

MEMBERS NEWSLETTER

June 2017 - Q2



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President's Corner

Alan D. Harding, alan.harding@incose.org



Old and New

Most of the time, we are talking about the future – the INCOSE Systems Engineering Vision 2025, our vision, and mission, and how we are addressing our strategic objectives. That is great and the right thing to do, but in this newsletter, I wanted to look back and highlight some of the world-class publication content that every individual member and CAB employee can access. I have picked one example “gem” from each source to illustrate what you might find. All these links work when you are logged into Connect at www.incose.org.

The [INCOSE International Symposium library](#) holds papers on all symposia dating back to Chattanooga, US-TN, in 1991. It contains a wealth of insight, and diverse views on systems topics. International Symposium papers do not just reflect the orthodox view of systems approaches; you will often find thought-provoking material that is relevant years later.

- The example I have picked is Marvin Talbott's 1993 paper on “[Why Systems Fail](#)” – a practical view of seven underlying principles that contribute to numerous generic system failures.

[Systems Engineering](#) is INCOSE's technical journal. Authors publish peer-reviewed papers in both themed and open issues up to six times a year by our partners Wiley under the editorship of Oli de Weck. Systems Engineering's first publication was in 1998.

- Eric Honour's 1998 article on the [History of INCOSE](#), which takes us, all the way back to the origins of the society and filled in a lot of background, was new to me.

[INSIGHT](#) is the INCOSE Practitioners Magazine, first published in 1993 and publishes four times a year. Bill Miller edits INSIGHT. For me the strength of INSIGHT is its themed issues, which each provides a powerful and attractive resource for a key systems topic.

- Showing open partiality I am using the Oct 2016 issue as my example as it focussed on [Systems of Systems](#) a subject close to my heart and a vital part of addressing today's systems challenges. This special edition includes 16 articles from authors in all three INCOSE sectors and multiple application domains and is an excellent resource for practitioners and academics alike.

[JET](#) – The Journal of Enterprise Transformation is a quarterly publication designed to provide a forum for original articles on trends, new findings, and ongoing research (both theory and application) related to enterprise transformation. Rahul C. Basole serves as the Editor-in-Chief for JET, published by Taylor & Francis. JET first published in 2011.

- Bill Rouse's 2011 article on “[Necessary Competencies for Transforming an Enterprise](#)” is well worth a read as it uses case studies to consider the complexities of transforming today's enterprises.

INCOSE uses webinars to share information about systems engineering and about INCOSE, and has established a significant [Library](#) of recorded webinars available to members. The main webinar series started in 2008 and there are almost 100 webinars available – in fact, our 100th webinar is days away, on June 19th!

- This milestone webinar addresses “Integrating Program Management and Systems Engineering” and the new book on the subject that is a product of INCOSE's collaboration with MIT and PMI.

The webinar library also includes webinars from INCOSE working groups, with over 70 webinars on topics including MBSE, SOSE, and Agile systems engineering.

I would encourage all members to spend some time to explore these resources, see what you find, and highlight any hidden gems you find – why not tweet about it or post to INCOSE's Facebook page to tell others? Be sure to tag INCOSE - [@incose_org](#) and/or me, [@incosepres](#)!

INCOSE Elections 2017

Later this year we will hold elections for key roles in INCOSE's Board of Directors. If you know someone (or indeed are someone) with passion, experience, and commitment who would want to help lead INCOSE forward, then please talk to them and talk to our [Nominations & Elections Committee](#).

These roles are a great way to develop leadership and management skills in an international environment, and to continue your professional development. Speaking personally, my time leading INCOSE UK, and now INCOSE as a whole, has been both demanding and rewarding, and while like all of us I am still learning, I have already gained much from the roles across the whole range of competencies necessary to run an organisation. If you are able to play a part then I wholeheartedly encourage you to consider it.

All nominations for the 2017 elections close on the 15th of September 2017. The roles being sought this time are:

- President-Elect (4 year term – two years as President-Elect, two years as President)
- Treasurer (2 year term)
- Chief Information Officer (3 year term)
- Director for Outreach (3 year term)
- Director for Asia Oceania (3 year term - nominated and elected by the Asia-Oceania chapter presidents)

Are You Ready to go Down Under?



27th annual **INCOSE**
international symposium
Adelaide, Australia
July 15 - 20, 2017



Registration is open for this year's International Symposium in Adelaide, South Australia. Our theme is "Unlocking Innovation through Systems Engineering" and there will be the usual mix of keynotes, papers, panels, business meetings, and social events. This is your opportunity to engage with your colleagues from the global systems engineering community, learn about state-of-the-art methods and essential skills, and find out how people are making a difference with systems engineering.

I do hope that as many INCOSE members as possible will join me in the Adelaide Convention Centre for this flagship INCOSE event. I can promise it will be informative, challenging, and fun!

Notes from the Board

Rachel LeBlanc, marcom@incose.org

The Board kicked off their April meeting in Toulouse, FR with an opportunity to meet with the local French Chapter, AFIS. The chapter presented an overview of their recent accomplishments, work in process, and organizational structure. It was excellent to have the chance to hear from such an accomplished chapter!

The Board packed the days following the AFIS event with meetings that covered a wide variety of topics from the strategic direction of INCOSE to tactical housekeeping items. The Board provided updates on our strategic objectives and work being done to better support our chapters, followed by lengthy discussions on each topic.

President-Elect Garry Roedler introduced a global operations section to the agenda, which focused on understanding constraints and opportunities for running a global organization operating in six continents. The initial focus was on establishing consistent guidance and guidelines. Topics included individual

membership, publications, CAB, chapters, products, and marketing.

CIO Bill Chown provided an update on the IT infrastructure including the launch of the new INCOSE Store, recent updates to our Connect template, and future plans for the website. If you have not had a chance to check out the new store, we would encourage you to do so!

Appointments and Elections Update:

- The Board elected Tony Williams to serve as Americas Sector Director, replacing Steve Dam who stepped down for personal reasons
- Bob Kenley (Associate Director for Professional Development) appointed Marilyn Pineda as Assistant Director, Professional Development Integration

As a note, many of the Newsletter cover photos are from the Q2 BOD Meeting in Toulouse. We look forward to seeing you in Adelaide, Australia for the 2017 INCOSE International Symposium!

IT Update

Bill Chown, billchown@gmail.com

We are pleased to be able to introduce the new INCOSE product Store, accessible online now at <https://connect.incose.org/store>.

This store includes currently available products, and is accessible for non-members and INCOSE members, with products listed at the appropriate prices according to membership status.

When browsing the product entries, you may see a "Being an INCOSE member has its benefits. Join Now!" message. If you are an INCOSE member and access the store pages before having logged in, click "Sign In" at the very top right-hand corner of your browser page to gain membership access.

We will continue to expand the store contents, and to add features and more information, as we build out this capability. This new store will also be able to reference relevant systems engineering products that are not published by INCOSE and are hosted externally, offering a common starting point for exploring the available merchandise such as the College Publication Series referenced later in this newsletter.

This is just one of the many planned improvements to the INCOSE online content that the IT team is working to

deliver, and is continuing to grow. If you find anything in the INCOSE online resources that you have problems with, or that you think needs improvement, please let us know at <https://connect.incose.org/help>, where you can find many answers to commonly reported questions, or add a new item to our active issue tracking list.

Professional Development Update

Purdue Students Bring Talents to INCOSE

Bob Kenley, kenley@purdue.edu

To enhance INCOSE's professional development capabilities, INCOSE Fellow and Associate Director for Professional Development Bob Kenley leveraged the skills and dedication of a senior design team from Purdue University. The team consisted of Eren Bozbag, Ayush Jaiswal, Brent Malloy, Josh Moore, and Alex Perry.

The team began their work by attending INCOSE's International Workshop in Los Angeles to meet with INCOSE leaders and key stakeholders to brainstorm project ideas. From those discussions, the team decided to pursue a proof of concept for an online professional development portal for INCOSE that would allow users to track their progress towards achieving various competencies within systems engineering. The portal is called I-SELECT (INCOSE Systems Engineering Learning Environment for Career Transformation).

The goal of I-SELECT is to establish a comprehensive professional development capability that increases INCOSE membership, general awareness for systems engineering, annual revenue for INCOSE, and provides further value to INCOSE members.

The Purdue students' objectives were to combine the ideas and input of key decision-makers and customers to make recommendations for both the technical and business aspects of the portal. The team conducted three phases: Brainstorming, Technical Analysis, and Business Analysis to accomplish the goal.

During the Brainstorming phase, the team conducted a Blue Sky Phase effort to determine the ideal system with no constraints. The students then created a value stream map, which added limitations to the Blue Sky Phase results and identified the specific functions that increase the value to the users.

In the Technical Analysis phase, the Purdue team created a systems architecture to identify the main components of I-SELECT's infrastructure.

The senior design team then conducted a Hierarchical Task Analysis to determine the major features of the I-SELECT portal. Finally, the results of the Hierarchical Task Analysis were used to create User Interface Mockups that incorporated the major features of the proposed I-SELECT solution while maximizing ease-of-use and intuitive layout.

Finally, in the Business Analysis phase, the Purdue students conducted a market analysis and created a Business Model Canvas. The team leveraged research conducted by Dr. Nicole Hutchinson from Stevens Institute to refine their understanding of the systems engineering market demographics. The team also performed a pricing strategy analysis for major companies in the Online Education space, as well as known brands of educational suppliers and universities. This information fueled the creation of the Business Model Canvas- a systematic methodology universally used by entrepreneurs to identify the nine key functions of any business.

After the analysis portion, the team compiled their recommendations and presented them to INCOSE's Board of Directors. The team had recommendations for both the development and the implementation of I-SELECT. Regarding development, the Purdue students recommended that INCOSE focus heavily on building a brand by implementing the intuitive user interface design developed by the team, and by partnering with universities and educational suppliers that have a strong brand in engineering, science, and management. The second recommendation for the development of I-SELECT was to use a "Freemium" pricing strategy where courses would be free to users, but certificates or proof of course completion would come at a price. The team's rationale was that a "Freemium" model increases awareness for I-SELECT and systems engineering in general.

The Purdue team recommended that INCOSE use a phased implementation strategy where they collaborate initially with several universities with brand name

recognition and then slowly expand to additional educational suppliers over time. The second recommendation was to utilize services from an outside provider already providing online education and training that has a more extensive reach than INCOSE with professionals worldwide. The Purdue students hope that their recommendations will allow I-SELECT to advance INCOSE and systems engineering around the globe.

INCOSE leadership was delighted with the progress that the students made and with their innovative recommendations. The Professional Development Steering Group and the Board will be following up to understand how to take full advantage of the students' work and achieve INCOSE's strategic objective to team with industry, government, and academia to raise systems engineering competency.

Editor's Note: A huge thank you to Bill and Bob for updating us on IT and Professional Development within INCOSE! We encourage each Director to share their news quarterly. The next deadline for content is just around the corner on August 15th, and we'll all want to hear the news from Adelaide - home of IS 2017!

Check out the [Purdue University INCOSE Student Division](#), advised by Dr. Bob Kenley if you haven't already, they continue to make meaningful contributions to INCOSE.



Photo 1. INCOSE Purdue University Student Division hosts a panel session on systems engineering.



27th annual **INCOSE**
international symposium

Adelaide, Australia
July 15 - 20, 2017



Unlocking Innovation Through Systems Engineering

Engage with Colleagues from around the World!

Learn about state-of-the art methods and skills.

Find out how people are making a difference with Systems Engineering.

Keynote speakers

Plan to be stimulated and challenged by the experts!

AVM Mel Hupfeld

Head Force Design, Australian Department of Defence

Dr Tomohiko Taniguchi

Special adviser to the cabinet of Prime Minister Shinzo Abe

Paul Nielsen

Director and CEO, Software Engineering Institute, Carnegie Mellon University

Bill Murtagh

National Oceanic and Atmospheric Administration (NOAA)

Program Highlights

101 papers, **28** poster/short presentation papers, **12** panels, **8** tutorials

Topics

Acquisition & Supply - Agile SE - Architecture - Automotive - Biomedical & Health - Complexity Science - Digitalization - Energy - Government, Defense & Security - Human Factors - Leadership - MBSE - Modeling & Simulation - Process - Project Planning - Requirements - Resilience - Risk & Opportunity Management - Small Systems - System Dynamics - System Integration - System Safety - Systems Science - Systems of Systems - Systems Thinking - Teaching & Training - Transportation - Verification & Validation

Workshops and more

MBSE – Professional Development & Education – Systems Summit on Critical Problem Definitions
Practitioner Challenge, SE101, Mentor Challenge



Mark your calendar now!
July 15 - 20, 2017

With the support of



Crossroads of America Chapter

The INCOSE Crossroads of America (CoA) chapter joins the rest of great chapters across the nation with stellar monthly meetings and networking opportunities for members. On June 13, 2017 the chapter met at Roche Diagnostics in Indianapolis, IN with two presentations, as usual.

Presentation 1: Agile for Healthcare Systems Best Practices 2017

Applying Agile methodologies to software development is becoming commonplace. However, applying these methodologies to the development of multi-disciplined systems is relatively new in industry, especially in Healthcare. To help advance this state-of-the-art the INCOSE Healthcare Working Group (WG), in collaboration with regional chapters, started an annual workshop on Agile for Healthcare Systems. This presentation summarized key best practices that various organizations shared with each other during the conference. Permission was given to INCOSE to share these practices at INCOSE events, but sharing outside of INCOSE events would require permission from the cited authors.

Presenter: Mike Celentano, Roche Diagnostics, INCOSE Technical Operations Director

Presentation 2: Great Lakes Regional Conference 2017 Overview and Update

The INCOSE Great Lakes Regional Conference (GLRC) is an annual regional-level INCOSE conference that celebrated its 10th Anniversary in 2016. The GLRC has grown steadily since 2007. It has been hailed as an excellent model for INCOSE chapter co-operative conferencing efforts by INCOSE leadership at the international level. The GLRC is put on by the chapters of the Great Lakes Region of the America's Sector of INCOSE. One chapter serves as the host chapter. The North Star Chapter is the host chapter for the 11th GLRC taking place in October 2017 in the Twin Cities. The Crossroads of America chapter will be the host chapter in 2018. GLRC11 Chair Dave Walden gave a brief overview and update of progress and provided a preview of what CoA members can anticipate for next year.

Presenter: Dave Walden, ESEP



North Star Chapter of Minnesota

Contributed by Kendra Kreutz, kendrakreutz@gmail.com

Announcing the 11th Annual INCOSE Great Lakes Regional Conference (GLRC11)

Save the Date Oct 11-14, 2017

The participating chapters of the INCOSE Great Lakes Region invite you to join them for their annual conference hosted by the North Star Chapter of Minnesota, October 11-14, 2017 in Minneapolis, MN.

The planning committee is working on:

- Keynote speakers
- Technical presentations
- Welcome reception on Wednesday evening
- Celebration banquet on Thursday
- Tutorials and workshops on Saturday
- Opportunity to take the INCOSE certification exam

Watch for our call for proposals and other conference information on the GLRC11 website:

www.incosegreatlakes.org

Washington Metro Area Chapter

Contributed by Muhammad F. Islam, WMA Chapter President

The INCOSE Chesapeake and Washington Metro Area (WMA) chapters jointly hosted a paper based SEP exam session for CSEP and ASEP certifications at Johns Hopkins University Applied Physics Lab (JHU-APL) on Saturday May 20, 2017. Sixty-five candidates took the exam and more than 15 volunteers from the INCOSE Chesapeake and WMA chapters worked to arrange and proctor the test session.



Photo 1. All about Certification – the Chesapeake and WMA Chapters showed up to help more systems engineers become certified

Americas Sector Updates

Dr. Robert Edson of the MITRE Corporation presented at the INCOSE WMA chapter meeting on May 10, 2017. The title of his presentation was "Systems Thinking - The Benefit to the Systems Engineer."



Photo 2. Dr. Edson presenting to the WMA Chapter in May

Asia-Oceania Sector Updates

Australia - Systems Engineering Society of Australia (SESA) Report

2017 has gone off with a bang! The SESA Management Committee prepared an Annual Operating Plan for 2017 (AOP2017) and approved a budget to fund it. SESA is launching some major new initiatives all aimed at returning member value and advancing our mission "to share, promote and advance the best of systems engineering for the benefit of Australian organisations and community" as part of this plan. This article highlights the most important initiatives.

The National Speaker Program (NSP)

The SESA Technical Director, Charles Homes, has done an excellent job to launch the NSP. This program offers continuing professional development to members, providing quality eminent speakers, at the same time offering opportunities for local networking with like-minded professionals within SESA and the broader engineering community as a whole. This blend will supplement existing local meetings currently coordinated by there Regional Branch Lead, and complement SESA's keystone conference - Systems Engineering / Test & Evaluation (SETE) Conference, and the Australian System Engineering Workshops (ASEW).

Asia-Oceania Sector Updates

SESA utilises the facilities of Engineers Australia (EA) (SESA is a Technical Society of EA) in all of its state capitals, in conjunction with its videoconferencing network, to link together our members across the nation, who gather for local networking opportunities. There are four such NSP events scheduled throughout 2017.

The dates are:

- Mon 6th March
- Mon 29th May
- Mon 4th September
- Mon 11th December

At our first event, John Wall addressed SESA on, Transport for New South Wales (NSW) - "Connected vehicles – the hype, the potential, and the reality?" John talked about the world's largest live trial of cooperative heavy vehicles running in NSW. An engaging speaker, John delivered a fantastic presentation with videos showing just how quickly heavy vehicle accidents can occur, the devastating consequences, and unpacking the engineering behind the trial and future solutions.

Following, there was an update on the Chartered Australian Systems Engineering (CASE) initiative by Wayne Biden, CPEng CSEP.

Late in May Luke Brown from the Department of Defence – Capability Acquisition and Sustainment Group (CASG) talked to us about "The Role of Systems Engineering and the Vision for the Future Management of Engineering CASG."

EA is developing a new electronic platform, called Digital CPD (continuing professional development), that will enhance our NSP, and SESA is looking at options to utilise this to extend these opportunities to neighbouring chapters in the Asia-Oceania sector, that can share this live experience in similar time zones.

INCOSE International Symposium (IS 2017) Come on Down Under

Of course, all will be aware by now that Australia is host to the INCOSE International Symposium, IS 2017, in Adelaide, the 15th -20th of July. This is a once in a career opportunity to attend this world-class event. It will incorporate our SETE Conference and the Asia-Oceania Sector Conference (AOSEC). All papers undergo peer review, and the presentations come from only the best papers. Panels of systems engineering experts examined these papers before presentation designation. You will not be disappointed. So, tell your boss, and your peers, to get behind the INCOSE IS 2017 and promote it throughout your enterprise!

Chartered Australian Systems Engineer (CASE)

Last year SESA brokered a Mutual Recognition Agreement (MRA) between EA and INCOSE to establish rationalised pathways to chartered status as a systems engineer that awards the dual certification of CPEng and CSEP.

Asia-Oceania Sector Updates

Thanks to the excellent work of our CASE lead, Wayne Biden, the CASE program is now operational. Already, CASE held two INCOSE knowledge exams, and a dozen or so candidates began the dual certification journey. There will be a similar opportunity presented to take the INCOSE knowledge exam at the IS 2017.

Enhanced Management Services

SESA entered into an Enhanced Management Services contract with EA to provide a range of finance and secretarial functions. SESA is pleased to introduce Karen Barletta, admin@sesa.org.au who will be our point of contact to coordinate these services. She comes highly recommended.

This contract will hopefully also draw us closer to EA, to streamline some of these functions, maximising the benefits offered by our parent, and align with the intent of closer integration with the technical societies, which is the theme underpinning the current review being conducted by EA.

A wind of change is blowing, not just with staff and the SESA committees, but also across the membership. This change is increasing membership growth and more importantly, is evidenced in real inroads to the achievement of our mission.

Editor's Note: This report provides some great talking points and initiatives to explore with our INCOSE hosts when 'Down Under' at IS 2017!

India Chapter

Contributed by Geetika Purohit, Committee Member, India Chapter

Local Circle Events

INCOSE India Chapter had its first local circle event of 2017 in Pune, which was hosted by KPIT Technologies. Fifty engineers attended the event, representing various engineering organizations like KPIT, TCS, John Deere, and Eaton. Nikhil Joshi, Secretary – INCOSE India Chapter, provided a brief overview of INCOSE and activities planned by the Chapter to the attendees. The KPIT team talked about systems engineering at KPIT. There were focused discussions on MBSE and the degree to which different companies are adopting MBSE tools. Akshay Vidap from Capgemini talked about "Tool-agnostic Framework for Systems Engineering Implementation." It was a great learning and networking opportunity for individuals practicing systems engineering in various domains.



Photo 1: India Chapter – Pune Circle Event

India Architecture Working Group

The India Architecture working group (WG) witnessed increased participation in last few months. It received 98 comments from the seven reviewers who participated in the review of ISO/IEC/IEEE 42030 - Architecture Evaluation Elements. The editorial team accepted 80% of the comments. The comments adjudication is due a few weeks from now.

India Healthcare Working Group

The India Healthcare WG formed in November of 2016. The WG includes three members so far. The WG formulated the theme to work on medical devices product development in emerging markets. Please write to india-healthcare-working-group+noreply@googlegroups.com if you are interested in joining or knowing more about it.

Singapore Chapter

Diego Abas, Communications Chair Singapore Chapter

Launch of Singapore Rail Academy:

INCOSE signs a Memorandum of Understanding (MoU) with the Singapore Institute of Technology and Land Transport Authority

On February 23, 2017, the Singapore Institute of Technology (SIT) co-organized the launch of the Singapore Rail Academy (SGRA) and a Public Transport Awards Ceremony with the Land Transport Authority (LTA). The event included the signing of Memorandum of Understanding between SIT, LTA, and INCOSE for collaboration on building systems engineering capability.

Mr. Serge Landry, then the President of the INCOSE Singapore Chapter, representing INCOSE, signed the Memorandum of Understanding (MoU) between INCOSE, the LTA, and the SIT. The guest of honor, Mr. Khaw Boon Wan, Coordinating Minister for Infrastructure and Minister for Transport of Singapore witnessed the MOU signing.

The event was attended by about 350 guests comprising of senior representatives from government agencies and transport operators, SIT Senior Management, staff and students; industry representatives; award recipients from various institutions and organizations, and the media.



Photo 2: Mr. Serge Landry, then the President of INCOSE Singapore Chapter (far left) after signing the MoU

Eric Rebentisch, Editor-in-Chief

Integrating Program Management and Systems Engineering

Methods, Tools,
and Organizational Systems
for Improving Performance



WILEY

Asia-Oceania Sector Updates

INCOSE Singapore Chapter Annual General Meeting

The INCOSE Singapore Chapter held their Annual General Meeting (AGM) on March 22, 2017. The meeting included the election of the new chapter management committee for the period of years 2017 – 2019. Mr. Yip Yew Seng, the former President-Elect, automatically assumed the role of the new chapter President succeeding Mr. Serge Landry.

The new chapter management committee members are Dr. Liew Pak San as President-Elect, Mr. Tham Ming Wah as Secretary, Mr. Jean Lancelin as Treasurer, Mr. Ramesan Panicker as Programme Chair, Mr. Diego Abas as Communications Chair, Mr. Clement Lee as Membership Chair, while the voting members elected Mr. Serge Landry and Mr. Toh Meng Seng as Committee Members.



Photo 3. The newly elected Chapter Management Committee (2017 – 2019), from left to right: Mr. Toh Meng Seng, Dr. Liew Pak San, Mr. Diego Abas, Mr. Ramesan Panicker, Mr. Jean Lancelin, Mr. Yip Yew Seng, Mr. Serge Landry, Mr. Tham Ming Wah

MoU Signing with Singapore's National Trade Union Congress



The INCOSE Singapore Chapter also signed a MoU with Singapore's National Trade Union Congress (NTUC) to be a U Associate Partner. This MoU helps NTUC to best understand, promote, and develop systems engineering as a profession and its value in Singapore's professionals' ecosystem. As part of the MoU INCOSE can leverage NTUC's facilities and training resources, as well as connectivity of the U Associate community, opening doors for INCOSE society and our members to numerous opportunities across many sectors of the industry.

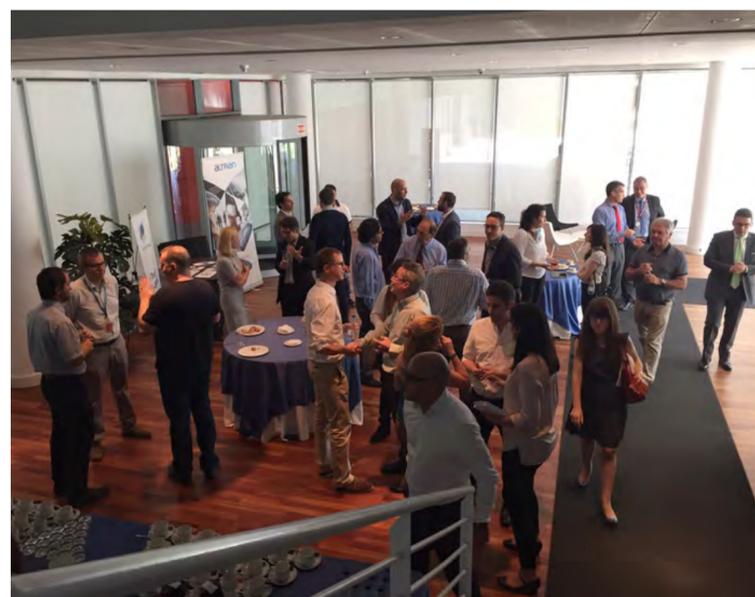
Photo 4. Mr. Yip Yew Seng, President of INCOSE Singapore Chapter (second from right) and Dr. Liew Pak San, President-Elect of INCOSE Singapore Chapter (far right), after the MoU signing with NTUC

Europe, the Middle East, & Africa (EMEA) Sector Updates

Contributed by Gauthier Fanmuy (AFIS), Carlo Leardi (AISE), Anabel Fraga (AESI), and Jean-Claude Roussel (EMEA Sector Director)

The South European Systems Engineering Tour (SESE 2017): a successful event!

For the 3rd time, INCOSE held the SESE (South European Systems Engineering Tour) in Europe. The SESE 2017 organization this year was a collaboration by the French (AFIS), Italian (AISE) and Spanish (AEIS) chapters of INCOSE and occurred in Paris (May 29th), Rome (May 30th) and Madrid (May 31st). The principle behind the systems engineering tours (as other systems engineering tours in Europe such as the Northern European Tour and the Air, Land, and Sea Tour) is to conduct a one day conference at different places with all lecturers. The purpose of the SESE is to promote systems engineering among practitioners and strengthen the links between the chapters. About 120 participants in total were attending SESE 2017 at the three locations. Several sponsors such as local corporate advisory board (CAB) companies including INCOSE (Jean-Claude Roussel, EMEA Sector Director was attending the event in Madrid) participated and joined the talks. Attendees had the opportunity to take the SEP exam for free this year with the participation of Courtney Wright. Nearly 50 attendees took the SEP Exam. This event reinforced the links between chapters in the EMEA sector and increased the communication between practitioners in the systems engineering profession.



More info: <http://sese.aeis-incose.org/>

Academic News

From The Academic Council of INCOSE

Thomas F. Gannon, tgannon@wpi.edu

Omega Alpha Association Systems Engineering Doctoral Dissertation Showcase

Contributed by Wolt Fabrycky, Omega Alpha Chairman Emeritus

The Omega Alpha Association (OAA) completed the first systems engineering dissertation recognition cycle during calendar year 2016. Three dissertations from three countries posted to the showcase as benchmark examples for dissertations being submitted during and beyond 2017. Please encourage applications, nominations, and declarations of intent to participate with guidance from the [OAA website](http://omegalpha.org).

Continuation of the Systems Engineering



Doctoral Dissertation Showcase (SEDDS) during and beyond 2017 will seek two exemplary dissertations, from two different countries. The OAA Board authorized a \$5,000 cash award for each exemplary dissertation, together with a certificate of Exemplary Recognition and an Omega Alpha Medallion.

Upon recommendation of the evaluation committee, and at the discretion of the OAA Board, dissertations chosen for final evaluation may receive Honorary Recognition. Cash awards are not yet available for these dissertations, but certificates and medallions will be. OAA is seeking cash awards for these honorary recognitions.

The Application and Nomination Deadline is July 31. Go to <http://omegalpha.org> for participation guidance.

Inauguration of the INCOSE Beijing Student Division at Tsinghua University

Contributed by David Mason, INCOSE Associate Director for Student Divisions

The inauguration took place at Tsinghua University, Industrial Engineering Department on Monday, 24th April, 2017 with twenty one students representing three universities. The dignitaries for the event included:

- a. Dr. Xinguo Zhang (President of INCOSE Beijing Chapter, Vice General Manager of Aviation Industry Corporation of China)
- b. Mr. Baozhu Guo (Academician of International Academy of Astronautics, Retired Deputy Director of China National Space Administration)
- c. Mr. David Mason (Principle consultant for Certification Training International, INCOSE Associate Director for Student Division)
- d. Dr. Lefei Li (Associate Professor of Tsinghua University, Industrial Engineering Department, and Vice Director of INCOSE Beijing Chapter, Advisor INCOSE Beijing Student division)
- e. Dr. Wang Chen (Associate Professor Tsinghua University, Advisor to the INCOSE Beijing Student Division)
- f. Ms. Huang TingTing, (PPI Marketing Manager, Asia)
- g. Ms. Jingbin Li (Senior Engineer Tsinghua University)
- h. Ms. Sijie Wang (President of the INCOSE Beijing Student division).
- i. Ms. Xuechun Dou (President-elect of the INCOSE Beijing Student Division)

The inauguration began with an introduction of the INCOSE China Beijing Student Division evening program by officers of the student division to those in attendance. Dr Lefei Li spoke of the value

of participation in the student division to the students in the audience. This was followed by a presentation by Dr. Xinguo Zhang on the importance of systems engineering within the Aviation Industry Corporation of China. David Mason, INCOSE Assistant Director of Student Division, gave a brief introduction to the students on the INCOSE organization and how each student represented the future in systems engineering.

After a few questions and answers to engage the audience with the inauguration and its value Mr. David Mason, the guest speaker for the inauguration, presented the topic: "Student Division 'Value Proposition.'" This topic began with a discussion on systems engineering and its use across all educational disciplines and professional domains. A couple of class examples using student experiences demonstrated the application of systems engineering. Mr. Mason also discussed how the students within the student division were to identify their value propositions by answering the 'what is in it for me' with an assigned measurement (metric) to quantify their achievement. These individual value propositions should be synergized for the student division and reviewed at selected intervals within the academic period to evaluate if the value propositions are being satisfied for all members. These are the metrics to determine the health and sustainment of the student division at Tsinghua and other student divisions. Although this student division includes students from nearby universities, they are encouraged to formulate a student division at their respective universities.

The evening concluded with handshakes with each of the students, professors, and university administrators in attendance at the meeting.

Mr. David Mason awarded Ms. Sijie Wang a Certificate of Approval for leading the inauguration the INCOSE Beijing Student Division (See Photo 1). Honored guests at the INCOSE Beijing Student Division Inauguration are pictured in Photo 2.



Photo 1. Mr. David Mason and Ms. Sijie Wang, President of the INCOSE Beijing Student Division with the INCOSE Certificate of Approval



Photo 2. INCOSE Beijing Student Division Inauguration honored guests (left to right and then front to back) Dr. Kaibo Wang, Mr. David Mason, Dr. Xinguo Zhang, Mr. Baozhu Guo, Dr. Lefei Li, Dr. Wang Chen

The audience at the inauguration included members of INCOSE staff, Vice General Manager of Aviation Industry Corporation (AVIC), and the AVIC Retired Deputy Director, Associate professors of Tsinghua University, Senior Engineers from Tsinghua University, Students from Tsinghua University, and Beijing University of Astronautics and Aeronautics (BUAA).



Photo 3. The first row (from left to right) -Dr. Kaibo Wang, Sijie Wang, Xuechun Dou (president elect of the INCOSE China Student Division), Mr. David Mason, Dr. Xinguo Zhang, Mr. Baozhu Guo

The second row (from left to right) - Mr. Jiasheng Zhang, Ms. Tong Xin, Ms. Huang TingTing, Ms. Jingbin Yan, Dr. Lefei Li, Dr. Wang Chen, Mr. Jiarui Zhang, Ms.Qian Wang, Ms. Qinghui Wu, Ms.Chen Zhang, and Ms. Sijia Sun

The third row (from left to right) - Mr. Jiahao Guan, Ms. Fengyi Sun, Ms. Xisi Liu, Ms. Linqi Chen, Ms. Ziwei Yang, Ms. Bing Han, Mr. Ouli Xian, Ms. Hao Dong, Mr. Fangyuan Li, Mr. Ganlin Zhao, Ms.Qing Shen, Ms. Xingyi Wang, Mr. Wenbin Cai

INCOSE Sponsoring Three Events at the 2017 ASEE Annual Conference & Exposition in Columbus, US-OH on 25th – 28th of June 2017

Contributed by Alice Squires, INCOSE Corporate Member Committee (CMC) Representative to ASEE, EWLSE Founder

The INCOSE Academic Council has three events they are sponsoring at the annual American Society for Engineering Education (ASEE) 2017 conference:

1) INCOSE CMC representative Alice Squires will be moderating a panel: “Perspectives on System Engineering’s Critical Role in Transforming Engineering Education Around the Globe” with speakers INCOSE Director of Academic Affairs, Ariela Sofer, BKCASE Editor-in-Chief Rick Adcock, INCOSE Academic Forum Research Advocate Tom McDermott, ASEE Systems Engineering Division board member Radu Babiceanu, and ABET Program Evaluator Satinderpaul Devgan.

2) INCOSE Director for Strategic Integration, Art Pyster, will be delivering a Distinguished Lecture on Wednesday, the 28th of June, from 9:45 to 11:15 in the morning: “Spice Up Every Engineer’s Education with A Pinch of Systems Engineering.”

3) Rick Adcock will also be leading a two-part workshop on “Integrating Systems Engineering: Foundations for First Year Students and Best Practices for the Capstone Experience” on Wednesday afternoon from 1:30 to 5:30.

Please send any questions or comments related to INCOSE activities with ASEE to alice.squires@wsu.edu.

INCOSE Participation in the ABET Symposium 2017

Contributed by Steve Sutton

INCOSE continued its involvement with ABET (formerly known as the Accreditation Board of Engineering and Technology). Through our membership in ABET, five INCOSE members participated in the 2017 ABET Symposium. Chris Davey, INCOSE member and Ford Motor Company CAB Representative presented, “The Role of Systems Engineering in Advanced Automobile Mobility Solutions.” ABET Executive Director and CEO Michael Milligan commented that it warrants a wider audience and would be a valuable contribution to the 2018 ASEE Symposium. Heidi Hahn, Eileen Arnold, Cliff Whitcomb, and Steve Sutton presented a panel session “Benefits of Integrating Systems Engineering Concepts into Engineering Curricula.” This panel reiterated what other speakers stated independently in a plenary and other sessions that engineers today need to exhibit a systems thinking (not necessarily the words used) and effective communicating and teamwork skills, all characteristics of an effective systems engineer. Apparently, others appreciate the attributes INCOSE values for systems engineers and see the benefit that all engineers have some of those same attributes. Additionally, ABET EAC (Engineering Accreditation Commission) General Criteria 3 and 5 have another iteration which is out for final approval by the ABET entities with the earliest approval by December 2017 and the earliest implementation for 2019-2020. These

criteria reflect INCOSE’s as well as other societies’ influence on improving the criteria for all engineering programs.

George Mason University Charters the Virginia Beta Chapter of Sigma Theta Mu

Contributed by Michael Vinarcik

Sigma Theta Mu is pleased to report that George Mason University has chartered the Virginia Beta chapter, bringing the count of chapters to five. We are working with a few other institutions and hope to add several more chapters by the end of the year.

Anyone wishing to establish a chapter may contact Michael Vinarcik at president@sigmathetamu.org.

Complete information about OAA may be found on omegalpha.org

Global Impact Enabled by the International Honor Society for Systems Engineering

Wolt Fabrycky, Founder and Chairman Emeritus of OAA,
woltfab@vt.edu

The Omega Alpha Association - Chartered in 2006

“Think about the end before the beginning,” from the philosophy of Leonardo da Vinci, is the Motto of the Honor Society for Systems Engineering. Chartered in the US-VA in 2006, the Omega Alpha Association (OAA) promulgates the interdisciplinary nature of systems engineering as briefly defined by the International Council on Systems Engineering (INCOSE), “An interdisciplinary approach, and means to enable the realization of successful systems.”



Systems engineering defined and described best for OAA purposes: A technologically-based interdisciplinary process for bringing systems, products, structures, and services (human-made entities) into being. While the focus is nominally on the entities themselves, systems engineering embraces an expanded strategy. Systems engineering inherently considers the end before the beginning and concentrates on what the entities will/intend to do before determining what the entities are, with form following function.

Omega Alpha identifies, recognizes, and honors individuals worldwide who have internalized and are promulgating the philosophy of Leonardo da Vinci; addressing the end before

the beginning. The designation, Omega Alpha, is appropriate. It derives from da Vinci thinking and emphasizes systems engineering as a process in service to humankind.

The Omega Alpha Association is the international honor society for systems engineering. It operates for the following “charitable” and “educational” dual purpose:

To recognize and honor truly distinguished academically inclined individuals through election to regular or honorary membership; and to celebrate quintessential contributions by individuals to the advancement of the art and practice of systems engineering, in accordance with the Omega Alpha motto.

OAA Very Unlike Honor Societies Within the Engineering Domains

Beginning with Tau Beta Pi for engineering in 1885, most disciplines of engineering in the United States have a cognizant honor society to recognize outstanding students studying at the undergraduate level - accomplished through campus-based chapters and a national office. Few of these honor societies have global mission or intent.

An incomplete list abstracted from the Association of College Honor Societies follows:

- Alpha Epsilon, AE (agricultural/biological engineering)
- Alpha Eta Mu Beta, AHMB (biomedical engineering)
- Alpha Nu Sigma, ANΣ (nuclear engineering)
- Alpha Pi Mu, ΑΠΜ (industrial engineering)
- Alpha Sigma Mu, ΑΣΜ (metallurgy/materials engineering)
- Chi Epsilon, ΧΕ (civil engineering)
- Eta Kappa Nu, ΗΚΝ (electrical engineering / computer engineering)
- Pi Tau Sigma, ΠΤΣ (mechanical engineering)
- Sigma Gamma Tau, ΣΓΤ (aerospace engineering)
- Omega Chi Epsilon, ΩΧΕ (chemical engineering)

In contrast, the Omega Alpha mission recognizes exemplary engineers practicing worldwide who embrace and are promulgating da Vinci-like thinking at the systems level.

From BOD to Charter Members (2005 -2006)

Five dedicated individuals constituted the founding Board of Directors (BOD) (that now numbers six). They are among fifteen distinguished professionals who agreed to serve as Charter Members of the Association. The Charter Members provide visionary international leadership, especially those serving on the BOD. These visionaries are: Erik Aslaksen (AU BOD); Manfred Broy (DE); Czeslaw Cempel (PL); Wolter Fabrycky (US BOD); Mary Good (US); Derek Hitchins (UK); Daniel Krob (FR); Yoshiaki Ohkami (JP); Donna Rhodes (US BOD); William Rouse (US); Andrew Sage (US); Stanley Settles (US BOD); Fei-Yue Wang (CN); Stanley Weiss (US

BOD); Wayne Wymore (US).

The Omega Alpha Association (OAA) incorporated in the Commonwealth of VA on the 10th of July 2006. The path forward is being determined by the living Charter Members listed. Sage and Wymore are deceased and Cihan Dagli replaced Settles. Dagli is now Chairman succeeding Fabrycky.

OAA Honorary Members (2009-2016)

Four Honorary Members in 2009, and then one each year have been named. With their acceptance, these individuals bring great honor to systems engineering and to practicing and future systems engineers worldwide. Counterintuitive indeed, but they honor us!

By name and year, these distinguished individuals are: 2009 - Augustine (US), Checkland (UK), Ramo (US), and Tsein (CN); 2010 Lui (SG); 2011 Seo (KP); 2012 Mulally (US); 2013 Forrester (US); 2014 Danielmeyer (DE); 2015 Mark (US); and 2016 Austin (US).

OAA in Academia (2011-2016)

During academic year 2010-11, we established the initial “OAA Presence in Academia.” This academic-centric initiative recognizes a few exemplary systems engineering doctoral programs worldwide.

We tendered invitations to ten individuals at five institutions in four countries, involving five major professors and five PhD scholars. The academic institutions and academicians are: University of South Australia - Stephen Cook; University of Southern California - Barry Boehm; Massachusetts Institute of Technology - Daniel Hastings; Technical University of Delft - Eberhard Gill; Technical University of Munich - Ulrich Walter.

OAA Full Members (2011-2016)

We first inducted full members in 2011 in conjunction with the OAA in Academia Initiative. The total number is now 22. Of these, 12 are from the US and 10 from eight other countries, namely: AU, CA (2), DE, IL, NL, SG, SE, and the UK (2).

Currently, OAA is composed of 50 individuals in total, representing 10 countries. Biosketches are posted on omegalpha.org.

Recognition by a Systems Engineering Doctoral Dissertation Showcase

During its tenth anniversary meeting in 2016 in Edinburgh, the OAA BOD authorized establishment of a Systems Engineering Doctoral Dissertation Showcase (SEDDS). Its legacy is a charter cohort formed from the five exemplary doctoral programs identified in 2011.

Three dissertations from three countries received the Exemplary Dissertation designation, and we showcase these under Exemplary Systems Engineering Doctoral Dissertations on the OAA web site. We posted these dissertations to the showcase as benchmark examples for dissertations submitted during 2017. The authors and countries are Simone D’Amico - NL, Andres Hein - DE, and Adam Ross - US.

The Application and Nomination Deadline for 2017

We completed the first Systems Engineering Dissertation Recognition Cycle during calendar year 2016. Applications, nominations, and declarations of intent to participate are being encouraged. Guidance is available from the OAA web site.

The SEDDS during and beyond 2017 will seek two exemplary dissertations, from two different countries in the interest of global distribution. The OAA Board authorized a \$5,000 cash award for each exemplary dissertation, together with a certificate of Exemplary Recognition and an Omega Alpha Medallion.

Upon recommendation of the evaluation committee, and at the discretion of the OAA Board, dissertations chosen for final evaluation may receive Honorary Recognition. Cash awards are not yet available for these dissertations, but they receive certificates and medallions. OAA is seeking cash awards for these honorary recognitions.

Omega Alpha Interface with INCOSE and Recognitions

Omega Alpha is not like any other academic honor society. It is not undergraduate and chapter based. OAA concentrates worldwide at the doctoral level. Although it has an academic bias, OAA chooses to focus on excellence at, and beyond the doctorate.

For practicing professionals, Omega Alpha seeks to make known those demonstrated quintessential accomplishments that inspire. This desideratum is in a manner consistent with the SEDDS initiative. The OAA, within INCOSE, pursues both for the benefit of humankind internationally.

The Power of Convergence through Diversity of Resources - Recap from CSER 2017

Shamsnaz S. Virani, ssvirani@wpi.edu

Empowering Women as Leaders in Systems Engineering (EWLSE) organized a panel discussion at the Conference for Systems Engineering Research (CSER) 2017 held from the 23rd - 25th of March in Los Angeles, US-CA. The panel topic was "The Power of Convergence through Diversity of Resources." The central idea of convergence is that bringing together a diversity of concepts, thinking, and approaches is helpful for solving complex problems.

Marilee Wheaton from the University of Southern California (USC) introduced and arranged the panel, and Ms. Rosalind Lewis from The Aerospace Corporation moderated. The panelists included Dr. Cecilia Haskins from the Norwegian University of Science and Technology (NTNU); Ms. Stephanie Chiesi from the Raytheon Company; Dr. Thomas McKendree from the Raytheon Company and Dr. Shamsnaz Virani from Worcester Polytechnic Institute (WPI).

Marilee Wheaton opened the panel with an introduction to EWLSE. The EWLSE vision is for men and women to work together as advocates for women as leaders in systems engineering by: creating a systems engineering environment welcoming to all; promoting the demonstrated value of women as systems engineers and leaders; and enabling increased participation and retention of women in systems engineering.

Next, Rosa introduced the diverse set of panelists, highlighting the breath, depth, and domains of the panelists and their perspectives. Stephanie represented the younger generation of women engineers in Raytheon with an emphasis on technical leadership and employed a sense of humor about work life balance. Cecilia and Thomas represented the 30+ years of engineering experience and changes in engineering workforce and workplace. Shamsnaz represented EWLSE leadership on celebrating women and reported on

past EWLSE sessions around the world and future opportunities for engagement.

Thomas reviewed Raytheon's process of investing in hiring women and discussed the resulting long-term benefits. Stephanie emphasized the fact that nerd pride and being comfortable with who you are results in job satisfaction and self-confidence for women engineers. Cecilia reflected how 38% of women leave jobs due to lack of job satisfaction and unfriendly work environment and credited her upbringing and volunteering experience to her career longevity and job satisfaction, encouraging everyone to be welcoming of diverse individuals to systems engineering. Shamsnaz reported on the EWLSE panel in India about "Unconscious Bias" and ways to tackle it.

The audience comprised of conference attendees and invited guests. The audience interaction revolved around power of role models, better training to understand unconscious bias, increased opportunity for diverse individuals, and developing mentoring employee research groups. The audience interaction continued with panelists long after the session ended.

Overall, it was a great opportunity to discuss diversity at a systems engineering research conference. Please contact EWLSE at ewlse@incose.org with interest and opportunities to continue these conversations at future conferences.



INSIGHT



This Issue's Feature:
**Systems that are
fit for purpose**

JUNE 2017
VOLUME 20 / ISSUE 2

A PUBLICATION OF THE INTERNATIONAL COUNCIL ON SYSTEMS ENGINEERING



Upcoming Events at the International Symposium 2017 (#incoseIS)

Industry Tracks at the INCOSE International Symposium

One of the unique features of INCOSE is its cross-industry membership and attendance at the International Symposium (IS). This provides opportunities to get an “outside the box” insight to how others practice systems engineering and how you can tailor systems engineering for your situation. Equally, you may also want to meet other industry colleagues and learn how systems engineering is applied within your industry.

For those delegates with interest in specific industries, we have compiled a set of “virtual tracks” indicating a recommended set of papers, panels, roundtables, and working group sessions that are relevant for the specific industries. This year we have produced downloadable flyers for the Automotive, Healthcare, and Transportation industries - see www.incose.org/symp2017/contact/downloads. It is also possible to apply industry-specific filters to each day shown on the Event Schedule to see what may be of specific interest from specific industries.

As a learning organisation, we encourage delegates to learn from each other and find out how other people are doing their systems engineering E, and the virtual tracks are a great starting point for this.

Practitioner’s Challenge

Applying Systems Thinking and System of Systems Engineering to Environmental Problems

The 2017 International Symposium Project Team is pleased to announce the 3rd Annual Practitioner’s Challenge. The purpose of the Challenge is to engage Symposium participants in a collaborative manner to demonstrate how systems engineering can be used to address and support solutions to global, sociotechnical issues. For the 2017 Practitioner’s Challenge, the focus will be on the application of systems thinking methods and systems of systems principles to a major environmental challenge.

What is the Practitioner’s Challenge? A chance to get together to with fellow symposium participants to practice applying systems approaches – this year systems thinking and system of systems – to a broad socio-technical problem. It is an opportunity to explore an interesting problem space and work with symposium attendees you might not otherwise meet.

Why should I participate? The primary objectives for participants of the Practitioner’s Challenge are:

- Let participants collaborate on a sociotechnical problem;

- Demonstrate the value of applying systems thinking and system of systems approaches to these types of problems;
- Gain new insights into the applications of systems thinking/system of systems approaches by interacting with a wide variety of systems engineers: new INCOSE members, members from defense, aerospace, and a range of other domains; and
- Create a series of artifacts that can be used by participants and by INCOSE to demonstrate the value of system engineering approaches.

Who Can Participate in the Challenge? The Practitioner’s Challenge is open to all who are registered for IS2017. However, the maximum number of participants will be 40, so if you are interested, it is best to sign up when you register. The Practitioner’s Challenge team will include as many of those interested as possible and we will send a confirmation notification to all of those who apply before June 15, 2017.

What Do I Need to Do? Register for the challenge when you register for the International Symposium. Attend 2 webinars prior to the conference (or watch the recordings at a convenient time). Webinars are scheduled for:

- May 17 at noon EDT – Systems Thinking, presented by Robert Edson (MITRE)
- June 21 at noon EDT – System of Systems Engineering, presenter TBD
- Join fellow participants during a few sessions of the conference technical track (there is flexibility here)

For more information on the Practitioner’s Challenge, contact Nicole Hutchison, nicole.hutchison@stevens.edu.

Systems Summit on Critical Problem Definitions

Rick Dove, rick.dove@parshift.com
James Martin, martinqzx@gmail.com

The INCOSE International Symposium of 2017 (IS2017) will feature an all-day Systems Summit on Sunday, 16 July – where four critical topics will be discussed in collaborative exchange. This event is a joint effort between two working groups: Systems Science and Agile Systems & Systems Engineering. There will be a \$50 participation fee to partially cover lunch and coffee breaks. Participants can sign up for the event when they register for the IS2017.

Structured as a collaborative exchange, rather than subject matter expert presentations, multiple collaborative discussions will investigate selected unresolved issues of pressing interest – with the intent of understanding the problem space requirements sufficiently to drive post-Summit solution-project work. In the spirit of a Summit, participants will share their perceptions of impediments to recognition of the issue, outline requirements for mutually compelling solutions, and plan follow-on project work. The intent of these discussions is to develop a multi-perspective understanding of the problem space, identifying the fundamental

IS 2017 Events

requirements that broadly embraceable solutions must address – not just in technical requirements, but also importantly in social and organizational requirements. What impedes the realization of the problem and the commitment to attention and solution – and how to overcome those impediments? Four topics have been selected for parallel break outs, with participants choosing which one to engage with:

- What blocks and enables integrating project management and systems engineering?
- What impedes and enables “capability” appreciation and development during business or mission needs analysis?
- What prevents and promotes broad appreciation and respect for systems engineering?
- What are the organizational challenges and opportunities for transforming to a systems engineering culture?

Agenda:

08:00-08:30 – Introductions, agenda, review of the concept of operations of the summit

08:30-09:00 – Four short topic introductions

09:00-11:30 – Four parallel topic breakouts

11:30-12:00 – Structured briefings on morning topic results

12:00-13:00 – Lunch

13:00-15:30 – Multiple parallel topic breakouts (continuation of morning activity)

15:30-16:00 – Structured briefings on afternoon topic results

16:00-17:00 – Open retrospective on, and evaluation of, the summit activities

Questions can be directed to rick.dove@parshift.com and/or James Martin at martinqzx@gmail.com.

The College Publications Systems Series

Harold “Bud” Lawson, Coordinating Editor, bud@lawson.se

The **College Publications Systems Series** establishes a means for publishing books in the areas of systems science, systems thinking, systems engineering, and software engineering. The Series is part of collaboration between the Stevens Institute of Technology where Jon Wade is the responsible editor and the Bertalanffy Center for the Study of Systems Science (BCSSS) where Wolfgang Hofkirchner is the responsible editor.

Having published books with major publishers including Prentice-Hall and Addison-Wesley and publishing on my own; I found College Publications at the recommendation of a former colleague. When I was finishing up my book, “A Journey Through the Systems Landscape” in 2010, I decided to use College Publications at Kings College in London as their publication strategy appealed to me. The strategy is:

- to provide the academic community with a non-profit, highly prestigious publishing outlet that will break the monopoly that commercial publishers have,
- to publish books that can be purchased at reasonable prices, making information accessible to all, and
- to show that academics no longer need to be controlled by commercial interests.

Finding many books on the market overpriced, especially for struggling students this alternative had great appeal. Since College Publications prints all books on demand, there is very low overhead, and College Publications offers generous royalties. Soon after publishing my book, there arrived another book in the systems area, and so, I agreed with College Publications, to start the Systems Series. I then received support from Stevens as well as BCSSS. BCSSS has an extensive editorial board that now includes many INCOSE members as a part of this effort. There are now 52 members of the editorial board.

All volumes are available via web providers such as Amazon. We all hope that you will be a frequent user and potential contributor to this expanding series. Proposals are welcome.

The books present various perspectives on systems and provide many important concepts and principles, paradigms, and models that provide insight into a variety of systems-related issues. The eight volumes available as of this publication are:

The College Publications Systems Series

Volume 1: A Journey Through the Systems Landscape

Harold "Bud" Lawson, www.thesystemslandscape.com

This book provides a comprehensive view of systems that promotes the importance of learning to "think" and "act" in terms of systems. A system-of-systems concepts and the systems coupling diagram paradigm provide "a systems survival kit." The book highlights relevant aspects of systems thinking and systems engineering, and several case studies illustrate the application of a systems perspective.

Volume 2: A Discipline of Mathematical Systems Modelling

Matthew Collinson, Brian Monahan, David Pym

This book combines the composition of formal specification --- using techniques from algebra, computation theory, logic, and probability theory --- with the control of the level of abstraction afforded by the classical mathematical modelling method. Throughout are examples, including industrial and commercial applications. Gnosis (programming language patterned after SIMULA) is the program used for the models.

Volume 3: Beyond Alignment: Applying Systems Thinking in Architecting Enterprises

Editors: John Gotze and Anders Jensen-Waud, www.beyondalignment.com

In a turbulent macro environment and volatile global economy where successful change increasingly depends on systemic inquiry and cross-disciplinary collaboration, systems thinking have never been more relevant. The book, in essence, discusses the many new issues faced by enterprise architects and suggests how one can apply systems thinking to frame, understand, and resolve them. Thirty professionals contributed to the different chapters; you will recognize them as leaders in the systems area.

Volume 4: Measuring Organisational Efficiency

Editors: Francisco Parra-Luna and Eva Kasparova

Organisational efficiency addressed in this book draws definition from different perspectives with application to various organisational dimensions and circumstances. The formal definition of organisational efficiency is the capacity of an organisation to maximize certain desired outputs with minimum input. In a dynamic context, efficiency should always seek the highest output/input ratio, assuming output growth or stabilisation. The purpose of the various contributions is to provide alternative theoretical angles that may help the reader understand the concept from a practical, but above all, a humanistic point of view.

Volume 5: Parcours au Pays des Systèmes , Harold "Bud" Lawson

Translation: Brigitte Daniel Allegro, <http://pensorsysteme.fr/2014/08/139>

Volume 5 is a French translation of Volume 1. Brigitte further developed ideas from the book and will contribute to a coming volume.

Note: Volume 1 is also available in Russian, but not via College Publications.

Volume 6: Architecting Systems: Concepts, Principles and Practice

Hillary Sillitto, www.sillittoenterprises.com/book/

The focus of this book is the blend of "soft," and "hard" systems approaches needed to architect sustainable and resilient socio-technical systems, to get people and technology working together in a way that is societally and environmentally sustainable. The book defines that the purpose of an "architecture" is to ensure that the various parts of our systems, when connected to each other and placed in their operating environment: fit together, work together, achieve the required effect, do not produce unacceptable side effects, and can be kept operational over time, reconfigured to meet "reasonable unforeseen" circumstances.

Volume 7: Software Engineering in the Systems Context

Editors: Ivar Jacobson and Harold "Bud" Lawson

This book aims to provide various perspectives concerning the problems and opportunities presented by the increasingly central role of software in the systems of the world. In particular, the role of and relationship between Software Engineering and Systems Engineering in provisioning software systems and their integration into system environments. Nineteen software and systems engineering experts responded to the call to provide their perspectives. Worth noting, is the OMG standard "Essence," that provides a method and practice independent approach for software engineering. Essence can be fruitfully deployed for systems engineering as well. The book makes an explicit call to unify software and systems engineering.

Volume 8: Using Systems Thinking to Solve Real-World Problems

Jamie P. Monat and Thomas F. Gannon

The application of systems thinking to solve real-world problems in business, the environment, healthcare, economics, society, international relations, and politics has thus far remained the aegis of academics and experts. Barring the hiring of a consultant, there has been no way for the layperson to address systemic issues. This book addresses this need. It provides a current, complete and succinct yet detailed systematic methodology for attacking real-world systems problems. The book provides several examples of the application of systems thinking.

There are several new volumes in development in the areas of Smart Cities, Resilience, Biological and Medical Systems, as well as Software Quality.

For further information about College Publications including discounted bulk orders contact Jane Spurr at: jane.spurr@kcl.ac.uk.

Proposals are welcome for new books of the series. Contact one of the editors: Harold "Bud" Lawson, bud@lawson.se, Jon Wade, jon.wade@stevens.edu, or Wolfgang Hofkirchner, wolfgang.hofkirchner@bcsss.org.

Spotlight ON!

Interviewed by Sandy Young, info@incose.org



Name: Stueti Gupta
Title: Manager, Cotton and Sugar Harvester Software Development Teams, Embedded Systems
Organization: John Deere India
Place of Birth: India
Current Residence: Pune, Maharashtra, India
Domain: Off-highway

transportation, particularly crop harvesters

Studied in college: Physics, mechanical engineering, mechanical engineering design

Year joined INCOSE: 2011

Role(s) in INCOSE: Programs officer, INCOSE India Chapter; Empowering Women as Leaders in Systems Engineering (EWLSE) lead for India Chapter; Lead, INCOSE Pune Circle; and Asia Pacific Council on Systems Engineering Conference (APCOSEC) 2016 Organiser/Technical Committee

Years in systems engineering: 6

1. What is your favorite part of being a systems engineer? Least favorite?

"It is thrilling to be a systems engineer when you work on complex real-world problems. Creating artifacts and experiencing the power of visual representation and analytical models to bring all disciplines on the same page and working synergistically towards a common goal is fulfilling.

My least favorite part is that systems engineers still need to convince some people about the importance of systems thinking."

2. What project or accomplishment are you most proud of in your career?

"I have completed a couple of projects using systems dynamics, employing stocks and flows models to understand how decisions impact market dynamics or the behaviour of supply chains. These projects helped me develop a deeper understanding of the business operations, as well as analytically evaluate decisions. One of my conference papers on this topic received the "Best Paper" award in an international simulation conference. I led a couple of projects for MBSE adoption within my organization in India.

I also founded the systems engineering circle at John Deere India, a platform for professionals from various domains to share and receive information on systems engineering theory, application, and tools."

3. Tell us about your role in INCOSE's Empowering Women as Leaders in Systems Engineering (EWLSE)?

"I believe I am one of the few members from India in this group. In November 2016, I helped organize a workshop in India attended by both men and women. The overarching theme of "Men and Women Working Together for Women as Leaders in Systems Engineering" addressed two key topics about women in leadership roles: leadership presence – overcoming fear and leadership development – power and influence.

I also worked with Alice Squires and Shamsnaz Virani to organize a panel, "21st Century Leaders, Tackling Unconscious Bias," during the 10th Asia Pacific Council on Systems Engineering Conference (APCOSEC) in 2016. The participants enjoyed both the panel and workshop."

4. What do you like to do outside of work?

"I have a 2.5-year-old daughter who keeps me super busy. Apart from INCOSE, I am an International Ambassador of Society of Women Engineers (SWE) from India and the president of its Pune Chapter. I lead several initiatives for school, college, and professional women, to make STEM attractive and demystify the path for women to thrive in STEM careers. I won the SWE Distinguished New Engineer Award recently, which recognizes engineers actively engaged in engineering in the first ten years of their careers."



Photo: Stueti and INCOSE President Alan Harding at the APCOSEC EWLSE Panel and workshop

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PMI & Systems Engineering

Contributed by Randall Iliff, From PMI Today, May 2017

Aligning the work of systems engineers and program managers could bring more success to programs and their projects. A book coming from the alliance among INCOSE, MIT's Consortium for Engineering Program Excellence (CEPE) and the Project Management Institute (PMI) details leading-edge research with practical solutions for engineering program management.

Integrating Program Management and Systems Engineering: Methods, Tools and Organizational Systems for Improving Performance, published by Wiley, is now available in the [INCOSE Store](#).

Integrating Program Management and Systems Engineering makes the case for achieving significant program and project improvements through the strategic integration of program management and system engineering practices. Chief systems engineers and program managers work together in a range of industries, including aerospace, defense systems, automotive, construction, energy, healthcare and complex information systems. The two leaders must collaborate closely to define the product, the program structure and objectives, and allocate and define the focus of work effort. Poor communication and lack of aligned technical and management approaches between these two critical leadership roles can spell the difference between success and disappointment for the program and its stakeholders.

Integration Brings Better Performance

The research found that programs with higher levels of integration between program management and systems engineering had significantly better performance on a number of dimensions than those that were less integrated.

Additionally, their performance was more predictable and more resilient in the face of challenges. More qualitative benefits were also seen, including better development of talent and more effective organizational cultures.

"This book blazes a new path by focusing on approaches for better enabling collaborative work between program managers and systems engineers," said Eric Rebentisch, PhD, lead editor and lead researcher for CEPE. "While there is plenty of published material focused on enhancing the performance of each individual discipline, very little published matter spotlights how the two disciplines align their efforts and work collaboratively. This book intends to help close that gap."

The integrated approach and framework detailed in the book offers a path of successful practices for creating better solutions.

The book presents a diverse group of contributors in program management, systems engineering and academia who share their collective knowledge of best approaches to improving program results through a unified working relationship between program managers and systems engineers.

The book features:

- Tools for assessing current capabilities and building up to custom-fit organizational needs.
- Proven tactics to improve cost, schedule, and technical performance of programs and their related projects.
- Innovative change management approaches through every stage of integration and performance improvement.

Extensive Examples and Case Studies

Over four years of primary research and exploration of engineering program dynamics produced this framework for strengthening integration and collaboration among program leadership. In addition to the framework, *Integrating Program Management and Systems Engineering* provides extensive examples and case studies showing the framework in practice inside actual programs. The book also features an in-depth analysis of one program to show all of the elements of the integration framework working together.

“The integration of program management and systems engineering is the vital mixture for success of complex organization and societal challenges,” said Edward J. Hoffman, PhD, former chief knowledge officer at NASA and executive in residence, Columbia University, School of Professional Studies. “This was the critical ingredient for the Apollo mission, and it is urgently needed for today’s fast-paced and networked world. This is an indispensable book for those seeking evidence-based research and results.”

INSIGHT Preview

William Miller, insight@incose.org

Preview into INSIGHT from the Editor-in-Chief

The focus of the upcoming issue of *INSIGHT* is systems that are fit for purpose. The full page ad in this Newsletter speaks to just that.

You will be able to read pieces from guest editor Jack Ring who sets the stage, calling for the revival of two factors in systems practice, efficacy and fit for purpose. This upcoming issue of *INSIGHT* features relevant articles on the theme of fit for purpose selected from past INCOSE symposia papers. Although the articles and authors represent all three INCOSE sectors around planet Earth, the center of gravity of the work addressing fit for purpose

is the United Kingdom. We thank the authors and their sponsoring organizations for granting permissions for publication.

We continue to solicit contributions for special features, standalone articles, book reviews, and op-eds for 2017 and beyond. Please send your proposals to insight@incose.org.

In Memoriam

Azad M. Madni, azad.madni@usc.edu

Elliot Axelband A Life of Leadership and Service

Elliot Axelband, INCOSE Fellow and a champion of systems engineering, passed away on May 14, 2017 two weeks shy of his 80th birthday. His passing created a void in our INCOSE community. Elliot was warm, genuine, and caring. Blessed with a sparkling sense of humor and a quick wit, people considered Elliot fun. A spirited debater, he could take a principled stand and hold his ground like no other. A born leader with considerable charm, Elliot was above all a doer. Several years ago, I remember meeting Mal Currie, former CEO of Hughes Aircraft Company, at a USC dinner. Elliot’s name came up. I recall Mal saying that at Hughes when he really needed to get something important done, he turned to Elliot. And Elliot always got it done.

My fondest memories of Elliot were the many interactions that we had after I took over as Director of USC’s Systems Architecting and Engineering (SAE) Graduate Program in 2009. Elliot and I would collaborate on how best we could serve the defense and aerospace community, how best we could serve our students, and how best we could meet the demands of the defense and aerospace industry. Before his health declined, Elliot would routinely stop by my office to chat about developments on the national front and their potential impact on the engineering workforce and our engineering curriculum. Elliot understood culture and politics, research and education, acquisition and engineering, and people and personalities. I will forever cherish the moments we spent together trying to make sense of how to make a better world especially for aspiring and practicing engineers. Elliot will continue to live on in our hearts and minds, through the innumerable Elliot stories that INCOSE, USC, and aerospace colleagues have to share. With his passing, INCOSE lost a leader and friend, and the aerospace and defense community lost a great American engineer.

Born in Brooklyn, New York, Elliot earned his BS degree in Electrical Engineering from Cooper Union on a full scholarship. He then moved to Los Angeles to begin a long and illustrious career with Hughes Aircraft Company. While working full time, he earned an MS in Electrical Engineering from USC, and a PhD in Control Theory and Applied Mathematics from UCLA. Early in his career at Hughes Aircraft, he worked on communications satellites and on the motion control of the Surveyor, the first craft to soft land on the Moon, a precursor to the Apollo program. Elliot had a distinguished career in the defense and aerospace industry and academia. He was the President of the IEEE Controls Society in

In Memoriam

1977 and a recipient of the Air Force Meritorious Civilian Service Award. He worked at Hughes for 35 years retiring as a Vice President and General Manager. In his “retirement,” he served as the Associate Dean and Professor of Engineering at USC, a senior researcher at RAND Corporation and Director and part owner of Legacy Engineering. Elliot is survived by his wife, Barbara, three children, and six grandchildren.

Some of Elliot’s INCOSE friends and colleagues wrote to me to share their memories. They characterized him as a truly accomplished systems engineer, mentor, and teacher. They extolled his honesty, integrity, and commitment to the engineering profession. They provided unique perspectives (a few had to be condensed in the interest of balance) that I wish to share with you.

Editor’s Note: In the interest of space in the Newsletter, these are posted online in Connect as the Full In Memoriam, which is also appearing in the Systems Engineering Journal.

Note from the Editor

Lisa Hoverman, newsletter@incose.org



Welcome to the 2nd Newsletter of 2017! With the exciting 27th International Workshop (IS 2017) just a month ahead of us, and exciting events just behind us like CSER, INCOSE Board Meetings in FR, the joint publication efforts between INCOSE, MIT, and PMI to produce a new book that is out, and the new INCOSE Store, 2017 is really highlighting the local, yet global impacts INCOSE makes.

The Newsletter continues to grow and improve in content to inform our readership on all things INCOSE – both current, upcoming, but also historically. There are some great references to historical background of INCOSE in this 2nd Newsletter of 2017. We are in our third year of publication and growing with your stellar submissions – so Thank You! Please keep sharing these with us as we continuously work to improve our communications. I hope that you see some of your suggestions and contributions in this issue. As always, we welcome feedback and contributors!

Update from Marketing and Communication: we continue to grow our INCOSE Social Media Presence.

As announced last quarter, we started an INCOSE Facebook Page! This is our outward facing page to the world of Facebook. We still maintain a Facebook Group where people can contribute and communicate as a community (currently ~1650 members). However, we are using the Facebook page to represent our brand and represent systems engineering as the global authority. Here is the link to the page: <https://www.facebook.com/INCOSE/>, if you have not checked it out yet!

We are working to increase traffic via Twitter ([@incose_org](https://twitter.com/incose_org)) and LinkedIn with our posts, and to highlight and advertise for the 2017 INCOSE IS!

We continue ask for your support in promoting the Facebook page, Twitter account, and LinkedIn page in your sectors, chapters, working groups, colleagues, etc., as appropriate. Further, we ask for your help in identifying information that we can post on the sites. This information can be about INCOSE and items of interest to the systems engineering community. Please send ideas for posts to marcom@incose.org.

We will use the accounts to promote our events as well. As we now have a new store, we will also use our accounts to promote our products. We are off to a good start. We reached over 75,000 people in just the last month on Facebook with a paid post about our new Integrating Program Management and Systems Engineering Book – with nearly 2500 engagements on the post; on Twitter we have over 1800 followers; and over 3500 members in our LinkedIn Group with lots of active, global discussion. We hope to see these numbers grow!

I end with a sincere note of appreciation to all who contributed to this Newsletter and updated members on the many events, and opportunities in INCOSE and your niches of systems engineering. I look forward to your upcoming contributions (submission dates in the table below!) and articles as we continue to improve and grow the Newsletter.

Have a terrific June!

Newsletter Due Dates

Due Dates for Q3 2017 Newsletter:

General Content (GC): August 15, 2017

Late Breaking News (LBN): August 25, 2017 (with permission from the editor)

Due Dates for final 2017 Newsletters:

Q4 Newsletter, GC: November 15; LBN: November 25

INCOSE Member Newsletter

Publication of the International Council on Systems Engineering

Editor	Lisa Hoverman newsletter@incose.org
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On the Web	http://www.incose.org
Article Submission	newsletter@incose.org

Publication Schedule. The INCOSE Member e-Newsletter is published four times per year. Issue and article/advertisement submission deadlines are as follows: 2nd Qtr 2017 issue – 15 May; 3rd Qtr 2017 issue – 15 Aug; 4th Qtr 2017 issue – 15 Nov. For further information on submissions and issue themes, visit the INCOSE website as listed above.

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Who are we? INCOSE is a 10,000+ member organization of systems engineers and others interested in systems engineering. Its mission is to share, promote, and advance the best of systems engineering from across the globe for the benefit of humanity and the planet. INCOSE chapters worldwide, includes a corporate advisory board, and is led by elected officers and directors.

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