MEMBERS NEWSLETTER

June 2020—Q2

Follow us

President's Corner

Kerry Lunney
kerry.lunney@thalesgroup.com.au

Well, we have endured quite a pivotal 4 months! It truly has been a rollercoaster ride—holding on and looking steadfastly forward as we plunge under COVID-19 terror, swaying left and right as we take each challenge and then climbing to the top to face the next surprise. Well, this ride is not over but we will make the best of the situation. You have received through social media and eblasts the series "Message from the President" over this period. I trust this kept you informed on the changes to our operations and the new initiatives we introduced and will continue to roll out. You can read more on this in the newsletter.

Before I continue however, I would like to personally wish every member, colleague, alliance, and family the very best in these trying times.

Amongst all the trials and tribulations of the last 4 months INCOSE continues to keep moving forward; working on various products and projects, introducing improvements to our website, providing better user experience, collaborating with our alliances, expanding our horizons, and opening new communication channels with the launch of the "Ask the Board" site and our Community Offerings, and the adoption of online collaboration applications, to name a few. The following paragraphs will provide you snapshots of these activities which are on the Board of Directors Top 20 Priorities for 2020-2021.

The Volunteer Opportunity (VO) Board is up and running, so if you are interested in supporting INCOSE no matter at what level, take a look at what is posted. If there is nothing of interest to you, feel free to make your enthusiasm known through the same VO Board and we will match you with a suitable opportunity.

The Technical Project Plan (TPP) is finally online. This was quite sometime in coming but now we are there, life should be easier for all. Please remember to follow the TPP process when embarking on producing an INCOSE/Alliance product regardless if it is a book, a paper, a primer, or similar output.

Our INCOSE Fellows are working on producing an initial document identifying "Systems Engineering Heuristics for the Future"—something I am quite passionate about. How often have each of us considered past experience, rules of thumb, applying techniques to similar but not the same problem, only to realize we often fall back to using our tried and trusted heuristics. Identifying existing and new systems engineering heuristics that will be applicable going forward will be a great tool for many of us to regularly reference.

The Value Strategy Objective team made great headway with a set of value statements targeted for progressive roll out over the remainder of the year. This set of value statements will serve a number of needs. For example, there will be a value statement that will resonate with individual members. Likewise, there will be another one for our corporate advisory board organizations, another for academia, and so on. These value statements will help illustrate the advantages of being part of the INCOSE community.

With the support of the Technical Leadership Institute (TLI) Cohort 5 we have a great 30th anniversary video to share with everyone. Closer to IS 2020 we will showcase the INCOSE brand video. I am confident you will enjoy the videos and be able to make great use of them.

Our Corporate Advisory Board (CAB) members and other organizations may find our new Advertising & Sponsorship Options Kit (ASOK) helpful. It allows you to select any number and combination of advertising and sponsorship options, thereby allowing full package tailoring with discounts for bundling.

Outreach has initiated exploration with non-engineering societies such as the National Association of Counties and American Society for Quality for possible collaborations. Likewise, activities with

our alliances are progressing. For example, we supported the Royal Academy of Engineering (UK) as part of their technical advisory group on reviewing a draft report on Safer Complex Systems.

During this period INCOSE has finalized, and submitted for approval, the ABET Systems Engineering Program Criteria. We hope after many years of hard work by the team this version will receive the green light by all 6 interested parties.

There are many more examples of our ongoing activities such as the Professional Development Portal, our Community Offerings, Systems Engineering Handbook V5 edition, Systems Engineering Vision 2035, Future of Systems Engineering (FuSE), which have continued to progress utilising online collaboration tools and virtual meeting applications INCOSE now has in place. If you are not aware of these, please reach out to our IT team for information and assistance.

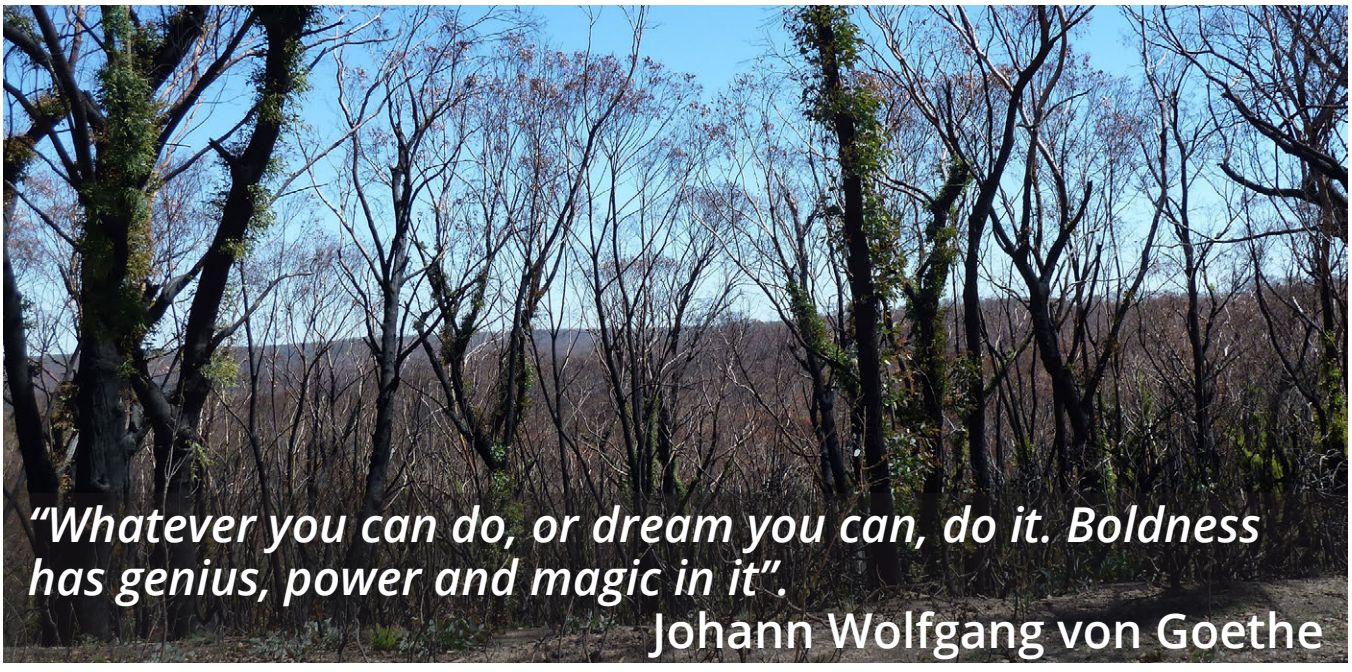
Likewise, further details on what our Board of Directors is focusing on are in a new column in this newsletter. We intend to continue to provide this as a regular column with different directors showcased in each edition of the newsletter.

Lastly, I would like to give you some insight to the future of our international events—the International Workshop (IW), the International Symposium (IS), sector, and regional events. It is our intent to provide a hybrid arrangement of a physical event with remote participation opportunities to join the event. This has been our plan for quite some time, only the implementation has accelerated under the COVID-19 crisis. We will learn from our execution of IS 2020 the virtual event and will adopt and adapt accordingly for the next event. This could very well be IW 2021 considering the pace of returning to "normalcy". Most importantly, the opportunity for participation at our events is now broader with greater outreach worldwide for both content, presenter, audience, exhibitor, and sponsor. I do hope you can join us, first starting with IS 2020. We will work very hard over the coming weeks to provide a quality program to you in the comfort of your homes. Remember—you all have first row seats for IS 2020!

It is important we acknowledge all of these activities, and more, carried out by our INCOSE community in these last 4 months. It has not been without its challenges. For myself, to give me that boost needed at times and remain curious, I use a quote from Goethe as my mantra. Perhaps you may find it resonates with you, particularly as we continue to move forward under COVID-19 constraints.

Cheers,

Kerry Lunney, INCOSE President 2020-2021



30th Annual INCOSE international symposium

Virtual Event
July 20 - 22, 2020

Join us for the 30th Annual INCOSE International Symposium and the 1st Virtual Edition

SYSTEMS ENGINEERING FOR EARTH'S FUTURE

Uniting Technology and Grand Challenges through Systems Engineering

The Premier International Systems Engineering Conference

3 Days, 3 Tracks, 3 Keynotes, 70+ Presentations, Panels, and More!

- over 70 Papers, Presentations on Systems Engineering — Monday - Wednesday
- 3 Inspiring Keynote Speakers — **Bernie Fanaroff** - Former Director Square Kilometer Array (SKA) Project Office; **Dr. Ronnie S. McKenzie** - Managing Director, WRP; **Jakob van Zyl** - Hydrosat, Inc.
- 25 Countries Represented — **Argentina - Australia - Brazil - Canada - China - Finland - France - Germany - India - Ireland - Israel - Italy - Japan - Lithuania - Netherlands New Zealand - Norway - Singapore - South Africa - Sweden - Switzerland Thailand - Turkey - United Kingdom - United States**
- 19 Application Domains — **Top Domains**: **Enterprise Systems Engineering - Defense - Aerospace - Academia - IT/Telecom - Environmental Systems - Automotive - Energy - Autonomous Systems - City Planning - Infrastructure**
- 38 Topics Represented — **Top Topics**: **Systems Thinking - System Arch/Design Definition - MBSE - Needs and Req Definition - Processes - Systems of Systems - Complexity - Systems Science**
- 4 Panels — Monday - Wednesday — Including Topics Like These Discussed With Global Leaders in Systems Engineering: **Aerospace - Systems Thinking - Defense - Diversity - System Security Teaching and Training - Cybernetics**

SPONSOR INCOSE IS 2020!

1. Unique brand of recognition and visibility for your organization
2. Access to the latest thinking relevant to the practice of Systems Engineering
3. Put a spotlight on your organization's competency in Systems Engineering
4. Be associated with the highest culture of professionalism and innovation
5. Demonstrate organizational support to INCOSE's mission
6. Develop sustainable business relationships

Lots of possibilities to interact with systems engineering communities

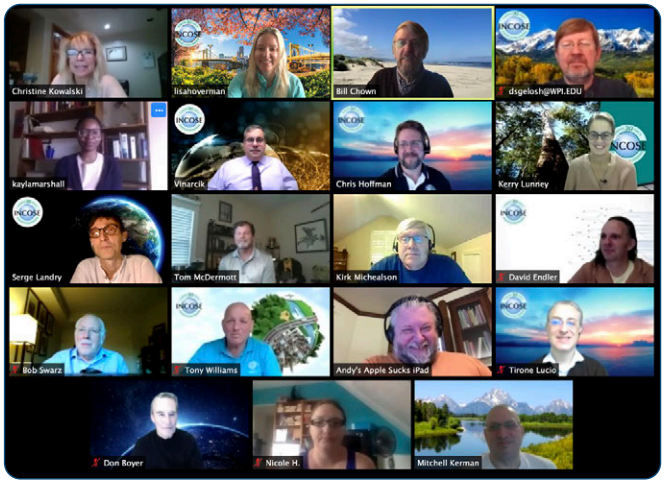
Visit **www.incose.org/symp2020** and contact us **TODAY** - The IS2020 Organizing Team

Notes from the Board

Lisa Hoverman, marcom@incose.org

The INCOSE Board of Directors (BoD) held their second quarter meeting remotely via Zoom in light of the global quarantine status. The focus of this BoD meeting was :

- Sharing progress on our high priorities for 2020 and our functional areas,
- Learning about the current Corporate Advisory Board (CAB) members' needs, as well as local vs. international CAB differences
- Reports from INCOSE Task Teams on:
  - Executive Management for INCOSE
  - Value Proposition for INCOSE Initiative
  - Licensing of INCOSE Products
  - Circle Awards for INCOSE Chapters
  - Special Projects
- News from our Nominations and Elections Committee
- Goals for and status of our value streams – these included:
  - Certification
  - Events



  - Membership
  - Products
- Pivoting to plan for a virtual International Symposium (IS), and
- Celebrations for our 30th Anniversary, while quarantined
  - Increasing value to members through online offerings – the INCOSE Virtual Community Offerings

Richard Beasley, a member of the INCOSE UK Chapter was appointed as the Deputy Director for Technical Services and Kirk Michaelson, a member of the INCOSE Orlando Chapter was appointed as the Policy Management Committee (PMC) Chair.

Members of the INCOSE BOD on a Zoom Call during the INCOSE Quarter Two Board Meetings

FYI

Information and Tools for Now

International Symposium Scholarships for Exceptional Volunteers

Rachel LeBlanc, rbowers@wpi.edu

The Directors for the Americas, EMEA, and Asia-Oceania sectors are offering scholarships for individuals who have a record of exceptional volunteerism within INCOSE. If you would like to be considered for one of these scholarships, please have your local chapter president submit your information to your sector director. Information required: nominee's name, email, and a description (3-4 sentences) of that individual's volunteer efforts over the last year. Scholarship amounts may vary but will be no less than $500 toward registration for the 2020 International Symposium. All requests must be submitted no later than 13 July.

Gerrit Muller, INCOSE Fellow, Recognised as a USN "Meritorious Teacher"

Prof. Gerrit Muller of the University of South-Eastern Norway (USN) is one of the first group of Meritorious Teachers. He was the only member of the member of the USN Technology, Science and Maritime Sciences faculty to receive this recognition.

This award recognises teachers:

for their contributions to enhance the quality of teaching and enhance the learning of our students."

New Feature for the Newsletter. Each issue four of your Directors will contribute.

Updates from the Board

Contributions from the Board

Updates from the Americas Sector

Tony Williams
antony.williams@incose.org

The Americas Sector is home to over 5,000 INCOSE members in 43 Chapters across the United States, Canada, and Brazil. These chapters not only span a diverse region, but the chapters themselves vary greatly in their size, constituency, activity levels, and interest areas.

As the Americas Sector Director, my role is to serve my constituent chapters to help them be successful. Given the sheer number of chapters, not to mention geographic distribution, and varied needs, this could be a daunting task. Fortunately, I have an amazing set of volunteers serving as my leadership team who help us succeed!

- Deputy Director: Kevin Weinstein
- Assistant Director North Region: Jack Stein
- Assistant Director Northeast Region: Bill Scheible
- Assistant Director Western Region: Renee Steinwand
- Assistant Director Southern Region and Latin America—Vacant (let me know if you are interested!)
- Assistant Director Academic Relations: Alice Squires
- Assistant Director Events: Eric Belle

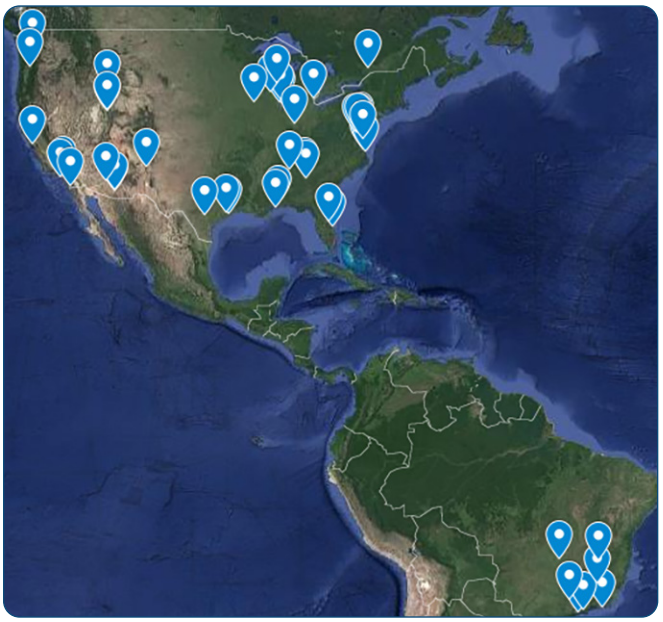
For 2020, we have defined a handful of priorities we are focusing our energy towards. Additionally, as the COVID-19 pandemic has changed our life, we will find ways to continue chapter activities and provide chapter benefits to a growing audience.

We have three priorities for the Americas Sector in 2020 Priorities.

Helping Struggling Chapters

Chapter size is sub-optimized in the Americas Sector, particularly in USA. While this is just an accident of history (based on our birth as NCOSE, the National Council on Systems Engineering), our ~5000 regular members comprise over 43 chapters, resulting in an average chapter size of ~120 but median chapter size <90. (Reference: EMEA Average chapter size =243). After considering the top three chapters (Washington Metro Area, Los Angeles, and Chesapeake) account for nearly 30% of the sector's membership, average chapter size further dilutes. The net result is sometimes, some chapters are challenged to find volunteers to fulfill chapter roles, which results in lower quality services provided to members.

Our leadership team maintains contact with our chapters and occasionally identify a chapter that could use some assistance. We



Americas Sector Meeting Locations

have engaged and facilitated chapter-restart activities, arranged for neighboring chapter leaders to provide consulting support, and do what we can to help. In some cases, we have pursued chapter retirement—which sounds like a dire consequence but can benefit members as they will have the ability to participate in an active chapter.

Encouraging Enhanced Communications.

Even with 43 chapters across the sector, the ability to conduct strictly 'local,' face-to-face chapter activities is limited to those relatively few members within an easy, 15-20-minute drive of a meeting location. To bring the chapter experience to more of our membership, we encourage, facilitate, and sometimes sponsor enhanced communications and collaboration so the Americas have far more mutual engagement. This includes leveraging more modern collaboration technologies and better shared event calendars.

During the last year, (pre-COVID), we began encouraging chapters holding events to 'invite the entire sector,' and have had as a result some widely attended chapter led activities—this has been very cool. During the COVID-19 pandemic, we leverage this initiative, and add additional capabilities for remote collaboration (including a half dozen new Zoom licenses for the sector), and we have had a lot of successes! This is one area where I hope we retain our new-found collaboration approaches after the pandemic abates.

Latin America

Due to language and distance barriers, we wanted to find ways to better engage our Latin America Chapter (Brazil) and our membership across Latin America. Thanks to Benardo Delicado of the Spanish Chapter, we made wonderful strides in this area as he has acted as an INCOSE Ambassador, reaching out across the region, identifying, and fostering pockets of systems engineering interest. Thanks to his efforts, I hope to announce a Mexico Emerging Chapter in the next year.

Updates from INCOSE Marketing and Communications

Lisa Hoverman
marcom@incose.org

Hello from INCOSE Marketing and Communications! As the Director of Marketing and Communications (MarCom), I sit on the Board of Directors serving a 3-year elected term. I receive support from two brilliant Assistant Directors, Alan Harding as the assistant director for Social Media and Rachel LeBlanc, as the MarCom-Events Liaison.

Alan has support from two great member volunteers, one for Facebook—Celestino Garcia—and one for LinkedIn—Daniel Lee. I am grateful to this all-volunteer team for all they do on a daily basis to keep INCOSE looking sharp and me sane! MarCom also receives support from a terrific group of contractors who help us stay engaged in the social scene daily and who enhance our branding as we expand our offerings.

MarCom exists to ensure effective internal and external communications for INCOSE, such as information on our strategic objectives and value streams. We promote INCOSE, its products, and services to current and potential corporate and individual members as well as the larger community and general public. In addition, we develop high quality materials to support INCOSE's communications needs, support targeted INCOSE initiatives, create and facilitate a "culture of communication" throughout INCOSE, and market INCOSE and its position as the world's authority on systems engineering.

We are focusing in 2020 on:

- Keeping our global membership informed, supported, communicating, networking, and working together remotely during the pandemic
- Increasing sponsorship and advertising with INCOSE to increase INCOSE revenues to offer more to our members
- Celebrating our 30th Anniversary and our first virtual International Symposium (IS)
- Promoting INCOSE as the global leader in systems engineering

We serve our membership in many ways, from keeping them informed through emails, eNotes, the Newsletter, and timely social media posts to developing marketing materials for the International Organization, local chapters, specific events we attend, and more.

Some of our highlights of 2020 thus far include:

- Working with the Membership Team to produce a beautiful new membership brochure If you are interested in obtaining some membership brochures, please email me at marcom@incose.org so we can share with you
- Producing two videos for INCOSE, one with the Institute for Technical Leadership celebrating INCOSE's 30th Anniversary, which you can watch on our YouTube Channel, the second will release at the INCOSE IS

INCOSE VIRTUAL COMMUNITY

Membership Brochure Front Side

Join INCOSE—Engage and Grow

INCOSE gives you the opportunity to:

- Meet systems engineering professionals and other system thinkers in your community at a local chapter
- Develop state-of-the-art products and standards by collaborating in INCOSE Working Groups
- Learn from dynamic, innovators and experts by networking across global industries, governments, and academia
- Gain systems engineering experience through work on real-world problems
- Increase knowledge and develop skills
- Discover potential career opportunities

INCOSE Products included in Membership

Online access to: every INSIGHT and SE Journal issue ▪ SE Handbook ▪ SE Vision 2025 ▪ SE Definitions ▪ SE Competency Framework ▪ Requirements Working Guide ▪ Product Line Engineering Primer ▪ State of the Discipline Report ▪ and more.

Professional Certifications

Our Professional Certification Program provides a formal method for recognizing the knowledge and experience of systems engineers. There are three levels: Associate, Certified, and Expert System Engineering Professional.

Membership Brochure Back Side

- Working with our President on communications around the Pandemic and the virtual IS
- Making INCOSE Zoom Backgrounds as we all transitioned to remote meetings
- Highlighting 30 of our Working Groups in 2020 Newsletters as part of our 30th Celebration (check out pages 23–29 for this quarter's highlights)
- Working closely with events as we produce our first ever Virtual INCOSE IS
- Supporting our new Virtual Community Offerings on Social Media and more—if you have not checked these offerings out, please do, the link is in the logo below—and both the Systems Exchange Cafés and the Webinar Showcase deliver terrific content to the Public Systems Engineering Community to www.incose.org/community

We look forward to serving INCOSE's marketing and communication needs in the second half of 2020 as we continue to grow and expand our reach as the leader in systems engineering globally. We hope to see you all online at the first-ever Virtual INCOSE IS! Register Today!

Call For Papers

CSD&MAsia2020

4th International Complex Systems Design and Management Asia Conference

New conference dates: 12-13 April 2021

New Submission Deadline: 1 September 2020

Mastering complex industrial systems is a strategic challenge. The CSD&M conference is a widely **open event dedicated to academic researchers and industrial & governmental actors**, interested in **Model-Based Systems Engineering and Digital Transformation in Engineering**. **The conference language is English.**

~~**September 21-22, 2020**~~ **12-13 April 2021 | Renaissance Beijing Wangfujing Hotel, Beijing, China**

CONFERENCE GENERAL CHAIRS

KROB Daniel
Institute Professor, Ecole Polytechnique, France
INCOSE Fellow
President, CESAMES

Dr. ZHANG Xinguo
Distinguished Professor,
Director of Complex Systems Engineering Research Center, Tsinghua University, China
INCOSE ESEP, President of INCOSE Beijing Chapter

PROGRAM COMMITTEE

Academic members

LI Lefei, Tsinghua University, China (Co-Chair)
CARDIN Michel, Imperial College, United Kingdom
DE WECK Olivier, MIT, USA
FENG Yanghe, National University of Defense Technology, China
GAO Xinghai, Beihang University, China
GUAN Ruoxi, Tsinghua University, China
HAMMAMI Omar, ENSTA ParisTech, France
JACKSON Peter, SUTD, Singapore
KOO John, Hong Kong Applied Science and Technology Research Institute, China
LV Yisheng, Chinese Academy of Sciences, China
RAUZY Antoine, NTNU, Norway
WANG Chen, Tsinghua University, China
WANG Yingxun, Beihang University, China

Industrial members

ZHANG Hongjun, China State Shipbuilding Corporation, China (Co-Chair)
DAURON Alain, Renault-Nissan Alliance, France & Japan
FERROGALINI Marco, Airbus, European Union
HOU Shudong, Huawei, China
ONG Robert, No Magic, Thailand
QIE Yongjun, Aviation Industry Corporation of China, China
SCHREINEMAKERS Paul, INCOSE, European Union
STARK Rainer, Fraunhoffer Institute, Germany
SUN Zhixiao, Aviation Industry Corporation of China, China
WEN Yuejie, Academy of Space Technology of China
XING Chenguang, Aviation Industry Corporation of China, China
YEE Victor, IBM, China
ZHANG John, Huawei, China

CONFERENCE TOPICS

Industrial domains

Aerospace, automotive, communications & e-services, defense & security, electronics & robotics, energy & environment, healthcare & welfare services, high tech, logistics & supply chain, ship & transportation, software industry, urban & public infrastructures

Scientific & technical topics

Systems fundamentals, systems architecture & engineering, model-based systems engineering, big data for industrial applications, systems manufacturing, systems modeling & simulation, system optimization, system project management, systems safety, systems serviceability, systems technology & policy

KEY INFORMATION

Important dates

- **Submission deadline:** ~~March. 21~~, *postponed to* 1 Sep 2020
- Results announcement: ~~April 30, 2020~~ 1 October 2020
- Final version: ~~May 29, 2020~~ 1 November 2020

Publication & indexation policy

Accepted papers will be included into the CSD&M Asia 2020 conference proceedings, published by **Springer Verlag** and referenced & indexed in **DBLP**, **EI Compendex**, **ISI Clarivate** and **Scopus**

How to submit

Access to submission procedure - https://www.2020.csdm-asia.net/call-for-papers-submission-procedure/

Organizers **Co-operators & Sponsors**

Contact: contact@csdm-asia.net / csaacsaa@126.com – Conference web site: https://www.csdm-asia.net/

Updates from Strategic Integration

Tom McDermott
thomas.mcdermott@incose.org

As INCOSE Director of Strategic Integration, it is my role to keep a focus on the long-term and make sure INCOSE activities and initiatives integrate across common strategic objectives. It has been hard to focus on the long-term with the many changes and near-term decisions needed for our organization to respond to COVID-19. However, I view these actions as catalysts for long-term change.

My primary opportunity to reach INCOSE membership is through INCOSE strategy session "events." These are part of a strategy session day on the Fridays proceeding the annual IW and IS events. Twice a year 50+ INCOSE members gather together and volunteer their time and thoughts to strategic topics of importance to INCOSE members and your Board. One topic this past January was "Making INCOSE Events Widely Accessible." This brainstorming session led by Tony Williams and René Oosthuizen identified a number of opportunities to reach a larger section of our membership, including much greater use of recorded video and online events access. One of the recommendations was to pilot a 100% online conference. Guess what? We are now 100% online for IS 2020. It was fortunate for us this group work could feed a task team addressing INCOSE's online capabilities, as well as a task team planning for a potentially fully virtual IS2020. Often events are catalysts for long-term change strategies. Beyond the virtual IS, some changes to come from these activities are additional options for INCOSE online meeting platforms, our new Virtual Community Offerings (www.incose.org/community), and even our first dual-language captioned webinar which will post shortly.

My goal with these strategy sessions is to capture your ideas and needs into a strategic framework and drive real change in an open and transparent fashion. There is a link to the strategy session topics and results on Connect: select the "Strategy Sessions" icon to the far right of the document libraries section. We will have strategy sessions this summer, and they too will be going virtual. If you have ideas for topics, or if you have experience facilitating with online brainstorming, whiteboarding tools, I would like to hear from you. We particularly need experienced online facilitators.

Updates from the Technical Operations

David Endler
de@davidendler.de

My name is David Endler, current INCOSE technical director. In this role, I lead Technical Operations (TechOps), which includes over 50 working groups, initiatives, and the standardization department. Luckily, the technical director is supported by a deputy and 14 assistant directors.

Another role the technical director fills, is leading the Impactful Products Committee (IPC). The IPC includes all governance roles included when INCOSE products are approved, publications for intellectual property (IP), marketing and communication for branding, technical review for independent reviews, and technical information for managing INCOSE's products.

My predecessor, Mike Celentano, promoted the need to apply systems engineering to our volunteer work. Consequently, we developed a lightweight product development process tailored to the needs and specifics of an all-volunteer organization. This process helps team members ask the right questions at the beginning of product development, document the answers, and adjust development appropriately.

My goal for the rest of 2020 is any INCOSE product developed follows INCOSE's product development process to avoid delays and rework. There have been several situations where we invested a lot of time and effort at the end of a product's development cycle to make products compliant with our branding guidelines, ensure all IP agreements are in place, and ultimately meet INCOSE expectations of an "Impactful Product."

To support the process, INCOSE IT has developed an online tool supporting the product development workflow. There is a guide in place to help authors fill in the online form and our technical information assistant director Masood Ahmed as well as his deputy Lori Zipes are more than willing to help with any questions you may have on the online tool or when you are unsure whether your product needs to follow the process.

I invite you to take a few minutes to think about your current INCOSE project. Please think about the important questions systems engineers ask at the beginning of a project ("what is the problem we are trying to solve here?", "who is the target audience of this product?", "who are the most important stakeholders to include?"). In case you have answers to all these questions make sure they are documented in the online tool. In case you are not sure whether the team has come to a conclusion on all these questions, please get in touch with the project lead and propose to use INCOSE's online product development tool then provide answers for these key questions.

Probably, all of you have experienced applying proper systems engineering to your projects leads to a more satisfied workforce. The thirteenth unwritten law of systems engineering (David F. McClinton, 1994) "We don't have time to do it right, but we have time to do it twice." applies for volunteer work too.

FYI

Information and Tools for Now

Call for Papers for Systems Engineering Special Issue on "Design of Complex Systems Resilient to Obsolescence"

The international scientific journal *Systems Engineering* is launching a special issue on Design of Complex Systems Resilient to Obsolescence. This special issue aims at reporting on the latest research results on obsolescence, on the underlying concepts of systems resilient to obsolescence, and their design.

Topics of interest to the special issue include, but are not limited to:

- Obsolescence
- Systems engineering approaches for design of complex systems
- Systems architecture
- Deadline Paper Submission: 30 June 2020

Click here to for more information.

Chapter Meeting Speaker Opportunities

Tony Williams, antony.g.williams@gmail.com

In response to COVID-19, chapters have leveraged virtual meetings to continue providing value to our membership. INCOSE will be creating shared chapter zoom accounts to help improve this experience.

During INCOSE's board meeting, the board shared they would be happy to present at upcoming chapter meetings. Topics might include COVID-19 responses, ongoing initiatives and activities, or could be other topics—determined by speaker interaction.

Please feel free to reach out to the board of directors members through Tony Williams to coordinate speaking opportunities.

Please keep using the INCOSE home page to advertise virtual chapter meetings! What a great way to provide benefits to members well beyond the local footprint

INCOSE-LA Report, 14 May 2020

Phyllis Marbach, prmarbach@gmail.com

INCOSE-LA proudly hosted 135 attendees over Skype for our 12 May speaker meeting. Al Hoheb of The Aerospace Corporation presented "Leading the Transformation of Model-Based Engineering: The Model-Based Capability Matrix" to attendees from 23 States, France, India, New Zealand, Turkey, and the United Kingdom. The "INCOSE Model-Based Capabilities Matrix and User's Guide" is available through the INCOSE Store. See https://aerospace.org/mbca for more information about a Model-Based Capability Assessment. Another event held 9 May was the Chapter Strategic Planning Meeting (SPM), conducted over Zoom. Most all board members attended, provided director reports, and discussed planning for the upcoming major events planned for 2020.

14 April the LA Chapter hosted their first all virtual speaker meeting when Larry Haas presented "Case Studies in SOS to ROI Transformation: The Top 5 Mistakes Leaders Make When Battling the Complexity Monster." More information can be found from Larry's book, "SOS to ROI—A Strategic Approach to Conquer the Complexity Monster and Accelerate Results." In this case the SOS means Help rather than System of Systems. When a company finds themselves needing help to scale up how can they do that and end up with a good return on investment (ROI). Charts are available at the LA Chapter Library.

Cindy VanEpps and Bryan Smith presented "Look! Gorillas are Doing Ballet—an Agile Transformation Story (Navy)" on 10 March 2020 at The Aerospace Corporation in El Segundo with one speaker in the room and one virtual. Cindy described how the Navy started using Agile to facilitate requirements decomposition, CMMi Key Process Areas of Requirements Management and Requirements Development, and to guard against requirements creep while taking advantage of the iterative nature of systems engineering in a spiral life cycle model.

INCOSE-LA actively works on conference committees for two conferences in 2020. The Conference on Systems Engineering Research (CSER) has been postponed to 8-10 October 2020. Systems engineers from around the world will meet either in person or virtually to present their research in systems engineering. This 18th CSER focuses on exploring recent trends and advances in Model-Based Systems Engineering (MBSE) and the synergy of MBSE with simulation technology and digital engineering. Learn more about it and register to attend CSER 2020 at our website: www.cser2020.org. The Western States Regional Conference 2020 will be in Seattle on 17–19 September 2020. The

Pictures from the LA Chapter: Remember when we could meet over dinner.

LA Chapter Members at IW 2019

technical program will finalize and registration expects to begin in June. Come celebrate successful applications of systems engineering in the Puget Sound rea and Western USA and identify future activities of potential value. If travel remains discouraged during this time, we expect to hold both in person and virtual sessions. Please see our website here for more information: www.incose.org/wsrc2020.

DevOps Tutorial

INCOSE San Diego

Virtual Event

This event is free to all.

- Date: Saturday, 20 June 2020, 9am–2:30pm (Pacific Time)
- Online Webcast Link: We will use GoToMeeting software, and it will not require a download/install if using the Chrome browser.
- Online Webcast Link: https://global.gotomeeting.com/join/423747781
- You can also dial in using your phone.
  United States: +1 (408) 650-3123
  Access Code: 423-747-781

NOTE—A certificate of attendance of this tutorial can be obtained by emailing us at info@sdincose.org. This letter may function as a Certified Educational Unit (CEU); please inquire with your organization.

In exchange for presenting, attendee names and emails will be available to the presenters. If you do not want your name/email provided to the presenters email us at info@sdincose.org and we will ensure your name/email info is not provided.

What is DevOps, and why should Systems Engineers learn about it?

Development Operations (DevOps) is a set of practices which combines software development and information-technology operations to shorten the systems development life cycle and provide continuous delivery. DevOps stresses continuous, highly automated testing and tests the code for errors (bugs), formatting, functionality, and often times security vulnerabilities (this is called SecDevOps, or DevSecOps). The code may also come automatically packaged and delivered/deployed.

Please join us for training and demonstrations in DevOps products, and to view actual DevOps 'pipelines' in action!

DevOps practices accelerate the pace of digital transformation and overcome challenges such as maintenance and compliance. Traditional approaches risk slowing software delivery, exacerbating audit pain, and leaving organizations with an incomplete view of compliance posture.

DevOps is also about removing the barriers between traditionally siloed teams, development, and operations. Under a DevOps model, development and operations teams work together across the entire software application life cycle, from development and test through deployment to operations. To improve collaboration and productivity DevOps automates infrastructure, workflow, and continuously measuring application performance. Developers deliver code in small chunks (new features and bug fixes) to integrate, test, monitor, and deploy. DevOps has a three-pronged approach:

- Plan & write code: the Dev team plan and write code using Code Configuration Management
- Build & Test: while writing the code the developer can build and test code
- Release & Deploy: automate the process of delivering code to customer.

Tutorial Agenda:

- OpsHub: 9:00am–11:00am (Pacific Time) (1.5 hour presentation, approx. 30 min for Q&A)
- Break: 11:00am–11:30am (Lunchtime plus ability to network via Chat)
- Puppet: 11:30am–1:00pm (Pacific Time) (1.0 hour presentation, approx. 30 min for Q&A)
- Crafty Penguins: 1:00pm–2:30pm (Pacific Time) (1.0 hour presentation, ~30 min Q&A)

Aerospace Day, 10 March 2020

VJ Jhaveri

Colorado hosts an Aerospace Day every year. It is always on the 2nd Monday of March at the Colorado State Capitol in Denver. Many local and surrounding area aerospace companies attend. Each organization sets up a table to network with attendees. Organizations that displayed information include the local military (Air Force, Navy, Army, National Guard, and Space Command); local universities and schools; local manufacturing industries; and local aerospace companies such as Boeing, Lockheed Martin, United Launch Alliance, Raytheon, and Sierra Nevada Corp. Local elected representatives and their support staff also attend. INCOSE rented a table at the event represented by me, VJ Jhaveri, and the Colorado Front Range Chapter membership director, Mr. Mike Prendergast. The attendees consist of industry employees, various university and high school (STEM) students, and other engineering related individuals. It is a one-day event, free for the public.

I, as a member of the INCOSE Outreach Ambassadors team and Colorado Front Range Chapter (FRC), hosted an INCOSE table at this event to provide outreach and advertise INCOSE to the attending public. It was a successful event. We displayed the INCOSE banner and the 2020 Western State Regional Conference (WSRC) information flyer and

Aerospace Day Hosts: Mike Pnadergast and VJ Jhaveri

distributed handouts about INCOSE, INCOSE pens, and sticky notes. INCOSE was well-received by all who inquired. We had consistent traffic at our table (despite the Coronavirus concerns). We also provided information on local chapter events and visitors showed interest in attending and we received contact information from some of the visitors. The Local University and STEM school students also inquired about INCOSE. Aerospace industries and local political representatives discussed Space Command and the potential for it to be located in the Colorado Springs area. This was a very positive, successful Outreach event, we look forward to each year.

FYI

Information and Tools for Now

AI4SE 2020, 13–14 October 2020

The Artificial Intelligence for Systems Engineering Workshop, AI4SE, is the meeting point for industry and academia to share promising experiences where AI applies to design and improves systems engineering processes, methods, or tools with a clear focus on practical applications.

The purpose of this AI4SE workshop is to focus on AI for Digitalization of Engineering, AI for optimization of System of Interest (SOI) Operation and Maintenance, AI for Technical and Organization Management, Systems Engineering for Intelligent Systems (Non-deterministic), and Ethics for Intelligent Systems.

Important Dates:

- Papers were due by: 1 June 2020
- Paper acceptance will be announced by: 31 July 2020
- The Workshop will be: 13-14 October 2020 at the Carlo III University of Madrid Leganés (Madrid), Spain.

Click here for more information.

Sector Updates—Asia-Oceania

INCOSE India Chapter

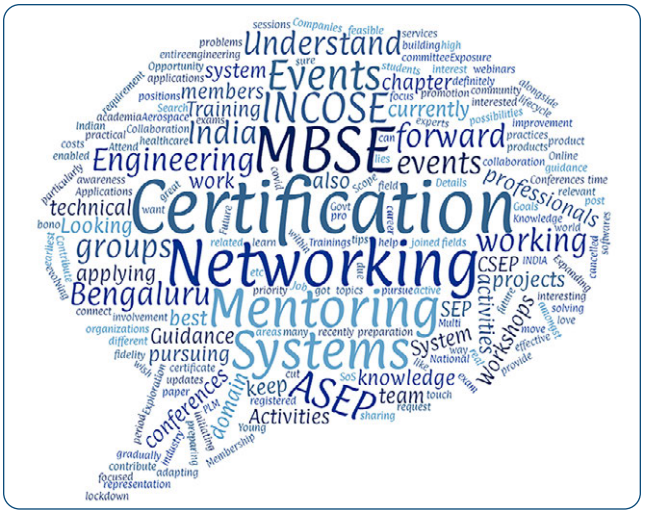
Mohan Vadnere, MohanVadnere@gmail.com

All Members Meeting

INCOSE India Chapter welcomed almost 70 attendees to the first all members virtual meeting in 2020. The meeting, held on 24 April 2020, opened the virtual session with Stueti Gupta—President of INCOSE India chapter—introducing new chapter governing body members elected in 2019 and INCOSE membership benefits. Stueti provided the key highlights of year 2019. The biggest highlight in 2019 was 12th Asia Oceana Systems Engineering Conference, AOSEC 2019 co-hosted with SAEINDIA Bangalore Section and ISSE. India chapter held paper exams for SEP certification in conjunction with AOSEC 2019. India chapter also kicked off two local working groups, MBSE and PHM working group.

India chapter completes a decade this year and had many networking events planned for the chapter members. However, in the covid-19 pandemic outbreak situation, the chapter did not want to compromise on networking opportunities hence shared awareness about upcoming events, goals of 2020, and India Chapter's social media presence with members. Mohan Vadnere, membership officer, summarized local and global volunteering opportunities. The chapter committee has planned local opportunities such as contributing to chapter activities, speaking, SEP mentoring, and many others.

The remainder of the session continued with working group updates. Mudit Mittal presented an overview of activities and future plans on behalf of Anand Kumar who leads the Architecture working group. Dr. Nikhil Joshi gave updates on MBSE local working group and summarized progress made on "Smart Parking Lot" project. Partha Pratim Adhikari, Airbus India, Bangalore, presented the Prognostics Health Management (PHM) working group charter. Both groups welcome members to join and contribute.



India Chapter conducted members' survey prior to the all members meeting. The survey received 91 responses including responses from 23 non-members and 68 INCOSE members. There was representation from various cities in India not represented in India meetings before. 79% people expressed interest in participating in chapter activities however, maximum ask from members was SEP certification.

INCOSE India Chapter Webinar Series

The webinar series is part of the 10 year celebration of the chapter. Networking events planned, across cities, to connect more members across the country, however, given the current situation, the networking events moved virtual in the shape and form of webinars. They planned to be interactive and engaging for participants.

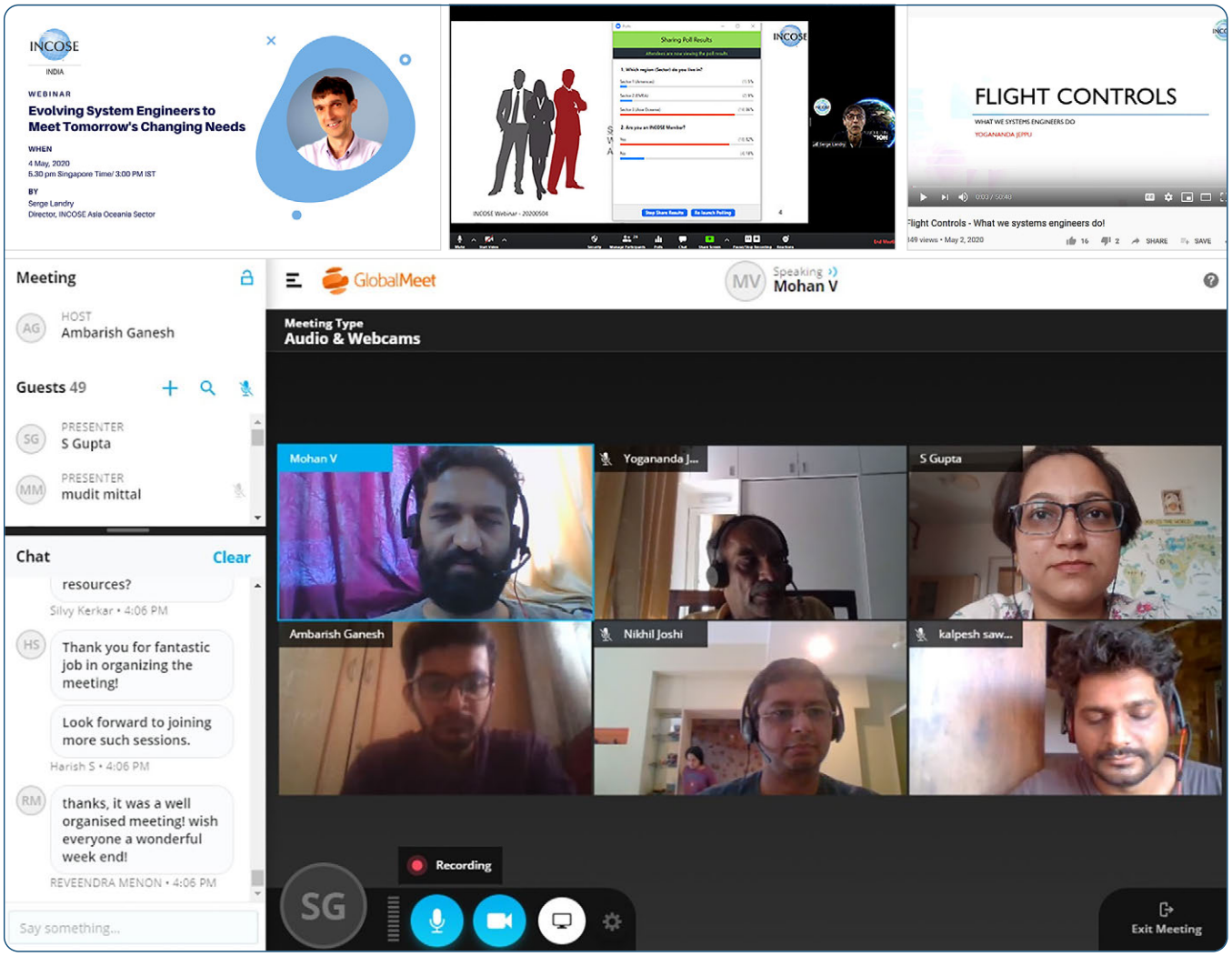
The first webinar, conducted on 4 May 2020, gave the chapter the honor to host Serge Landry—Asia Oceania Sector Director. 30+ members attended and it drew interests from around the world. You can watch the recording here.

https://www.youtube.com/watch?v=y3k_CQbSbFM&list=PL3wD0Sb1jb1LxR0sP61G5E4WFXcf1ZVgW&index=2&t=0s

To learn about upcoming events, follow India Chapter on LinkedIn (https://www.linkedin.com/groups/2876451/) and Twitter (https://twitter.com/INCOSE_India)

University Interactions—Sessions for students

INCOSE India chapter facilitated an online talk on "Flight Controls—What we systems engineers do" to engineering college students from two institutions—UPES (University of Petroleum and Energy Studies https://www.upes.ac.in/) and Hindustan Institute of Technology and Science (https://hindustanuniv.ac.in/). Dr Yogananda Jeppu, INCOSE India chapter treasurer and a systems engineer with over 32 years experience in design and development of flight control systems, present the talk. The sessions had about 100+ participants (students & faculty). The talk takes the audience through the design for a fly by wire flight control system from design to certification. The session included videos to make it enjoyable for the student community. It encourages them to not be just discipline centric, think only on software or aerospace or electronic engineering, but strive to be system engineers. The session included an introduction to INCOSE and how students can actively participate in various activities in INCOSE. A recording of the session is available on YouTube, https://www.youtube.com/watch?v=_dlrt_onmmU clocking 349 views as of 10 May, and on LinkedIn with more than 8000 views



SESA Updates

From SESA President , Bill Parkins, ESEP

It has been a terrible start to our 25th Anniversary year; massive bushfires followed by 3 months (so far) of lock-down due to the COVID-19 coronavirus pandemic. As for many people and organisations around the world, our 2020 plans are no longer achievable, and a significant required re-plan is under way.

Events

SETE 2020, planned for Brisbane in May and postponed with the organising committee retained to devise substitute events to fill the gap in the program. At the time of writing, there are 2 events planned:

- A virtual 'mini-SETE' held in a series of 1-2-hour sessions over a 2-week period in mid-June. The program will include
  - Presentation of 'key take-aways' from some of the papers already prepared and reviewed for SETE
  - A reduced number of keynote speeches and panel sessions selected from the original (face-to-face) program.
  - Details of the program, sent out by mid-May, include how to register, join remotely, read papers, and send in questions
- SETE 2021 Brisbane will be part of an Integrated Project Engineering Congress (IPEC) at the end of May 2021. Since there will be many conferences deferred to 2021, several Technical Societies of Engineers Australia* have collaborated to hold their conferences in the same week at the one venue. A committee comprising Risk Engineering Society (RES), Australian Cost Engineering Society (ACES), Asset Management Council (AMC), SESA, International Test and Evaluation Association (ITEA), and the College of Leadership and Management will plan the event(s).There are advantages in scale, sponsorship, and marketing together with the opportunity to reach out to other like-minded engineers working in or around projects.
- A virtual component of the conference will allow attendance from remote regions of the country and overseas. One positive outcome from 2020 will be the addition of virtual meetings and conferences.

**SESA is a Technical Society of Engineers Australia and the Australia Chapter of INCOSE*

National Speaker Program (NSP)

The next SESA National Speaker Program will be Tuesday 26 May 2020. The speaker is Dr Richard Hodge with his talk "This Century—Leading (and Engineering) Care".

Further NSPs planned for 25 August and 24 November.

ASEW 2020 Sydney

The Australian Systems Engineering Workshop, tentatively scheduled on 26-27 October 2020 in Sydney, will provide both virtual and face-to face participation, with the exact mix determined later in the year.

TLI Cohort 6

SESA had 2 candidates accepted into Cohort 6 of the INCOSE Technical Leadership Institute (TLI); Emma-Rose Tildesley and Alex Deng. They both received high recommendations for the TLI and I expect them to continue their INCOSE leadership journeys into the future. Their introductory bios are below.

Emma-Rose Tildesley

Emma-Rose Tildesley is one of SESA accepted applicants to the TLI Cohort 6. Emma has volunteered with SESA for 3 years, starting with membership to the Victorian Transport Working Group where she took on roles of secretary and event coordination, to now leading the Victorian SESA branch operations and coordinating branch leads across Australia.

Emma attended her first Australian Systems Engineering Workshop (ASEW) in 2017 where she took the INCOSE knowledge exam and later received ASEP certification. Emma went on to co-facilitate workshops at the next two ASEWs for the transport stream.

Emma is an electrical engineer with a specialisation in control systems. She has a broad range of experience across industries where she has applied systems engineering practice. Emma is currently an Associate Director at KPMG where she offers systems engineering to clients across many sectors but with a prime focus in transport. She has completed a number of short courses in systems engineering and looks forward to taking this next step in her journey to technical leadership.

Pictured above, Emma has temporarily moved in with her partner in country Victoria (to limit their movements between areas) where the heating system has broken. While they wait for the company to send out a new part, Emma creatively keeps warm with heat packs, Canadian headgear, and regular hot teas.

Alex Deng

Alex Deng commenced his career as a software R&D engineer at NxtControl in New Zealand & Austria, which Schneider Electric acquired. He worked five years in New Zealand, three of which included major Re-signaling & European Train Control System (ETCS) Projects with Invensys Rail (Siemens Rail Automation) at Auckland. After that, he came to Australia and became a consultant—predominantly for large scale, complex, government sponsored transport projects, and his experiences there set him on the path to the world of systems engineering.

Since 2017, Alex has actively supported SESA committee on external engagement, Transport working group, and served as a Sponsorships Manager for SETE 2020 conference. Most recently he became assistant treasury to support the SESA treasurer, secretary and president on a daily basis across various INCOSE/SESA work. During this time, he obtained Chartered Status (Systems Engineering) with Engineering Australia and accreditation as a Certified Systems Engineering Professional (CSEP) by INCOSE.

Alex is currently a Principal Consultant for SNC-Lavalin Atkins (SNCL Atkins) ,a Canadian company based in Montreal providing engineering, procurement, and construction (EPC) services to various industries. He provides advice to a range of clients on all types of matters associated with systems engineering and feels fully ready to take on a leadership study at an advanced level.

Alex is a big fan of software development and integration and has a passion to develop software tools to pursue comprehensive problem-solving methodologies.

Handover Time

My 2 year term as SESA President will complete at the end of June. I will deliver my President's Report at our annual General Meeting in early June and hand over to Mr. John Nasr who is the current President-Elect.

Best wishes and stay safe! Bill

FYI

Information and Tools for Now

Systems Engineering Journal Special Issue

This special virtual issue of *Systems Engineering* provides free full PDF access to 30 recent papers on resilience, adaptability, and flexibility. https://onlinelibrary.wiley.com/topic/vi-categories-15206858/virtual-issues/15206858

Systems Resilience

(First published:27 April 2020. Last updated:27 April 2020). The global COVID-19 pandemic has disrupted system behaviors from many perspectives. The implications of these disruptions are uncertain and are only beginning to be understood. As these systems respond to events, they impact social, technical, or economic aspects in domains such as healthcare, networks, supply chains, manufacturing, services, or defense. Their behaviors are causing stresses and challenges to continued operation and delivery of intended outputs. Explicit consideration of resilience, adaptability, and flexibility characteristics during the processes of conceiving, designing, implementing, and operating systems can result in maintaining desired operational effectiveness in the face of uncertain environments. The journal *Systems Engineering* provides this virtual issue on these topics to help organize resources on what to think about and what to consider for systems research, development, and deployment in the future.

EWLSE Updates

Alice Squires, ewlse@incose.org

Empowering Women Leaders in Systems Engineering (EWLSE) wishes all a safe and healthy summer as we continue to operate during the global pandemic. We have a couple of virtual events to report on—EWLSE at Chicagoland, written by Stephanie Sharo Chiesi, and Asia Oceania EWLSE Events written by Stueti Gupta. Stueti champions EWLSE in Asia Oceania sector and, if you would like to volunteer and participate in EWLSE activities in the Asia Oceania sector, you can contact her at stueti.gupta@incose.org. Erika Palmer leads EWLSE in the EMEA sector and, if you would like to volunteer and participate in EWLSE activities in the EMEA sector, you can contact her at erika.palmer@incose.org.

Please join me in congratulating our two newest EWLSE candidates welcomed into the INCOSE Technical Leadership Institute (TLI) 2020 cohort: Erika Palmer and Maria Romero, joining Allison Weigel (cohort 2019), Heather Feli (cohort 2018), Lauren Stolzar (cohort 2018), and Heidi Davidz (cohort 2018) and many other TLI graduates who are current members of EWLSE. The INCOSE TLI is looking forward to more exceptional EWLSE candidates in the future. To find out more about the process for applying to the INCOSE Technical Leadership Institute, please contact David.long@vitechcorp.com; the annual deadline for applicants is March 31st. Also for those new to systems engineering or those who have been practicing for decades, if you are looking for a systems engineering mentor or ready to be a systems engineering mentee or both, please sign up here: https://bit.ly/2G6TJPL.

How do you advocate for women leaders in systems engineering? Please contact ewlse@incose.org to share your stories!

EWLSE at ChicagoLand April Chapter Meeting

Stephanie Sharo Chiesi, ewlse@incose.org

The Chicagoland Chapter contacted EWLSE regarding a virtual chapter presentation to educate the chapter and their guests on the EWLSE mission and projects. Little did anyone realize at the time that all over the world we would be planning events and work and school of all kinds to be virtual for an extended period! It was a welcome invitation to introduce EWLSE to Chicagoland and get the chance to engage with their membership.

In recent time the convenience of remote meetings and speakers has become commonplace. For many INCOSE chapters virtual engagements have accommodated chapter members participating from outside the immediate region or while on travel. This was just the case with Chicagoland, so the chapter was well prepared for an EWLSE outreach meeting.

On Thursday, 16 April, I joined the chapter for their monthly meeting and presented the EWLSE mission and goals, along with our current projects and programs in work. This overview of EWLSE is a summary of work we have shared since the founding of EWLSE in 2015 at the INCOSE 25th International Symposium. As EWLSE is now celebrating its 5th anniversary there are many accomplishments to review and even more still in the works.

The Chicagoland chapter had an amazing turnout for this virtual event and made great use of the environment to engage with participants. Those on the meeting introduced themselves briefly one at a time in order of when they were born. This was a great way to get everyone participating and to share a little bit about what intrigued them to attend and what they hoped to learn. I presented our EWLSE introduction about the initiative, our history, and current projects. The group was very attentive, interested, and conducted a great question and answer period after the presentation. This included questions about getting involved with EWLSE, lessons learned, resources, and other current publications in work.

This was a wonderful event, and something EWLSE is happy to offer to other chapters looking for additional virtual programming options for their chapters. You can contact the leadership team at: heidi.hahn@incose.org for planning.

All files presented or related to the INCOSE EWLSE sessions are accessible at this url: https://www.dropbox.com/s/ffdfneroas45ux6/EWLSEMarch2020.pptx?dl=0.

Asia Oceania EWLSE Events

Stueti Gupta
stueti.gupta@incose.org

This is a report on two Asia Oceania EWLSE related events. For the first event, Stueti Gupta presented at SAEINDIA Off-highway Webinar Series, on 28 April 2020, about Systems Engineering in Off-highway Industry (*Figure 1*). The focus of the talk was what is systems engineering, its application, and benefits for off-highway industry. Stueti discussed some case studies she has worked on in her career in off-highway. The session, relayed to all members of SAEINDIA, included 100+ participants. In the end she also introduced INCOSE and its mission, benefits of the membership, and highlighted the MoU (memorandum of understanding) with SAE International.

Figure 1: SAEINDIA Off-Highway Industry Webinar Series

Stueti Gupta also attended a panel discussion on 15 May 2020, part of the new South India chapter of ALL "Manufacturing's" virtual launch (*Figures 2* and *3*). ALL Ladies League (ALL) is an international forum for women present in over 130 counties and more than 150,000 members. This manufacturing platform aims to

Figure 2: Virtual Launch of All Ladies League Manufacturing Sector South India

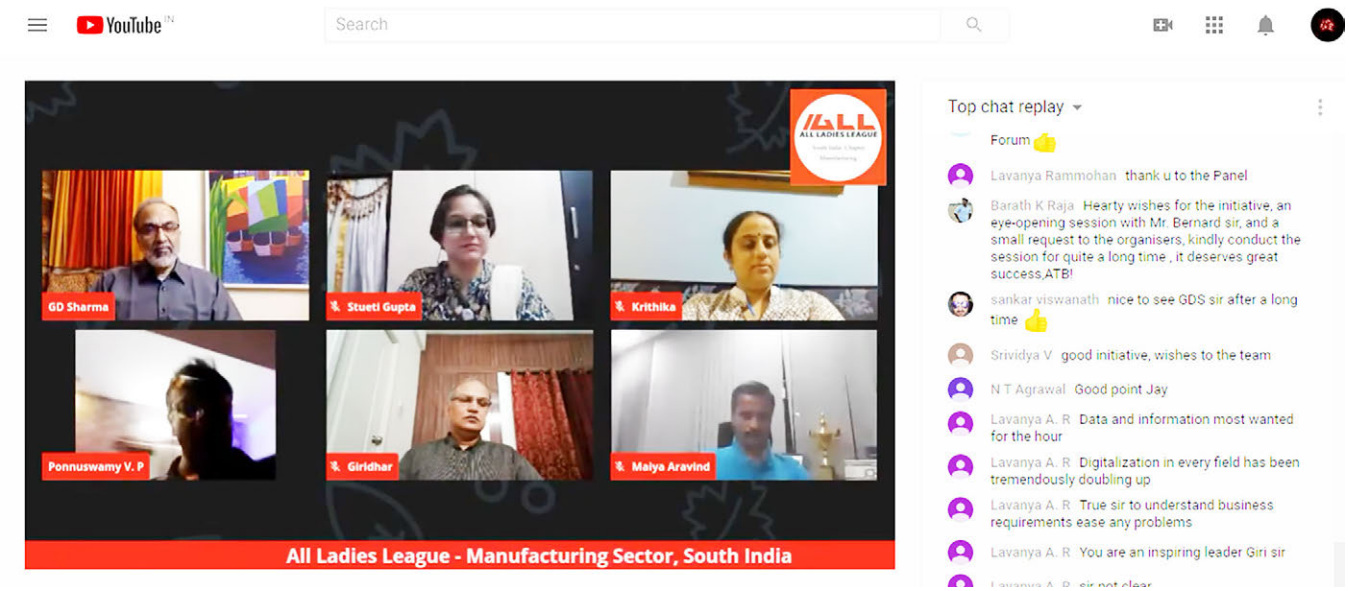


Figure 3: All Ladies League Manufacturing Sector Meeting, In Action

bring together mechanical engineers to senior leaders in manufacturing, R&D, and many other sectors and engage in building, strengthening, and nurturing women leadership in the manufacturing sector through its 3 strong pillars "Mentoring, Learning & Networking". Two panel discussions were part of the agenda. Inspire panel; senior professionals spoke on navigating through the career tracks in manufacturing and industry. The panelists shared some personal stories and mentoring lessons with budding professionals. The other, Aspire panel, consisted of female students pursuing careers in mechanical or automobile engineering.

FYI

Information and Tools for Now

INCOSE Technical Product Announcement

Systems Engineering Handbook V4.0 Tutorial Slides

Gabriela Coe gabriela.coe@incose.org
John Clark john.clark@incose.org

The INCOSE Training Working Group reminds you the INCOSE Hampton Roads Area Chapter's Systems Engineering Handbook V4.0 Tutorial slides received designation as an INCOSE Central Technical Product.

The slides are downloadable for free through the INCOSE store or on CONNECT. At either link:

- Scroll down to Systems Engineering Handbook V4.0 Tutorial; Tutorial ID: 01_October 2015; Tutorial Session: 00_Shared Documents
- Download all slides in Marcom Format, JOC 191212.

The prior Systems Engineering Handbook V4.0 Tutorial, including its webinar recordings, is downloadable by accessing Tutorial Sessions 01 through 34. Other downloadable Tutorials, and webinar recordings, include:

- Human Systems Engineering
- Systems Engineering Fundamentals
- Systems Engineering Handbook V3.2.2
- Leadership Skills
- System Engineering Technical Processes
- Systems Engineering Principles.

Questions? Contact gabriela.coe@incose.org or john.clark@incose.org.

Highlighting 30 Working Groups for the INCOSE 30th!

Lisa Hoverman, marcom@incose.org

This year at the INCOSE International Workshop (IW), the premier conference to contribute meaningfully to the state of the art in systems engineering, 47 Working Groups (WGs) spanning topics from Artificial/Augmented Intelligence to Configuration Management to Digital Engineering to Empowering Women Leaders in Systems Engineering to Model-Based Systems Engineering, to Natural Systems, to Smart Cities, to Social Systems, to Telecommunications, and more gathered in Torrance, CA to work on the big and complex challenges facing our planet.

The working groups self-organize and self-report at the end of the workshop. Most working groups are open sessions so new members can attend, learn about the work, and engage at the level that is right for them. The work the group does at the IW and reports on from their time spent working together at the IW is available on the INCOSE website here. If you are a new member, or a member looking to get involved in a working group, this is a wonderful place to start learning about what INCOSE is up to, and where you might want to contribute!

As part of our 30th year celebration, we are going to highlight 7–8 working groups each Newsletter in 2020 to showcase their work, provide insight to what we do technically in INCOSE and how we contribute back in a big way to the larger Systems Engineering Community! In this issue, we are highlighting 7 working groups we hope you enjoy learning about and will potentially join!

WG9—Architecture

Chair: Mike Wilkinson, michael.wilkinson@incose.org
Richard Martin, richardm@tinwisle.com
Anand Kumar, anand.ar@tcs.com
Jean-Luc Garnier, jean-luc.garnier@thalesgroup.com

Members: 15 regular members and over 200 corresponding members

Purpose/Mission

To expand the practice of architecture and advance the body of knowledge.

Goals

Standing goals as follows; pursued in conjunction with other bodies as appropriate.

- Advance and evolve the body of knowledge on architecture
- Promote the use and practice of architecture
- Share best practices for the use of architecture
- Expand the effort in architecture related standards and specifications

Scope

The ArchWG will address Architecture in relevant areas (such as Traditional Systems, Enterprises and Software) as it relates to Systems Engineering applied to all levels and types of systems

IW Outcomes

- Review of ArchWG operation and contacts and verify INCOSE email service use
- Updates of ArchWG participant activities and opportunities not otherwise on agenda
- Review current status of OMG UAF revision and discuss implications of use
- Review and discuss ISO/IEC/IEEE 42010 revision draft terms and basic models overview
- Briefly review ISO/IEC/IEEE 42020 and discuss completion of Technical Product Proposal for Guide to ISE/IEC/IEEE 42020 Architecture processes use project
- Introduce FEAPO Common Perspective on Enterprise Architecture white paper

revision, discussion observed issues and recommendation for revision

- Discuss Implication of Systems of Innovation Pattern as possible inclusion into white paper

Planned Activities

- Continue review and comment activities for International Standards and OMG UAF standard
- Complete TPP for Guide to ISO/IEC/IEEE 42020 Architecture processes document
- Engage with IEEE and Business Architecture Guild about revision recommendations to FEAPO white paper Common Perspectives on Enterprise Architecture

Planned Work Products

- Guide to ISE/IEC/IEEE 42020 Architecture processes document
- Revision of FEAPO Common Perspective on Enterprise Architecture white paper
- Comment submission for ISO/IEC/IEEE/CD 42010 Ed2 Architecture description

Why join the Architecture WG

- Active, well established membership
- Exciting work prospects
- Collaboration opportunities

WG10—Digital Engineering Information Exchange

Chair: John Coleman, drjcoleman3@outlook.com

Co-Chair: Chris Schreiber, chris.schreiber@lmco.com
Frank Salvatore, Frank.salvatore@saic.com

Members: 110

Purpose/Mission

The initial purpose of the working group (WG) is to fulfill the needs identified by the international representatives from the digital artifacts challenge team. The reason for the working group is to adopt previous and evolving knowledge regarding the exchange of digital engineering information between multiple disciplines, digital technologies, and throughout the systems lifecycle. The working group will strive to ensure the way we define, create, use, and exchange digital-artifacts is acceptable.

Goals

- Define a finite set of digital artifacts
- Develop constructs for assembling of digital artifacts
- Build a consensus-based standards framework for digital artifact exchange
- Adopt a common lexicon

Scope

This working group's efforts will span the systems engineering lifecycle as it relates to the digital artifacts for decision making and its consumption by downstream engineering activities.

It will also address the exchange of digital artifacts between various technical disciplines involved in the systems engineering lifecycle.

Finally, it will cover the presentation of digital engineering information to classes of technical and non-technical stake holders within Federal Government.

IW Outcomes

- Completed a draft and community vetted High Level Concept Document (HLCD) for digital engineering that explains concepts in the lexicon
- Developed a concept SysML model for the digital artifact exchange concept
- Developed a digital viewpoint model that requestors can use to define what they want to see in the digital views
- Developed the objectives and a plan to conduct a DEIX Challenge as proof of concept for the digital viewpoint model as a means to define and receive the digital views as defined

Planned Activities

- Conduct proof of concept challenge at the 2020 IS

- Publish High Level Concept Model in the INCOSE INSIGHT
- Get the Digital Engineering Primer through impactful products process before the IS 2020
- Produce draft article with addendum on reference DEIX standards Framework by June 2020
- Complete the Digital Ecosystem Reference Model for WG review by June 2020
- Produce Draft Digital Viewpoint Model methods and approach by end of IW 2021

Planned Work Products

- DEIX Primer
- Digital Engineering Ecosystem Reference model
- DEIX Standards Framework
- Digital Viewpoint Model Methods and Approach

Why join the Digital Engineering Information Exchange WG

- Forward looking working group
- Digital projects
- Product focused

WG11—Infrastructure

Co-Chair: Alain Kouassi, alain.kouassi@parsons.com

Members:80

Purpose/Mission

The Infrastructure Working Group's Charter is to provide a forum for designers, builders, and operators of economic and physical infrastructure systems to advance the application of systems engineering.

Goals

- International Outreach to public and private organizations involved in infrastructure delivery and operations
- Systems engineering product development to support the domain

Scope

Public and commercial facilities and networks necessary for the economic and physical well being of society (power generation and distribution, waterways and ports, industrial facilities, telecommunication networks, and transportation)

IW Outcomes

- Collaborated with TWG, AWG, and CIPR
- Reviewed and Updated Strategic Plan, including:
  - Organization Structure
  - Plans
  - Collaboration
  - Product development
- Discussed Opportunities for collaboration with other Working Groups
- Discussed strategies to progress the products under development including timeline

Planned Activities

- Host Webinars
- Collaborate with other Working Groups including AWG, TWG, and CIPR
- Conduct outreach within INCOSE and other entities (government agencies, supplier organizations and professional organizations)

Planned Work Products

- Collaborate with AWG, TWG, CIPR and Smart Cities Initiatives to develop Systems Engineering Handbook Framework
- Develop a leaflet on Configuration Management
- Develop a leaflet on Asset Management
- Translate previous leaflets in French, Spanish, German and Dutch
- Define Stakeholders and Develop Outline of Version 2 of the Guide to the Application of Systems Engineering in Large Infrastructure Projects
- Finalize MBSE Drawbridge Model (Including Podcast and Video)

Why join the Infrastructure WG

- Collaborative
- Lots of projects planned

WG12—NAFEMS-INCOSE Systems Modeling and Simulation

Chair: Roger Burkhart,
burkhartrogerm@johndeere.com

Co-Chair: Frank Popielas,
frank.popielas@smsthinktank.com

Members: 200+

Purpose/Mission

The Systems Modeling & Simulation Working Group (SMSWG) is a collaboration between NAFEMS (the International Association for the Engineering Modelling, Analysis and Simulation Community) and INCOSE (the International Council on Systems Engineering). The Mission of the SMSWG is to develop a vendor-neutral, end-user driven consortium that promotes the advancement of the technology and practices associated with integration of engineering simulation and systems engineering.

Goals

The SMSWG supports activities that bridge engineering simulation and systems engineering to optimize the integration of Systems Engineering and Engineering Simulation solutions for both OEM and supplier. This includes education, communication, promotion of international standards, and development of requirements that will have general benefits to the engineering simulation and systems engineering communities.

Scope

Systems Modeling and Simulation (SMS) is the use of interdisciplinary functional, architectural, and behavioral models (with physical, mathematical, and logical representations) in performing Model-Based Systems Engineering (MBSE) to specify, conceptualize, design, analyze, verify and validate an organized set of components, subsystems, systems, and processes. MBSE is the formalized application of modeling to support system requirements, design, analysis, verification and validation activities.

IW Outcomes

- Recap of 2019 Accomplishments
  - Trifold handout flyer on What is Systems Modeling & Simulation?
  - NAFEMS-INCOSE leadership sessions and panel at NAFEMS World Congress (Quebec City, June 2019)
  - Monthly online meetings for SMS Community
- Reports from SMSWG Focus Teams
  - Roadmap and Sharing of Best Practices
  - Terms & Definitions
  - Standards Ecosystem
- Standards Working Session
  - Model Identity Card
  - LOTAR and PDES
  - MoSSEC
  - NAFEMS Standards Initiative
  - FMI, SSP, DCP
  - SysML V2
  - OSLC
  - SysPhs
- Planning for 2020 Activities

Planned Activities

- SMSWG Program at NAFEMS Americas Conference on Advancing Analysis & Simulation in Engineering (CAASE) 2020 (June 16-18, 2020; Indianapolis, Indiana (https://www.nafems.org/events/nafems/2020/caase20/)
- SMSWG presence and activities at INCOSE International Symposium
- Monthly online meetings for SMS Community members

Save the Date: Thursday, 23 July 2020

All Members are invited to join us for the Joint Leadership Meeting 23 July at 8am EST, US.

Check your email in the coming weeks for the invitation to sign up.

- Support of NAFEMS-INCOSE leadership discussions on additional areas of collaboration under the MoU (Membership, Certification, Training)

Planned Work Products

- Trifold flyer on "What is Model-Based?" (MBx Terms & Definitions)
- User scenarios and validation cases for SMS-related standards
- Proposed Special Issue of INCOSE Insight on Modeling & Simulation
- Proposed contributions to NAFEMS Benchmark Magazine

Why join

- Active international working group
- Well organized
- International collaboration

WG13—Small Business Systems Engineering

Co-Chair: Rüdiger Kaffenberger, Ruediger.kaffenberger@gfse.de
Ken Ptack, swoop42@verizon.net
Angela Robinson, adanrobins@gmail.com
Claude Y. Laporte, claude.laporte@etsmtl.ca

Members: 69

Purpose/Mission

- Support systems engineering concepts that have been adopted and adapted by most industries
- In the context of Very Small Entities (VSE) and small projects, that these concepts can be tailored to improve:
  - Product development efficiency
  - Product Quality
- Contribute to Standardization

Goals

- Support and promote the application of systems engineering by entities with a workforce of five up to 25 persons
- In the context of VSE's, these concepts can be used or tailored to improve:
  - Product development and service delivery efficiency (including costs and delays)
  - Lifecycle Management Guides and Deployment Packages (DP) to meet stakeholder needs

Scope

This working group has the scope of the ISO 29110 as it pertains to organizations of five up to 25 persons

IW Outcomes

A Technical Project Plan is in submission for:

- Basic Profile Guide
- Configuration Management DP
- Project Management DP
- System Requirements Engineering DP
- System Architecture DP
- Interface Management DP
- System Integration DP
- Verification and Validation DP
- System Deployment DP
- Self-Assessment DP

Planned Activities

- Develop marketing material to distribute at conferences, chapter, and WG meetings
- Collaboration with INCOSE WG's to develop domain specific work products

Planned Work Products

- Update the Guide for the Intermediate Profile and the associated DP's
- This WG seeks to add MBSE capability to the nine DP's

Why join the Small Business Systems Engineering WG

- Small business focused
- Productive

WG14—Telecommunications

Chair: John Risson, johnrisson@anacom.com.au

Co-Chair: Susan Ronning, s.ronning@adcomm911.com
Dan Spencer, dan@spencertech.com.au

Members: 9 active members and 22 in WG community

Purpose/Mission

- To improve delivery of telecommunications solutions by enhancing the systems engineering body of knowledge for telecommunications applications.
- To enable telecommunications systems stakeholders and providers to better support their users:
  - Critical and emergency services personnel
  - Federal and municipal governments, utilities, and transportation agencies
  - Enterprise and consumer users of commercial telecommunications services
  - The broader public

Goals

- To improve delivery of telecommunications services and solutions by demonstrating practical application of systems engineering best practices
- To enhance the systems engineering body of knowledge for telecommunications applications
- To develop a community of telecommunications specialists within INCOSE
- To promote, encourage, supervise, and perform research where it improves practice of systems engineering for telecommunications

Scope

The working group will address telecommunications systems engineering across the whole life cycle: needs gathering; requirements, architecture, and modelling; verification and validation; operation and maintenance; growth and evolution.

IW Outcomes

- Reviewed 2 draft technical publications for communication service providers and critical infrastructure stakeholders:
  - Model-Based Systems Engineering for Communication Network Upgrades
  - A Systems Model for Critical Communications Networks
- Identified collaboration opportunities with other INCOSE working groups e.g. Critical Infrastructure Protection and Recovery

Planned Activities

- Collaborate with the Critical Infrastructure Protection and Recovery working group
- Run a panel session and INCOSE booth at International Wireless Communications Expo 2020
- Engage with at least 2 technical working groups of the European Telecommunications Standards Institute
- Present at Systems Engineering Test and Evaluation (SETE 2020) conference in Brisbane

Planned Work Products

- Paper, “A Systems Model for Complex Communications Networks” by Thomas Manley, Susan Ronning, bill Scheible
- Paper, “Model-Based Systems Engineering for Communication Network Upgrades” by Fabrice Lestideau, John Risson, Dan Spencer
- Guide for the Application of Systems Engineering to Large Communication Network Systems
- INSIGHT article, “Designing Critical Communications Networks to Withstand Daily Events and Failure Incidents”

- Two primers for (critical) communications stakeholders

Why join the Telecommunications WG

- Involved in community
- Goal driven

WG15—Value Proposition Initiative

Chair: Juan Amenabar, juan.p.amenabar@leidos.com

Co-Chair: Ken Harmon, kharmon@vt.edu

Members: 10

Purpose/Mission

The Value Strategic Initiative (VSI) seeks to distill the characteristics of value propositions and project those values to a prioritized taxonomy of needs whose major classes include the audience (who is the target), the area (what is the content) and the industry (how should it be tailored). The rationale for this initiative is derived from a strategic need to better articulate these benefits and values in the operation and management of INCOSE as a more effective service delivery enterprise.

Goals

- Develop a process to distill the core characteristics of a value proposition, define the needs of the community, develop value statements tailored from this set
- Develop value statement products that are tailored to specific needs and users
- Maintain communication within and outside INCOSE on these products to promote INCOSE products, membership and certification, promote systems engineering as a whole
- Maintain developed products overcome misconceptions regarding systems engineering

Scope

Develop and maintain tailored value proposition statements for INCOSE and for Systems Engineering as a whole

IW Outcomes

- Finalized initiative charter
- Completed development of a process to generate value propositions in 2019
- Completed a study to characterize the salient points of any value proposition in 2019
- Presented material at IS19 special planning meeting
- Drafted initial set of value proposition statements being presented at IW2020 CAB meeting

Planned Work Past IW

Planned Activities

- Receive community feedback during 2020 and incorporate comments
- Continue to generate draft statements for a full draft set for IS2020
- Work with INCOSE to plan for adoption, distribution and continued stewardship

Planned Work Products

- Updated draft statements set by IS2020
- Implementation plan by end of IW2021
- Draft paper with process and outcomes by IW2021

Why join Value Proposition Initiative WG

- Growing but organized
- Plenty of opportunities for progression
- Needs oriented

FYI

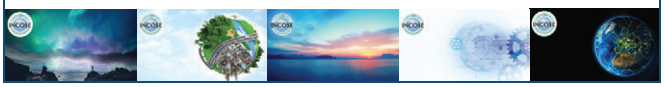
Information and Tools for Now

INCOSE and Zoom

cio@incose.org

If you are an INCOSE Chapter or Working Group, INCOSE has a Zoom license for you. Email cio@incose.org to request the license.

Want to bring INCOSE style to your Zoom meetings? Check out our awesome backgrounds here.



Special Feature—Participate in Systems Thinking Research

Ross Arnold, ross.arnold1@gmail.com

Systems thinking—the ability to understand systems, predict how they behave, and figure out how to change them—is considered a critical skill for systems engineers, as per INCOSE's own vision statement. In an age of complex systems and global interconnectedness, it is more important than ever to effectively apply systems thinking skills to all kinds of decisions, from politics to economics to large scale engineering problems.

Imagine if everyone, from the most influential decision makers to elementary school children, were taught how to look at problems holistically. If they could see the obscure but critical connections between seemingly unrelated events. If they appreciated all the little factors that add up to make a big difference. If they examined different perspectives, root causes, and had the ability to produce lasting, sustainable, effective change!

It is not a stretch to think the spread of systems thinking skills might be a global game-changer. Like a disruptive technology, systems thinking is a disruptive mentality. It has potential to change the way we live our lives, and to allow everyone to approach all kinds of systems in more effective ways.

We can make this happen, if we can teach and spread systems thinking concepts at a large scale. However, there is a problem. We know what systems thinking is. We know what it does. But we do not know how to test it. How do we know our educational methods are effective at teaching something we cannot test? We have reached the edge of human knowledge in this field. It is time to push that edge forward by exploring innovative ways to measure systems thinking ability.

You can help solve this problem without even moving from your computer screen. A computer game, designed and built for this purpose, is still in the early research phases. Called the Systems Thinking Game, it tests players' systems thinking skills across a wide range of key factors. This game is a novel method that has never been done before. But, for it to work, we need many more players to play the game.

Research Instructions

As an INCOSE newsletter reader, you are a perfect candidate for this research! If you choose to participate, you will be among the first in the world to pioneer this new approach. The game is online, so you can do everything comfortably from your home. All you need to do to participate is:

- Go to the website: http://www.systemsthinkingtest.com
- Click on the "Tutorial" link on the bottom right and watch the YouTube tutorial.
- Click the "Take the Systems Thinking Test" link at the bottom, then keep/accept/download and run the Java file. The file is secure and signed with an independently verified code signing certificate.

The data collection is all automated and requires no extra steps on your end. As an added bonus, if you can finish the game, you may be provided with your novel systems thinking score in a variety of different areas at the conclusion of the research. Thank you so much for taking the time to advance the state of the art in systems thinking and helping to navigate our increasingly challenging global complexity!

INCOSE Strategic Value Initiative

Juan P. Amenabar, juan.p.amenabar@leidos.com

Value statements for systems engineering, corporate and individual INCOSE membership, and INCOSE Systems Engineer Professional (SEP) certification are key elements of attracting and maintaining members. Value statements are a top priority according to the 2017 INCOSE Corporate Advisory Board (CAB), the Future of Systems Engineering (FUSE) 2018 initiative, and earlier INCOSE efforts that led to specific studies and results. Generally, these early products were very specific, lacked a holistic development approach, and have therefore not kept pace with the evolving nature of systems engineering and do not encompassed the breadth of needs.

The Value Strategic Initiative (VSI) has overcome these shortcomings through:

- Generation of a taxonomy identifying all key elements and stakeholders
- Generation of profiles encapsulating key characteristics of each taxonomy element
- Utilization of these profiles and taxonomy organizations to create relevant and tailored value statements

Through the generation of a development and maintenance process, this effort has ensured this product remains relevant in the future. 2019 saw the VSI infrastructure completion including the development of the value statement process and taxonomy of value elements that include the area (value topic) and audience (value tailored to). Major recent highlights include:

- Conducting a poll to compress the third taxonomy element, industry, into a smaller more manageable set. Based on the results, the new industry axis contains large project government, aerospace, infrastructure industry; commercial industry; non-profit, research and academia industry/ organizations.
- Generating and submitting the first draft of the VSI report as evidence with this report for review.
  - This draft report aims to provide an accounting of work to date including the process and taxonomy, a complete draft outline of the final report, and a set of initial draft value statements.
  - This first draft requires inputs from the community. Please submit comments to: juan.p.amenabar@leidos.com

Based on these efforts, work will continue compiling the draft report review comments and continued value statement development.

This project is on target for a reviewed final report by IW21 and an initial release v1.0 and implementation/delivery of value statements and report recommendations by IW22.

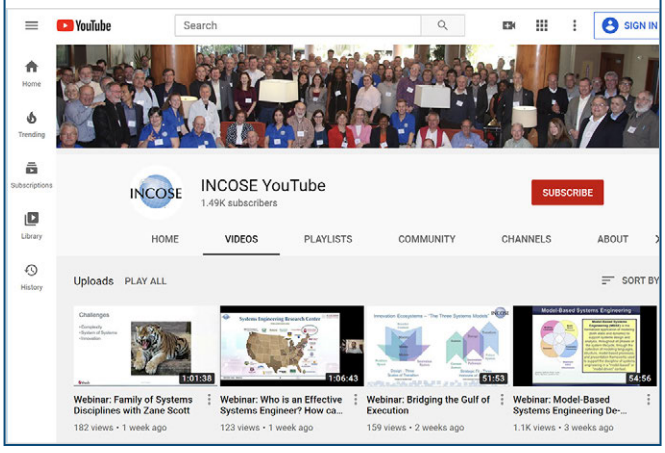
FYI

Information and Tools for Now

INCOSE Expands Product Accessibility

INCOSE is dedicated to expanding systems engineering learning and making it available for everyone who wants to become part of this field. As part of this dedication INCOSE began the webinar series to connect with a broader audience on various systems engineering topics.

Now, INCOSE's Accessibility Task Team's work is forging ahead with the completion of webinar captioning. So far, this team has completed caption three webinars with plans to continue captioning more. Check them out on our website and on YouTube.



Remembering JackRing

Bill Mackey

I have been asked to write this article for INCOSE, but do so with a heavy heart. I lost a dear friend with whom I could argue and come away from the discussion with our friendship fully intact. I met Jack in 1965 (55 years ago) when we were both working for the GE Missile and Space Division. We both moved on from GE, but remained in contact. After I completed my doctoral work, Jack gave me a call and offered me a job again at GE-ISP in Washington, D.C. Jack moved me from the Philadelphia area to Alexandria, VA where I still live. Jack became my boss, my mentor, and my dear friend. When I attended INCOSE functions I always looked forward to spending one evening with Jack at dinner where we would discuss systems engineering, politics, the law profession which he disliked, auto racing which we both enjoyed, and myriad other subjects. Jack was so well read, he could state his own opinion and provide sound facts and reasoning to support his positions.

Everyone in INCOSE knew Jack, because he was bigger than life. Many colleagues had ways of characterizing Jack that were unique:

- Jack could always reliably provide thoughtful, if iconoclastic, contributions.
- He was one of such independent thinkers which we do not have enough of in our systems engineering world.
- Jack challenged all our thinking and offered great insights.
- Jack was one of the most intelligent people I have ever met in my life.
- A twinkle-eyed greeting with a mischievous grin,
- An engulfing hug with a barrel chest,
- Flirtatious and feisty,
- A gentleman, a scholar, and one who called a spade a spade

Jack Ring passed away peacefully on 22 April 2020, at the age of 85 in Mesa, AZ after a hard battle with liver cancer. He was born in St John, Kansas on 14 April 1935. Jack was proud of St. John, Kansas. When I personally toured many mid-west states, Jack gave me an action item to explore St. John and report back what I found. I dutifully did what he asked and found St. John to be a delightful small town. Jack loved action items. Another colleague, who also reported to Jack at GE, told me Jack was giving him action items three years after he moved onto another job in a different company.

Jack is leaves his wife, Mary Lou, whom he resided with in Gilbert, AZ; his sister, Barbra Atterbery from Tribune, KS; his son, Jordan Ring from Glendale, AZ; his daughter, Kelly Ring Orosy from Krum, TX; and his stepchildren and grandchildren. Jack graduated from St John High School and Emporia State College, where he earned a Bachelor of Science in Chemistry. Jack had a passion for science and technology and was a member of several professional societies including MENSA and INCOSE. Jack volunteered many hours as a mentor to his peers and served as a board and council member for numerous organizations, including The University of Advancing Technology and Starshine Academy. In his later years, he devoted his time to researching how people think and learn and worked to create a new teaching pedagogy to enhance the K-12 educational system. Jack will be remembered for his kind heart, eccentric style, and superior intellect. He was greatly loved and is greatly missed.

I submit working for and with Jack was always a challenge because he always asked questions to inspire thought. When he finally convinced someone his opinion had merit, which it often did, he would offer more opinions in a still different direction. I concluded tackling intellectual pursuits was a game with Jack. When I realized it was a game, then everything we did together was a laughing matter and enjoyable.

When I came up with an idea to pursue work in Nuclear Safeguards, Jack had his doubts

and asked me "what was the metric used for a nuclear cross section?" He figured I could not reply to that question and would give up. Since I did study nuclear physics, I quickly responded a nuclear cross section was measured in "barns." We laughed, and he supported me in that pursuit. We were later asked to lead a nuclear safeguards exercise requested by President Nixon to Jack Welch, GE-CEO. Since it became high profile, we had our careers on the line. I led the exercise involving the IAEA, Department of Energy, the Nuclear Regulatory Agency, the Brookhaven National Laboratory, and GE Nuclear Fuel Fabrication Department, and Jack supported me throughout the effort. We made the effort a success together.

When I became INCOSE Fellows Chair in 2001, I immediately asked Jack to be Co-Chair and he accepted. That too often became a laughing riot, but he hung in with me for the duration. Jack had a way of becoming very close friends for those who took the time to understand him and gained respect from those who did not. I previously nominated Jack to become INCOSE Fellow. All who met Jack were impressed with his intellect, and if he ran a panel or workshop it was *always* extremely well attended.

He always had a love for red corvettes and racing cars, but nothing compared to his love for his wife, Mary Lou, and his children. I offered to take Jack to the Indianapolis 500 because of his early interest in auto racing. Jack said that auto racing was one venue that was a perfect example of a system because one could measure the results lap by lap. Dennis Buede, another giant systems engineer, Jack, and I formed the Motor Sports Working Group and, while attending an INCOSE Workshop in Phoenix, AZ, Jack took us to another of his good friend's establishment, the Bob Bondurant School of Racing in Phoenix. Bob is a famous former race car driver having raced in the 24 Hours of LeMan's and having trained many of the famous drivers from around the world. Bob took us on a trip around his race track at racing speed and agreed to support our effort to develop a course for teaching the principles of systems engineering and applying it to the auto racing venue. Dennis got heavily involved in developing his private consulting company and Jack got involved in a teaching effort with his wife Mary Lou, so the Motor Sports WG eventually fell by the wayside.

While in Phoenix on another occasion, I had dinner with Jack and Mary Lou before they got married. I told Mary Lou that I loved Jack too, and she was braver than me, because I could not live daily with a person like Jack. That would drive me crazy. We all laughed.

As big a presence as Jack was, I found him basically a humble man. When Jack became ill, we talked and, having my own serious medical challenge, I was able to offer some medical advice and knowledge. We usually talked over the phone every month or two. We talked about life, our work experiences together, politics, and fun things like travel because Mary Lou wanted to see Machu Picchu and the Galapagos. Jack was one of the best bosses, one of the best read and intelligent persons I have ever known, and a great colleague and friend. With tears in my eyes and thanks to God for permitting me the opportunity to know this unusual and great man, I must now say farewell. I love you Jack and Mary Lou Ring!

Systems Exchange Café

The Café is a Zoom meeting to discuss Systems Engineering topics. The idea is to discuss an idea—a topic, a book chapter, a paper, a journal article or a news item. At the café meeting the topic will be discussed by those attending, and the conversation will go wherever the attendees take it. Similar to a conversation in a bar or a café when a group of Systems people meet and discuss systems.

- ***Fir Tree Café:*** Wed. 8am Japan, 9am Australia, Tue. 4pm US Pacific , 7pm US East
- ***Oak Tree Café:*** Wed. 8am UK, 9am Europe, 12:30pm India, 5pm Australia)
- ***Maple Tree Café:*** Fri. 8am US Pacific, 11am US East, 4pm UK, 5pm Europe

INSIGHT Preview

William Miller Editor-in-Chief, insight@incose.org
Dinesh Verma, dverma@stevens.edu

INSIGHT's mission is to provide informative articles on advancing the state of the practice of systems engineering. The intent is to accelerate the dissemination of knowledge to close the gap between the state of practice and the state of research as captured in *Systems Engineering*, the Journal of INCOSE, also published by Wiley. INCOSE thanks corporate advisory board (CAB) member Lockheed Martin for sponsoring *INSIGHT* in 2020 and welcomes additional sponsors, who may contact the INCOSE director for marketing and communications at marcom@incose.org.

The March 2020 issue of *INSIGHT* addresses *augmented intelligence (AI) for systems engineering (AI4SE) and systems engineering for augmented intelligence (SE4AI)*. SE4AI addresses the transformation we need in methods, procedures, and tools (MPTs) to engineer systems with embedded AI fit for purpose and doing no (unintended) harm. AI4SE addresses challenges required to overcome to leverage AI in the practice of systems engineering much as a lever or pulley provides mechanical advantage to perform work in Newtonian mechanics.

Tenets of systems engineering from control systems engineering are that engineered systems be observable, controllable (to assure system stability with tolerable errors), and identifiable (Möller 2016). AI is in the forefront of technology advances with widely publicized innovations in image identification, diagnostics, and autonomy; AI applications gone awry are newsworthy in both the popular and scientific/engineering media.

AI methods fit broad classifications as rule-based and neural-network based. Rule-based methods are mature with decades of experience in application and understanding. In contrast, much is unknown of the contextually driven behavioral characteristics of neural network-based AI, referred to as machine learning and deep learning. Neural network performance critically depends on the datasets used to train the algorithms and whose actions currently cannot guarantee *fit for purpose* to meet the attributes of elegance that systems

accomplish their intended purposes and resist effects in real-world operation while minimizing unintended actions, side effects, and consequences (Griffin 2010).

The articles represent ongoing research in the Systems Engineering Research Center (SERC), a university-affiliated research center (UARC) of the US Department of Defense, in addressing the AI4SE and SE4AI challenges as stated in their research roadmap for AI and autonomy (SERC 2019). The SERC (www.sercuarc.org), operated by Stevens Institute of Technology with the University of Southern California (USC) as principal collaborator, leverages the research and expertise of faculty and researchers from 22 collaborator universities throughout the US. The INSIGHT editorial staff and SERC theme editors Dinesh Verma, Tom McDermott, and Kara Pepe thank the authors for their contributions. The lead article by Tom McDermott, Dan DeLaurentis, Peter Beling, Mark Blackburn, and Mary Bone overviews the AI and autonomy research roadmap and maps

the subsequent articles to the parts of the roadmap.

The SERC articles are within the scope of the systems community initiative on the future of systems engineering (FuSE) that has AI4SE and SE4AI as an initial project. The May 2019 *INSIGHT* addressed other FuSE projects on systems engineering principles and foundations for systems engineering (F4SE). *INSIGHT* intends to report on FuSE related topics on an ongoing basis.

We hope you find the upcoming *INSIGHT* informative and relevant!

References

Griffin, M. D. 2010. "How do we fix system engineering?" 61st International Astronautical Congress. Prague, CZ; 27 September–1 October.

Möller, D. P. F. 2016. *Guide to Computing Fundamentals in Cyber-Physical Systems: Concepts, Design Methods, and Applications*. Springer, CH.

Systems Engineering Research Center. 2019. "Research Roadmaps 2019-2020." https://sercuarc.org/wp-content/uploads/2020/01/ROADMAPS_2.3.pdf.

FYI

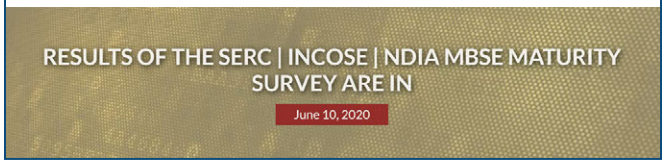
Information and Tools for Now

Results of MBSE Maturity Survey

Systems Engineering Research Center

In the second half of 2019, INCOSE paired with the Systems Engineering Research Center (SERC) and National Defense Industrial Association (NDIA) Systems Engineering Division (SED) to create a survey to benchmark the adoption of model-based systems engineering (MBSE). The survey (released by the SERC, INCOSE, and NDIA in November 2019) closed in February 2020. INCOSE would like to thank all participants in the program.

The SERC report, "Benchmarking the Benefits and Current Maturity of Model-Based Systems Engineering across the Enterprise," which indexes the MBSE Maturity Survey results, is now publicly available (SERC-2020-SR-001). Click here to find out more.



Note From the Editor

Lisa Hoverman, newsletter@incose.org

What a year INCOSE's 30th Anniversary Year is turning out to be. The world is still learning how to best operate in this pandemic, in quarantine, and how to advocate for social change globally for oppressed communities, all while trying to keep our economies stable and our children fed and safe. Systems engineers, and systems thinkers need to exercise their skills beyond the traditional domains even more. We have seen so many of our wonderful CAB companies and systems engineers working to help out their governments at every level to work on the problems facing us—check out our posts on social media highlighting these efforts. An unexpected silver-lining of COVID-19 has been the ability for any INCOSE member anywhere to attend chapter meetings globally! We have received reports of Californians attending Texas Chapter meetings, someone in every sector attending California chapter meetings, and more!

In celebrating our 30th Anniversary and in light of our quarantined state, INCOSE is offering some fantastic Virtual Community Offerings! Please, check those out! Our Systems Exchange Cafes seem to be the biggest hit!

We hope you fully enjoy the second issue of the Newsletter, with highlights of INCOSE pre-quarantine, during quarantine, and as we prepare for our first ever virtual International Symposium (IS)! This event is so cool in that it affords those who have never had the ability or finances to attend the INCOSE IS to do so this year. If you have never been, I strongly encourage you to attend. You will experience amazing systems engineering content that you will have access to for 2 weeks, discussions, panels, and networking. There is nothing quite like the INCOSE IS, and this year promises to be one of our best ever. Register today!

The Newsletter continues to grow to inform our readership on all things INCOSE, both current, upcoming, and historical. There are some interesting previews on the upcoming and exciting 2020 virtual happenings, at the chapter level, sector level, all the way up to the IS! New to this Newsletter are Updates from the INCOSE Board of Directors. Check out what the Americas Sector Director, the Marketing and Communication Director (yours truly), and the Directors for Strategic Integration and Technical Operations are all up to and leading in 2020. They have some excellent content to share!

Please keep sharing your publications with us as we continuously work to improve. I hope you see some of your suggestions and contributions in this issue. As always, we welcome feedback and contributions at newsletter@incose.org.

We look forward to seeing you participating, networking at, and presenting at one of the many terrific upcoming *virtual* INCOSE events. I end with a sincere note of appreciation to all who contributed to this Newsletter. Have a wonderful June, stay healthy and I really hope to see you online at the upcoming IS!

INCOSE Member Newsletter

Publication of the International Council on Systems Engineering

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On the Web http://www.incose.org

Article Submission newsletter@incose.org

Publication Schedule. The INCOSE Member e-Newletter is published four times per year. Issue and article/ advertisement submission deadlines are as follows:

- Q1 Newsletter, General Content (GC): 15 Feb, Late
- Breaking News (LBN): 25 Mar
- Q2 Newsletter, GC: 15 May, LBN: 25 May
- Q3 Newsletter, GC: 15 Aug,, LBN: 25 Aug
- Q4 Newsletter, GC: 15Nov; LBN: 25 Nov.

For further information on submissions and issue themes, visit the INCOSE website as listed above.

Who are we? INCOSE is a 17,000+ 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 charters chapters worldwide, includes a corporate advisory board, and is led by elected officers and directors.

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