts for a worldwide observational system. At the end of the topic, participants had the opportunity to do a concept map for a system of their own choosing.

(See “Systems Thinking” on page 10)

An expert with a hammer sees everything as a nail.

June Speaker Meeting Unleashing Big Space: Next Generation Applications with Small Satellite Advances

By Karen Miller and Karen Grothe

Pioneering efforts in small satellites are laying the foundation for the next generational leap in space applications. At the June 9, 2015 speaker meeting, David Barnhart, a professor at the Space Engineering Research Center (SERC) at University of Southern California (USC), discussed the challenges of aggregating small satellites. He started his career at a rocket propulsion lab in the desert and worked for the Department of Defense's Defense Advanced Research Projects Administration for over three years. SERC, where David works now, is part of the USC Information Science Institute in Marina Del Rey and the Astronautical Engineering Department, which is located on campus. It is an engineering teaching center with graduate students, researchers, and interns based on a model like teaching hospitals with representatives from both industry and academia participating. David mentioned many areas of research at SERC, areas such as Aeneas, a microsatellite project, and Leapfrog, a lunar lander flown by jet engines that students can fly for experiments. The center also has a dish antenna that locates satellites, a high altitude thermal vacuum chamber, and a rocket propulsion laboratory where students can get "hands-on" experience with the hardware.

CubeSats are small, low cost satellites which have low resolution due to the constraints of physics. In his research, David has explored using cellular morphology to build spacecraft on-orbit to reduce the aperture mass of large spacecraft. Static and dynamic aggregation of small spacecraft "cells" could be used on orbit, but quantifying the efficiency (and thus the cost) of connecting in space is difficult. Biological cells have infinite interfaces and leverage a medium, such as water or air, for mobility and control, but satellites have limited interfaces and no external stability, because they have nothing to push against. One solution could be cellular robots in different configurations to assemble in various interfaces. The cost depends on dimensional stability.

Another area of research is docking, rendezvousing, and transferring with limited area of contact. Contacting using lower amounts of energy for aggregation and standoff contact are some of the challenges. SpaceX's Dragon capsule is pulled into the International Space Station dock by an arm, for example. Potential techniques for first lowering the cost of first contact when docking include active Velcro with loops and hooks that move about, reconfigurable manifolds, a thin film wide strip sticky lasso, reconfigurable space robotics - Satbots which could merge satellites by robot, an electromagnetic funnel (essentially a "tractor beam"), or electrostatic contact balloon. Electrostatic rings with 9v batteries could create a magnetic field for wall crawlers. Many other ideas are out there, he explained, but they all need further study and funding.

2016 Regional Mini-conference

The leadership team of the 2016 Mini-conference is fully engaged in the preparations for the conference. Representatives of the chapters working on the conference met during the International Symposium in Seattle to get to know one another and to review the plans for the conference. The team consists of over twenty-five volunteers from the Central Arizona, Southern Arizona, San Diego, San Francisco Bay Area, and Los Angeles chapters. In addition, the INCOSE Student Division is participating in the conference.

A unique element of the team is the use of mentors. Veteran members of the team will mentor those are interested in learning about how to produce a conference by providing over-the-shoulder guidance as the person being mentors gets to learn "hands on." Individuals who are interested in participating should contact the Volunteers Manager, Karen Miller, at kamill888@aol.com. When contacting Karen, please share with her your area of interest and whether or not you are interested in participating in the mentoring program.

The team is working on the outreach to sponsors and exhibitors. In past mini-conferences sponsors and exhibitors have been an important element of the success by being able to display their products and to meet systems engineering professionals while helping defray the cost of the conference.

**FRIDAY AND SATURDAY
APRIL 8 AND 9, 2016
AT LOYOLA MARYMOUNT UNIVERSITY
CALL FOR PAPERS COMING SOON**

The theme for the conference is: Systems Engineering — One Discipline Global Value: Fundamentals, Applications and Innovation.

The technical team is developing topical areas and subjects of interest to the engineering community. Agile, biomedical, systems thinking, resiliency, bid data analysis, and critical and complex systems were discussed as the primary candidates.

The team is setting up a website that those interested can use to learn more about the conference and how to participate with the call for papers being one of the first milestones. The link is in work at press time, but the Chapter website (<http://www.incose.org/ChaptersGroups/Chapters/ChapterSites/los-angeles/chapter-home>) is available for interim updates as they are made.

For additional information as it becomes available, watch for reflector notices, check the Chapter website, and read future editions of the *Newsletter*.

Not a member? Join INCOSE!

Learn more about becoming a member by clicking on <http://www.incose.org/membership/valueofmembership.aspx>

INCOSE-LA Chapter NEWSLETTER

Vol. 13, Issue 4: August – September 2015

(More IS2015, continued from page 2)

Member Observations:

Scott Jackson, a frequently published member of our Chapter, took time to share his latest book, “Systems Engineering for Commercial Aircraft” (second edition), published by Ashgate Publishing in the United Kingdom. The first edition is now available in Chinese. The subject of Scott’s book is the adaptation of the systems engineering process to the commercial aircraft domain.

While at the Symposium, Scott attended the Resilient Systems Working Group meeting and met with his Embraer aircraft colleagues.

Eric Belle and Jorg Largent participated as mentors. Mentoring has become an annual activity at the symposiums. Mentoring has two goals. One is to help people unfamiliar with the symposium find their way around the symposium. The other is to answer questions that a neophyte might have with respect to the systems engineering process.

Chapter member Josh Sparber shared his observations of the symposium. Josh was active with the Infrastructure Working Group and their new interest in the Global Water Energy Network (GWEN).

GWEN had a meeting on Tuesday with leading representatives from the Energy, Transportation and Infrastructure WG. The purpose of the meeting was to create the Critical Infrastructure Working Group (CIWG). The purpose of the CIWG is to galvanize people into becoming involved in solving a major world problem: protecting our infrastructure against electromagnetic pulses, starting with the United States. The thesis Josh is working on for a degree from University of Denver is involved in solving a segment of that problem. He plans to present his thesis to the GWEN meeting in Colorado at the end of September, 2015.

The group will be actively seeking interested system engineers and other interested parties with possible access to decision makers who can act on the group’s recommendations. Josh also contacted Mathew Hause, the master SysML modeler for the IWG. Mathew, aside from conducting tutorials on System Modeling, also attended the CIWG.

Josh also coordinated with Alain Kouassi, IWG, chair on handing out the five tri-folds on explaining systems engineering to the construction industry. These have been and are being accepted as INCOSE products.

On the social front, Josh particularly appreciated the Boeing Museum of Flight, a museum that is built around the “Old Red Barn,” the first Boeing facility. The Old Red Barn had been moved across a street to its current location and then restored. At one time it contained artifacts from the aircraft design and manufacturing industry of one hundred years ago. A large building and outdoor display have artifacts that cover the gamut of aerospace from before World War I to Skylab, the moon and beyond.

An academic perspective from the University of California Davis: Confederated better than federated because eventually everyone gets the information
For the first time it possible to use establish theories and methodologies to better understand how university culture responds and evolve

A “Best Paper” award was given to the paper titled “when two sis good company but moe is not a crowd.” The presentation addressing a different perspective based on “Graves’ Value Systems” or “Graves’ Levels,” presented by Jennifer Russell and Andrew Picard. Jennifer and Andrew deftly merged the eight levels with systems engineering:

1. Survival
2. Tribal: cohesive, one leader
3. Power :all about power – hero chief engineer; ideal person for crisis; they want to get on with; no necessarily
4. Truth: likes laws, rules, processes, governance, the process does the thinking not the person; a lot of that here at IS15; process is more important than success
5. Achiever: success focus; acquirer; every level is a sum of the predecessors; Systems engineering begins at this level; 4 to 5 transition is toughest
6. Collaborative development: the needs of the many outweigh the needs of the one; because they are good at listening and collaborating; so good they don’t want to stop
7. Systems thinking: knowledge is power respect competence, reject ignorance prone to analysis paralysis
8. Global thinking: it is only by consensus that we can solve the world’s problem.

Jennifer noted that how one speaks to an individual, based in the Graves’ model, will makes one’s language more effective, but cautioned, “Don’t talk about Graves, just take advantage of it.”

On Friday members (and Boeing employees) Beth O’Donnell and Phyllis Marbach helped facilitate the Boeing VIP Factory Tour. The tour provided an opportunity for an up-close, floor-level visit to the production process for wide body airplanes at the Everett, Washington manufacturing center. The tour highlighted the history of the factory, the largest building in the world, from the 747 to the 787. The tour featured the moving assembly line for the 777. Over 30 people went on the tour. Boeing employee Liam Nedredd led the factory tour and was full of interesting facts and information. An added attraction was a tour of the flight line narrated by the bus driver (Bob), and a stop at the nearby Boeing Store at the Future of Flight Aviation Center before heading back to the conference hotel. Phyllis kept everyone entertained and engaged on the 30 minute bus trip (from Bellevue to Everett) with a Jeopardy-inspired trivia game, giving miniature candy bars to those giving correct answers [pictures on page 9].

The members who attended found the symposium to be rewarding and educational. The food was excellent. The exhibitors had many interesting and informative displays. As an aside, Caltech’s rubber-band-propelled foam rocket replaced Georgia Tech’s WD-40 and duct tape engineering kit as a popular trinket. Future events to which INCOSE members can look forward are the International Workshop 2016 in southern California and the International Symposium 2016 next summer in Edinburgh, Scotland. In the interim, INCOSE-LA Chapter members can participate in Working Groups as well as local tutorials, networking events, speaker meetings, and work shops.

International Council on Systems Engineering Central Arizona, Southern Arizona, San Diego, San Francisco Bay Area, and Los Angeles Chapters

are proud to present

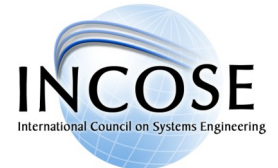
The 2016 Regional Mini-Conference
This Year's Theme:

*Systems Engineering
One Discipline/Global Value:
Fundamentals, Applications, and Innovation*

UNDER CONSTRUCTION
CONTENT WILL BE AVAILABLE SOON

To be Held at Loyola Marymount
University near the ocean in Los Angeles
Two days: Friday and Saturday, April 8
and 9, 2016

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Systems Engineering

October 5 - October 9, 2015	Las Vegas, NV
December 7 - December 11, 2015	Las Vegas, NV
February 8 - February 12, 2016	Las Vegas, NV
April 25 - April 29, 2016	Las Vegas, NV
August 22 - August 26, 2016	Washington, DC

Systems Engineering Management

December 7 - December 11, 2015	Las Vegas, NV
March 14 - March 18, 2016	Las Vegas, NV

Requirements, OCD & CONOPS in Military Capability Development

October 19 - October 23, 2015	Chantilly, VA
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Requirements Analysis & Specification Writing

August 24 - August 28, 2015	Seattle, WA
October 26 - October 30, 2015	Boston, MA
January 25 - January 29, 2016	Seattle, WA

Human Systems Integration

October 26 - October 30, 2015	Las Vegas, NV
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Upcoming Deliveries

July 6 - July 9, 2015	Las Vegas, NV
August 17 - August 20, 2015	Austin, TX
September 28 - October 1, 2015	Detroit, MI
October 12 - October 15, 2015	San Francisco, CA

November 16 - November 19, 2015	Chantilly, VA
December 7 - December 10, 2015	Los Angeles, CA
February 8 - February 11, 2015	San Diego, CA
February 22 - February 25, 2015	Las Vegas, NV

Register today at: www.certificationtraining-int.com

(Speaker Meeting, continued from page 1)

BIOGRAPHY:



Al Hoheb is a Principal Engineer at The Aerospace Institute, the educational division of The Aerospace Corporation, a Federally-funded research and development center leading high profile learning projects. Mr. Hoheb has over 30 years of systems acquisition experience across 30 satellite system acquisitions. He joined The Aerospace Corporation in 1987, worked in the corporation's matrixed engineering group, moved to direct customer support for several space system program offices, worked architecture, specification and request for proposal/source selections as part of the Corporate Chief Engineer's Office and most currently develops engineering workforce development at The Aerospace Institute. He works across the government space community on space workforce competency development, defining competency goals, curricula and courses for systems architects, systems engineers as well as program and project managers. He personally instructs in space systems engineering, mission assurance, acquisition, project management and risk management. He has delivered professional papers and workshops to INCOSE, the Systems Engineering and Risk Conference, the AIAA Space Conference and others. He is a guest lecturer for several universities. Mr. Hoheb has earned a B.S. Biology, Bachelor of Electrical Engineering, Master of Electrical Engineering, and respectively from the State University of New York at Plattsburgh, Worcester Polytechnic Institute, and the California State University at Fullerton. Mr. Hoheb enjoys warm waters, being outside, and has active interests in real estate and stock investing.

PARTICULARS:

WHEN: Wednesday, August 19, 2015

TIME: 5:30p.m. — 8:00p.m. Meeting Schedule:

5:30 – 6:20 p.m. Registration,, Networking, Refreshments

6:20 – 6:30 p.m. Welcome and Announcements

6:30 – 8:00 p.m. presentation followed by questions and answers.

COST: Members and non-members: FREE for this event.

(Non-members are usually requested to make a suggested donation of \$10.00 at meeting sites when/where refreshments are provided, to cover the cost of refreshments.) Refreshments will be provided at the host site.

REGISTRATION: Please register on-line. Registration requirements vary by site.

WHERE:

Host site:

The Aerospace Corporation

200 N Aviation Boulevard

El Segundo, California

Building D8 - Room 1010

See below for directions

Host — Susan Ruth, susan.c.ruth@aero.org,

Refreshments will be provided.

Host site registration requirements: register on line by Wednesday, August 12, 2015.

Remote sites and registration requirements:

Antelope Valley/Palmdale: open to all, coordinator: Mike Wallace (m.wallace@ngc.com)

Azusa: Northrop Grumman Corporation, coordinator: Louise Fluegeman or Maria Alvarez (louise.fluegeman@ngc.com or Maria.Alvarez@ngc.com)

Goleta: Control Point Corp, 110 Castilian, Suite 200, Goleta, California, open to all, coordinator: Don Adams or Paul Stowell (don.adams@control-pt.com or paul.stowell@control-pt.com)

Pasadena: Jet Propulsion Laboratory, 4800 Oak Grove Drive, coordinator: Michela Munoz-Fernandez (michela.munoz.fernandez@jpl.nasa.gov), registration required on or before August 19, 2015.

Huntington Beach: Boeing, *United States citizens and resident aliens only*, coordinator: Phyllis Marbach, (phyllis.r.marbach@boeing.com , of robert.noel@boeing.com) registration required on or before August 19, 2015.

San Fernando Valley: Capstone Turbine Corp, 21211 Nordhoff Street, Chatsworth, coordinator: Susim Gedam (sgedam@capstoneturbine.com), telephone 818-734-5113.

Remote Webcast Sites are not yet completely confirmed, but are listed below, the reminder will have the confirmed remote sites:

Virtual attendance for individual participants:

We are providing virtual meeting capability for this event so that those who might otherwise be unable to participate may do so. See the web page for this event on the INCOSE-LA website (www.incose.org/los-angeles) for more information on joining as an individual virtual participant.

DIRECTIONS to Host Site:

The Aerospace Corporation

200 N Aviation Blvd El Segundo California

Building D8 Room 1010

The host site is located between Imperial Highway and El to the north and Segundo Boulevard to the south, and between the 405 Freeway to the east and Sepulveda Boulevard to the west.

From the San Diego (405) Freeway heading SOUTH:

1. Take the exit towards El Segundo Boulevard.
2. Turn Left onto South La Cienega Boulevard.
3. Take the 1st Right onto W El Segundo Boulevard.
4. Take the 2nd Right onto N Aviation Boulevard.
5. Bldg D8 will be on the third building on the Right, just past the discount bakery.

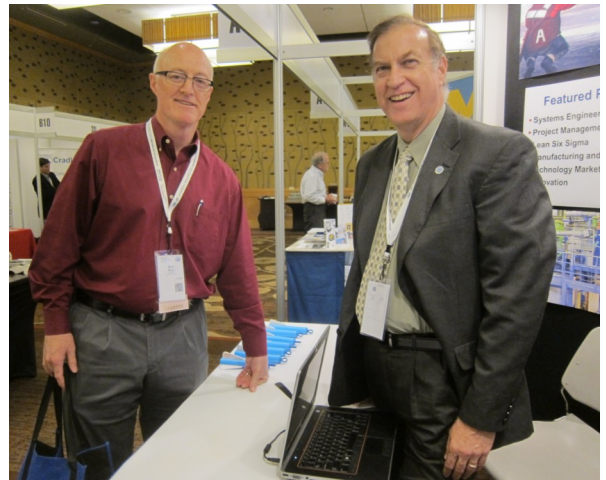
From the San Diego (405) Freeway traveling NORTH:

- 1 Take the El Segundo Boulevard exit, Exit 44.
- 2 Turn Left onto W El Segundo Boulevard.
3. Turn Right (North) on N Aviation Boulevard.
4. Bldg D8 will be on the third building on the Right, just past the discount bakery.

(See "directions, + continued on page 10)



At right, the IS participants on the Boeing VIP Factory Tour. Above, Phyllis Marbach entertains the participants with a “quiz show.”



At left: Paul Schreinemakers and INCOSE-LA President Stephen Guine Above: INCOSE-LA Director of Communications Bob Noel and Director of Programs Dr. Rick Hefner at the Caltech exhibit

2015 Board of Directors

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INCOSE-LA Chapter NEWSLETTER

Vol. 13, Issue 4: August – September 2015

(IS2015, continued from page 1)

Other Chapter members in attendance were Josh Sparbar, Dick Emerson, Jorg Largent, Beth O'Donnell, and the author.

Professor Madni presented a paper with his Boeing counterparts on Wednesday that was exceptionally well-received. Professor Oppenheim was recognized as INCOSE Fellow during Monday's plenary session. Professor Madni was his nominator. During Tuesday's plenary session Beth and Shirley Tseng (who could not attend) were recognized for their outstanding service to INCOSE. Past-president Eric Belle had nominated them for the awards. On Tuesday evening, the INCOSE-LA soiree drew a crowd and a good time was had by all.

On Friday the first cohort started its two year program in the INCOSE Technical Leadership Institute. There were 25 attendees from all across the world in the first face-to-face workshop. The workshop was designed to let attendees assess themselves and identify their weaknesses as technical leaders and try to come up with strategies to conquer their weaknesses. The group's next face-to-face workshop will be at INCOSE International Workshop 2016 in Torrance, CA. A new cohort will start their journey in the Technical Leadership Institute in INCOSE International Symposium 2016 in Edinburgh, Scotland.

[Edwin Ordoukhanian is president of the Student Division at the University of Southern California, and attended the IS2015 as the guest of the Los Angeles Chapter. Ed.]

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

(Directions, continued from page 8)

From the 105 Freeway traveling WEST:

1. Take the exit towards 405 South
2. Before getting onto the 405 Freeway, take the El Segundo Boulevard exit.
3. At the bottom of the ramp, turn left (west)
4. Turn right on Aviation Boulevard.
5. Bldg D8 will be on the third building on the Right, just past the discount bakery.

The facility: It is the third building from the corner of Aviation Boulevard and El Segundo Boulevard, just north of the discount bakery outlet. The facility has four gates, but only the southern-most gate is open. There is staff security where you will identify yourself as attending the INCOSE meeting. You can park where security directs you to park. We will badge in through the lobby at the center of the building where the flag poles are. Knock on the first of the double doors and someone will open the door for you. The handicap ramp is on the north side and can be reached by driving all the way around the back of the building. Tell security that you need to use that ramp.

(Systems Thinking, continued from page 2)

The PICARD Theory views a system as a sum of Parts, Interactions, Context, Actions, Relationships and Destination. It avoids the common misconception that a system is simply the sum of the parts. Furthermore it helps you select the six constituents carefully. It helps you see the whole system by viewing the system from the point of view of different observers. Thus for example an operator, a user, the architect and a developer may view the same system differently. This was illustrated using the example of the same observational system used in topic 2. This leads to a holistic image of the system.

The Seven Samurai gets its name from the famous Japanese film by the same name made in 1954. It is a tale of heroism and sacrifice where Samurai warriors are hired by a Japanese village to protect against a band of marauding thieves. Again it helps you see the whole system by seeing it as seven interrelated systems. First there is the Context System which the problem is part of. Secondly, there is the Intervention System which is usually the "System of Interest" that will be developed to meet given requirements of the problem. Thirdly, there is the Realization System which is needed to understand the problem within the Context System. Then there is the Deployed System which is often different from the "as-designed" system. The other three systems that need to be considered are the Collaborating System, the Sustainment System and the Competing System. There are fifteen interactions between these systems which were also explained. Too often systems engineers focus too much on the Intervention System.

In the final topic, James showed how the Knowledge Pyramid helps you understand how systems convert data into information that is used for the discovery of knowledge to be used in making better decisions. The Knowledge Pyramid consists of Signals, Data, Information Knowledge and Wisdom with Signals at the bottom of the Pyramid. Different tools may be needed to address these five different modeling domains. For instance the tool "Trous Architect" may be used in the Enterprise Domains of Wisdom and Knowledge while tools such as Opnet, Rational Rose and Popkin System Architect may be used in the System Domains of Information, Data and Signals.

These tools also may overlap across some of the Domains. An example of an Enterprise Architecture from the NASA Earth Science Program was used to illustrate this process.

James concluded by saying Systems Thinking is hard but is necessary to see the whole system. However, it is made easier with good tools and methods that are enabled by good systems principles and concepts.

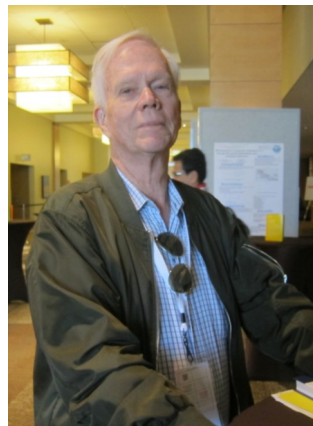


Caltech took flight at the International Symposium

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
Jacqueline Wyrwitzke		Aerospace
Joseph Krause	Student	USC
Michael Wallace		
Duane Akerss	Senior Technical Leader	Boeing, Test & Evaluation
Amand Lim	Student	
Patrick Weydt		Diabetes Group
Jochen Hom		R&D
Christi Gau Pagnanelli	Director of BDS SE and EMSL	BOEING
Masafumi Kawakami	Assistant Chief	ASAHI Breweries
Yee Chang		USC
Nicolas Veau		
Sarvani Grandhe		R&D
Robert Rimmer		Stellar Solutions, Defense Sector
Michael LaSorda		
Chirag Shah		BSCI
Jesse Glazer		
Nawapom Phongpatanakhun		
Elisha Porat		Northrop-Grumman
Hung Tran		Northrop-Grumman
Keith Turcot		
Aleksander Zadrozny		Northrop-Grumman
Gamer Kesheshe		
Arvind Ramesh		
Satoko Yoshima		Northrop-Grumman
Reza Ahmadi	Dr.	
Michael Ubowski		Electronics Systems



At left: Transportation Working Group Member Jennifer Russell with fellow working group member and Los Angeles Chapter member Mike Krueger. Center: author Scott Jackson. At right: Loyola Marymount's Dr. Bo Oppenheim

INCOSE-LA Chapter NEWSLETTER

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Forwarding Service Requested

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

System Engineering Competencies for Space System Program Managers

Presenter: Al Hoheb, Principal Engineer, The Aerospace Institute

Date: Wednesday, August 19, 2015

Time: 5:30 p.m. to 8:00 p.m.

Location: *The Aerospace Corporation
200 N Aviation Boulevard, El Segundo, California*

See article on page 1 for details

Networking Event

Networking and Bowling

Date: Wednesday, August 26, 2015

Time: 5:30 p.m. to 8:00 p.m.

Location: *Bex Bar and Grill – Underground Bowling Lounge
706 W Lancaster Boulevard, Lancaster, California*

Work shop Saturday in October

Speaker Meeting

Body of Knowledge and Curriculum to Advance Systems Engineering (BKCASE)

Presenter: Dr. Barry Boehm

Date: Tuesday, September 8, 2015

Look for a Reflector Notice in your email or check the Chapter website for more details

Strategic Planning Meeting

Date: Saturday, September 12, 2015

Time: 9:00 a.m. to 2:00 p.m.

No Cost, just bring your ideas

Location: Northrop Grumman S Café, Redondo Beach

Look for a Reflector Notice in your email or check the Chapter website for more details

Regional Conference

Date: Friday and Saturday, April 8 and 9, 2016

Location: Loyola Marymount University

Look for a Reflector Notice in your email or check the Chapter website for more details

Call for papers coming soon!