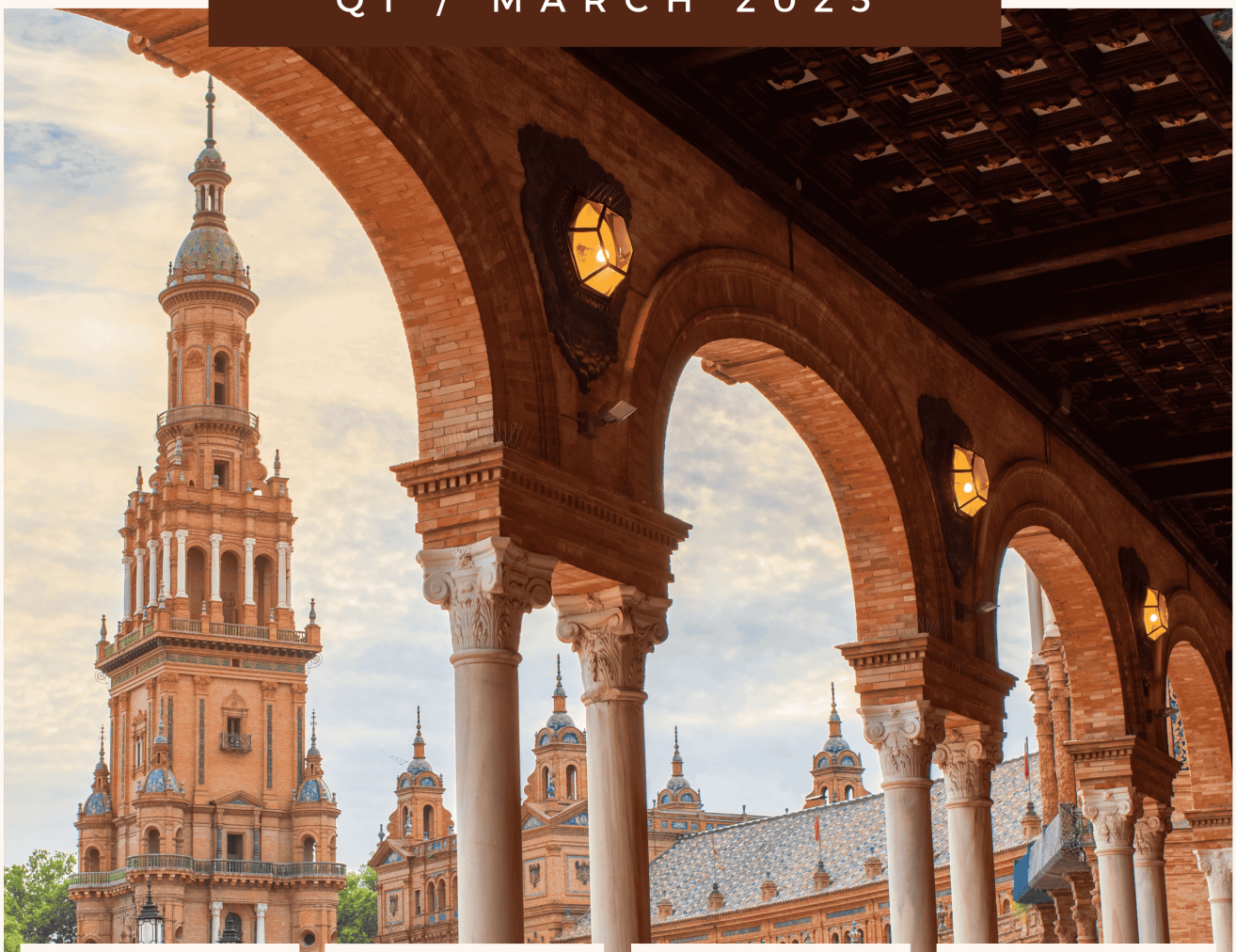
MEMBERS NEWSLETTER

Q1 / MARCH 2025



INCOSE

Introduction

IW2025 Recap

Chapter Updates

Back To Table of Content

Working Groups & Initiatives Updates

Community Updates and Interests

Services, Products & Publications

Partner Updates

Events

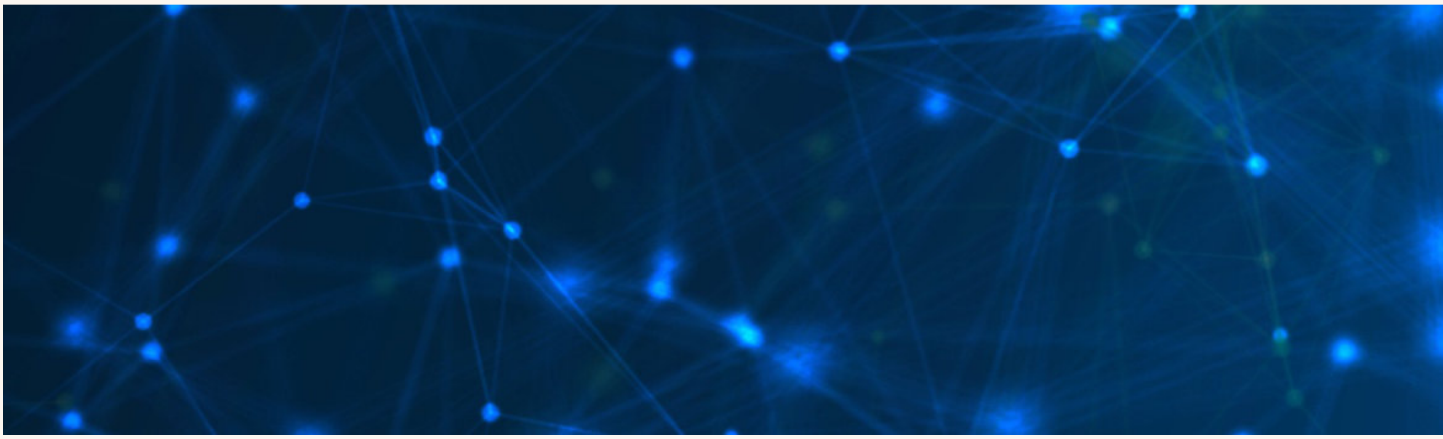
A MESSAGE FROM THE INCOSE PRESIDENT

Dear INCOSE Community,

The start of 2025 was marked by a milestone event: the first International Workshop (IW) held outside the United States, in Seville, Spain. This occasion placed special emphasis on the presence of EMEA chapter working groups, fostering awareness and collaboration in alignment with our “One INCOSE” ambition. Building on the successful practices introduced at IW23 and IW24, we continued to highlight key cross-disciplinary themes while facilitating productive engagements among all working groups and committees to shape plans for 2025. Prominent topics included the energy transition, digital twins, and the MBSE initiative.

Additionally, we had the opportunity to update participants during a town hall meeting on INCOSE’s organizational evolution plans, which were approved by the Board in December. Furthermore, developments in the Academic Council as well as enhancements to technical operations are taking place. In alignment with our strategic objectives, Friday’s strategy workshop explored INCOSE’s future role in education and training. The same discussion extended to the topic of standards, was also a major focus during the Board meetings.

On March 4, INCOSE proudly participated in the UNESCO World Engineering Day, organized by the World Federation of Engineering Organizations (WFEO). The central in-person event took place at UNESCO headquarters in Paris. As an international member of WFEO, INCOSE participated in committee and management discussions, particularly regarding the future of our engagement and the new Systems Engineering working group within WFEO, which



Back To Table of Content

INCOSE leads.

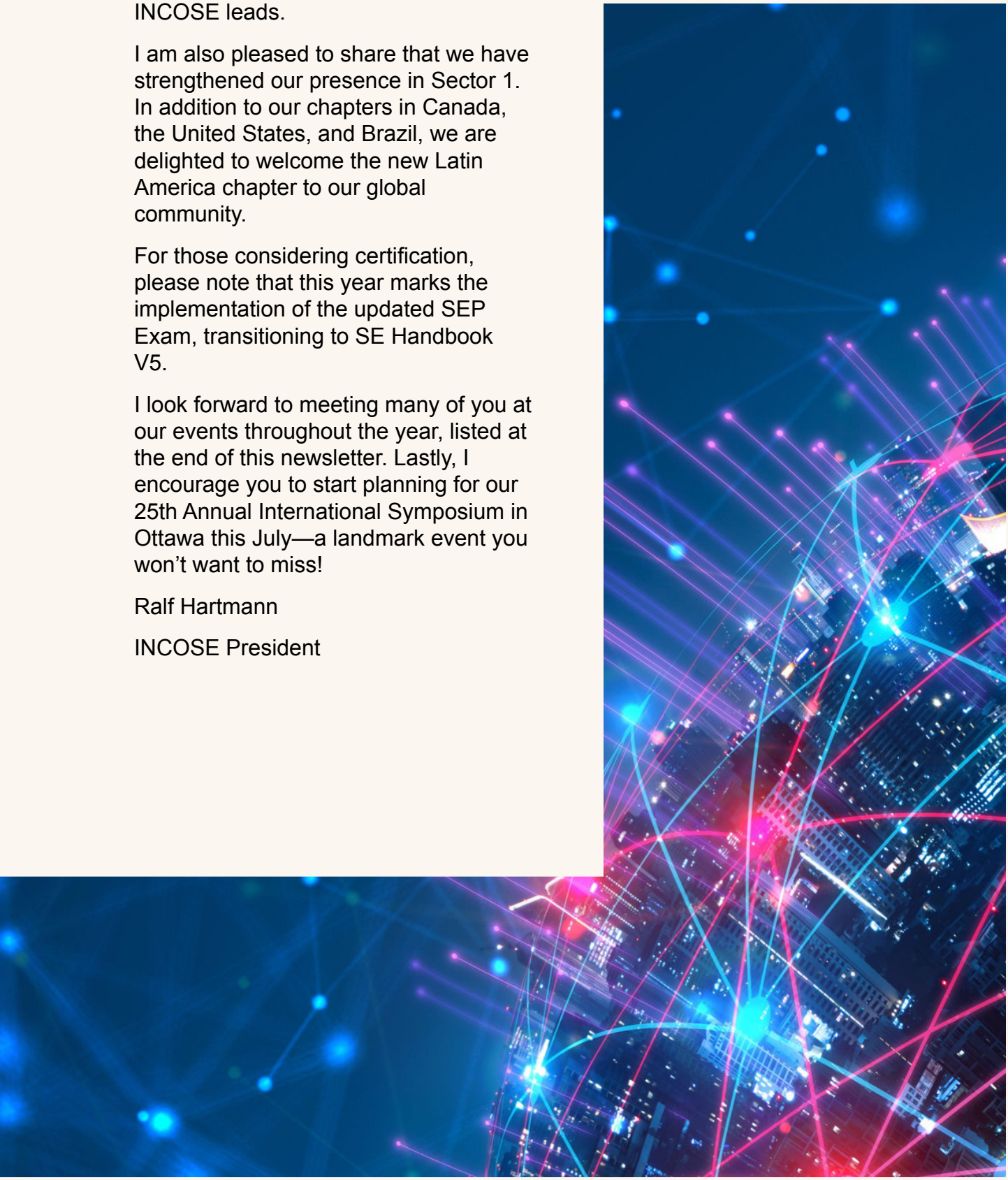
I am also pleased to share that we have strengthened our presence in Sector 1. In addition to our chapters in Canada, the United States, and Brazil, we are delighted to welcome the new Latin America chapter to our global community.

For those considering certification, please note that this year marks the implementation of the updated SEP Exam, transitioning to SE Handbook V5.

I look forward to meeting many of you at our events throughout the year, listed at the end of this newsletter. Lastly, I encourage you to start planning for our 25th Annual International Symposium in Ottawa this July—a landmark event you won't want to miss!

Ralf Hartmann

INCOSE President



A MESSAGE FROM THE EXECUTIVE DIRECTOR

Dear INCOSE members,

I hope you have had a great start to your 2025. We have at INCOSE!

2024 was a year dedicated to planning and capacity building. For 2025, we are actively working to execute our plan to deliver more value to you. We are working to advance and expand the discipline of systems engineering, grow INCOSE, focus on professional development for our members, and improve our operational execution and capacity. Implicit outcomes of these objectives include INCOSE being more impactful, strategic, global, and professional.

INCOSE has long been an 'International' organization, but we have a goal to operate as a global one, not just an international one. This means we are clearly working to engage and involve our members, leaders, and partners from around the world in better ways. Already this year we have held our International Workshop in Sevilla Spain – the first IW held outside of the US. We have attended the AFIS' (the French INCOSE Chapter) Congres Annuel, held in person planning meetings with the leaders of AISE (the Italian INCOSE Chapter), met with keys leaders from INCOSE UK, GfSE (the German INCOSE Chapter), SESA (the Australian INCOSE Chapter), AEIS (the Spanish INCOSE Chapter), INCOSE Netherlands, INCOSE India, INCOSE Brasil, and many others. Being more intentionally global also asks for us to be intentionally collaborative. I believe that together, working as One INCOSE – aligning on strategies and goals, sharing resources, supporting the whole, we are a better organization.

In March, INCOSE will be at the World Federation of Engineering Organization (WFEO) World Engineering Day celebrations in Paris. We are one of the only international organizations invited and we are the only organization representing Systems Engineering. INCOSE will also be well represented in the leadership and collaboration at Conference on Systems Engineering Research (CSER), the Object Management Group (OMG) meeting launching SysML v2, and at MIT's Complex Adaptive Systems conference. INCOSE members and leaders are instrumental in all of these affiliated conferences and organizations, which highlights the influence INCOSE already has on the discipline.

As we continue to execute our plans, please be on the lookout for an event coming near you. Our local chapters are always active in national and local events, and, from an INCOSE-wide perspective, our International Symposium will be in Ottawa Canada in 2025 and in Yokohama Japan in 2026 –

Back To Table of Content

continuing to expand the footprints of our large events.

We are diligently working to make SE more widely known and accepted while bringing the INCOSE network and learning events to you, everywhere in the world. Thank you for being a member of this fantastic organization. We work for you and we cannot do any of this without you!

Steve Records

"INCOSE has long been an 'International' organization, but we have a goal to operate as a global one, not just an international one."

EDITOR-IN-CHIEF'S LETTER

Welcome to the first INCOSE Members Newsletter of 2025! I'm thrilled to officially introduce myself as your new editor. While my name might be new in this particular spot, I'm certainly not new to INCOSE or this publication. I've been working behind the scenes on the newsletter since last year, managing submissions, writing and editing articles, and collaborating closely with the previous editor to ensure a smooth transition. You've also likely encountered my work in other INCOSE communication channels, including organizational emails, event promotions, the website, eNote, and our social media presence.

I will continue to support all INCOSE communication channels, and now, stepping into the editor role, I have some exciting plans for 2025 that I'm eager to share. As you may have noticed, we've unveiled a new user experience for the newsletter, making engaging with the valuable content it provides even easier. We'll also be launching a new monthly publication to replace the previous eNote! This new publication will be your go-to source for all the latest INCOSE updates, news, events, and resources each month, so keep an eye out for its debut in your inboxes soon. (Hint: If you haven't checked your INCOSE subscriptions recently, make sure to log in to your profile and check the options you're interested in so you don't miss out!)

One of the things I'm most looking forward to in this role is connecting with our vibrant INCOSE community. I'm always on the hunt for compelling stories and member highlights. If you have something special to share – a project success, a chapter achievement, a personal milestone, or anything else you think the INCOSE community would be interested in – please don't hesitate to reach out! I'll find a way to spotlight your success in one of our INCOSE channels.

I'm truly excited to collaborate with all of you to highlight your incredible work and showcase how INCOSE is uniting and advancing the global systems community. I look forward to hearing from you and working together to make this newsletter a valuable resource for everyone.

Sincerely,

Kelly Henseler

Back To Table of Content


LEVERAGE YOURSELF
WITH INCOSE!

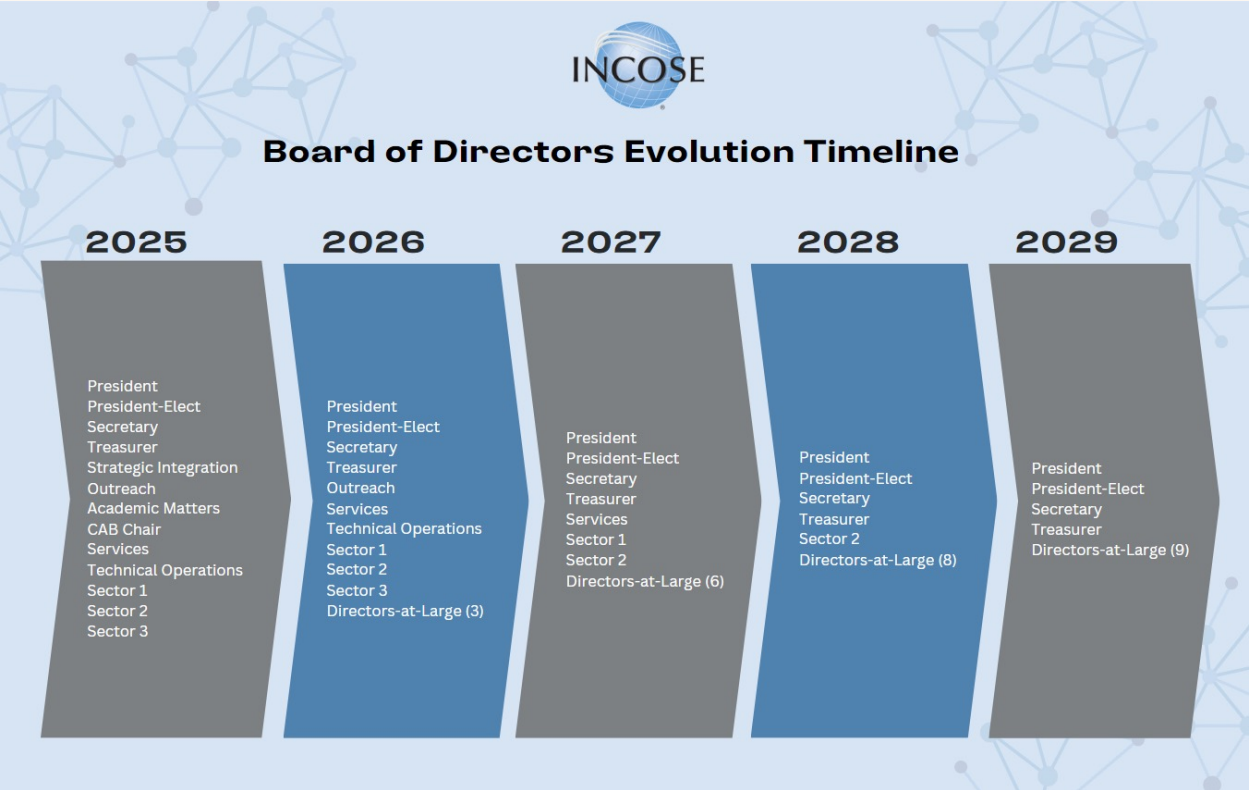
INCOSE BOARD OF DIRECTORS EVOLUTION AND COMMITTEE UPDATES

2025 marks the beginning of an exciting evolution for INCOSE as we embark on decisive steps to take action on our new strategic plan released at last year's International Symposium. We benchmarked other associations, including INCOSE, to determine the best way we can address a growing global community, quickly evolving technology and research, and how we operate.

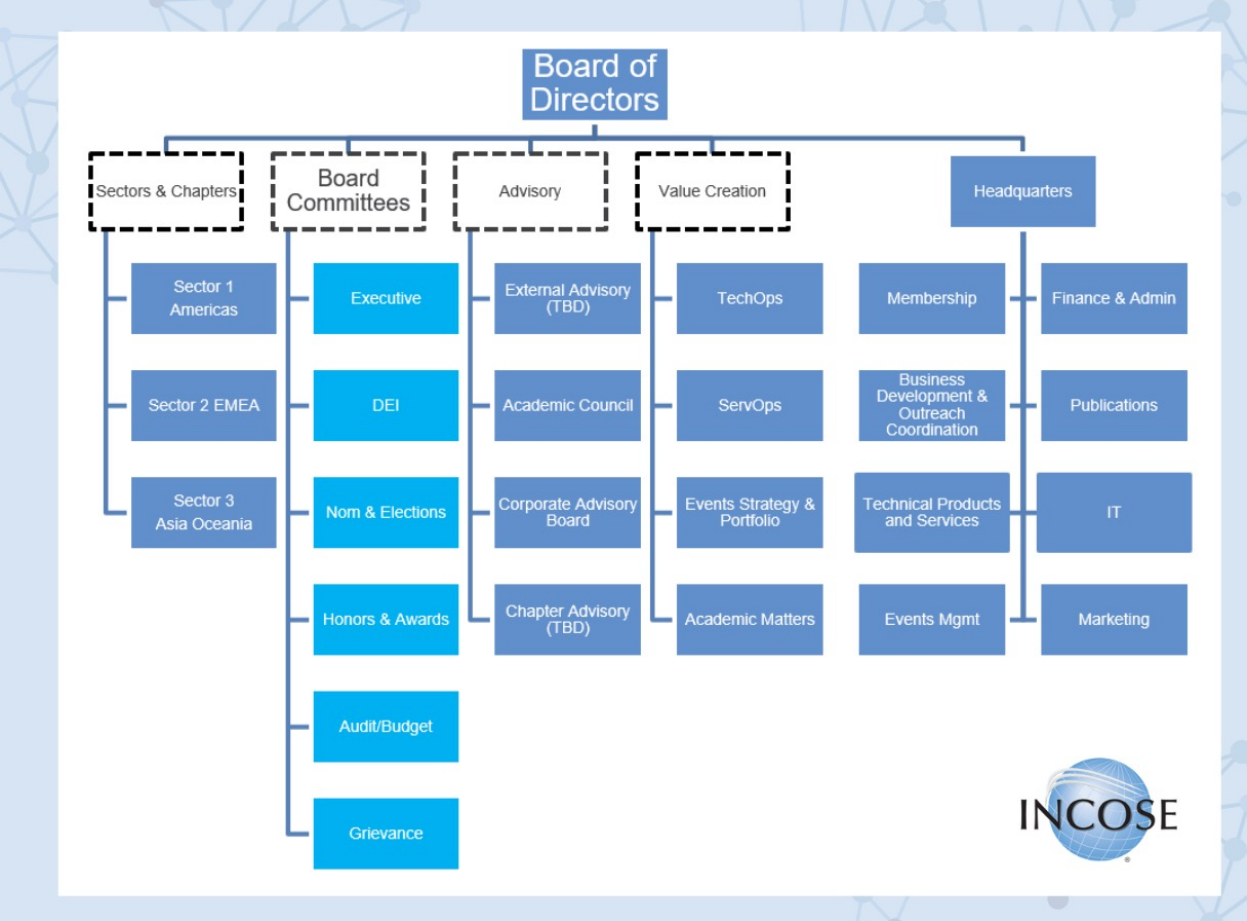
What led to INCOSE's success over the first 30 years will continue to drive us – the focus on delivering the state of the art and the state of the practice, the development of technical products, international events, and all of our important initiatives.

The INCOSE Board of Directors is undergoing a significant transformation to enhance its effectiveness and strategic focus. Over the next five years, there will be a transition from the board's current structure to a structure comprised of four key standard board positions: President, President-Elect, Secretary, and Treasurer. We are strategically transitioning from former specialized Director positions to Director-at-Large roles. This includes both appointed and elected positions that will become active as the former Director roles are retired.

These changes will empower the Board to more effectively oversee strategic direction and long-term vision while enabling operational volunteers and professional staff to effectively support the organization and deliver on the



Back To Table of Content



Board's strategic directives.

In addition to the Board restructuring, INCOSE is establishing new committees and reinforcing existing ones to manage and oversee critical organizational initiatives effectively. These committees will play a vital role in driving the strategic direction of INCOSE and advancing our mission.

Volunteer Opportunities

We encourage all INCOSE members to consider contributing their valuable time and expertise to the organization.

- **Join a Committee:** If you'd like to join one of the committees, contact INCOSE's Secretary, Stueti Gupta at stueti.gupta@incose.net with an introduction and your notification of interest.
- **Join a Working Group:** Explore the numerous Working Groups that INCOSE has to offer and consider contributing your knowledge and experience.
- **Engage with your Local Chapter:** Contact your local chapter's leaders and ask how you can get involved.

Your contributions are essential to the continued success and growth of INCOSE. We look forward to working with you to unite and advance the global systems engineering community.

A NEW ACADEMIC COUNCIL FOR INCOSE

By Dr. Alejandro Salado

We are kicking off a new structure and a new way to engage members of the academic community and/or those interested in academic-related issues with INCOSE.

If you are doing #systemsengineering in academia or interested on it, please, read this because it may affect how you want to engage with INCOSE!

What is changing?

Until now, the Academic Council (AC) was a subset of the Corporate Advisory Board (CAB), composed of CAB members who represented institutions of higher education. As of today, that structure no longer exists. Moving forward, the CAB and the Academic Council will be two distinct bodies, each with its own specific functions, membership conditions, and benefits. Your organization may choose to participate in either or in both. Here is a comparison of the two:

Why this change?

This restructuring aims to better align the Academic Council with its intended purpose by:

- Lowering the barrier to entry so the Academic Council can truly represent the voice of the broader academic community.
- Decoupling benefits from the Academic Council's activities, ensuring its focus remains on the needs of SE as a field, rather than the specific interests of individual organizations.

Universities or other higher education institutions seeking a more transactional relationship with INCOSE, such as to achieve or maintain academic equivalency, can still join (or remain in) the CAB without changes to fees or benefits.

	CAB	Academic Council
Perspective	Advise INCOSE from the perspective of the needs and wants of the CAB member (the organization)	Advise INCOSE from the perspective of the needs of SE as a field and SE academia at large
Conditions of membership	Same annual fees as today	No annual fee
Benefits	Same benefits as received today (e.g., possibility for Academic Equivalency)	No benefits to the organization; involvement is altruistic and not transactional

Additional details about the new Academic Council are provided later in this article.

Back To Table of Content

Can I be a member of the new Academic Council?

The AC consists of individuals affiliated with organizations that offer academic degrees (associate, bachelor's, master's, and/or doctorate) in systems engineering and systems engineering related programs and/or who may also conduct academic research in systems engineering and systems engineering related fields, and representatives of K12 education. The AC is the "Voice of the Academic Community" for INCOSE and acts altruistically, not transactionally.

The following individuals may apply for membership to the AC:

- Any representative of an organization that offers systems engineering or systems related education in an institute of higher education.
- Any representative of K12 education in charge of curriculum design, ideally at least at the level of the county.
- Any tenured/tenure-track faculty that conducts research in systems engineering or a systems related field, if representation for his/her unit is not already present in the AC.
- Any faculty member pursuing the establishment of a systems engineering or systems engineering related educational program at their institution.

Membership to INCOSE is not a requirement to be a member of the AC for the first 3 years of service in the AC.

(Note that membership of the AC must comply with the requirements of the INCOSE Countries of Concern chart.)

What are the expectations for members of the Academic Council?

The AC will:

Evaluate and make recommendations regarding policy issues of relevance to the academic community to the Board of Directors, via the Director for Academic Matters.

- Initiate and facilitate discussion and exploration of issues the AC members deem important to systems engineering academic community.
- Evaluate and make recommendations on INCOSE products and services.
- Assess the state and health of the systems engineering academic community every 3 years.
- Nurture a healthy, internationally recognized systems engineering academic community, for example by proposing projects to Academic Matters.

Involvement in the AC is expected to be altruistic and not transactional. Academic Council member organizations will receive no specific benefits for their service.

The AC will meet physically or virtually at least twice annually in conjunction with INCOSE's International Symposium and its International Workshop. The AC may hold additional virtual meetings at the request of the AC Chair. Physical and virtual meetings of the AC will normally be open to all interested parties attending the International Workshop and International Symposium. However, at his/her discretion, the Chair of the AC may establish an executive session of the AC restricted to members only.

How do I become a member of the Academic Council?

As of today, the current Academic Council is dissolved. If your organization is a CAB member, such membership remains unchanged, but you will not be considered to be a member of the Academic Council if you do not explicitly request so.

Starting today, we will be accepting requests for membership and nominations for the Academic Council Chair. No dues are associated with being a member of the AC. You may use this form: https://forms.office.com/r/xMSpw9LeM2

The AC will elect the Chair of the AC among the members of the AC that are also INCOSE members. The Chair of the AC will serve for a period of 3 years.

Details about the specific dynamics of the Academic Council will be provided at the INCOSE IW 2025.

(Note: The role of the Academic Council Chair will be separate from the role of the Director for Academic Matters.) The new Academic Council will be formally established at the 2025 INCOSE International Workshop, where members will elect the new Chair.

What if I have questions?

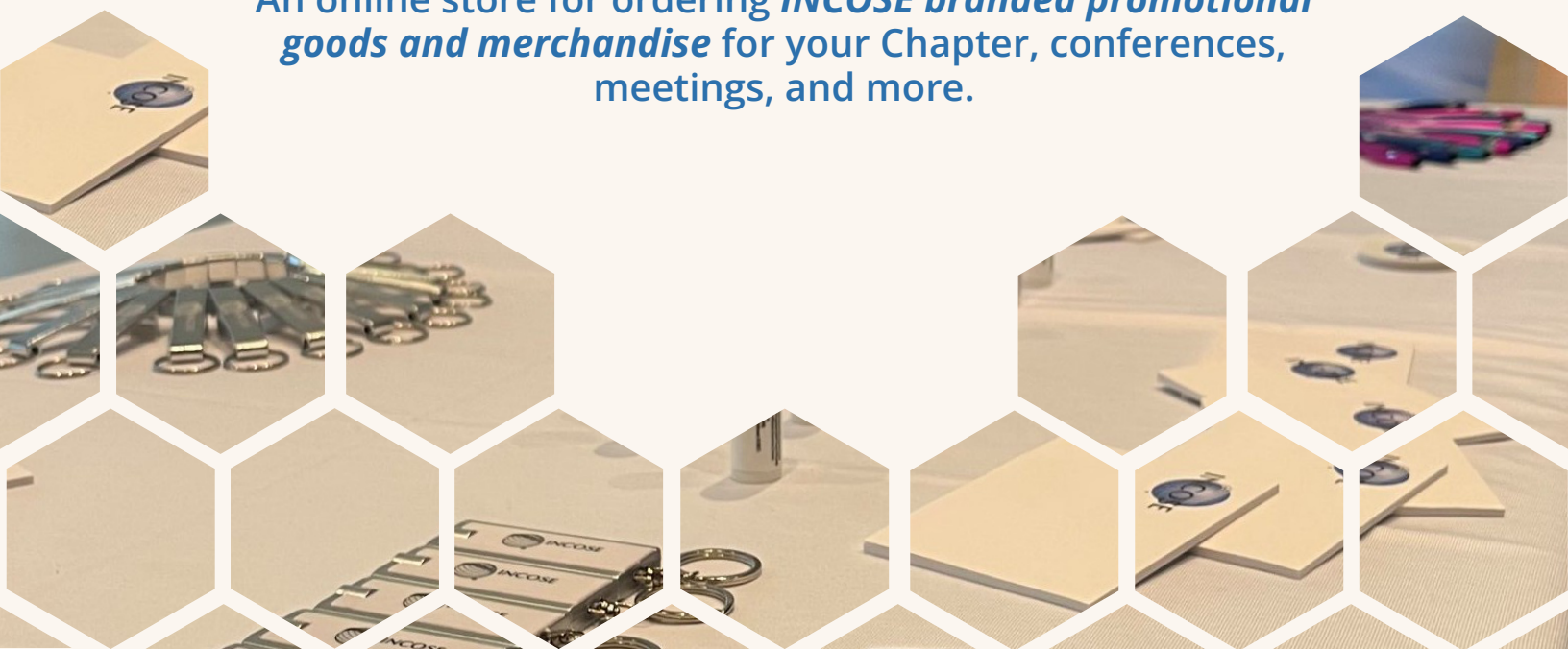
Please, direct all your questions to me (alejandro.salado@incose.net).

Back To Table of Content

INCOSE Promotion & Merchandise Products

Scan QR code to visit www.incose.org/swag

An online store for ordering ***INCOSE branded promotional goods and merchandise*** for your Chapter, conferences, meetings, and more.




Previous section:
Board Updates

Next section:

IW2025 Recap

INCOSE INTERNATIONAL WORKSHOP 2025 RECAP

The INCOSE International Workshop (IW) 2025 has concluded its successful run in Seville, Spain, marking a significant milestone as the first IW held outside of the US and within the EMEA sector. With a remarkable turnout of 658 attendees, comprising 384 in-person participants and 274 virtual attendees representing 35 countries, the event fostered a vibrant atmosphere of collaboration and knowledge sharing. Beyond the insightful sessions and workshops, attendees enjoyed ample networking opportunities, fueled by an impressive 2,120 cups of coffee!

This year's IW featured three highly engaging thematic workshops, each addressing critical areas within systems engineering.

Digital Twins Workshop

The Digital Twins workshop provided a comprehensive exploration of this rapidly evolving field, covering key aspects through:

- 4 Sessions: Delving into the "What," "Why," and "How" of Digital Twins, and exploring "What else?" this technology offers.
- 11 Presentations: Showcasing diverse perspectives from 3 sectors and 5 INCOSE chapters, along with insights from academia, industry, and standards development organizations.
- 3 Q&A Sessions: Facilitating interactive discussions and addressing participant queries.
- Strong Participation: Engaging 67 online and 50 in-person participants.

Energy Transition Workshop

This workshop focused on the crucial role of systems engineering in the energy transition, addressing the challenge of communicating its value to non-SE-minded sectors. Key takeaways included:

- Value Proposition Narrative: Developing a compelling narrative for the value of SE in the energy transition, designed to resonate with diverse audiences.
- SE Offerings for Gains and Pains: Identifying specific SE contributions to address the gains and pains associated with energy transition initiatives, such as systems overview, standardization, reuse, productivity, digitalization, integration control, and risk-based requirements.
- Stakeholder Feedback: Gathering valuable feedback that emphasized the need for quantitative business cases and implementation roadmaps.

MBSE Workshop

The MBSE workshop offered valuable insights and guidance for advancing Model-Based Systems Engineering practices, focusing on:

- Continued MBSE Adoption: Strategies for expanding MBSE adoption through engagement with pioneers and early adopters.
- Organizational Strategy: Emphasizing the importance of an organizational strategy for effective

Back To Table of Content

MBSE implementation.

- SysML v2 Advancement: Highlighting the progress of SysML v2 as the next-generation modeling language, including its submission to the OMG for final adoption and the development of SysML v2 tool vendors.
- SysML v2 Transition Planning: Encouraging participants to begin planning their transition to SysML v2 and offering introductory training and transition planning workshops.
- SysML v2 API: Showcasing the capabilities of the SysML v2 API for enabling the digital thread and digital engineering ecosystem.
- Community Engagement: Recognizing significant MBSE activity across INCOSE chapters and working groups.

INCOSE Awards

The IW also celebrated outstanding contributions to the systems engineering community through a range of prestigious awards. Congratulations to the following recipients:

- **2024 Collaboration Award:** Infrastructure and Transportation Working Groups, Chairs Marcel van de Ven and Dale Brown, Co-chairs Alain Kouassi and Laura Uden.
- **2024 Outreach Award:** Systems Engineering for Sustainability and Responsibility Working Group (AFIS – French Chapter), Chair Claude Pourcel, Co-chairs Amaury Soubeyran, Anne Sigogne.
- **2024 Achieving the Systems Engineering Vision Award:** Systems Security Working Group, Chair Rick Dove, Co-Chairs Beth

Wilson, Dawn Beyer, Mark Winstead.

- **2024 Sustained Performance Award:** Program Management – Systems Engineering Integration Working Group, Co-Chairs Amir Abrari, John Lomax, Mark Kaufman, Samuel Boutin, Steve Dam, Tammy Tober, Tina Srivastava.
- **2024 Product of the Year Award:** INSIGHT magazine (April issue) editorial team, Editor-in-Chief William Miller, Theme Editor David Rousseau, Technical Editor Christian Sprague.
- **2024 Outstanding Service Award:** Kirsten Helle, Satya Kokkula, Anne Sigogne, Frederic Autran, Odile Mornas.
- **2024 Stevens Doctoral Award:** Stephanie Charo Chiese, Hossein Basereh Taramsari.

The Workshop proved to be a resounding success, fostering collaboration, driving innovation, and celebrating the achievements of the systems engineering community. We look forward to building on this momentum at the International Symposium in Ottawa, Canada 26 – 31 July!

35th Annual INCOSE international symposium

hybrid event

Ottawa, Canada
26 - 31 July 2025

Book your Hotel for IS2025!

https://www.incose.org/symp2025

INCOSE IW 2025: MODEL BASED SYSTEMS ENGINEERING (MBSE) WORKSHOP HIGHLIGHTS

The MBSE Workshop was held as part of the INCOSE International Workshop 2025 in Seville, Spain on February 1-4, 2025. The focus for this year's MBSE Workshop was on SysML v2 Transition, which was a follow-up to the INCOSE IW 2024 SysML v1 to SysML v2 Transition Guidance Information Session led by the USA Department of Defense (DoD) Office Under the Secretary of Defense, Research and Engineering OUSD(R&E).

The session was directed at new and existing MBSE practitioners, MBSE/ Digital Engineering leads within organizations, and INCOSE Working Group members interested in applying MBSE with SysML v2. This session provided information needed to motivate and begin planning the transition to SysML v2, and included presentations, tool demonstrations, introductory training, and a transition planning workshop.

Background

SysML v2 is the next generation systems modeling language that is intended to significantly enhance precision, expressiveness, consistency, usability, interoperability, and extensibility, compared to SysML v1. SysML v2 includes a flexible graphical representation to enable broad system understanding and a complementary textual representation to facilitate model interpretation and automation. A standardized API provides a set of services to navigate, query, and update the model and enables interoperability across tools and models throughout the system development lifecycle.

To effectively transition from SysML v1 to SysML v2, organizations will need to define and execute an effective transition strategy and plan. This will help preserve their investments in SysML v1 models while leveraging the enhanced capabilities of SysML v2. To accomplish this, organizations will need to provide the infrastructure needed to support SysML v2, which includes updates to their modeling practices, methodology, tools, and training. In addition, organizations should carefully consider which projects will transition, when to transition, and how to transition to maximize the benefits and minimize costs and risks to programs and systems performance.

INCOSE has continued to support the development of system modeling standards through the Object Management Group (OMG) Standards Development Organization for many years which includes the Systems Modeling Language (SysML ®), the Unified Architecture Framework (UAF ®), the Risk Analysis and Assessment Modeling Language (RAAML™), and the Cubesat System Reference Model (CSRM). INCOSE and OMG recently signed a memorandum of understanding (MOU) to continue to expand their collaboration efforts and leverage INCOSE's systems engineering expertise and OMG's modeling standards development expertise.

The SysML v2 specification is planned to be submitted to the OMG for final adoption in February 2025 after more than 7 years of development. The SysML v2 specification will be submitted along with the KerML specification which

Back To Table of Content

provides the underlying foundation for SysML, and the Systems Modeling API and Services specification which provides the standard API for SysML v2 modeling tools. Commercial and open-source SysML v2 tools are anticipated to be available in 2025.

Summary and Takeaways

The workshop included an introductory presentation by Mark Sampson, who co-chairs the INCOSE MBSE initiative along with Troy Peterson. Mark emphasized the need to leverage change agents, including pioneers and early adopters, to continue to advance MBSE adoption. Richard Beasley presented the keynote, emphasizing the need to make sure that MBSE is an integrated part of the organization's overall capability to "create systems that work," and quoted the title of a UK Royal Academy of Engineering publication. Sanford Friedenthal highlighted the capabilities of SysML v2 and how it contrasts with SysML v1, and Chris Schreiber shared experiences from Lockheed Martin on their SysML v2 transition efforts.

The presentations were followed by a SysML v2 tool vendor session where eighteen (18) vendors presented their SysML v2 roadmaps and implementation status. The vendors demonstrated a broad array of capabilities and substantial progress towards providing commercial and open-source tooling in support of SysML v2 as part of a digital engineering environment.

Manas Bajaj described how SysML v2 uses the API to support maintaining the digital thread. Hans Peter de Koning and Sam Gerene presented efforts to update the concurrent MBSE environment used by the European Space Agency (ESA) based on SysML v2, and Ed Seidewitz gave a presentation and follow-up demonstration on how SysML v2 is being integrated into the next generation of OpenMBEE to provide open-source repositories, tool integrations, and document generation capabilities.

The MBSE workshop included a presentation by Aurelius Morkevičius on the SysML v2 extension for UAF and a presentation by Gene Shreve and Jerome Hugues on the SysML v2 extension for Real-Time Software Systems, both of which demonstrate how SysML v2 can be extended for specific domains.

Sanford Friedenthal delivered a half-day introductory training session to expose the participants to SysML v2, and Chris Schreiber conducted a half-day workshop on transition planning to assist participants in their organizational transition efforts.

Lucas Aviles, Chris Delp, and Russell Peak led the MBX/Digital Ecosystems (DECO) & OpenMBEE Workshop on Monday, February 3 which included a keynote presentation about Digital Engineering at JPL, an MBSE & robotic arm digital twin demo, model complexity analysis using graph metrics, OpenMBEE usage at Boeing, and OpenMBEE & SysML v2 demos.

At the MBSE Social on Sunday evening, Matthew Hause (center of photo)

presented the propellor hat awards to Hans Peter de Koning (left) and Tim Weilkiens (right). The propeller hat award has become a tradition for the last many years of the INCOSE IW MBSE Workshop to award individuals for their contributions to MBSE. Congratulations to Hans Peter and Tim.

The workshop also included presentations by multiple INCOSE chapters and working groups that are applying MBSE practices as part of their efforts, which is a positive indicator of how systems engineering practice is transforming to a model-based approach.

The presentations and vendor videos from the workshop are available on the INCOSE-OMG MBSE Wiki page.

INCOSE TECHNICAL OPERATIONS – WHAT TO EXPECT IN 2025

By Tami Katz, INCOSE Technical Director and Jimmie McEver, INCOSE Deputy Technical Director

The INCOSE Technical Operations organization would like to thank all of those who contributed to a very successful and engaging International Workshop in Seville, Spain!

IW2025 is the first INCOSE International Workshop in Europe. We wish to extend a special thank you to the EMEA Sector and Chapters for collaborating on this event and providing specialized content for the workshop attendees. Additional appreciation goes to those who worked diligently to host the thematic workshops. The two new specialized workshops on Energy Transition and Digital Twins were well attended and resulted in some actionable outcomes, and the MBSE workshop was, as usual, very popular and informative for the INCOSE community. We also want to send appreciation to those who contributed their projects to the EMEA Marketplace, which enabled the IW2025 attendees to see all of the great work going on with our European Chapters and their Working Groups.

We are also happy to announce that two new Working Groups have submitted charters at the IW: The Sustainability Working Group and the Enterprise Systems Engineering Working Group.

What is going on in Technical Operations? Last year, we integrated with the Future of Systems Engineering (FuSE) activities, led by Bill Miller (Assistant Director for FuSE). Bill is working across the working groups,

project teams, FuSE streams, and throughout the systems engineering community to ensure the Future of Systems Engineering Roadmap is completed and associated project teams created. There was a lot of engagement at IW2025 in this area, and Bill continues to reach across organizational boundaries to ensure we consider the systems engineering foundational principles as our volunteers generate innovative and helpful products for the INCOSE community.

In 2024, we implemented the concept of Project Teams, which is a group of volunteers that address specific problems in a short-term effort; these are cross-working group (WG) collaborative efforts with specific charters and membership. One Project Team was formed in 2024, the AI and Requirement WG collaboration project, and more are being formed in 2025 as part of additional cross-WG collaborations and FuSE project development.At IW2025, the Technical

Operations leadership team was transitioned. We would like to thank Olivier Dessoude for his leadership over the last two years as the Technical Director, as well as Bill Scheible, Tony Williams, and Carl Landrum for their roles as Assistant Directors. Several new volunteers have stepped up to help the organization implement our 2025 goals, working alongside many of our volunteers already actively leading efforts in working group and project team coordination, INCOSE event contribution, technical reviews, technical product development, and standards development.

For 2025, INCOSE Technical Operations is working on the following goals:

1. Establish infrastructure for the working groups and project teams
2. Update the roadmap for FuSE
3. Ensure alignment of working group and project teams with INCOSE strategic objectives
4. Improve the pace of technical products through the pipeline
5. Implement a technical review process for technical products
6. Implement organized inputs for SEBoK and SE Handbook updates
7. Improve WG alignment with IS Technical Program for IS2026
8. Implement Board strategy for Standards

We will share progress over the next year to show how we are meeting each of these goals.

For the infrastructure goal (goal #1), we have recently implemented the Technical Operations iNet page, https://www.incose.org/inet/technical-operations, meant to provide useful information for our Technical Operation volunteers. This site contains answers to frequently asked questions (FAQ), upcoming meeting times and links, guidance for our Working Group and Project Team leaders, and links to useful resources such as the Charter tool and Technical Product Plan (TPP) form. We will keep this site maintained and encourage our Working Group and Project Team leaders to use this as their first resource when they have questions on processes and support. Their next resource is their Coordinators, the Assistant Directors who are the first point of contact for the volunteers to help with questions and support:

- Applications Domain WGs: Tim Swanson (timothy.swanson@incose.net)
- Process Enablers WGs: Aryes Lahiry (aryes.lahiry@incose.net)
- Analytic Enablers WGs: Dale Brown (dale.brown@incose.net)
- Transformational Enablers WGs: Phyllis Marbach (phyllis.marbach@incose.net)
- Project Team Coordination: Mona Humes (mona.humes@incose.net)

If a working group is unaware of which domain they are assigned, we ask them to check their charter or the INCOSE Working Group website for this information.

For our organized inputs to the SEBoK and SE Handbook goal (goal #6), we have recently asked the new Deputy Assistant Director for Technical Product Development, Kevin Orr, to be a point of contact for questions and support for both the SEBoK editors and the working groups. The SEBoK editors have asked

Back To Table of Content

for Working Group reviews of the SEBoK articles (http://sebokwiki.org) along with input to help ensure the articles are current and correct. Please reach out to Kevin (kevin.orr@incose.net) for further information on how working groups can support this effort.

We are excited about the great work that is happening in Technical Operations and appreciate the support from the many INCOSE volunteers and staff members, their activities and products enable systems engineering growth and practice for our INCOSE community!

VIRTUAL ENGAGEMENT AT INCOSE IW2025: ADVANCING CONFIGURATION MANAGEMENT AND TECHNICAL OPERATIONS

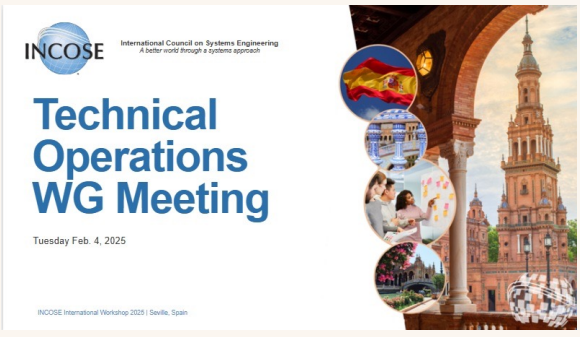
By Aryes Lahiry, Assistant Director for Working Group Coordination (Process Enablers) and Co-Chair, Configuration Management Working Group (Sector-3, Asia-Oceania)

The INCOSE International Workshop 2025 (IW2025) provided an invaluable platform for global systems engineering professionals to collaborate, discuss innovations, and shape the future of our discipline. As an Assistant Director for Working Group Coordination (Process Enablers) and Co-Chair for the Configuration Management Working Group (CM WG) within INCOSE, I had the privilege of participating virtually in three significant events across two teams on February 2 and February 4, 2025.

Participation in Technical Operations Leadership Meetings

On February 2, I attended the IW2025 Tech Ops Leader Meeting, conducted by Dr. Tami Katz, who officially took over the Technical Operations Director role from this IW2025. In this session, we welcomed new Assistant Directors (ADs), including myself, reviewed Technical Operations (Tech Ops) roles and responsibilities, and debriefed the latest INCOSE Board Meeting. The session also included discussions on 2025 goals and resources available for ADs. These insights provided clarity on the evolving landscape of Tech Ops, emphasizing collaboration, strategic alignment, and support for Working Groups (WGs).

Continuing the engagement, I joined the Tech Ops/WG Leader Meeting on February 4, also led by Dr. Tami Katz, which built upon the discussions from the earlier session. This meeting was attended by a number of WG Chairs and Co-Chairs, highlighting the importance of cross-WG collaboration. Along with discussions on working group coordination, resource allocation, and best practices for enhancing synergy among various WGs, a detailed SEBoK update discussion took place, addressing planned revisions and contributions from different WGs. These conversations reinforced the importance of structured governance and effective



Back To Table of Content

leadership in driving INCOSE's mission forward.

Key Contributions to the Configuration Management Working Group (CM WG)

As a Co-Chair of the CM WG, I actively participated in our working group meeting on February 2, which was conducted by Sandrine Gonthier and Adriana D'Souza. The agenda covered:

- A historical perspective on the CM WG's formation and evolution
- A review of 2024 activities, including collaborations with SAE and SEBoK contributions
- Ongoing efforts related to ISO 26581 (Configuration Management for Product Line Engineering)
- The future direction of CM in Model-Based Systems Engineering (MBSE) and Digital Twins

This session was full of brainstorming discussions with Larry Gurule, David Hetherington, Aleksander Przybylo, and many more, focusing on strengthening CM methodologies, addressing emerging challenges, and refining best practices within the field.

We contributed to discussions on SEBoK updates, where the CM WG is working on refining the Configuration Management and Information Management (IM) sections for the April 2025 publication cycle. Additionally, we were involved in reviewing progress on the 'Don't Panic Guide for Configuration Management', a valuable resource aimed at making CM principles more accessible to beginner level practitioners.

Reflections and Future Outlook

My participation at IW2025 reaffirmed the critical role of collaboration, standardization, and knowledge-sharing in advancing Configuration Management within Systems Engineering. The CM WG continues to make strides in integrating CM with MBSE, ensuring that best practices align with evolving industry needs. Looking ahead, our team remains committed to strengthening cross-sector partnerships, refining key CM methodologies, and contributing to the broader INCOSE technical ecosystem.

I extend my gratitude to my fellow CM WG members and Tech Ops leaders for their insightful contributions and unwavering commitment to excellence. As we move forward, I encourage more professionals to engage in INCOSE's working groups to help shape the future of Systems Engineering.

For further details on the Configuration Management Working Group, visit the INCOSE CM WG Page.

MY FIRST IW: A SEVILLE SUCCESS

By Erica Barrett, SESA Chapter, Company: Hammerstone

IW2025 celebrated its first European installment, and it marked my first attendance at either an International Workshop (IW) or Symposium. During receptions and meal breaks, long-standing INCOSE members were welcoming, and I was invited to several group dinners. The interactive nature of the daily workshops additionally allows IW to be a great chance to build networks. Thank you one and all for the robust discussions and friendly chats!

Often, the parallelized activities at IW complicated participating in all you are interested in (though there is luckily the availability of recordings after the event), but I was grateful to be able to come away with greater insight into:

- SE approaches for very small to medium businesses, taking consideration of their cost and people barriers
- Modelling of the data construct and processes in decision-making to improve transparency and quality consistently
- Product line engineering (PLE) practices
- The spatial alphabet, known as patternABC, which children are predisposed to observe
- Self deception behaviours we engage in and how to transition to an outwards mindset to lead to benefits in your technical leadership
- Hands-on development of sysMLv2 textual notation and graphical outputs using Jupyter
- Achievements across Sector 3 local chapters
- Possibilities and challenges in greater digitalisation in the Integration, Verification, and Validation space, to move towards test-driven design and efficient integration
- Breadth and user applications of the vendor tools available in the SE lab

Thomas Manley, Paul Pearce, Erica Barrett – SESA members

Back To Table of Content

During the few days in Seville, a few fellow Australian attendees and I snuck in a flamenco show, which was a visceral Spanish experience I'd recommend!

Thank you to my workplace for valuing IW's learning opportunities. It seems INCOSE can be the basis for enduring friendships beyond business transactions but based on common interests and a desire to solve challenges together. Thank you also to the Australian chapter of INCOSE (SESA) for the encouragement and significant support to attend IW2025.

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CONFIGURATION MANAGEMENT WORKING GROUP AT IW2025

Looking back on the International Workshop 2025, the Configuration Management working group representatives were thrilled to have been part of such an impactful event in Seville!

We successfully hosted a hybrid meeting that brought together participants from diverse backgrounds, encouraging vibrant brainstorming sessions on future topics for exploration and potential collaborations. This engagement was enriched by a comprehensive overview of our past and ongoing activities, paving the way for inspiring conversations.

We also had the opportunity to attend the PLE Working Group meeting focused on preparing the future ISO Configuration Management for PLE standard (ISO 26581). The exchanges among participants were equally fruitful, and the diverse perspectives shared by attendees created an excellent opportunity to consider a wide range of viewpoints. We are committed to remaining actively involved in the review of this emerging standard.

IW2025 served as a pivotal opportunity for us to engage with multiple working groups, connect with fellow members, vendors, and academic representatives, and identify key areas for enhanced collaboration. We gathered valuable insights and inspiration from various initiatives while addressing the pressing challenges of sustainability and digitalization that are shaping current trends.

In the rapidly evolving landscape of systems engineering, it's clear that numerous topics will emerge for our

working group to explore. We will continue to adapt and contribute to the field of Configuration Management. Don't hesitate to contact us to join and work together!

The IW event was indeed a remarkable experience, held under the captivating blue skies of Seville, where the city's historical architectural treasures provided a stunning backdrop for four unforgettable days.

Looking forward to the next event in Ottawa, Canada!

Casa de Pilatos

Plaza de España

BIRTH OF THE SUSTAINABILITY WG AT THE IW 2025 IN SEVILLE

By Jean-Claude Roussel & Alain Dauron (on behalf of the future INCOSE Sustainability WG)

The last IW 2025 held in Seville, Spain beginning of February, the ever first IW happening in Europe, was rather successful in terms of level of participation and quality of the program.

Among WG meetings and some significant outcomes, one notable success was the set of successful meetings organized by AFIS and GfSE during this event to prepare the creation of an INCOSE Sustainability WG.

This followed a previous initiative held in April 2023 during the EMEA WSEC 2023 in Seville (again!) with several Guest Speakers on this key theme, Gerhard Krinner from IPCC, David Long and Cecilia Haskins and a first meeting was organized by Jean-Claude Roussel, as point of contact for EMEA sector, to create a Sustainability WG.

Two other meetings were then organized in order to create a charter and a core team, one during IS 2023 in Honolulu and another one during the IW 2024 in LA under coordination of Javier Calvo Amodio, as PoC for the Americas Sector.

This IW 2025 in Seville was therefore the right time and place to make this WG a reality thanks to a session presenting the AFIS Technical Committee (ISDR for “Ingénierie Système Durable et Responsable”) and proposing the framework of an international WG, and several sessions prepared and managed by the GfSE Sustainability WG, which posed the general problem and developed a concrete use case. All this created the common purpose between participants to gather ideas and inputs and to elaborate a WG Charter.

A draft WG charter has been jointly proposed by AFIS, GfSE and UK Chapters with 3 co-chairs (Amaury Soubeyran from AFIS, Hamza Bassam from GfSE and Alan Harding from UK) with a core team to initiate and support a work plan. We now await formal validation or update request of the charter by Tech Ops, in order to officially commission the WG. A kick-off meeting is already scheduled on 25th March 2025 where everyone interested is welcome.

For further information, please contact: *incoserelation@afis.fr*

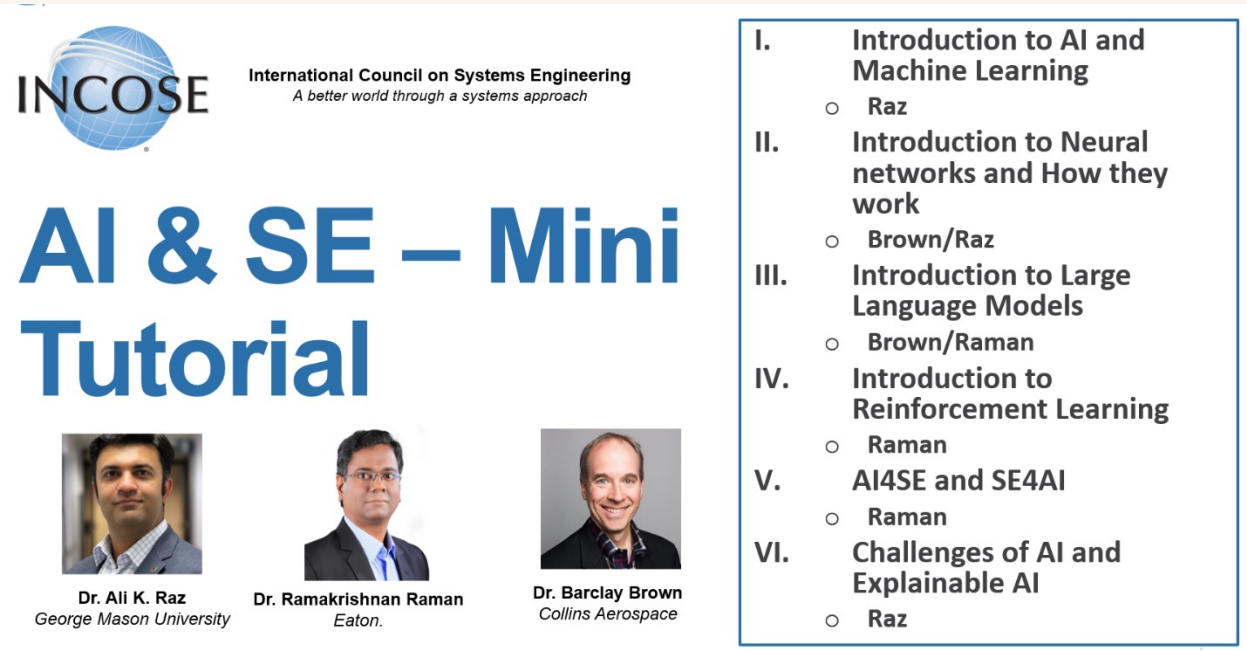
IW 2025: AI WG STEERING ADVANCEMENTS IN INTEGRATION OF AI & SE

By Dr. Ramakrishnan Raman, Co-Chair – AI Systems Working Group, ESEP, INCOSE Fellow, ramakrishnan.raman@incose.net

With over 1,000 members, the INCOSE AI Systems Working Group (https://www.incose.org/ai) continues to grow and thrive towards impactful advancements in the integration of AI and systems engineering. The working group sessions organized during the recently held INCOSE International Workshop 2025 highlighted this journey. The working group is chaired by Dr. Ali Raz, George Mason University and Dr. Ramakrishnan “Ramki” Raman, Eaton.

There were three sessions organized by AI WG during the workshop. In the first session, the Working Group Chair & Co-Chair provided an overview of the activities and highlighted exciting initiatives, including an upcoming primer that is intended to serve as an essential resource for the systems engineering community on AI, and the recent "Call for Papers" for a Special Issue on AI and Systems Engineering in the INCOSE Systems Engineering Journal (https://incose.onlinelibrary.wiley.com/hub/journal/15206858/call-for-papers/si-2024-000807). In the first session, there was also a presentation on SERC AI Roadmap by Dr. Tom McDermott, Systems Engineering Research Center, that provided valuable insights into the future of AI in systems engineering.

A key highlight during the workshop was



Back To Table of Content

AI Working Group Sessions by Dr. Ali Raz and Dr. Ramakrishnan Raman during IW

the Mini-Tutorial session on AI for Systems Engineers, by Dr. Ali Raz and Dr Ramakrishnan Raman, (tutorial material co-authored with Dr. Barclay Brown). Topics covered in the tutorial included: Introduction to AI and Machine Learning for Systems Engineers, Large Language Models (LLMs), Reinforcement Learning, AI for Systems Engineering (AI4SE) and Systems Engineering for AI (SE4AI) and Challenges of AI and Explainable AI. The session was very well-attended and witnessed significant discussions and was highly appreciated, reinforcing the importance of equipping systems engineers with foundational AI knowledge and bringing in systems thinking with AI.

There was also a dedicated session for strategic discussions on the AI WG activities - with INCOSE leaders, including INCOSE President Ralf Hartmann, President-Elect Mike Watson, and Past President Kerry Lunney, and brainstormed strategies for AI Working Group in alignment with INCOSE's overall strategic objectives and vision for the future.

AI Working Group has recently embarked on a joint project with Requirements Working Group, to study the interplay and integration between Requirements Engineering and AI. During the workshop, there were three sessions held by the AI4RE project team.

It was truly exciting to see the INCOSE AI Systems Working Group activities expanding in alignment with INCOSE's broader strategies, driving impactful advancements in the integration of AI and systems engineering.

AI WG Session participants

AI Working Group Chair Dr. Ali Raz (R) and Co-Chair Dr. Ramakrishnan Raman (L)

PROGRAM MANAGEMENT-SYSTEMS ENGINEERING INTEGRATION WORKING GROUP

The location of the International Workshop in Seville, Spain, meant that many of the members of the PE-SE Integration Working Group (PM-SEIWG) could not attend the conference. Dr. Steven Dam represented the working group at a number of sessions, including formally receiving the "Sustained Service Award" for the working group. Other members of the leadership team, chaired by Dr. Tina Srivastava (pictured on the right below) received their awards in the mail. The awardees also include Mr. Mark Kaufman, Mr. John Lomax, Ms. Tammy Tober, Dr. Samuel Boutin, and Mr. Amir Abrari. Dr. Dam represented the working group at meetings on SEBoK & WG Partnership Updates, the new Embedding SE into Organization (ESEIO) Working Group, Project Wildfire, and the TechOps/WG Meeting.

The PM-SEIWG has a workstream to update the SEBoK Part 6: Related Discipline's topic on Systems Engineering and Project Management. The SEBoK & WG Partnership Updates

Steve Dam receiving the award from INCOSE President Ralf Hartman

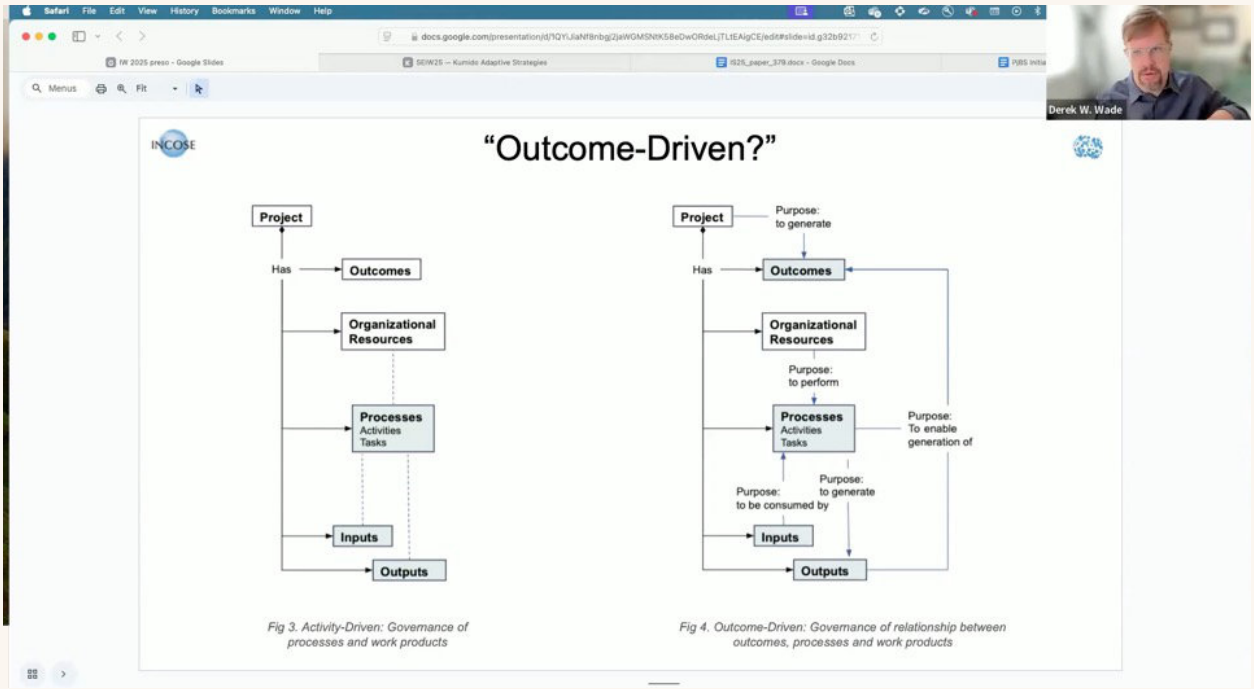
provided valuable information on the submission process changes.

The ESEIO WG meeting, led by Richard Beasley, was looking for inputs from other working groups on problems people have found in trying to embed SE into their organizations. This effort will be of great interest to the PM-SEIWG.

Project Wildfire is another new initiative to explore the applications of SE to support emergency management preparation, recovery, and return to normal. This session included a video and the participation of Ms. Patence Wittingham, the prior Lane County, Oregon Emergency Manager during the 2020 Holiday Farm Fire. This new initiative is led by Ms. Susan Ronning, Ms. Judith Dahmann, and Mr. Alan Harding.

The Tech Ops/WG Meeting was led by new Tech Ops Director, Tami Katz. She discussed the organizational changes and summarized the recent INCOSE Board of Directors Meeting.

Back To Table of Content



Outcome-driven Approach Enhances the Likelihood of Obtaining the Desired Result by the Customer

In addition, the working group held a 20+ minute session on "Outcome-Driven Product Development" where John Metcalf and Derek Wade remotely presented their work on a draft technical paper. The thesis of this presentation is that an activity-driven approach may or may not products the desired outcome, while an outcome-driven approach, focusing on the outcome throughout the process, will provide the products desired by the customer ("just what I asked for, but not what I want"). They requested feedback from the participants using the QR-code and the weblink https://kumido.com/seiw25. This site contains the PDF paper, a link to the Google Doc, and an anonymous feedback form.

In the remaining few minutes, Mr. Metcalf presented a "Report to the 2025 INCOSE International Working Group" on the status of the Project Breakdown Structures (PjBS) workstream. This initiative was "launched several years ago to investigate the relationships between information structures in Project Management and Systems Engineering." The authors of the reports, were Mr. Metcalf, Dr. Samuel Boutin, Dr. Francesco Dazzi, and Mr. Michael Halvorson. Anyone interested in this or other PM-SEI WG initiatives are welcome to attend our next meeting on March 26 at 8:30am Pacific Time.

HSI AT IW 2025

By Grace Kennedy (HSI WG Chair) & Ricardo Reis (HSI WG/AI WG)

With HSI WG co-chairs Dimitri Masson and So Young Kim attending in Seville and other WG members joining in hybrid, the WG sought to discuss challenging topics, network, and benefit from the knowledge across INCOSE's WGs. The HSI WG was pleased to join the global SE community by hosting four workshops during IW2025.

Workshop 1 - HSI Architecting for Human-Advanced Automation: The workshop goal was to launch a joint proposal for funding a network of researchers and industry for tools and methods to address ever more entangled Human-Machine systems in safety-critical domains. Ricardo Reis (Embraer) introduced the theme and provided, as motivation, an interim overview of results from HAIKUproject.eu focused on Human-AI teaming in aviation. A first draft of focus points and interests from the hybrid audience was captured as "absence of common vocabularies," "tools for interdisciplinarity," "life cycle assurance and management," and "teaming design methods and practice." During IW2025, connections were made with the AI WG and Architecture WG. Dedicated sessions to engage these and WG will follow, well outreach actions beyond INCOSE. The ambition is to submit a proposal for cost.eu during the current year.

Workshop 2 - HSI in Early Stage Systems Engineering: Led by So Young Kim (Collins Aerospace), Basak Ramaswamy (NASA JPL) and Dimitri Masson (ESTIA). ConOps has been touted as one of the critical guiding products across the SE lifecycle. They can be captured in various ways: graphically, narrative, diagrams, and models. It can be anything from a 1-pg graphic to a 100+pg document, or a series of SysML-like models. HSI WG explored tailored examples from NASA HSI practitioners and discussed best practice amongst the attendees. The next steps will be to develop a white paper early stage HSI in the SE lifecycle covering the utilisation of ConOps, OpsCon, use case and scenario-based concept design (and other relevant early stage HSI products).

Workshop 3 – HSI Primer: Grace Kennedy (Acmena Group) and Dimitri Masson (ESTIA) led this workshop featuring guest speaker Harington Lee (Sierra Nevada Corp) from the Systems Science WG. Volume 1 of the Primer was published in late 2023, with 4 more volumes in the pipeline. The workshop sought to reboot the process, with the

Back To Table of Content

aim of streamlining the writing and formation of small writing teams. Harrington presented on the FuSE project on developing an INCOSE Heuristics Database and how HSI WG could support the specifying of new heuristics related to our work. The workshop then focussed on Volume 3, which discusses transdisciplinary HSI and covers information about different INCOSE WGs and how HSI relates to them. The activity was a good starting point to both identify new WG collaborations and also candidate statements that could become heuristics.

Workshop 4 – Society 5.0 & Societal Systems: A joint workshop between the HSI WG and Social Systems WG, co-led by Grace Kennedy (Acmena Group) and Randy Anway (New Tapestry). After a brief recap on Society 5.0 principles and the need for social systems/natural systems thinking, workshop attendees considered how this plays out in the current Vision 2035. A poll was conducted to understand attendees' first response to the topic.

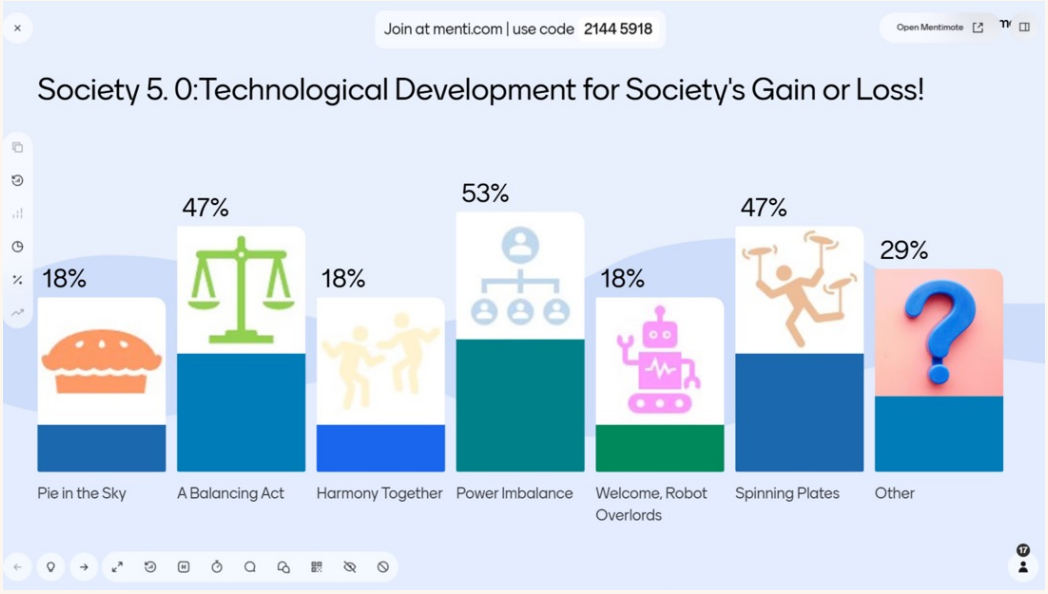
Split into small groups in-person and online, miro was used to guide and record two discussion activities:

1. How does SE and Society 5.0 link? What skills can SE practitioners bring to Society 5.0, and what in turn do SEs need to consider in the future systems that we develop?

2. What then are the barriers and facilitators for SEs to do this?

The workshop was lively and there were commonalities between the outputs from each small group discussion.

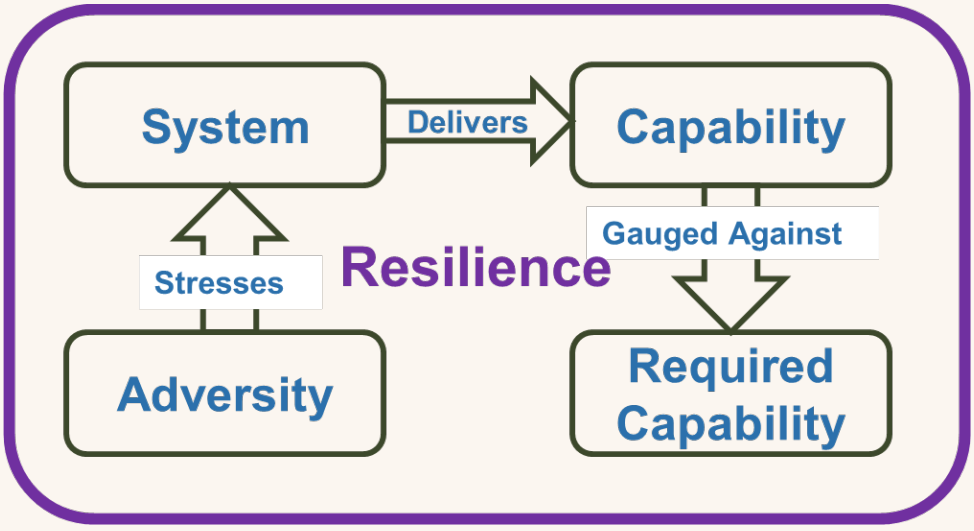
Example Workshop Output



First Responses to the Topic

RESILIENT SYSTEMS WORKING GROUP (RSWG)

The INCOSE Resilient Systems Working Group (RSWG) hosted two sessions at the International Workshop 2025 (IW25). The first was an outreach session for potential new members and a status briefing for interested participants. The second session reviewed and updated techniques for achieving system resilience in preparation for the 2025 cycle 1 update to the System Engineering Body of Knowledge (SEBoK). This included consideration of advances in the state-of-the-art, e.g., Artificial Intelligence, Moden-Based Systems Engineering, Digital Engineering with Digital Twins, and Organizational Resilience. Also updated were recommendations for "How to Justify Resilience," a "Resilience Elevator Speech," and plans for communication, synergy, and cooperation with other INCOSE Working Groups and teams, especially FuSE and Adaptability.



The fundamental value of Resilience is the ability to provide required capability when facing adversity.

Back To Table of Content

UPDATES FROM INCOSE'S TECHNICAL LEADERSHIP INSTITUTE

By Suja Joseph-Malherbe, TLI Coach, suja.joseph-malherbe@incose.net

Nominations for Cohort 11 are open and close on March 31st.

To learn more about who can nominate candidates, the nomination process, criteria for nomination, and information about the Institute and its members, visit www.incose.org/learn/tli. We look forward to Cohort 11 beginning their journey in June 2025.

Twenty-one members of Cohort 9 are nearing the end of their initial two-year experience and will be inducted as full members of the Institute in June 2025. In the spirit of *learning by serving others* (initiated with Cohort 8), Cohort 9 continues with the task of exploring the leadership needs problem space for three stakeholder groups (Chapter Leaders, Working Group Leaders, and INCOSE members). Last year, Cohort 8 developed a chapter leadership guide on how leadership styles and behaviors affect chapter stagnation, a technical leadership resource guide for working group leaders, and a whitepaper for all INCOSE members on how leadership styles impact psychological safety in teams. We look forward to sharing the leadership needs Cohort 9 identifies and the corresponding the offerings or artifacts they develop.

Cohort 9 members have completed three major projects and submitted

TLI topical engagement at IW 2025 in Seville

papers describing their findings and learnings to IS2025. Hopefully, these papers will be accepted, and you can learn more about moving towards shared understanding in a multidisciplinary space, understanding the role of vision in the context of project teams, and developing self-awareness and our ability to lead from the cohort at the symposium in Ottawa in July 2025.

In January, twenty-four Cohort 10 members individually and collectively identified topics they would like to explore as part of their learning journeys. We are working to shape these into major projects that the cohort will address across 2025.

Hosting social and topical engagements at regional and international events as well as the quarterly virtual workshop series are ways the TLI seeks to support each member's ongoing learning journey. At the IW 2025, Stephanie Chiesi (TLI Cohort 1, General Atomics) led an engagement event on *"Leadership and self-deception: Transforming a leadership journey,"*. The engagement reminded us of how the stories we tell about ourselves, other, and the world influences the way we engage and frame situations. We then had the opportunity to enjoy some fine Spanish tapas as we furthered our connections as a global leadership learning network.

2025 marks the 10th year since the inception of the Technical Leadership Institute. We are treating the entirety of 2025 (culminating at IW 2026) as the 10th anniversary celebration of the Institute. The celebration will encompass the Institute's origin story, the impact, and its journey to-date, essentially sharing the story of the members which is the story of the Institute.

The word institute embodies the definition of *an organisation for the promotion of a cause*. The cause simply put is to continually explore and evolve the concepts of leadership in the context of systems engineering. There are many facets the Institute value in this context that has shaped and will shape its journey. This includes, having an appreciation that leadership resides in the complex domain which therefore requires us to have a traveler mindset to enable discovery, to have courage, to remain curious, to seek to understand first before seeking to be understood, to be of service, to collaborate, to build agency, and to recognize that as leaders we are continuously leading and learning together.

TLI members gather socially at IW 2025 in Seville

Back To Table of Content

FOCUSING ON INCLUSION AND COLLABORATION AT THE INCOSE IW2025

The Diversity, Equity, and Inclusion (DEI) and Empowering Women Leaders in Systems Engineering (EWLSE) groups sponsored **events at the IW** that created inspiring spaces for engagement, learning, and collaboration in the lovely city of Sevilla, Spain. Each session provided unique opportunities to connect, share insights, and reinforce DEI as integral to successful systems engineering.

The **Cultural Connect Morning Walk** set a welcoming tone, allowing people to engage in meaningful conversations while exploring diverse cultural perspectives in an informal setting. As we walked through the charming streets of Seville, passing by its historic landmarks, participants had the opportunity to connect and learn about each other's cultures and journeys, sharing experiences and insights in a relaxed and inspiring environment.

The **Unleashing Your Leadership Potential Inspired by *I Am Remarkable*** session empowered attendees to recognize and articulate their achievements. Through guided exercises and reflection, participants explored ways to overcome self-doubt and embrace their leadership potential, fostering confidence and visibility in professional spaces.

The **Empowering Systems-Focused Leadership Using Large Language Models** session explored resilient, inclusive, systems, and sustainability leadership and applied these leadership strategies to four conflicting leadership

situations using large language models. The audience learned the importance of prompts, that large language models can save time and provide value but that there are also inherent weaknesses in the recommendations provided, that one needs to use caution in trusting the responses, that it is important to vet the information and properly cite the sources, and that biases are inherent in the model training and the historical data used.

The **INCOSE DEI Strategic Planning Meeting** was a key moment for reflection on the future of DEI within the systems engineering community. Leaders and participants collaborated to discuss strategies that integrate INCOSE DEI's mission, vision, and strategic objectives into governance and initiatives, focusing on near-term goals and action plans to ensure long-term impact. To ensure continued collaboration, we set up a platform for participants to share insights on the DEI action plan.

The **DEI and EWLSE Networking Reception** was a fun and engaging event where attendees could connect with new faces using guided prompts, allowing fantastic conversations and connections. Two EWLSE sponsors were recognized at the reception: 1) System Innovation, the DEI and EWLSE

Networking Reception sponsor; and 2) Caltech, long-time sponsor and supporter of the EWLSE working group. EWLSE presented Tracee Gilbert, Ph.D., CEO of System Innovation, with a copy of "Emerging Trends in Systems Engineering Leadership: Practical Research from Women Leaders" in recognition of her innovation and achievements in the field, as well as for inspiring and empowering women in the workforce through her leadership. EWLSE presented Rick Hefner, Ph.D. of CalTech with "Dandelion Wishes: A World Where We Collaborate as Equals" by Alice Squires, Ph.D., in recognition of his advocacy and support of women in systems engineering leadership. Both Tracee and Alice shared their engineering background and personal insights and lessons learned from their life experiences, and Rick shared his

Back To Table of Content

vision of the importance for advocating for women and changing the world, together.

Together, these events reinforced DEI as a fundamental component of systems engineering, fostering inclusive collaboration, inspiration, and innovative solutions that drive impactful results.

NORSEC AT IW2025

By Cecilia Haskins and Satya Kokkula

IW2025 was a banner event for the INCOSE chapter in Norway (NORSEC). Two of our longstanding volunteers were awarded Outstanding Service Awards, and the University of Southeastern Norway (USN) qualified for Academic Equivalency with the INCOSE certification program.

Both Satya Kokkula CSEP (current NORSEC president) and Kirsten Helle (past-president NORSEC and current deputy for the EMEA Sector Director) were recognized for their sustained contributions to the growth of the Norwegian chapter and coordination between the EMEA sector chapters. Their full citations are available online.

In addition, INCOSE has recognized USN for Academic Equivalency. Beginning January 2025 the students/ participants completing the Fundamentals of Systems Engineering (SEFS6102) course with specified requirements shall be qualified for SEP certification. As announced in the closing plenary session, USN is only the second European university to become a member of the CAB.

These recognitions follow on the recent

OSA awards – Satya Kokkula (L) and Kirsten Helle

SEP recognition - Cecilia Haskins (L), Satya Kokkula, and Ralf Hartman

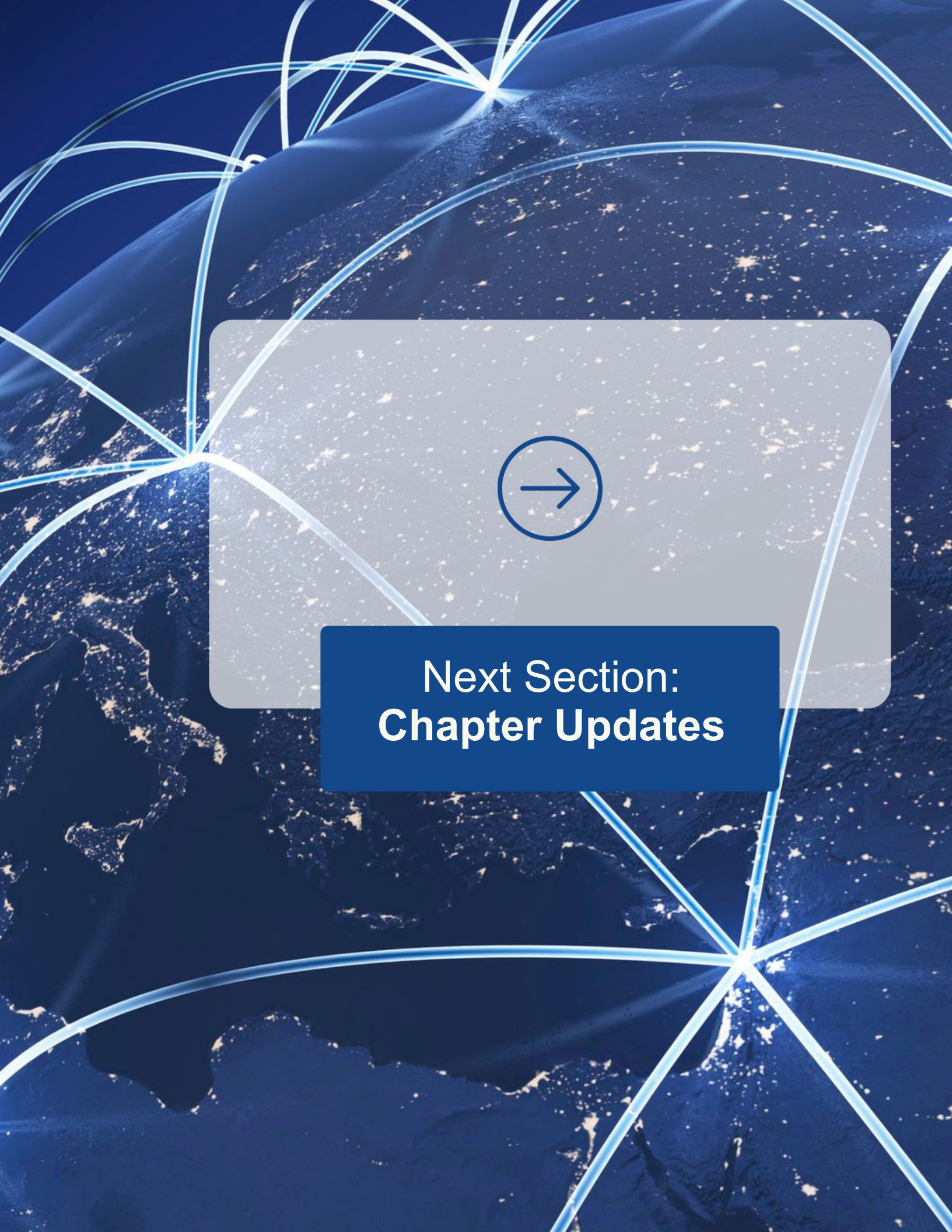
increase in SEP certificates earned by taking the knowledge exam. In 2024, NORSEC added 5 new certified SE and just before the IW2025 Todd Wohling (immediate past president) was recognized as CSEP, bringing the total of SEP to 11 with representation in all 3 levels. A paper exam was sponsored on 12th February based on the SEHv4 to support those who did their primary preparation in this version before the new exams that will be based on SEHv5 in March.

NORSEC also supports professional development activities for its members and others in our Norwegian SE network through biannual Systems Engineering Study Group (SESG) events, an annual conference in June (KSEE - Universitetet i Sørøst-Norge), and participation in the Nordic Systems Engineering Tour. The SESG on 13th February included 5 speakers and a workshop addressing the question "Where are we on the digital journey?" Our presenters were Nils Wolter, KTA; Oluf Tonning, KDA; John Pastor; Optime, Todd Wohling, Intec;, and Jose Pinto, TechnipFMC.

Back To Table of Content

DASSAULT SYSTEMES

Previous Section:
IW2025 Recap


Next Section:
Chapter Updates

Chapter

Click on the chapter logo

Back To Table of Content

Updates

to go straight to their update

WORLD ENGINEERING DAY EVENT IN SINGAPORE

On Feb-11, the Institute of Engineers, Singapore (IES) held a World Engineering Day event at the Singapore Polytechnic. (https://for.edu.sg/wedcrdgl25) The theme was "Towards a sustainable world: Engineering the way forward", focusing on the topic of Circular Economy and Resilient Future. The event was supported by 50 organizations and had a turn-out of 1,219 participants (722 in-person, 497 online). INCOSE Singapore Chapter also participated as a presenter in the afternoon break-out sessions. The Chapter President began by giving a light introduction of INCOSE, the past, the present and the future (INCOSE Vision 2035). The Chapter Secretary then took over to explain the SEP program. After that, the past-term Sector 3 Director presented a case study of how MBSE advances industrial symbiosis systems in layman terms without being overly technical. Lastly, a skim-through of the SE Handbook version 5 was done. Throughout the session, the audience was held in rapt attention by the brilliant story-telling and humorous speech of the four speakers. When the session ended, people from the audience came forward to commend them on making the session so informative and interesting.

Background: IES is the national organization of engineers in Singapore. It aims to promote and advance the science and profession of engineering in the country.

Back To Table of Content

JCOSE UPDATES FROM IW2025

By Midori Daida

The INCOSE International Workshop 2025 (IW2025) took place from February 1st to 4th in Seville, Spain. The INCOSE Japan Chapter (JCOSE) actively participated in various meetings and discussions, sharing updates on ongoing projects. Below are key highlights from our activities at IW2025.

INCOSE and JCOSE Automotive WG Meeting

Date: Monday, February 3, 2025

Led by: Alain Dauron, INCOSE Automotive WG Co-Chair

The INCOSE Automotive Working Group (WG) held a collaborative meeting with the JCOSE Automotive WG. During the meeting, Yutaka Ayame, Co-Chair of JCOSE Automotive WG, provided an overview of the group's activities since its establishment in July 2024.

JCOSE Automotive WG currently operates four subgroups, each focusing on a specific technical or research area within the automotive industry. Ayame shared the group's progress, detailing the achievements and ongoing initiatives within each subgroup.

The session was highly productive, with valuable feedback provided by Alain Dauron, David Hetherington, and other members, including online participants. Their insights will help JCOSE strengthen collaboration with international experts and refine its approaches for future projects.

The Asia-Oceania Sector III Meeting: JCOSE Participation

Date: Monday, February 3, 2025

Led by: Dr. Quoc Do, Asia-Oceania Sector Director

The Asia-Oceania Sector III Meeting brought together chapter leaders and members from across the region to discuss 2024 accomplishments and share plans for 2025. The meeting fostered active participation, with some leaders attending in person while others joined online, making it a dynamic and informative session for exchanging updates.

JCOSE presented several key updates, including:

- JCOSE Systems Conference 2025 (JS 2025), scheduled for March 5 in Yokohama.
- JCOSE Automotive WG Meeting, scheduled for March 11 in Nagoya.

- The ongoing Japanese translation efforts for the INCOSE Systems Engineering Handbook 5th Edition.

IW2025 was an excellent opportunity for JCOSE to strengthen global partnerships, exchange ideas, and gain insights from international experts. JCOSE looks forward to applying these insights to upcoming projects and continuing its engagement with the global systems engineering community.

INCOSE BRASIL UPDATE

By Bruno Soares do Livramento, Director of Communications of INCOSE Brasil

INCOSE Brasil Presents Systems Engineering Vision 2035 at Embraer Event

INCOSE Brasil was invited by Embraer to present our perspective on the current scenario and future challenges associated with Systems Engineering to their community of practice. On January 29, INCOSE Brasil President Fabio Silva delivered an online talk, sharing the key aspects of the Systems Engineering Vision 2035 with a highly engaged audience that asked many insightful questions. This presentation reinforced the role of our chapter in collaborating closely with local industry to disseminate the knowledge and practice of Systems Engineering in the country.

We would like to thank Embraer's Carlos Coelho and Natalia Rocha for the opportunity and their continuous collaboration.

INCOSE Brazilian Chapter Launches Translation Project for the 5th Edition Systems Engineering Handbook

The INCOSE Brazilian Chapter is leading the translation of the INCOSE Systems Engineering Handbook, 5th Edition, into Brazilian Portuguese, aiming to make Systems Engineering more accessible. The chapter is recruiting volunteers, including certified INCOSE members and experienced systems engineers. The project is expected to be completed by Q4 2025, supporting the expansion of INCOSE in Brazil. Those interested in contributing can contact INCOSE Brazil for further details.

WPI HOSTS 6TH ANNUAL INCOSE FALL WORKSHOP

By Larry Mallak, WPI

At the end of November, WPI hosted the 6th annual INCOSE fall workshop in partnership with the INCOSE New England Chapter. Held at WPI's historic Higgins House, the day featured engaging discussions, remarks, and presentations by industry professionals, WPI professors, and students.

Breakfast and coffee welcomed attendees as they settled in. Brian Sheehan, INCOSE NE Board Member and Systems Engineer at the Charles Stark Draper Laboratory Inc., opened the event with remarks. He was followed by Bill Luk, INCOSE NE President and Point of Contact for BAE Systems North America within the NDIA SE and AIA Engineering committees, who also thanked event sponsors and staff. Luk introduced the day's important theme: *The Artificial Intelligence Landscape in Systems Engineering.*

John McNeil, Dean of Engineering at WPI, took the stage to welcome attendees and introduce WPI. He shared WPI's history related to Systems Engineering and AI, along with insights on how AI could impact higher education. Larry Mallak, Academic Director for WPI's Systems Engineering Program, then delivered the keynote presentation, *Systems Engineering on Fire*. Starting with a realistic AI avatar introducing himself, Mallak then engaged the audience with an interactive trivia quiz offering prizes for winners. He discussed how AI transforms work and daily life, posing the thought-provoking question, "Am I obsolete or more productive with AI?" before opening the floor for questions.

Back To Table of Content

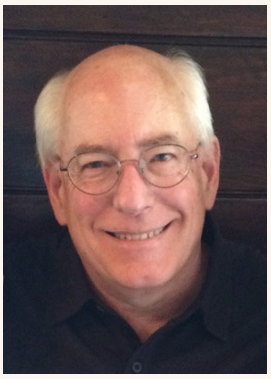
After a short break, Shamsnaz Virani Bhada, Assistant Professor at WPI, and her graduate student, Krish Patel, presented on Systems Engineering and Technical Debt. Their talk covered AI-enabled policy content modeling and mitigating technical debt using AI. Mark Vriesenga, Chief Engineer of Information Analytics at BAE Systems, followed with *The Myths and Truths of Artificial Intelligence/Machine Learning*. He addressed eight common myths, such as “AI applies to any problem” and “ChatGPT is thinking.”

During the lunch break, attendees enjoyed a student poster presentation competition held in the Higgins House sunroom.

The afternoon resumed with Tom McDermott, CTO at the Systems Engineering Research Center (SERC), presenting on trust and trustworthiness in AI-enabled systems. Ali Raz, Assistant Professor at George Mason University, discussed integrating AI in a SoS environment. The event concluded with a panel discussion moderated by Shamsnaz Virani Bhada on the role of AI in Systems Engineering education and practice, featuring Carlo Lipizzi (Stevens Institute of Technology), Jyortimay Gadewadikar (Raytheon Technologies, Pratt and Whitney), and Cameron Hendricks (MITRE).

A special thanks to our workshop sponsors: Dassault Systèmes, BAE Systems, Inc., and Draper. We look forward to hosting more workshops in the future!

FROM DORMANT TO DYNAMIC: REINVIGORATING THE GREATER PHILADELPHIA INCOSE CHAPTER



The Greater Philadelphia Chapter of INCOSE faced an all-too-familiar challenge: inactivity. Like many chapters of membership-based professional associations, it succumbed to the disruptions of the COVID-19 pandemic, leading to a decline in engagement and, ultimately, dormancy. However, a dedicated group of members, led by Michael (Mike) DiMario, recognized the value of a local INCOSE presence and embarked on a mission to revive the chapter.

"The long duration of COVID gathering restrictions resulted in many of the board members moving on with their careers and life responsibilities," explained Mike. "The Philadelphia Chapter is engaged with student university bodies. Student bodies could not physically meet and did not have ready access to online collaboration tools for INCOSE interaction."

Undeterred by the challenges, Mike envisioned a chapter that embraced a broader perspective. "I had specific ideas of the Philadelphia Chapter engaging with commercial enterprises," he shared. This vision extended beyond traditional defense and aerospace sectors, recognizing the growing importance of systems engineering principles in diverse industries like pharmaceuticals and chemicals.

The revival process started with informal meetings. Mike said, "[It] began with small side meetings with the chapter president and other interested board members, as well as INCOSE chapter administration at the International Workshop and International Symposium conferences, with continued conversations." These meetings fostered collaboration and built momentum, culminating in the formation of a new, revitalized board.

However, the path to reinvigoration was not without its obstacles. "The INCOSE support processes and communications services, such as MS Teams and INCOSE email, had rapidly changed," Mike recalled. "The chapter was significantly out of step with the new infrastructure and had to reinitiate how it interfaced and worked with INCOSE as well as the chapter membership." Navigating these challenges required perseverance, strong teamwork, and valuable guidance from experienced INCOSE members.

Today, the Greater Philadelphia Chapter is once again taking steps towards becoming a vibrant hub for systems engineering professionals. "[Our] Initial goal is to re-establish and maintain communications and activities with the chapter membership and chapter regional organizations," Mike outlined. "Next is to build a suite of systems engineering programs in the form of presentations and tutorials for the membership and universities." While establishing these programs, the chapter hopes to create paths to commercial organizations, such as the pharmaceuticals and chemical

Back To Table of Content

enterprises in the area, as well as other local universities with systems engineering curricula.

Looking ahead, Mike expressed enthusiasm for the chapter's future. "There is tremendous opportunity in the Greater Philadelphia Chapter regional area," he emphasized, “[including] DoD contractors, a navy yard, large commercial production enterprises, and several universities that teach systems engineering.” As systems engineering and its associated processes are becoming more widely adopted across enterprises, local INCOSE chapters have the opportunity to provide a common systems engineering thread throughout a region.

The revival of the Greater Philadelphia Chapter serves as an inspiring example for other INCOSE chapters that have potentially become dormant. When asked what advice he would give a fellow dormant chapter, Mike said, "Do something; this is far better than no activity at all. Gather like-minded chapter members or board members who are interested in a revival. A small meeting can provide enough momentum to begin a revival. Do not let assumptions of INCOSE administrative processes or assumptions of chapter requirements impede a revival. Just do it. The rest will fall into place." By taking that initial step and leveraging the support and resources available through INCOSE Headquarters, any chapter can overcome inactivity and once again become a valuable asset to its local systems engineering community.

REFLECTIONS ON 2024: A YEAR OF ACHIEVEMENT AND GRATITUDE

By Gary Lee Thomas

At the January 2025 chapter meeting, I completed my term as the President of the INCOSE Washington Metro Area Chapter.

It has been an incredible honor to lead this all-volunteer organization. Reflecting on 2024 fills me with immense gratitude and pride for our chapter's accomplishments.

Here are a few highlights of what we achieved:

Quarterly Newsletters: Thanks to the dedication of our chief editor, Mr. Nalini Muppala, we published four insightful newsletters, providing valuable content for our members and readership.

Training Opportunities: We hosted a standout training session on requirements decomposition and analysis, facilitated by Mr. Kyle Miller and taught by Dr. Steven Dam, a former president of both the INCOSE San Diego and Washington Metro Area chapters.

Chapter Events: We held four outstanding events that were not only educational but also strengthened connections among members, students,

Back To Table of Content

and families. These events were expertly planned and led by Ms. Kathleen Flynn.

INCOSE Engagement: Our chapter was well-represented at the International Workshop (IW-24) and International Symposium (IS-24), ensuring our involvement in the broader INCOSE community.

Expert Speakers: We welcomed accomplished guest speakers from academia, industry, and other INCOSE chapters, who enriched our meetings with their expertise and insights.

Student Chapter Collaboration: We proudly onboarded the student chapter at The George Washington University under the leadership of Past President Dr. Houng Soo. Additionally, we built relationships with George Mason University through meetings with their student leaders, SEOR Department Chair Dr. John Shortle, and our involvement in the Andrew P. Sage Systems Engineering Design Competition.

Student Unity: For the first time, we facilitated a meeting of student chapter presidents from George Washington University, George Mason University, and Virginia Tech. This initiative, led by Dr. Taylan Topcu and executed by PhD Candidate Jannatul Shefa, brought a sense of unity and pride to our chapter. Experienced members like Mr. Bill Schieble generously shared their wisdom with these young leaders.

Elections: Our elections committee executed a seamless election process using INCOSE's tools, setting an example for other chapters.

Professional Certifications and Growth: Sixty of our members earned professional certifications in systems engineering in 2024. Several of our officers completed their master's degrees in systems engineering, and others made their decisions to start their MS in Systems Engineering in 2025.

These achievements indicate our INCOSE chapter is building momentum and is on track for major accomplishments in the years ahead.

I'm confident the chapter is in excellent hands. Under the leadership of Dr. Lowanda Studevent in 2025 and Dr. Shawn Na in 2026, I believe our INCOSE Washington Metro Area chapter will continue to grow and set new standards within the INCOSE Americas Sector. I am especially excited about Dr. Studevent's vision for collaboration across chapters to strengthen our engineering community.

To our volunteers, guest speakers, chapter leaders, and chapter members: thank you. Your dedication to systems engineering, passion for sharing your expertise, and the volunteering of your

time drive this chapter forward.

Thank you.
Gary L. Thomas,
Past President (incoming)
INCOSE Washington Metro Area Chapter

Back To Table of Content

INCOSE WELCOMES THE NEWEST ESTABLISHED CHAPTER: LATIN AMERICA!

INCOSE is thrilled to announce the official establishment of the Latin America (LatAm) Chapter! This exciting development marks a significant step in expanding the reach of systems engineering and the INCOSE community across the globe. We sat down with Adrian Unger, one of the LatAm Chapter Leaders, to learn more about the driving forces behind this achievement, the challenges overcome, and the vision for the future.

A Region Ripe for Systems Engineering

The motivation behind forming the LatAm Chapter stemmed from a deep understanding of the region's unique context. "Latin America is a vast and beautiful region, but it suffers from significant socio-economic instability, with each country facing its own particular challenges," Adrian noted. "However, the culture of Latin Americans is one of resilience and determination to move forward." This contrast, he explained, creates a regional awareness of the need to improve conditions through industry, production, education, and scientific development. "It is evident that both systems thinking and systems engineering strongly contribute to these objectives. Thus, we recognize an undeniable connection between improving the region’s situation and developing systems engineering in a methodical and persistent manner. And what is the proven formula worldwide? Creating a community for SE through the INCOSE structure." This vision for community growth and professional development underscores the LatAm Chapter's commitment to advancing systems engineering throughout the region. With this foundation and vision, the LatAm Chapter is poised to become a driving force in shaping the future of systems engineering in Latin America.

Overcoming Challenges, Building a Community

The journey to becoming an official chapter wasn't without its hurdles. "The most challenging aspect is balancing voluntary work with the necessary commitment to professional and personal life. It takes strong conviction not to give up along the way," the chapter leader shared. He emphasizes the importance of a dedicated team and the ongoing support received over the years: "Ultimately, the real challenge is finding the right people who share the belief that systems engineering can improve a country, a region, and even the world."

Another significant obstacle has been the high cost of INCOSE membership relative to the average income in Latin America. "In Latin America, the membership fee is extremely high relative to the average people's economic means, making it difficult to attract enough members—even when providing real value to the community." Despite these challenges, the LatAm Chapter remained steadfast in its mission to cultivate a thriving systems engineering community and contribute to the region's progress.

Adrian expressed immense gratitude for the support received. "From the beginning, we received strong support from INCOSE Central, the INCOSE

Foundation, as well as INCOSE Brazil, INCOSE Spain (and a lot of individual members, too!). This achievement would have been impossible without the backing of all of them."

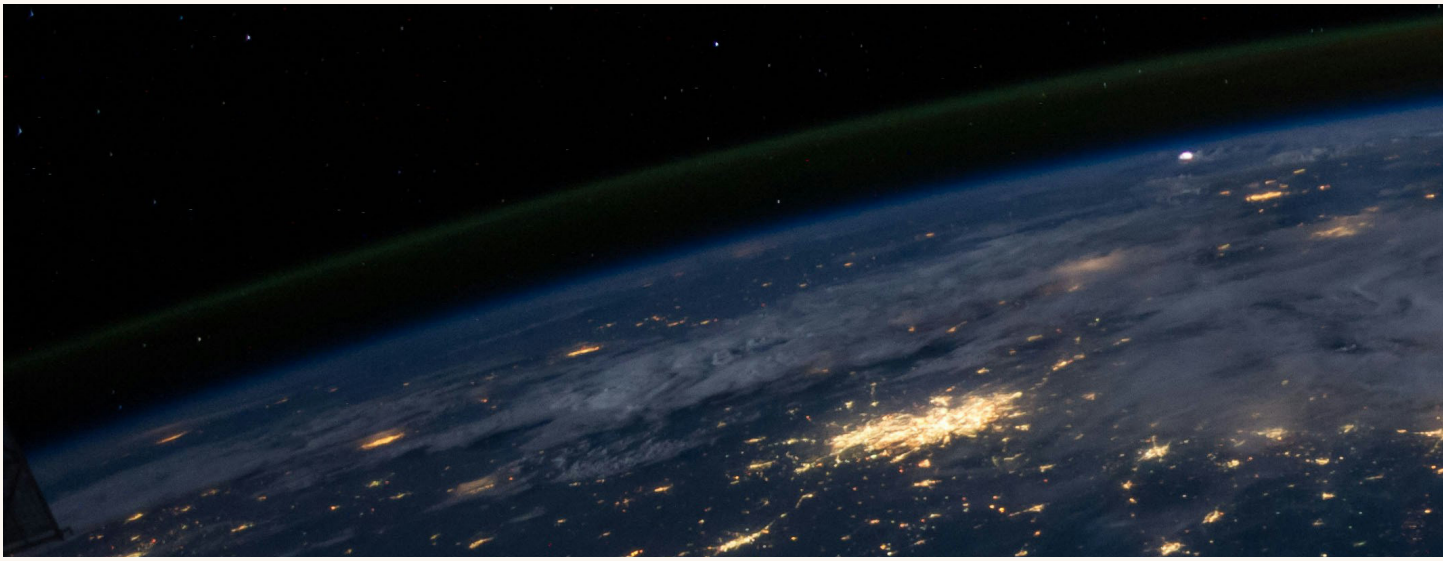
The official recognition of the LatAm Chapter brings numerous benefits to systems engineers in the region. "The official recognition of the chapter provides reassurance to the community by affirming that for INCOSE, Latin America also exists," Adrian stated.

Beyond the recognition of existence, the establishment of the chapter reflects the importance of its presence in the global SE community and the value it will bring in uniting and advancing the discipline. "The Latin America Chapter is a significant step forward in expanding the reach of systems engineering and fulfilling INCOSE's strategic objective to grow our global community," says Renee Steinwand, Americas Sector Director. "This new chapter will not only serve the needs of systems engineers within the region but also contribute valuable perspectives and expertise to the broader INCOSE network, fostering collaboration and driving innovation in the field."

A Vision for the Future

The chapter's vision for the future of systems engineering in Latin America focuses on two key areas: industry collaboration and educational institutions. Recognizing the existing high-tech clusters in the region (e.g., astronomy, aerospace, automotive) that already utilize systems engineering, the chapter aims to provide additional support. On the academic front, the chapter seeks to unify and stabilize educational and technological activities related to systems engineering, working closely with INCOSE Headquarters to guide universities in their curriculum development.

The LatAm Chapter leaders are already actively building connections across the region. "We are actively working with multiple Latin American countries, focusing on identifying Points of Contact (PoCs) in regions where we do not yet have strong connections," Adrian explained. While some countries have more established industries and a longer history of systems engineering adoption, the chapter is committed to supporting and expanding the community throughout Latin America.



Back To Table of Content

The new chapter has ambitious plans for 2025, including completing the Spanish translation of the HBv5 with AEIS (INCOSE Spain). "This is a critical milestone, as a large number of Latin American professionals do not have full proficiency in English, making this official recognition even more impactful." This commitment to translation reflects INCOSE's global vision and dedication to a One INCOSE mindset, ensuring that valuable resources are accessible to all members of the systems engineering community, regardless of language.

They also plan to launch a series of discussion panels focused on systems engineering education in Latin America and conduct a comprehensive survey to better understand the needs of the LatAm systems engineering community.

Advice for Aspiring Chapters

Reflecting on the journey, Adrian offers valuable advice. "In our case, it took approximately three years from the initial idea to become an official chapter. The effort gradually increased, but we never doubted that delivering value to the community would lead to success." His concrete, actionable advice to emerging chapters includes:

- Host a free, open webinar every month to consolidate a strong community,
- Don’t get discouraged if volunteer groups change or rotate, and
- Ensure that each volunteer feels comfortable contributing as much time as they can while knowing there is backup support from colleagues to cover tasks when needed.

The future of systems engineering in Latin America is bright, and the newly established chapter is poised to play a pivotal role in its growth and development. The LatAm Chapter is a valuable addition to the INCOSE family, bringing new energy and perspectives to the global systems engineering community.

To follow the LatAm Chapter’s journey, visit their webpage, follow them on LinkedIn, check out their YouTube channel, or contact latam@incose.net to get involved.

INCOSE-HUNTSVILLE REGIONAL CHAPTER (HRC)

Alabama Regional Future Cities Competition (ARFCC)

The INCOSE – Huntsville Regional Chapter (HRC) participated in the 24th Annual Future City Competition – Alabama Region, which was held by Auburn University's Samuel Ginn College of Engineering in Auburn, Alabama, on Saturday, January 25, 2025. Twenty-three middle school teams competed for awards from 14 different professional societies.

Beckett Buckridge, Marley Conner, and Violet Hurt represented the Barton Academy for Advanced World Studies from Mobile, Alabama. They were the recipients of INCOSE-HRC's "Best Integrated Systems Solution" Award for developing and describing an integrated systems solution to deal with rising sea levels. Their floating city was self-contained and fully sustainable. They addressed all the basic needs of its citizens to include their safety during threatening weather and sea state events. Every item included within their well-constructed display was designed to perform a specific function which was necessary to sustain a hospitable and thriving habitat.

The Alabama Regional Future City Competition is a state-wide, project-based learning experience where students in 6th, 7th, and 8th grade imagine, design, and build cities of the future. Students work as a team with an educator and engineer mentor to plan cities using SimCity™ software; research and write solutions to an engineering problem; build tabletop scale models with recycled materials; and present their ideas before judges and other local attendees.

This event was graciously hosted by the Samuel Ginn College of Engineering at Auburn University. The Samuel Ginn College of Engineering houses the Department of Industrial and Systems Engineering which prepares students to practice industrial and systems engineering professionally and ethically in a competitive and diverse global environment. An INCOSE student division was established at Auburn University in 2024 and has begun to help and prepare students for future careers in systems engineering.

Back To Table of Content

INCOSE NEW ENGLAND CHAPTER UPDATE

By Brian Sheehan, Amy Thompson, and George Sawyer

The INCOSE New England Chapter has partnered with INCOSE Americas/ Canada, INCOSE WG's, IEEE Smart Cities, and the Massachusetts Institute of Technology's System Design Institute (MIT SDM) for an event convening Complex Systems scholars from academia and industry. The Complex Adaptive Systems Conference's 2025 (CAS2025) will be held March 5-7 at MIT's Cambridge MA campus.

The first night of the conference, the New England Chapter will host a "New England INCOSE Night" featuring guest speaker, Dr. Mark Vriesenga, at the MIT Museum. Dr. Vriesenga will share a talk on Transdisciplinary Systems Engineering Approaches that explores the relationships between Cyber, Artificial Intelligence, and Systems Engineering Activities.

"Today's product and services systems are multi-faceted, with distinct levels of implementation that entail complex logic with levels of reasoning in intricate arrangement, organized by webs of connections. These systems increasingly demonstrate self-driven adaptability, autonomy, and emergent behavior. The demand for — and possibility of — systems adaptability will impact design, manufacturing, and operations across many sectors, including defense, healthcare, energy, transportation, emergency response, agriculture, and society overall."

At the same time, engineering activity for complex systems challenges is increasingly transdisciplinary, from problem framing and concept development to solution implementation. Transdisciplinary engineering is characterized by engagement of multiple technical disciplines along with non-engineering experts and stakeholders. This year's CAS Conference theme is **adaptability of complex systems through transdisciplinary systems and solutions**. *How we engineer* as well as t*he systems we generate* are systems with significant opportunity from adaptability, and risks from lack of adaptability.

CAS 2025 seeks to **balance attention to research on advanced methods and domain applications**. Domain application studies are invited across a broad range of systems, including mechanical, computational, urban, biological, natural, and services systems. The conference aims to foster innovative methods to address adaptability, including recent advances in autonomy, resilience, AI, complex sociotechnical systems, and system of systems.

THE REBIRTH OF THE INCOSE HAMPTON ROADS AREA CHAPTER

The INCOSE Hampton Roads Area (HRA) Chapter, once a vibrant hub for systems engineers, has risen from dormancy to reclaim its place as a vital resource for the local community. Founded in the late 90s by engineers from shipbuilding and NASA, the chapter enjoyed years of success, hosting large-scale events, developing a CSEP Prep Tutorial that became an INCOSE product, and fostering collaboration with other professional societies. "During the early years 2000-2003, the chapter held massive events with hundreds of attendees from all over the world," recalls Becky Reed, ESEP, CEO and Founder of Reed Integration, Inc. and HRA Past President. "The chapter received the Gold Circle Award multiple times and was instrumental in supporting the creation of the awards program at the international level."

However, like many organizations, the HRA chapter faced challenges, particularly with the onset of the pandemic. Membership dwindled, board members relocated, and engagement waned. "As the pandemic began, the HRA chapter suffered the same issues as many organizations did with the shift from in-person activities to remote status," explains Reed. "Previous membership from local shipbuilding companies and other major contractors dwindled substantially. The HRA Board of Directors was reduced to 2-3 people trying to maintain some level of communications." Financial reporting lapsed, and the chapter's connection with INCOSE Headquarters (HQ) was weakened.

Recognizing the potential for revival, Reed stepped up to lead the charge. Drawing on her experience with a similar situation as the past president of the INCOSE Huntsville Chapter as well, she was well-versed in the need for updating outdated operational processes, where the chapter's bank account even had the old "NCOSE" instead of "INCOSE" as its name. She was confident the HRA chapter could be revitalized. "Having already worked with a chapter that had gone inactive in Huntsville, I was confident the HRA chapter would be able to rally as we moved into 2023 and started to recover from the worst of the pandemic years," she says.

Her first steps involved contacting INCOSE HQ, obtaining the current membership list, and re-establishing communication with existing members. Michael Enloe, CSEP and Senior Lead Engineer with Booz Allen and current HRA Chapter President remarked, “Becky put out a call for people willing to help reinvigorate the chapter. I put my hand up and stepped into the Vice President position just before the 2024 International Workshop. From there, I was hooked.” With the support of Enloe and the remaining active board members, virtual events were introduced, featuring software demonstrations and guest speakers on topics ranging from innovative product development to the “Great Digital Unknown” of Model-Based Systems Engineering (MBSE) and Digital Engineering (DE). "Trying to get the members informed and involved in our new virtual events has been challenging," admits Reed. "We’ve worked to make the sessions convenient during the workday lunch timeframe, and the presenters and subject matter have been amazing." The chapter also supported a research sprint

pitch event for Old Dominion University (ODU) graduate students in human systems integration in conjunction with the ODU chapter of Women in Systems Engineering (WiSE). A redesigned logo, courtesy of Reed's company's graphic designer, added a fresh look to the revitalized chapter.

One of the biggest hurdles was re-engaging members and ensuring consistent participation. The geographically dispersed nature of the region made in-person events difficult, so virtual sessions became crucial for outreach. Reed and Enloe also emphasize the importance of managing chapter finances: "I don't think most people realize how critical it is to get the chapter financials under control. Tracking down the last person with access to a bank account after 6 years or more can be very difficult," said Reed. They stress the need for accurate financial reporting to INCOSE to ensure continued support and funding. "Chapter leaders need to be able to know their financial situation to pay for membership events, dues to other organizations, etc. – and to have the information required for the annual financial report to INCOSE that allows the dues portion to be allocated. That can be the only source of income for a chapter for a while."

Looking to the future, the HRA Chapter is excited to see the chapter continue to grow. "I am most excited to see engineers who are new to SE or early in their SE careers be able to participate and grow with the chapter," exclaims Reed. "Opportunities for certification, connection to INCOSE resources, and access to other members for guidance and mentoring are wonderful benefits for chapter members as they advance in their careers." Moving forward, Enloe is especially interested in engaging with industry and academia in the area. "We have a great academic opportunity in Old Dominion and a huge defense industrial base in Hampton Roads – providing a bridge for ideas between the two would be a huge boon for the chapter and SE practice in the area," he remarked.

The advice to others looking to revive inactive chapters is clear: "When people offer to help, take them up on it! Besides local members, there are people in other chapters and at the main INCOSE level who are willing to support, and that can be so important when a chapter is trying to rebuild." The resurgence of the INCOSE Hampton Roads Area Chapter is a testament to the dedication of its leaders and the enduring value of a strong professional community. It stands as an inspiration for other chapters seeking to reconnect with their members and contribute to the advancement of systems engineering.

To follow the HRA Chapter's new journey, visit their webpage or email hampton-roads@incose.net to get involved.

AUBURN UNIVERSITY STUDENT DIVISION

The INCOSE Student Division at Auburn University held its first meeting of the spring semester on February 10, 2025. Emily Kalifa, Student Division President, and Gabriella Hawkes, Student Division Vice President, started the meeting by providing an overview of INCOSE and how they came to learn about systems engineering career opportunities. Gabriella further highlighted her recent summer internship experience as a Computer Science intern that emphasized the importance of developing robust software requirements. This insight and greater awareness of the systems engineering discipline in the workplace has both Emily and Gabriella seriously considering careers in systems engineering.

Tony Lindeman, ESEP, and Dr. John Wilson, Ph.D., were asked to provide an overview of the INCOSE – Huntsville Regional Chapter (HRC). They provided details of INCOSE-HRC's efforts to increase their membership, which includes working closely with INCOSE student divisions. These efforts include helping SE students pursue careers in systems engineering and gain an appreciation for the life-long benefits of maintaining an active INCOSE membership.

The INCOSE Student Division at Auburn University was established in March 2024. Additional meetings will be scheduled during the semester as they prepare to pursue summer internships and to learn more about the practice and application of systems engineering.

UPDATE FROM INCOSE CANADA CHAPTER

Message from the Chapter's President

As we enter 2025, INCOSE Canada is poised to build on last year's momentum, which saw remarkable growth in networking opportunities, knowledge-sharing platforms, and SEP certification support. Our 2024 achievements—including a series of well-attended technical webinars, in-person meetups in Vancouver and Toronto, and peer-led SEP study cohorts—laid the foundation for a thriving systems engineering community. This year, we're amplifying our efforts to continue providing value and support to our members nationwide while strengthening ties with student and Francophone communities.

There are a number of new initiatives that the Canada Chapter will bring to drive this vision in 2025, including a Student Award Program, increased French-language outreach activities, and the Canadian Transit Agencies Systems Engineering Roundtable, which aims to convene industry leaders to address shared systems engineering challenges in transportation infrastructure. We will continue our tradition of supporting our members in SEP certification along with a carefully curated technical webinar series. Geographically, our in-person event footprint will grow to include Calgary and Ottawa, complementing our Toronto and Vancouver hubs.

Together, these efforts underscore our commitment to making systems engineering a cornerstone of Canada's technological future. I invite every member to engage, collaborate, and help shape this exciting journey.

INCOSE Canada Chapter Highlights at the International Workshop

Members of the INCOSE Canada Chapter made valuable contributions at the INCOSE IW 2025.

Ray Barton, Past President of INCOSE Canada, organized the Open Multi-Working Group Forum on Complex Adaptive Systems
Learn more: https://www.incose.org/communities/working-groups-initiatives/systems-adaptability

Ivan Taylor, Treasurer of INCOSE Canada, presented two papers: *'How Can System Dynamics Support System Adaptability'* and *'The Integration of System Dynamics with SysML for Adaptive Design.'*. His presentations focused on the role of System Dynamics in enhancing system adaptability, modeling mission changes, design alternatives, and switching costs, with a real-world example of an aircraft engine adaptability case study.
Learn more: https://www.youtube.com/watch?v=78is_odaUWc

Membership Report

We are thrilled to welcome our newest members to the INCOSE Canada Chapter! Be sure to greet them at our upcoming events. The following individuals joined us in Q4 2024:

Congratulations to Our Q4 2024 Systems Engineering Professionals!

CERTIFIED INCOSE CSEP SYSTEMS ENGINEERING PROFESSIONAL™

Jair Cavalcanti

Caroline Youssef

ASSOCIATE INCOSE ASEP SYSTEMS ENGINEERING PROFESSIONAL™

Norbert Irsik

Yihan Wang

Hany Soloumah

Trevor Zakus

In 2023 and 2024, many individuals participated in the INCOSE Canada Chapter's study group, where systems engineers studied the INCOSE Systems Engineering Handbook over 12 weeks to prepare for the INCOSE Certification Exam. Additional study groups are planned for 2025 for those aiming for ASEP or CSEP certification. If you're interested, please email canada@incose.net.

Events Highlights

The INCOSE Canada Chapter recently hosted three engaging and insightful online events that brought together experts and enthusiasts from the systems engineering community:

- **January 13th:** David Long, the INCOSE Director for Strategic Integration, presented "Systems Engineering Vision 2035," discussing the evolving context of systems engineering and INCOSE's strategic plan for the future.

Back To Table of Content

Event Recording: Watch on Vimeo.

- **January 20th:** Stéphane Lacrampe, co-found of Obeo and a leading expert in open-source modelling software, introduced SysON, an open-source SysML v2 modeling tool, showcasing its capabilities and vision for digital engineering transformation.
  Event Recording: Watch on Vimeo**.**
- **February 10th:** Prof. Alex Ellery explored lunar industrialization with self-replicating machines and in-situ resource utilization, highlighting revolutionary space exploration possibilities.
  Event Recording: Watch on Vimeo.

If you're interested in presenting at one of the Canada Chapter's events, please contact us at canada@incose.net. We welcome a variety of Systems Engineering topics, including Requirements Management, Model-Based Systems Engineering (MBSE), Verification and Validation, Machine Learning/AI, Cyber Security, and Systems Safety/FMEA. As a presenter, you'll receive a certification from the INCOSE Canada Chapter in recognition of your contribution.

INCOSE TÜRKIYE CHAPTER NEWS

By Ebru Caglayan, Chapter Lead

INCOSE Türkiye Chapter has made a fast start to 2025!

SEP Knowledge Exam

After the announcement that the Systems Engineering Professional (SEP) knowledge exam will be exclusively based on the INCOSE SE Handbook, fifth edition, we have organized our latest hybrid paper-based exam in Ankara. The SEP exam took place in two sessions, one in the morning and one in the afternoon. The exam takers had the opportunity to participate in the final hybrid exam organized by the chapter.

Online Webinars

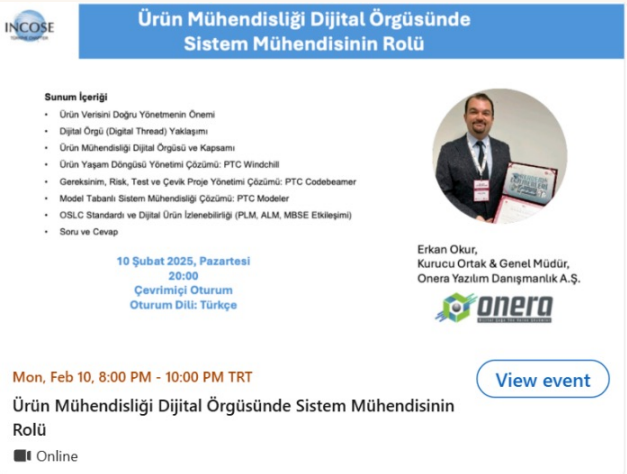
We organized two online webinars in Q1:

In the first webinar, our Chapter Lead, Ömer Korkmaz, gave an informative presentation about “OCSMP (OMG Certified Systems Engineering) Certification Steps,” which includes information about OMG certification programs, application process, and examination.

During our second webinar, the CEO of Onera, Erkan Okur, presented comprehensive and detailed slides about the “Role of Systems Engineering in Product Engineering Digital Thread,” which covered product engineering digital thread approach, product lifecycle management solution with a tool demo, and OSLC standard with digital product traceability.

Blog Series

We have kicked off a blog series on our



Back To Table of Content

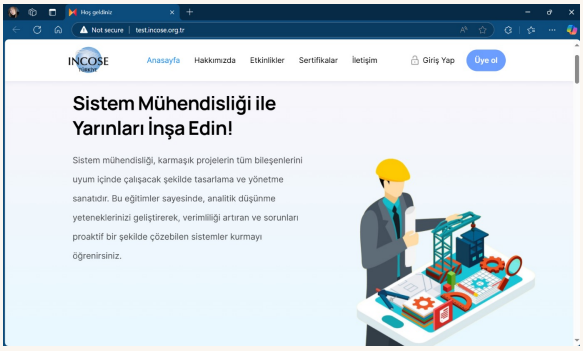
LinkedIn account. Every week, we publish articles by our members on a wide range of topics, such as the roles of a systems engineer, the basics of systems engineering, and systems engineering methodologies.

Website

We are launching this year a website for our chapter, INCOSE Türkiye!
We have already chosen our theme and decided on the topics to be shared on our website.
Thanks to our hardworking members in our chapter, the test version of our website is now ready: http://test.incose.org.tr

Systems Engineering Master's Degree Programs in Türkiye

We are currently in discussions with various university authorities to launch



Systems Engineering Master's Programs in Türkiye. We are conducting market and demand analysis, checking accreditation and educational quality requirements as well as a robust curriculum and resource needs. These master programs are expected to increase collaborations between INCOSE, universities and industries in Türkiye.

Follow us on Linkedin for more updates: [INCOSE TR: Overview | LinkedIn]

AFIS ANNUAL CONGRESS

By the AFIS Program committee and Community Management

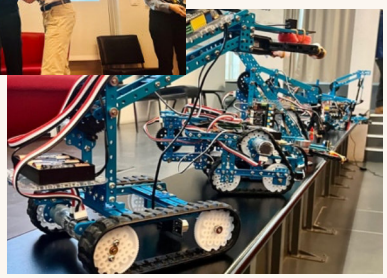
AFIS, the French INCOSE chapter, held its annual congress from January 14 to 15, in Saint-Ouen (suburb of Paris), on the theme “Systems engineering for a complex world”. It brought together French Systems Engineers from academia, industry, and government with about 200 members and non-members, sharing knowledge on projects, development of standards, and thematic committees carried out by AFIS, assess practices, and explore challenges and future of Systems Engineering (SE). We had the pleasure to welcome Ralf Hartmann, INCOSE President, Steve Records, Executive Director, and Olivier Dessoude, Technical Operations Director for his last official intervention before a handover at the IW2025.

During this event, the RobAFIS contest (Robotics Engineering) involved ten teams of students coming from nine Engineering Schools. They had to develop their robots to fulfil specification

given by the Program Committee but also validate the behavior on the congress site and demonstrate the quality of the robot Systems Engineering data during audits. Congratulations to the winning team « Insavengers » from INSA Toulouse - Institut National des Sciences Appliquées de Toulouse!

PhD Students Seminar prize was awarded to Mr. Cyril Bacquet (CRAN, Univ. of Lorraine) for his work on “Conceptual Model to enable set of requirements Verification and Validation”, winner among 16 PhD students who defended their work in front of an academic and industrial audience.

Back To Table of Content



Keynote speakers came to broaden the Systems Engineering horizon: Charles Blondel de Joigny from Dassault Aviation, focused on the

"CONCERTO Project," which aims to define a certification framework for disruptive technologies in aviation, particularly hybrid-electric propulsion and future aircraft. This initiative led to the creation of the Certification Readiness Level (CRL) scale, assessing the maturity of technologies for certification readiness.

Bruno Vuillemin from Capgemini focused on "Frugality of the SE approach... towards frugal systems,"

advocating for a shift in SE towards reducing resource usage while focusing on real needs and being more ingenious. His presentation emphasizes "technological sobriety" and a "just enough" approach, where only necessary features and functionalities are included.

Yves Mérian from IMdR presented "The Systemic Approach: Definition, Variations, Uncertainties, and

Recurrences," distinguishes between analytical and systemic approaches to problem-solving. He highlighted the limitations of analytical methods for complex systems, stressing the importance of considering human, technological, and organizational factors. He explored "emergence," where system behavior cannot be predicted from individual parts, and drew on complex systems theories, cybernetics, and holism. He emphasized the need to address real-world problems and ensure systems function in all conditions, including unexpected ones.

Steve Records and Olivier Dessoude delivered a keynote with two enthusiastic messages about INCOSE. Steve outlined INCOSE's vision, challenges, and plans, focusing on three

core themes: Unite, Advance, and Trusted Authority. He addressed the

challenge of inclusivity within the Systems Engineering community and the federated nature of INCOSE. His plan aims to mature SE through strategic partnerships and aligned initiatives. Olivier discussed AFIS's role within INCOSE's technical operations, covering working groups like Architecture, Automotive, Configuration Management and others. He suggested fostering inter-chapter coordination and exploring topics like Loss-driven Systems Engineering and Systems Engineering for Sustainability.

The round table discussions covered key topics in systems engineering (SE):

- Sustainability in SE explored integrating sustainability principles, including Life Cycle Assessments and automation, with insights from industry and research.
- Human vs. Artificial Intelligence in SE examined AI's role, interoperability in production systems, collaborative combat experiences, and projects on secure systems, knowledge management, and systems thinking.
- Configuration Management highlighted challenges in implementation, the need to clarify its value, and distinctions between methods and tools.
- Digital Twins reviewed advancements, emphasizing SE and architecture's role in lifecycle viability through real-life experiences.
- SE and Value analyzed the relationship between value analysis and SE, discussing stakeholders' perspectives, best practices, and standards.
- Agility in SE focused on applying agile methodologies, addressing requirements engineering, pain points, and practitioner expectations.
- SE in Strategic and Ecosystemic Topics explored expanding SE into non-technological domains through system thinking adaptations.

Key projects were presented as the translation of the Systems Engineering Handbook V5 into French aims to improve comprehension for INCOSE certifications and serve as a training resource. The project involves machine translation, reviews, and collaboration with INCOSE and Wiley. The PRODENER (Production of Energy) project explores sustainable systems engineering using an electrical energy system as a case study, aligning with eco-modernism's technology-driven environmental solutions. Also, a presentation on standardization mission highlighted the role of norms in SE, emphasizing gaps in Agile, AI, and Digital Twins. The CORNAC project was also introduced, comparing norms and recommendations with the CMMI model to identify areas for improvement.

With the INCOSE support, AFIS organized an INCOSE ASEP/CSEP certification session, allowing candidates to assess their Systems

Back To Table of Content

Engineering skills. During 130-minute, 20 candidates answered to 100 questions based on the SE Handbook V4 and V5. Among them, 12 candidates passed.

The social event allowed the attendees to freely exchange and network, while

sharing the art of living “à la française!” on a houseboat.

In addition to the congress, the 1st Workshop on Research Trends in Systems Design was held the following day, with the support of IEEE France Section. The Workshop brought together 52 researchers working on all aspects of current and future systems design research trends in both academia and industry, through 6 scientific sessions: Requirements Engineering, Empirical Studies for Evaluating MBSE methods and tools, Product Line Engineering, Systems Design Methods, Model-Based System Problem and Design Definition and Industry-Driven Design Research for System Design.

Olivia Penas (AFIS VP Education and Research) and Pascal Hubert (AFIS Technical Director) as co-chairs of the congress warmly thank the INCOSE executives for their attendance, the organizing committee for the huge effort to achieve all the objectives, our sponsors who made all these events possible (Airbus, Dassault Systèmes, INGESCAPE, Mathworks, OBEO, Capgemini, CIL4Sys Engineering, SIEMENS), our technical sponsors (AFNeT, SAGIP and GiS Smart) and also ISAE Supméca for the warm welcome we received at its campus.

For further information, please contact: communitymanagement@afis.fr or directiontechnique@afis.fr

NORSEC NORWAY CHAPTER UPDATES SPRING 2025

Systems Engineering Study Group (SESG) on 13th Feb.

NORSEC in collaboration with University of South-Eastern Norway (USN) has been regularly holding Systems Engineering Study Group (SESG) events at the University of South-Eastern Norway, Kongsberg, Norway. The objective of the meetings is to exchange experience between people who are interested in systems engineering or who have the intent to become a systems engineer. The SESG discusses one theme per meeting.

SESG theme for Spring 2025: **Where are we on the digital journey**

There were thirty-five Systems Engineers who joined the session. We divide Spring 2025 SESG activities into three parts.

Part I

In connection with SESG, NORSEC arranged a paper-based INCOSE certification Knowledge Exam for its members on 12th Feb., marking the second time this has been held in Norway. Satya Kokkula CSEP, Chapter President of NORSEC proctored the exam. We look forward to increased SEP certifications from NORSEC.

Part II

The University of South-Eastern Norway proudly received the INCOSE Academic Equivalency (AcEq) at IW2025 in Seville, Spain. The achievement was celebrated with a delightful gathering featuring cake and coffee, attended by faculty members, students, alumni, and network partners. The event was graced by Elisabet Syverud, Dean of the

Fig. 1 Celebration of INCOSE Academic Equivalency at the start of SESG session.

Back To Table of Content

Faculty of Technology, Natural Science and Maritime Sciences (TNM), and the leadership team. This milestone was supported by kta naval systems, with Sebastian Schröder, Chief Financial Officer, presenting a Systems Engineering Professional (SEP) "pillow" to Elisabet Syverud, see Fig. 1.

Before the festivities, Nils Wouter from kta naval systems delivered an insightful presentation on their Systems Engineering initiatives for submarine construction, see Fig. 2.

Fig. 2. Nils Wolter presenting about kta naval systems

Part III

The SESG session started @15:00, featuring four distinguished speakers who shared their insights on their digital journeys from different domains. Fig. 3 presents the speakers at SESG.

1. John Pastor, Optime
   "So, what's all this about requirements, anyhow?"

2. Jose Pinto, Technip FMC
   "Digital Transformation Journey"

3. Todd Wohling, Intech
   "Digitalization of Standards"

4. Oluf Tonning, KDA
   "Digital Engineering is Amazing! Why aren't we doing it?"

Presentations can be accessed from gaudisite.nl

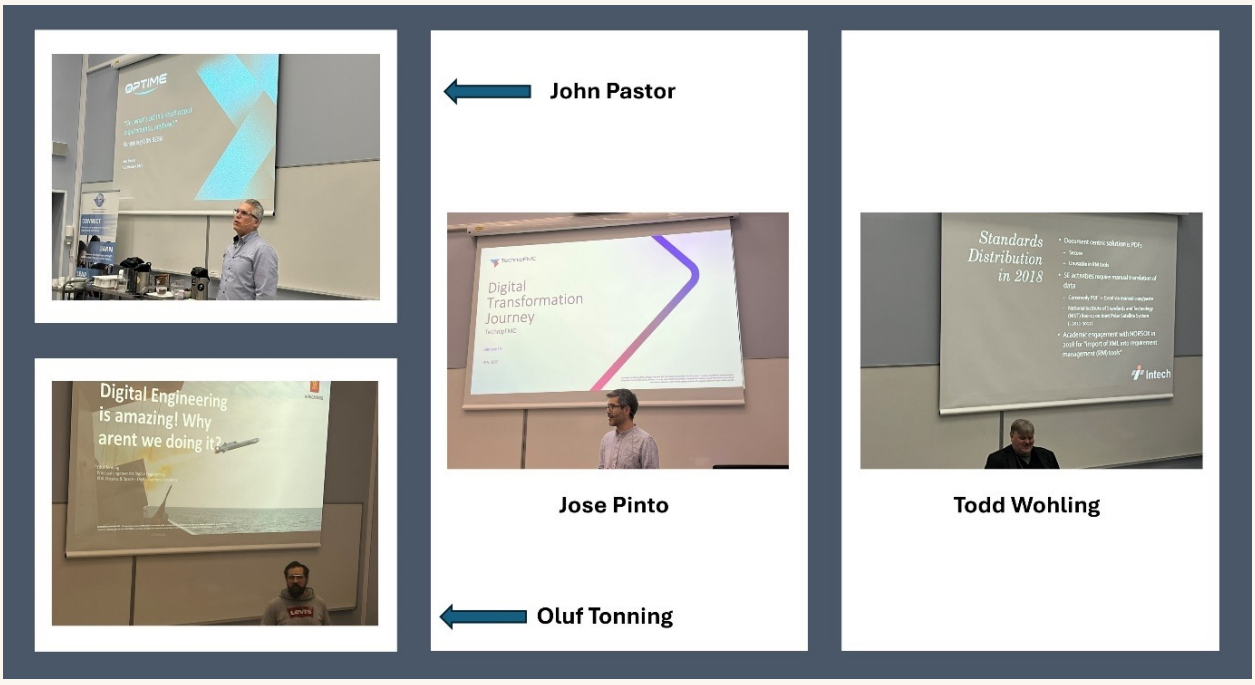


Fig. 3. Gallery of speakers at SESG Spring 2025.

Fig. 4 SESG Spring 2025 participants

After the presentations there was a networking break for 30 minutes. Before fetching tea/ coffee, we gathered for a group photo (see Fig. 4).

After the break we gathered again for the workshop session. During the break Prof. Kristin Falk and Satya Kokkula, came with the following questions

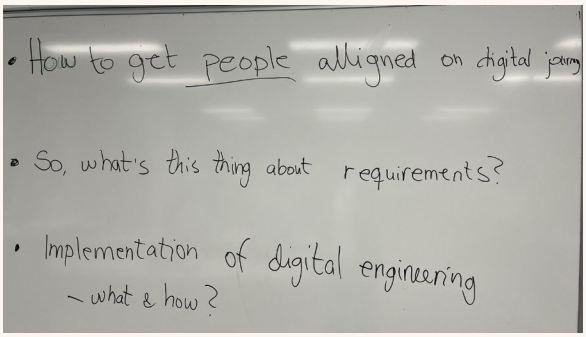


Fig. 5 Questions for workshop activity.

We divided the participants into three groups to work on the above questions (Fig. 5) and present the results in a plenary session before closing the session.

Take aways from group work

Group I:

1. There is significant resistance to the adoption of new digital tools, especially among teams with long-tenured members.

2. Having heroes or champions for specific tools who use and promote the tool enthusiastically might help lower resistance.

3. The group favored taking baby steps when transitioning to digital engineering to make teammates more comfortable and reduce resistance.

4. There is a case to be made for allowing resistance to digitalization to taper off over time by either gradually introducing tools or addressing the resistance case-by-case.

Group II:

1. People's behaviors are targeted by policies to align with common objectives, but policies alone are often ineffective without external motivation and recognition for desirable results.

2. There is inherent resistance to change, particularly due to the comfort of operating in silos or fiefdoms of information. Overcoming this resistance requires addressing these negative aspects directly.

3. Willingness to align with new objectives may vary by career stage, with early and late-career engineers more open to change, while middle-career engineers might prefer maintaining the status quo. This hypothesis warrants further research.

4. Any company entering the transition should first evaluate where they already are in the digital journey timeline and assert the values held by the company that should be reinforced by the changes. This value can be determined by reviewing where success has been achieved in the past and honest assessment of where there may be hidden costs and missed schedules in the current workload. An

unthreatening environment of non-blame and diverse employee representation is necessary to succeed in this assessment.

Group III:

1. To transition to digital engineering, secure management buy-in despite initial costs and unpredictable future savings. Engage Subject Matter Experts to support and defend the process for smoother implementation.

2. Clear requirements are essential for effective communication, allowing parties to negotiate and understand necessary compromises. Digital engineering adds significant value by facilitating impact analysis, helping identify the effects of requirement changes throughout the system hierarchy.

3. Ensure that the end goal and value of digital engineering are clear and measurable and educate employees to embrace the changes for improved competitiveness and profitability. While initial challenges are expected, industries that adopt early will likely reap significant rewards, depending on customer appetite for such innovations.

We were excited to see a number of employees from KTA Naval Systems joining our Academic Equivalency celebrations, along with USN faculty and network partners. Their presence added a special touch to the event, fostering a sense of community and shared achievement. We deeply appreciate the contributions and insights from the speakers and the engaging discussions during the workshop by the participants.

Future event

USN's annual Kongsberg Systems Engineering Event (KSEE) 2025 is scheduled for 11th June (start @15:00) to 12th June (ends @12:00). For more details see www.usn.No/KSEE2025.

Theme for KSEE2025:
Transdisciplinary collaboration is key to successful systems development

Photo credit: Satya Kokkula and Maren H. Dahn

Fig. 6 SESG participants in action during the workshop and the results were presented by John Mulholland (group III), Cecilia Haskins (group II), and Todd Wohling (group I) *(top row, from left to right).*

GFSE UPDATE

Nordic Systems Engineering Tour Spring 2025

Mark your calendars as from 2 - 4 June 2025, the NoSE Tour returns for the 15th time! This unique conference travels around multiple northern European countries and brings the conference to you. The spring tour will take place in these three fascinating cities:

🗓️2. June 2025 📍Linköping, Sweden

🗓️3. June 2025 📍Copenhagen, Danmark

🗓️4. June 2025 📍Hamburg, Germany

Do you have an interesting Systems Engineering topic to share? Do you want to be part of this incredible tour and connect with Systems Engineers from northern Europe?

Submit your proposal to be a speaker in as little or as many locations as you prefer until March 16th!

👉 https://www.nordic-systems-engineering-tour.com/call-for-presenters/

We are looking forward to your submissions.

The German Chapter at IW2025 in Sevilla

We are looking back on a successful IW2025.

Tim Weilkiens, who has been a GfSE member for many years, was awarded the Propellor Hat Award for his contributions to Model-Based Systems Engineering! Congratulations and thank you for your hard work.

Additionally, two of our working groups participated in workshops and at the EMEA Marketplace.

The fairly new working group IPS4SE (Integrated Product Support for Systems Engineering) reported that their participants agreed that there is a need to work on this topic as it is a relevant matter. Sustainability, AI, and Laws that enable the right for repair will shape future discussions and tasks for the working group to develop a catalogue with descriptions, definitions, and advice. This should serve as a base to explain the need for IPS and provide a knowledge base, as currently, there is a lack of awareness and understanding.

SuSy, the working group for “Sustainability enabled by Systems Engineering”, also participated at the EMEA Marketplace. Furthermore, they collaborated only a couple of days before the IW with the sustainability working group from AFIS (French sector) to develop a new working group. They submitted the official application for this new Sustainability Working Group at INCOSE. About 30 INCOSE members voiced their interest in participating in this working group already. During the IW sessions, they developed a holistic approach developed to specifically address the issue of sustainability. With a case study from the SuSy working group, they want to demonstrate how to transform a traditional approach into a sustainable one. Other working groups expressed their interest in supporting the working group’s efforts.

Back To Table of Content

INCOSE UK CHAPTER UPDATE

By Johanna Becker Communications Team, INCOSE UK

ASEC 2025

After a successful Annual Systems Engineering Conference in 2024, we are excited to announce that ASEC 2025 will take place at the Ashford International Hotel, Kent, England on 25-26 November 2025.

The Call for Papers & Tutorials and Reviewers has been announced in the latest edition of ePreview (103) here: https://incoseuk.org/Normal_Files/Publications/ePreview

For more information on how to submit a Paper or Tutorial proposal, please visit www.asec2025.org.uk

New Early Careers Forum Chair Elected

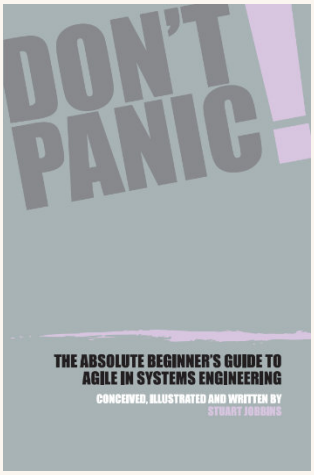
We are pleased to announce that Nintse Dan-Thé has been elected as the new chair of the INCOSE UK Early Careers Forum.

She shares, “I am thrilled to have the opportunity to play an important role in the ECF, acting as Chair during a time of transformation and looking ahead. It is a responsibility I do not intend to take lightly, as it will be my priority to represent Early Careers Systems Engineers (ECSEs) at the highest level within INCOSE UK.”

YouTube

Following the launch of the last two Don’t Panic! guides, we invited the authors to discuss their writing processes and the motivation for the guides.

Meet the Author: Don’t Panic! The Absolute Beginner’s Guide to Agile in Systems Engineering

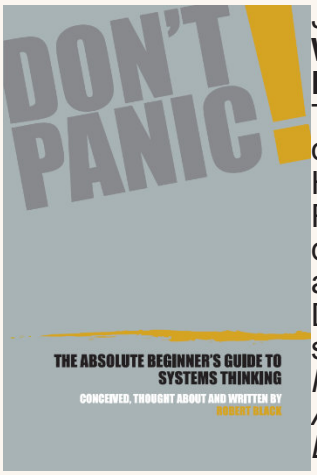


On 30th January, we held a Meet the Author Session with Stuart Jobbins, Author of *Don’t Panic! The Absolute Beginner’s Guide to Agile in Systems Engineering*. In this session, Stuart discussed his motivations, writing style, and process with INCOSE UK Technical Director Jon Holt. The idea of the book began as an internal ‘position paper’ and was subsequently shortened to be submitted as a paper to

be presented at the 2022 Annual Systems Engineering Conference (ASEC). His paper went on to win Best Paper at the ASEC 2022 and has since evolved into the Don't Panic! guide that it is today.

If you missed the session, you can watch it on the INCOSE UK YouTube Channel here: Meet the Author: Don't Panic! The Absolute Beginner's Guide to Agile in Systems Engineering

Coming soon: Meet the Author - Don't Panic! The Absolute Beginner's Guide to Systems Thinking



Join us on **Wednesday 19th February**, as Technical Director of INCOSE UK Jon Holt and author Robert Black discuss the new addition to the Don't Panic! series; *Don't Panic! The Absolute Beginner's Guide to Systems Thinking*.

This session will be recorded and will be available on the INCOSE UK YouTube Channel following the session.

30 years of INCOSE UK

At ASEC 2024 we celebrated not only Systems Engineering, but also 30 years of INCOSE UK. If you would like to learn more about the history of INCOSE UK, you can watch the following video which was shown at the ASEC 2024 Event Dinner:

INCOSE UK 30 Years Anniversary video:

https://www.youtube.com/watch?v=ID4KKkSN-dw

Back To Table of Content

Leverage Yourself with the INCOSE Career Center

Supported by DASSAULT SYSTEMES

Are you ready to take the next step on your career path?

INCOSE's Career Center can help you gain valuable insights into the systems engineering industry and level up your resume writing and interview skills.

Benefits include:

- **Resume Uploads:** Make your resume visible to top employers seeking talented systems engineers.
- **FREE Annual Resume Review:** Receive expert feedback and guidance to enhance your resume's impact.
- **Comprehensive Job Database:** Search for open positions by field, location, and desired role.
- **Certified Career Coaching:** Access personalized guidance from experienced professionals.
- **Essential Interview Tips:** Gain confidence and ace your next interview with our expert advice.
- **Industry Insights:** Stay informed about the latest trends and opportunities in the systems engineering field.
- **And Much More!**

To get started:

1. Go to careers.incose.org or scan QR Code
2. Click the 'Upload Resume' button in the Resume Review box.
3. If you are not logged into incose.org, you will be prompted to either login or sign up for an account. *NOTE: Creating an incose.org login is free and does not require joining INCOSE.
4. Follow the prompts to upload your resume and utilize the Career Center features.

Previous Section:
Chapter Updates


Next section:
Working Groups &
Initiatives Updates

EMBEDDING SYSTEMS ENGINEERING INTO ORGANIZATIONS WG – REPORT FROM INCOSE IW 2025

By Richard Beasley, Working Group Chair

This working group was launched a year ago at INCOSE IW 24. It is looking at providing guidance to advocates of the Systems Approach on how to embed it appropriately in their organization. It is felt that this important guidance is currently missing from INCOSE products, which tend to focus on individual Systems Engineers. Therefore, this working group (started a year ago at IW24) is looking to provide guidance on how to go about implementing Systems Engineering.

At IW 2025 in Seville, we had three lively and well-attended meetings, discussing progress to date and the next steps – summary points

1. An analysis of the many problems encountered in embedding Systems Engineering, identifying seven groups of problems or symptoms that can be encountered when embedding Systems Engineering, meaning Systems Engineering is not effective

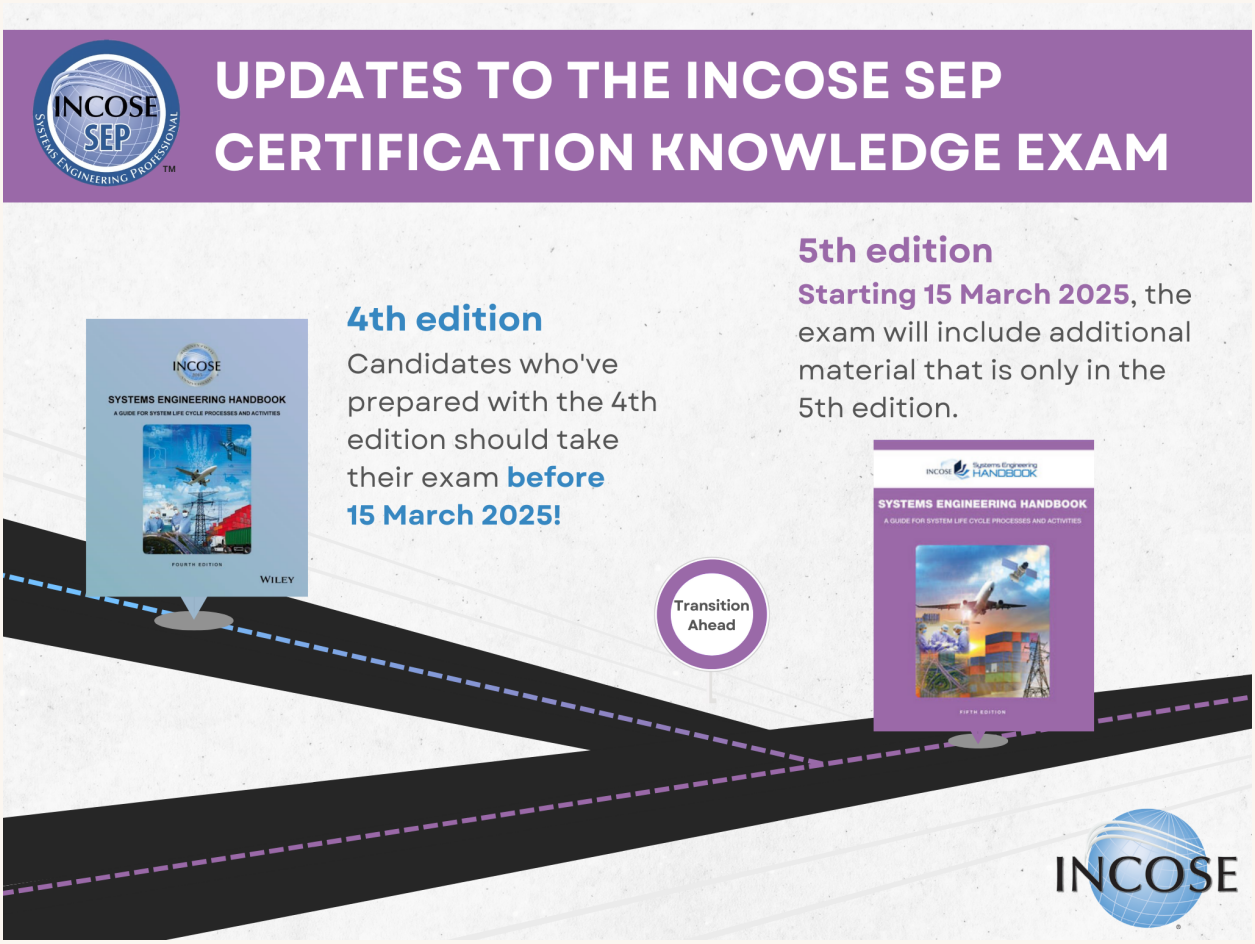
2. Prepared an industry-wide survey to help understand how organizations

Back To Table of Content

implement systems engineering practices. The results will guide the activities and products of the working group. Please circulate widely across as many organizations as possible – the survey can be found at http://www.surveymonkey.com/r/ESEIO

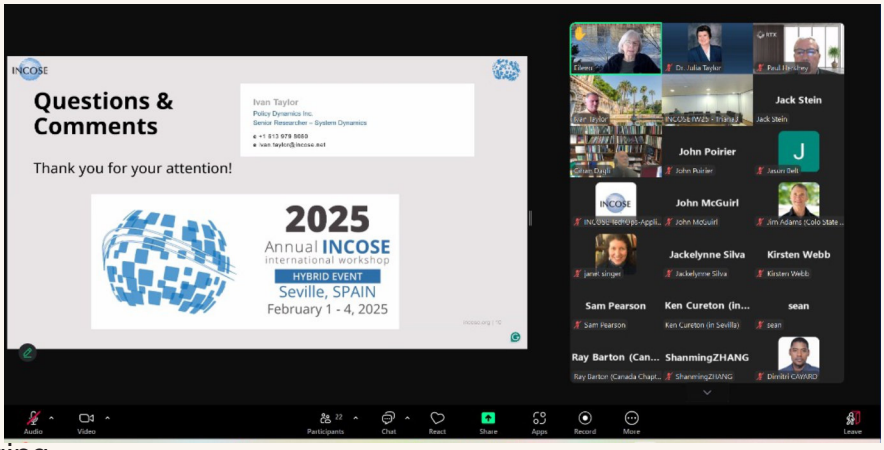
3. Significant discussion about the problems explaining the what, why, and how of Systems Engineering when embedding. It is clear that an explanation that is good in one circumstance is bad (or even toxic) in another. A major part of the next stage of work will be defining the different scenarios when explanation is needed and providing a route map to and describing the pros & cons of the different explanations (and, if needed, looking to create new ones to fill the gap
4. Start discussions of appropriate measures of an organization – to determine the appropriate Systems Engineering for the work org does, the state of its use of systems approaches (implicit or explicit) to guide improvement activity, and the "attitude" to Systems Engineering that affects how it is explained

Lots to do on this important activity – so if you think you can help develop the guidance so that Systems approaches can be successfully embedded, please come and join the WG and do some work! See our webpage for more details Embedding Systems Engineering into Organizations



COMPLEX ADAPTIVE SYSTEMS WORKING GROUP AT IW 2025

By Dr. Julia Taylor, President, San Diego Chapter of INCOSE



The Complex Adaptive Systems working group met at IW in Seville, Spain recently. This is a very interesting group because it applies to many different disciplines and offers an approach that is becoming more and more necessary in the modern age. We are on the cusp of a new era due to all of the emerging technologies such as AI, Quantum Computing, IOT, Robotics, New Materials (due to discovering new elements), and Additive Manufacturing. These technologies impact every discipline and are catapulting us into an environment of unprecedented levels of change. There has never been a moment in history when our working group has been more relevant for addressing society's challenges.

You may be asking: What's it all about? It's about complex adaptive systems. Well, what's that? A complex adaptive system (CAS) is a system made up of many interacting parts that can't be predicted easily. CASs are dynamic and can exhibit emergent properties, meaning they can create new structures and patterns. (from Google) CAS include Economic Markets, Healthcare Systems, Global Climate System and & The Power Grid.

This working group is led by Dr. Haifeng Zhu from Boeing. Talks at IW included: Climate Change as CAS by Dr. Wei-Jen Lee, University of Texas at Arlington; Power Grid Infrastructure Resiliency by John Juhasz, Telepath Systems; System Dynamics Supporting System Adaptability by Dr. Ivan Taylor, Policy Dynamics, Inc.; & Adaptability as Risk Mitigation by Jack Stein.

The great news about this working group is that it addresses challenges that are not addressed by independent disciplines, which means that a whole new realm of tools and techniques are becoming available for those who are struggling with these challenges.

It's important for more disciplines to become aware of the power that CAS groups such as this working group has to offer. I am new to this working group and my area of interest is the organization or more specifically, the corporation. In order for organizations to continue, they have to continuously adapt to changes in the environment or else become obsolete and often go out of business. That's why I believe that CAS has a lot to offer for this area.

Back To Table of Content

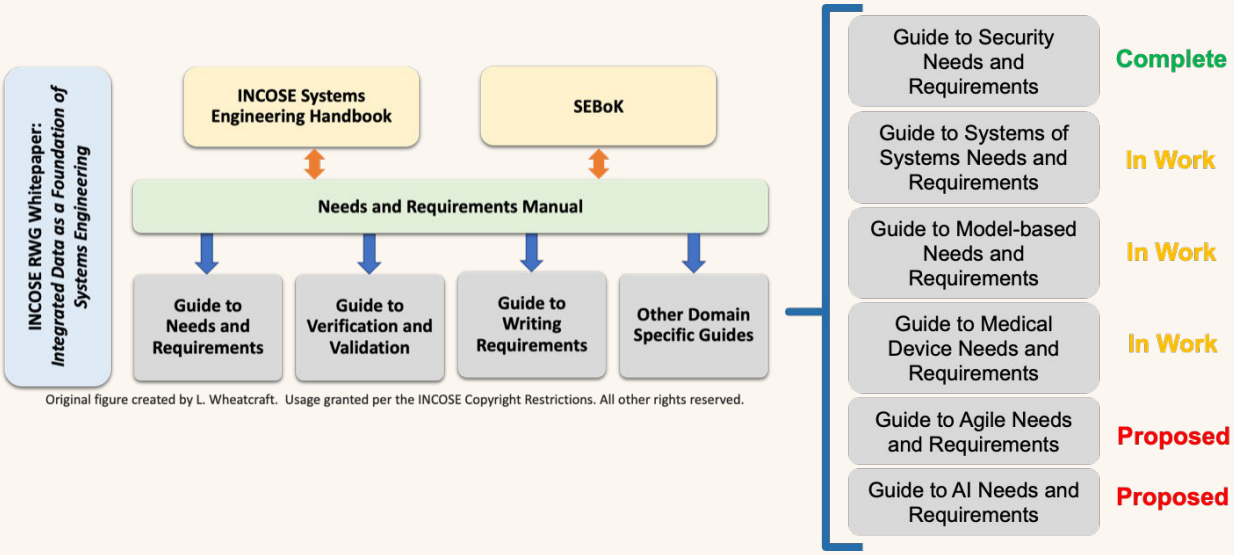
REQUIREMENTS WORKING GROUP

The Requirements Working Group (RWG) remains highly engaged, with over 2,200 followers on Viva Engage. Our activities include publishing the updated Needs and Requirements Manual (NRM) V2 in November, updating both the public-facing RWG website and the internal iNet website, collaborating with other WGs, conducting monthly meetings, responding to chapter requests for presentations, hosting multiple RWG sessions at IW2025, and initiating several projects. Among these projects are the development of a Guide to Model-based Needs and Requirements, a companion model, and a Guide to Medical Device Needs and Requirements.

Led by Beth Wilson, the Systems Security Engineering WG published the Guide to Security Needs and Requirements (GtSNR) as part of the family of domain-specific Guides being developed to tailor and elaborate the concepts and activities described in the NRM to specific domains. In work is a Guide to Systems of Systems (SoS) Needs and Requirements using the GtSNR as a template. In addition, work has begun on a Guide to Medical Device Needs and Requirements. Other guides are in the concept stage.

At IW2025, the RWG had two dedicated sessions at IW2025 led by cochair Katarzyna Kot. It was good to see the number of attendees who were this year's first IW attendees and their interest in needs, requirements, verification, and validation across the system lifecycle.

An overview of the RWG was presented, discussing its purpose, our online presence, presentations on the INCOSE RWG YouTube Channel, our Viva Engage community, our products, our outreach activities, and how to join both the RWG and other WGs of interest.



We then discussed the activities the leadership team worked on during the latter half of 2024 and outlined our plans for 2025. Project leads provided an overview and status update on the various activities and projects underway. The remainder of the session was dedicated to open discussions where attendees shared their knowledge of the RWG products and their practical applications in both personal enrichment and enhancing their organizations' SE activities throughout the lifecycle.

During IW2025, cochair Jeff Williams hosted six detailed sessions to discuss his team's work on developing the Guide to Model-based Needs and Requirements (GtMBNR) and its accompanying model. This model aims to implement the concepts and activities outlined in the NRM from the perspective of language-based models. The model is being developed using tools available in the INCOSE SE Lab. Once registered with the SE Lab for the necessary tools to view the model, INCOSE members can contact Jeff for access to the model. Overview presentations about this project will soon be available on the RWG iNet site.

Cochair Katarzyna Kot continues to update and maintain the RWG's public-facing web page and the members-only iNet site. She led a session at IW2025 to propose the development of a Guide to Agile Needs and Requirements. This guide aims to translate and map Agile methods to the concepts and activities discussed in the NRM. Additionally, the goal is to demonstrate how systems engineers can benefit from understanding and adopting Agile concepts and activities, and vice versa for Agile practitioners.

Presentations by RWG Chair Lou Wheatcraft in the second half of 2024 included a presentation titled "Medical Device Needs and Requirements" at the RWG October monthly meeting and a Webinar 177 presentation titled "Traceability: The Threads That Link SE Artifacts Together Across the Lifecycle" in November.

Our new RWG cochair, Sarah Vazquez, led several remarkable sessions in 2024. Notably, in June, she led a session titled "Terrible Requirements," and in December, she moderated an open discussion session titled "AI in RE, what is your industry/company doing?"

The presentations mentioned above are accessible for viewing on both the INCOSE RWG YouTube Channel and the RWG iNet site. This site also provides copies of the presentations and chat files.

Sarah has volunteered to update the Guide to Needs and Requirements (GtNR) to ensure its alignment with the NRM V2. During our IW 2025 general session, Sarah also presented a proposal to create a series of micro-learning training videos that will effectively summarize the key concepts covered in the RWG products.

Cochair Mike Ryan has agreed to update the Guide to Verification and Validation (GtVV) to align the contents with NRM v2.

Cochair Kevin Orr leads our efforts to organize monthly meetings. Scheduling them at two different times has proven to be a significant success in accommodating our members' varying schedules. A comprehensive list of past and upcoming meetings is available on our iNet site, along with copies of slides and presentations as they become available. We announce sessions via email to our membership, as well as on our Viva Engage community site, and the RWG public-facing web page.

If any readers have a specific topic of

interest they would like to learn more about it or have a topic they would like to inform others about at one of our monthly meetings, please inform the RWG leadership at requirements-leaders@incose.net.

Cochair Kevin Orr is also a co-lead for a newly formed joint project called AI for Requirements Engineering (AI4RE), which is a collaboration between the AI Systems WG and INCOSE. In addition to chapters and working groups, INCOSE has introduced the concept of a Project, which involves the collaboration of two or more WGs with a defined project team and a specific, defined outcome within a specific period. AI4RE is the inaugural Project under this concept.

The project, which is just getting started, has begun holding regular virtual meetings. During the IW2025, they conducted three sessions. They plan to host periodic public virtual meetings to present their progress and seek inputs from the broader INCOSE Membership. Currently, access to their materials is restricted to the project team and the sponsor WG leadership.

Previous section:

Working Groups & Initiatives Updates

Next section:

Community Updates & Interests

HARMONIZING SYSTEMS, SAFETY & DOMAIN ENGINEERING: A DIGITAL FRAMEWORK FOR ELECTRIC AVIATION

By Shantanu Mishra, CSEP, Asst Deputy Director, INCOSE Outreach & FuSE

The growing complexity of aerospace electrical power systems requires seamless integration of systems, safety, and domain engineering processes, because of the magnitude of work products that these processes generate. With just a few iterations the number of work products and their versions can grow exponentially. In today's digital world the greatest challenge for organizations is managing versions of these work products across development phases while maintaining an effective change & configuration control management. For most organizations integrating workflows that generate these work products across enterprise systems and Product Lifecycle Management (PLM) systems is a gigantic undertaking. With the complex development challenges presented by the Advanced Air Mobility (AAM) industry, we have just begun to grasp the true scale of this problem which has made us rethink our digital engineering strategy.

Digital Thread Integration

Modern Model-Based Systems Engineering (MBSE) tools serve as the foundation for integrating systems and domain engineering processes. The concept of digital thread, where requirements can be traced from high-level aircraft functions down to individual component specifications, while maintaining traceability to safety analyses has become even more relevant for organizations.

Event driven change management is an important feature of PLM systems that can minimize development risk due to oversight. For example, changes to battery management system architectures can automatically trigger change control related to Functional Hazard, Safety Assessments and other related work products. An integrated tool chain with PLM data stored as a single source of truth can provide teams with a holistic view of product behavior, interactions and safety issues much earlier in the development cycle.

Safety-Driven Architecture Development

Digital engineering empowers engineers to create realistic simulations that predict and mitigate critical performance parameters or points of failure. It provides a foundation for integrating ARP4754A guidelines and processes to develop safety-driven architecture, allowing exploration and evaluation of design options against applicable safety criteria.

For example, engineers can quickly assess how different configurations of power electronics, batteries, and backup systems affect overall safety classification. To support these capabilities digital engineering requires

Back To Table of Content

careful evaluation of the business processes, methods, tool chains, data models, tool interfacing and integration. Digital platforms enable collaborative work environments where systems engineers, safety analysts, and design engineers can work concurrently while maintaining data consistency.

To further enhance these capabilities Artificial Intelligence (AI) can automate these workflows by monitoring changes and estimating their impact. If set up correctly, AI enabled systems may help guide cross-disciplinary teams manage their workflows and aid concurrent development at an unprecedented pace.

Advanced Maintenance and Monitoring

Breakthroughs in Digital twin technologies have led to the development of hyper-realistic virtual models that constantly update to mirror real-world counterparts. For instance, sensor data can help engineers quickly identify potential battery degradation issues or predict maintenance needs, ensuring continuous operational effectiveness. Elements of this capability are already in use today that monitor and log live system health data during aircraft operation. The health data is then further analyzed to issue service advisories and perform timely maintenance to avoid unexpected downtime. The goal of digital twins is to take this capability a step further in developing a digital clone of every product in service and predict performance that might vary from one equipment to another due to variations in service history, supply chain etc. Thereby allowing organizations to manage their resources much more efficiently.

Future Outlook

The future of electric aviation development lies in further integration of digital tools across systems engineering, safety and design domains. Emerging technologies will enhance our ability to:

- Optimize system architectures for performance and safety
- Predict potential safety issues earlier in the development cycle
- Automate routine workflows and minimize oversight
- Streamline certification processes through advanced data integration

By embracing these digital strategies, organizations can manage the inherent system complexity while maintaining the development rigor required by aerospace safety standards. The key to success lies in viewing systems engineering, safety, and domain engineering in a unified development landscape, supported by robust digital tools and frameworks.

AI's vision for a digital enterprise in the aviation industry

GENERATIVE AI FOR SYSTEMS ENGINEERING: ADVANCES, REASONING MODELS, AND DEPLOYMENT PARADIGMS

By Barclay R. Brown, PhD, ESEP, Senior Technical Fellow, AI Research, Collins Aerospace
Past chair, INCOSE AI Systems Working Group

1. Introduction

Generative artificial intelligence is rapidly transforming the field of systems engineering. Traditionally, engineers have relied on manual design, simulation, and analysis methods to address the increasingly complex challenges of modern systems. Recent advances in deep learning and large language models (LLMs) have paved the way for AI systems that can generate technical content—from detailed diagrams and executable code to refined system requirements—with minimal human intervention (Alzoubi et al., 2024). This evolution is not merely about automating routine tasks; it represents a paradigm shift in how engineers conceive, validate, and iterate on designs. By integrating extensive systems engineering information with sophisticated computational techniques, generative AI is enabling a more efficient and error-resistant approach to both conceptual and practical engineering work. Recent innovations in multimodal processing and reasoning have expanded the potential of these systems, allowing them to process text, images, and even audio inputs concurrently. In this emerging landscape, generative AI is set to redefine not only the efficiency but also the creativity and precision of engineering solutions (Decardi-Nelson et al., 2024; TechTarget, 2025).

2. Role and Potential of Generative AI in Systems Engineering

Generative AI can play a multifaceted role in systems engineering by providing tools that extend the capabilities of human experts. One of its primary functions is to automatically generate complex technical content based on simple textual inputs. For example, engineers can now transform unstructured specifications into detailed flowcharts, system architecture diagrams, and even executable code. This capability not only accelerates the early design phases but also ensures consistency across project documentation—a critical factor in large-scale systems development (Alzoubi et al., 2024).

In addition to content generation, these AI systems excel at clarifying and refining engineering requirements. By analyzing natural language specifications, generative AI can identify potential issues or contradictory statements and propose clearer alternatives. Such functionality enhances communication among stakeholders and reduces the risk of costly design errors. Retrieval-augmented generation (RAG) techniques further bolster these benefits by integrating external data sources into

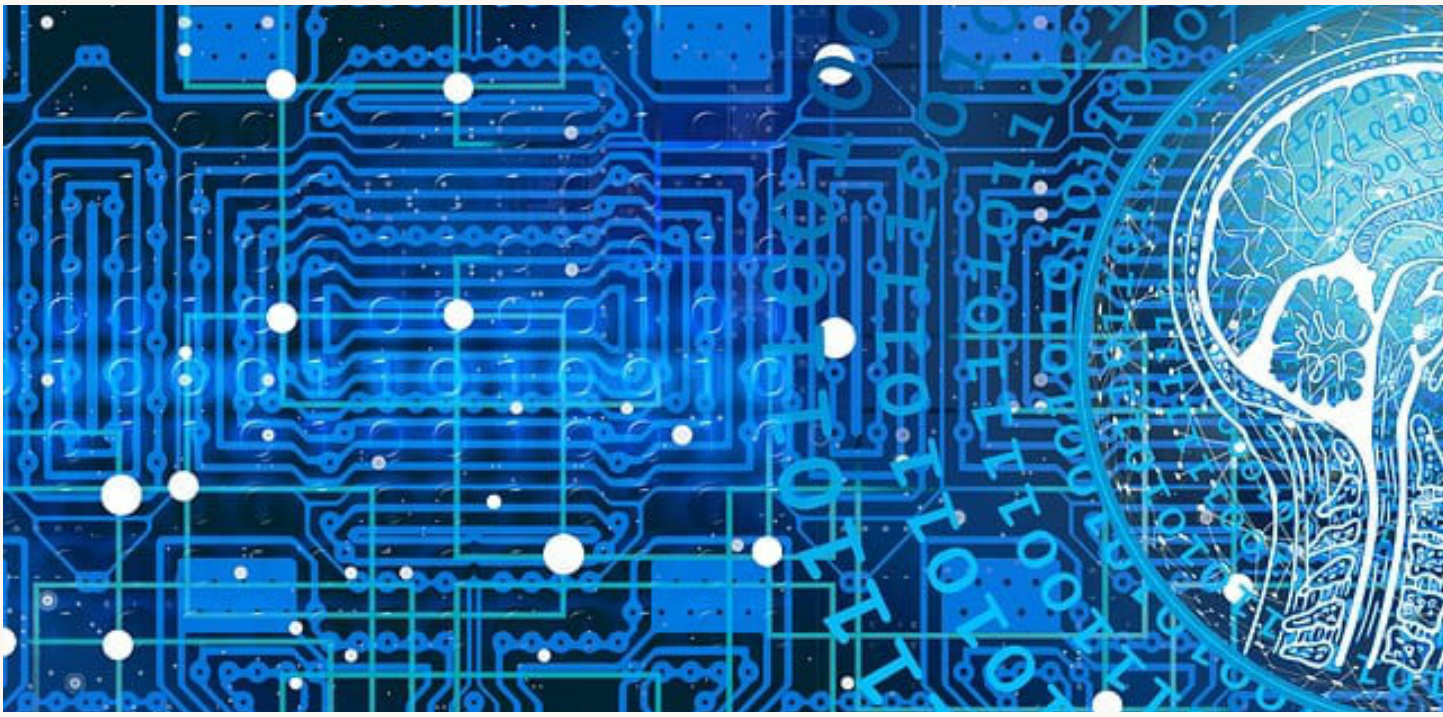
the decision-making and text-generation process, increasing the contextual accuracy of AI outputs (Decardi-Nelson et al., 2024).

Another significant potential of generative AI lies in its multimodal capabilities. Modern systems can simultaneously process text, images, and audio, offering a holistic view of system behavior and enabling dynamic simulations. This integration is particularly valuable for model-based systems engineering, where a comprehensive understanding of interdependent system components is essential. Overall, the versatility and scalability of generative AI make it an indispensable tool in advancing both the efficiency and innovation of systems engineering projects (TechTarget, 2025).

3. Advances in Thinking and Reasoning Models

One of the most exciting recent developments in generative AI is the emergence of dedicated thinking or reasoning models. Unlike earlier models that predominantly rely on straightforward next-word generation, advanced reasoning models—such as GPT-o3—are designed to emulate a multi-step analytical process. These models engage in internal "simulated reasoning," where they break down complex problems into discrete steps, self-correct intermediate conclusions, and ultimately generate more coherent and accurate outputs (Agustinmantaras, 2025).

For instance, when faced with intricate mathematical problems or coding challenges, GPT-o3 demonstrates a significantly higher level of performance compared to models like GPT-4o. In benchmark evaluations, reasoning models have shown marked improvements in accuracy on tests such as the American Invitational Mathematics Examination (AIME) and



SWE-bench coding challenges (TechTarget, 2025). This is achieved without the need for explicit prompts like "think step-by-step," as these models inherently process the problem in a manner akin to human reasoning. Their ability to perform such detailed internal analysis not only minimizes hallucinations but also enhances the reliability of the outputs—a crucial aspect of important engineering tasks.

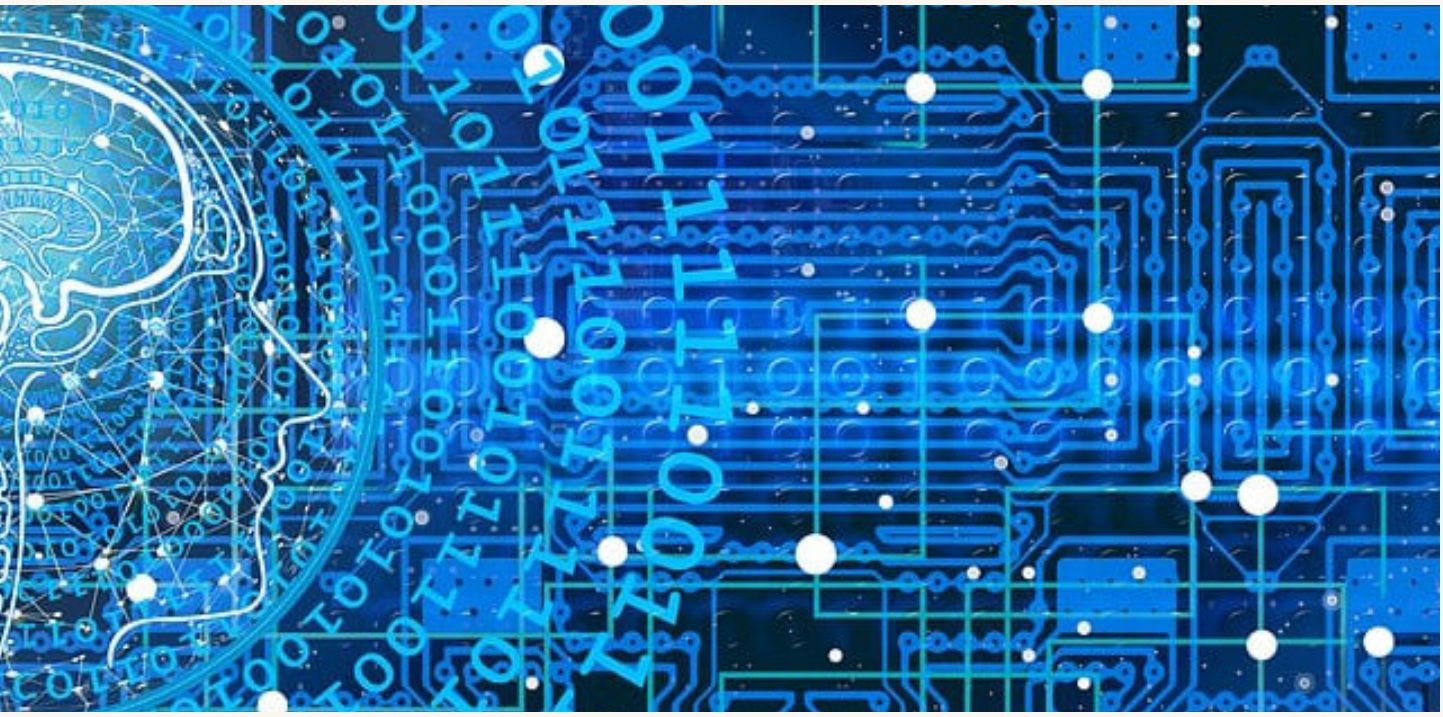
Furthermore, these reasoning models incorporate advanced safety features such as deliberative alignment. By internally evaluating the safety implications of a given prompt, they reduce the likelihood of generating unsafe or misleading content. Such innovations are essential as AI systems become more integrated into sensitive engineering applications, including defense and critical infrastructure projects (Agustinmantaras, 2025; TechTarget, 2025).

4. Frontier versus Open-Source Generative AI Models

The current generative AI landscape is marked by a clear distinction between frontier models and open-source alternatives. Frontier models—such as GPT-4o, GPT-o3 mini, Claude, and Gemini—embody the cutting edge of performance, scalability, and multimodal integration. These systems are hosted on robust cloud platforms (e.g., OpenAI, Azure, AWS) that support high computational demands and enable government-grade, secure deployments for sensitive applications (Forward Future Daily, 2025; IEEE, 2024). Their advanced capabilities make them ideally suited for complex tasks such as large-scale content generation, intricate simulations, and high-volume technical analyses.

In contrast, open-source models like Llama (from Meta) and Phi (from Microsoft) are designed for local or private server deployment, offering greater control over data privacy and security. Although these lighter-weight models may not match the capabilities and performance of frontier solutions,

Back To Table of Content



they are particularly attractive for organizations focused on cost efficiency and strict data protection. This balance between performance, operational cost, and security is central to the choice of model for any given application (TechTarget, 2025).

Moreover, the “generative world” we live in increasingly relies on AI to produce on-demand images, text, music, and diagrams. For example, iterative prompt engineering—even when minor errors or typos occur—can yield customized images or creative outputs that are refined through subsequent iterations. Such capabilities further underscore the transformative potential of both frontier and open-source generative AI models.

5. Practical Applications in Systems Engineering

Generative AI is not just a theoretical advancement—it is already a practical tool reshaping systems engineering. Far from being a threat, it acts as a highly adaptable resource that engineers are able to adopt early in order to "squeeze" maximum value out of the technology (Alzoubi et al., 2024).

One practical application is in content generation. Engineers and designers can use AI to create customized documents for various audiences or adjacent purposes from existing engineering information or summarize numerous survey responses with high precision. For instance, an AI system might generate a draft engineering document that is then refined through human review, ensuring both efficiency and accuracy. Similarly, retrieval-augmented generation (RAG) techniques empower AI systems to incorporate external data—such as comprehensive program document databases—into their outputs, effectively handling complex queries. Models with large context windows can also facilitate document input (Decardi-Nelson et al., 2024).

Another significant application is in diagram and model generation. Large

language models (LLMs) can automatically produce visual representations—such as pie charts, flowcharts, and system diagrams—in languages like Mermaid, DOT, and SysML. This capability streamlines the conversion of textual descriptions into structured diagrams, which is crucial for model-based systems engineering. Additionally, AI-driven retrieval techniques can synthesize relevant context from external databases to enhance these diagrams, offering a more holistic view of system behavior.

Generative AI also plays a key role in automating code and task execution. For example, LLMs are increasingly used to generate Python code that creates dynamic outputs like real-time data visualizations. This automation not only accelerates development workflows but also aids in debugging and iterative design processes.

Furthermore, AI tools are proving invaluable in resolving ambiguities in engineering requirements. By analyzing and proposing alternative wordings for unclear specifications, these systems help clarify project documentation. An example might involve an AI system reviewing a set of requirements, flagging ambiguous language, and offering several refined alternatives to better capture the intended meaning.

Finally, the integration of AI as a component within larger systems is becoming common practice. Rather than functioning as standalone solutions, LLMs are embedded as modules within broader application architectures. Simulations of multi-role conversations—such as a Star Trek-inspired scenario where different AI “agents” interact according to designated roles—demonstrate how generative AI can be orchestrated to support complex, role-based interactions in a system (TechTarget, 2025).

6. Future Directions and Challenges

As generative AI becomes further integrated into systems engineering, its applications are set to expand dramatically. A future where AI not only automates routine tasks but also drives innovation through creative and technical applications is emerging. The growing importance of prompt engineering skills is one clear indication of this shift. Resources, such as free courses offered by DeepLearning.ai, are helping professionals acquire the necessary expertise to craft highly specific and effective prompts. Techniques such as chain-of-thought prompting and formatted outputs (e.g., JSON, Mermaid, DOT language) are becoming essential for harnessing AI’s full potential (Agustinmantaras, 2025).

Yet, significant challenges remain. Advanced reasoning models like GPT-o3, while offering deep analytical capabilities, require considerable computational resources. This can lead to higher operational costs and potential delays in response times due to the intensive internal processing needed for multi-step reasoning. In sensitive applications—such as defense or critical infrastructure—the reliance on cloud-based frontier models raises data security and privacy concerns. Conversely, while open-source models deployed locally provide improved data control and cost efficiency, they may lack the performance needed for the most complex tasks.

Future research will need to focus on integrating AI agents as part of a broader ecosystem, where multiple specialized models collaborate seamlessly. This approach promises even more integrated, creative, and technical applications, further reducing development time and enhancing system reliability. The ability to simulate multi-role conversations and dynamic

code execution will likely drive the next wave of AI innovations in systems engineering.

7. Conclusion

Generative AI is set to redefine systems engineering by merging advanced AI capabilities with human creativity. As an adaptable tool, AI offers numerous benefits—from automatically generating technical content and refining ambiguous requirements to producing detailed diagrams and automating code generation. Its role as a generative tool is especially significant in a world where on-demand creation of images, text, video, and diagrams is increasingly commonplace. The integration of multimodal advances, as seen in GPT-4o's extended capabilities in spoken language, audio, and video, further enhances these possibilities.

Moreover, the emergence of sophisticated reasoning models like GPT-o3 illustrates a critical evolution in AI. These models are capable of performing multi-step analytical processes internally, thereby enhancing the accuracy and reliability of outputs for high-stakes engineering tasks. While challenges related to computational cost, response latency, and data security remain, the potential for integrating AI as a modular component within larger systems is vast.

In summary, by embracing generative AI early and developing prompt engineering skills, systems engineers can not only improve efficiency and accuracy but also unlock innovative solutions that transform traditional engineering practices. The future of generative AI in systems engineering is bright, promising a seamless fusion of technology and creativity that will drive the next generation of engineering breakthroughs.

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Previous section:

Community Updates & Interests

Next section:

Services, Products & Publications

INCOSE SERVICES ENHANCE MEMBER BENEFITS

By Heidi L. Davidz, Ph.D., CSEP, OCSMP, SPC6, INCOSE Services Director

During the 2025 INCOSE International Workshop, attendees learned more about opportunities provided through the Services Committee. SE Laboratory vendors provided overviews of the tools they donate to working groups and members. Two platform training sessions helped working group leads better understand available Dassault 3DEXPERIENCE platform capability. There are now 27 vendor-supported tools, and 3 open-access tools provided for member use. A series of “Demo Days” continues to showcase each SE Lab tool, and each demo is recorded for reference. If you or your working group would like to utilize these tools, reference the website at, https://www.incose.org/selab.

The Technical Leadership Institute (TLI) held both technical and social engagements. TLI is accepting nominations for the incoming cohort. Nominations are due March 31. Information on TLI can be found on the webpage, https://www.incose.org/tli.

The Certification team was busy as well, providing an opportunity to take the certification knowledge exam. A session on academic equivalency best practices was held. As a reminder, the knowledge exam will be fully based on the INCOSE Systems Engineering Handbook version 5 starting in March. Information on Certification can be found on the webpage, https://www.incose.org/certification.

Strategy sessions and a Board of Directors exercise focused on defining the INCOSE role in education and training. The Services Committee held planning sessions to discuss 2025 efforts. The Professional Development Portal, Mentoring Program, and Systems Engineering Tools Database plans were discussed. More information on Services can be found at, https://www.incose.org/communities/services-committee.

If you have questions on individual offerings or if you would like to get involved and contribute, please do reach out. We encourage you to fully utilize the benefits included in INCOSE membership, and we look forward to enhancing the value and impact these services provide to you in 2025.

Figure 1: Vendors Presenting at the SE Lab Vendor Spotlight Session - Etienne Julio and Samuel Rochet, Obeo; Robert Haemisch, Spicy SE; Peter Lunk, IncQuery Group; Olaf Kath, Ansys; Jason Wilson, Dassault Systemes; Steven Dam, SPEC Innovations

Back To Table of Content

THE INCOSE SE LAB GROWS WITH NEW TOOLS AND VENDORS

The INCOSE Systems Engineering Lab (SE Lab) continues to expand its offerings, providing INCOSE members with access to a rich collection of industry-leading systems engineering tools. Our vision remains clear: to create a computing environment where members can freely explore and utilize full versions of these tools for learning, non-commercial INCOSE projects, and professional development. This initiative benefits both our members, who gain valuable hands-on experience, and our participating tool providers, who gain exposure for their products.

We're thrilled to announce significant growth in the SE Lab! We now boast an impressive portfolio of 14 vendors, supporting 27 vendor-supported tools, and even including 3 open-source tools. This diverse selection ensures members can find the right tools to meet their specific needs.

A warm welcome to our newest vendors: PREEvision and eXXcellent solutions!

PREEvision: Model-Based Systems Engineering at its Finest

PREEvision

PREEvision offers a comprehensive suite of Model-Based Systems Engineering (MBSE) tools, fully supporting the Requirements, Functions, Logic, Physics (RFLP) approach. Their latest release introduces exciting new capabilities, including sequence diagrams based on SysML, allowing users to easily model and visualize system component interactions.

What truly sets PREEvision apart is its seamless integration. It's more than just a SysML tool; it connects directly with requirements, test specifications, and the physical architecture (both software and hardware), creating a complete and cohesive environment for complex systems development. This integrated approach ensures all stakeholders have access to up-to-date data, fostering collaboration and streamlining the development process.

eXXcellent solutions: Revolutionizing Simulation Processes

eXXcellent solutions

eXXcellent solutions brings its innovative tool, orchideo | easySSP, to the SE Lab. This game-changing, web-based platform is built on open SSP and SSP Traceability standards from the Modelica Association. orchideo | easySSP empowers users to create modular system architectures with clearly defined interfaces and connections, supporting both top-down and iterative design methodologies. Its powerful workflow feature guides users through simulation tasks, ensuring automatic process traceability and comprehensive documentation.

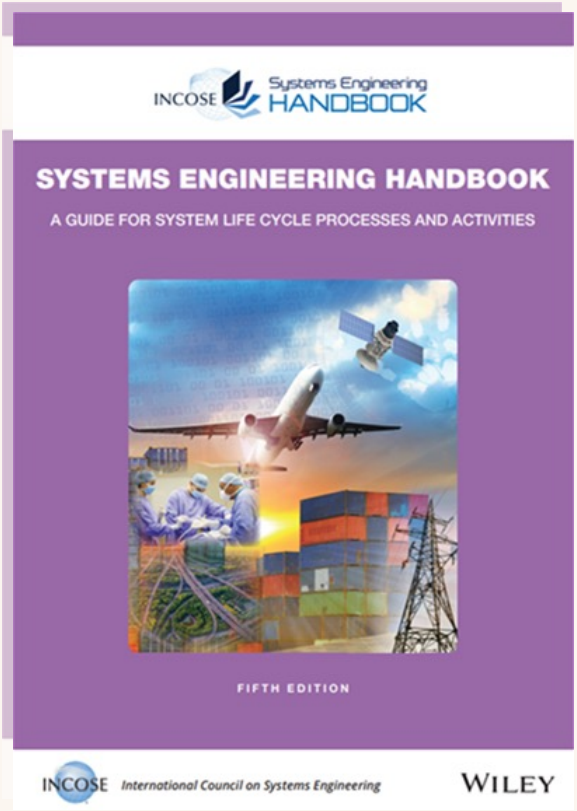
Access the SE Lab – It's Free for INCOSE Members!

The INCOSE SE Lab is a valuable resource available FREE to all INCOSE members. Take advantage of this opportunity to explore cutting-edge tools, enhance your skills, and contribute to INCOSE projects. Visit the SE Lab website today to learn more and start exploring the available tools!

SEP CERTIFICATION EXAM TRANSITIONED TO SE HANDBOOK FIFTH EDITION

An important change to the Systems Engineering Professional (SEP) knowledge exam, a requirement for both the Associate Systems Engineering Professional (ASEP) and Certified Systems Engineering Professional (CSEP) certifications, took effect on 15 March 2025. The exam, which serves as the primary method for verifying candidates' knowledge, transitioned to being solely based on the Fifth Edition (SEH5E).

Previously, the multiple-choice exam covered overlapping content from both the SEH4E and SEH5E. As of 15 March 15, the exam now exclusively reflects the content and terminology found in the SEH5E, incorporating new material not present in the Fourth Edition.



For anyone now preparing to take the SEP exam, it is crucial to ensure that you are studying using the SEH5E. The exam is now exclusively based on this edition, and using older materials will not adequately prepare you for the current exam content.

INCOSE members can access the SEH5E for free in the INCOSE store. Make sure to utilize this valuable resource to ensure your success on the exam.

For more information about SEP Certification, please visit the Certification Program Overview webpage.

Back To Table of Content

Previous section:

Services, Products & Publications


Next section:
Partner Updates

COMPANIES WORK TOGETHER: THE POWER OF PARTNERSHIPS IN ADVANCING SYSTEMS ENGINEERING

By Honor A. Lind

INCOSE's individual members find different groups that fit them best. Some engage with their local chapters, others with topical working groups, and many contribute through **Certification, Mentoring, and leadership roles** at global and strategic levels. Some members act as **liaisons between their company, university, or government agency and INCOSE**, facilitating the exchange of **critical knowledge and best practices**. Just like in systems engineering, these interfaces are among the most valuable aspects of the INCOSE community.

The success of INCOSE lies in the **strength of its partnerships**. As a professional society, INCOSE acts as a **bridge between academia, industry, and government**, ensuring that **systems engineering remains a forward-thinking, impactful discipline**. Research by the **American Society of Association Executives (ASAE)** highlights that organizations with strong industry partnerships see a **25% increase in professional development opportunities** and a **30% higher retention of certified professionals**. INCOSE's collaborations help shape educational curricula, **strengthen industry capabilities**, and advance systems engineering methodologies globally.

Why Partnerships Matter: The Value Proposition

INCOSE's partnerships deliver **tangible value** by:

✅ **Bridging Education and Industry:** Aligning university programs with industry needs ensures graduates are workforce-ready.
✅ **Enhancing Professional Development:** Certification and training programs backed by corporate support accelerate career growth.
✅ **Strengthening Workforce Readiness:** Companies leveraging INCOSE's knowledge base can better recruit and retain top talent.
✅ **Driving Innovation:** Cross-sector collaboration fuels advancements in systems engineering practices.

These **strategic partnerships foster a skilled, adaptive workforce** while ensuring industry-wide success in an era of rapid technological change.

The Role of the INCOSE Corporate Advisory Board (CAB)

The **INCOSE Corporate Advisory Board (CAB)** represents a **crucial interface between industry, government, and academia**, enabling organizations to **directly shape the future of systems engineering** while benefiting from the collective expertise of the global INCOSE community.

The Value of CAB Membership

- **Influence Industry Standards & Best Practices**
  CAB members play a key role in defining and refining **global systems engineering standards and methodologies**, ensuring their

Back To Table of Content

organizations stay ahead of emerging trends.

- **Access to Cutting-Edge Systems Engineering Insights**
  CAB companies gain **early access to research, publications, and industry reports**, helping them remain competitive in an ever-evolving field.
- **Professional Development & Certification Support**
  CAB members encourage their employees to pursue **INCOSE Certifications (ASEP, CSEP, ESEP)**, reinforcing professional credibility and workforce development.
- **Talent Acquisition & Career Development**
  INCOSE's **Career Center, Virtual Career Fairs, and networking events** allow CAB members to recruit top talent while **engaging with future leaders in systems engineering**.
- **Collaboration with Academia**
  CAB organizations partner with universities to **ensure that educational programs align with industry needs**, helping produce graduates who are **ready for systems engineering careers**.

CAB in Action: Real-World Impact

- **Booz Allen Hamilton & Certification Advocacy**
  Chris Waskiewicz, CSEP, a member of the **San Diego chapter**, shares: *"I was encouraged by my Booz Allen leadership to pursue certification. As partners with INCOSE, Booz Allen is an advocate of the certification process, and I became interested in demonstrating my knowledge by becoming an ASEP."* Chris has since earned his **CSEP**, demonstrating how **CAB companies actively support professional development**.
- **Industry Collaboration for Academic Equivalency (AcEq)**
  Companies recognize the value of **Academic Equivalency (AcEq)** in helping universities prepare students for real-world systems engineering challenges. CAB members have

been instrumental in **encouraging universities to align their coursework with INCOSE Certification**, making students **more attractive to employers upon graduation**.

- **Strengthening Global Systems Engineering Communities**
  Omer Ertekin, ESEP, from INCOSE Turkey, explains: *“My motivation to provide these trainings is to create a knowledgeable systems engineering community in Turkey and to disseminate systems engineering through having powerful SEPs within companies who can advocate and apply systems engineering based on the best practices.”*

CAB engagement doesn’t just benefit companies—it strengthens the **global systems engineering ecosystem**, ensuring that organizations across industries **stay connected, informed, and competitive**.

INCOSE Chapters and Universities: Connecting Education with Industry

INCOSE chapters serve as **regional hubs**, often collaborating with universities to ensure students are prepared for careers in systems engineering. The integration of **Academic Equivalencies (AcEq)** with INCOSE Certification is one such initiative.

Tony Lindenman, ESEP, from the **Huntsville chapter**, has been instrumental in encouraging universities to align their courses with the **INCOSE Systems Engineering Handbook**.

"When universities align their curricula with INCOSE certification, graduates enter the workforce with a well-grounded foundation in systems engineering principles and best practices. In addition, many graduates are further encouraged to take advantage of INCOSE’s Academic Equivalency initiative to obtain

Back To Table of Content

their INCOSE ASEP certification prior to graduation," explains Lindeman.

According to the **National Center for Education Statistics (NCES)**, **graduates from industry-aligned programs are 40% more likely to secure relevant jobs within six months** of completing their degrees.

INCOSE Chapters and Companies: Building Strong Industry Connections

INCOSE chapters bring together professionals across industries, creating a **collaborative environment for knowledge sharing and professional growth**.

When NASA experienced a downturn, members of the **Texas Gulf Coast Chapter (TGCC)** transitioned into the **Energy industry**. The chapter played a key role in facilitating these career shifts by helping members **translate their systems engineering skills to new industries**.

This example underscores the **value of INCOSE Certification** as a **portable credential that enables engineers to move across industries seamlessly**.

Companies and Universities: Developing the Next Generation of Engineers

The relationship between industry and future employees is another critical interface. INCOSE's **Corporate Advisory Board (CAB)** members benefit from multiple engagement opportunities, including **talent acquisition, professional development, and research collaboration**.

CAB members can post job openings through **INCOSE's media offerings** and connect directly with candidates at events like the **2025 INCOSE Virtual Career Fair on March 25th**.

According to the **Society for Human Resource Management (SHRM)**, companies that actively engage in **professional association-led recruitment efforts** experience a **50% higher success rate in finding qualified candidates**.

ESEPs frequently report that their certification **validates their expertise and enhances their marketability**. Employers, in turn, recognize **INCOSE certification as a benchmark for systems engineering excellence**.

The Bottom Line: Partnerships Strengthen the Systems Engineering Ecosystem

INCOSE's partnerships create a **sustainable and thriving systems engineering ecosystem** by:

- **Enhancing professional development** through education-industry alignment
- **Increasing certification adoption** for workforce readiness
- **Providing talent pipelines** for companies through networking and career support
- **Driving industry innovation** by fostering cross-sector collaboration

As the **systems engineering field continues to evolve**, strategic partnerships—**especially through CAB engagement**—will remain **crucial for maintaining a skilled, adaptable, and forward-thinking workforce**.

Through INCOSE's collaborative efforts, **industry, academia, and government stakeholders co-create a future where systems engineering drives global innovation and impact**.

For more details on how your organization can **engage with INCOSE's partnership opportunities**, check out our **INCOSE Media Kit 2025, https://www.incose.org/about-incose/incose-marketing-communications.**

STRENGTHENING SYSTEMS ENGINEERING THROUGH COLLABORATION: HOW INCOSE CHAPTERS, UNIVERSITIES, AND COMPANIES WORK TOGETHER

By Courtney Wright, INCOSE Business Development

Individual members of INCOSE find different groups that fit them best. Some are involved with their local chapters; some with topical working groups; others have special roles in services like Certification and Mentoring; and a few are leaders at the global, strategic level. Some INCOSE members act as liaisons between their company, university, or government agency and INCOSE, transferring information in one or both directions. There are nearly as many varied relationships as there are INCOSE individual members. Just like in systems engineering, these interfaces are one of the most important parts of the INCOSE community design.

INCOSE chapters, companies, universities, and other organizational members share a common goal of advancing the discipline of systems engineering and developing the skills of practitioners. They are all organizing structures that have interfaces with the systems engineering community beyond INCOSE. They all benefit from each other's engagement. Here are some examples of that overlap:

INCOSE Chapters and Universities: Connecting Education with Industry

Location and culture are the bonding characteristic of INCOSE chapters. They often work with universities to make sure students are ready for careers in systems engineering. For example, Tony Lindenman, ESEP, from the Huntsville chapter, has been encouraging universities to create Academic Equivalencies (AcEq) with INCOSE Certification. This means universities can adjust their courses to align with the INCOSE Systems Engineering Handbook, so students are better prepared for their future jobs.

Chapters benefit too. By working closely with universities, chapters understand what schools are teaching and what companies are looking for in systems engineers. Chapter leaders help make sure university programs are connected to real-world industry needs, helping students be more successful when they graduate.

INCOSE Chapters and Companies: Building Strong Industry Connections

INCOSE chapters have a geographic and cultural connection and may contain a variety of companies, industries, educational backgrounds, and experience levels from their individual members and corporate supporters. When NASA had a downturn and jobs dwindled in that industry, several members of the Texas Gulf Coast Chapter (TGCC) connected with the Energy industry. Those who had

INCOSE Certifications were particularly well-prepared to talk about their SE skills in terms that were understandable to Oil and Gas hiring teams. That INCOSE chapter strengthened its relationship with the Energy industry since its members crossed domains.

Companies have been part of the outreach to universities to request that they set up AcEq. Chris Waskiewicz, CSEP, a member of the San Diego chapter, reports, “I was encouraged by my Booz Allen leadership to pursue the certification. As partners with INCOSE, Booz Allen is an advocate of the certification and I became interested in demonstrating my knowledge by becoming an ASEP.” Chris has since gone on to earn his CSEP.

Omer Ertekin, ESEP, of the INCOSE chapter in Turkey has also encouraged INCOSE Certification for the purpose of strengthening his chapter and industry relationship. “My motivation to provide these trainings is creating a knowledgeable systems engineering community in Turkey and to disseminate systems engineering through having powerful SEPs within companies who can advocate and apply systems engineering based on the best practices.”

Companies and Universities: Helping the Next Generation of Engineers

A final example of interfaces is the relationship between industry and future employees. INCOSE Corporate Advisory Board (CAB) members can advertise openings using INCOSE media offerings as described in the Media Kit linked near the bottom of this page: INCOSE Marketing & Communications, INCOSE MarCom. They also have an opportunity to meet candidates live during the **2025 INCOSE Virtual Career Fair** on March 25th. Whether formally using INCOSE advertising or networking through connections made at INCOSE or using SEP status as a filter for candidates, employers use INCOSE for finding quality candidates. ESEPs, in particular, report that their certification communicated to their employers that they had relevant and transferrable skills. John Vantuno, ESEP, shares his experience in the job market. “Eli Lilly wanted to accelerate their process improvements related to medical device development, so they sought to hire a highly skilled Systems Engineer. A quick and easy pre-screen of candidates was their INCOSE certification. Having an ESEP certification helped me get that job.”

Previous section:

Partner Updates


Next section:
Events

GET READY FOR INCOSE'S 35TH ANNUAL INTERNATIONAL SYMPOSIUM

You are officially invited to INCOSE's 35th Annual International Symposium! This year's event promises to be an engaging and informative experience, bringing together systems engineering professionals from around the globe. Whether you're a seasoned expert or just starting your journey in the field, this symposium offers invaluable opportunities for learning, networking, and professional development.

A Glimpse into the Program

Prepare to be inspired by our exceptional lineup of keynote speakers:

Monday - Langdon Morris

Langdon Morris is an award-winning innovator, futurist, and world-renowned strategy consultant. He is Senior Partner at InnovationLabs, where he leads the firm's global consulting practice with a wonderful variety of clients in business, government, and the non-profit sector. His original and ground-breaking work is being applied by corporations and universities on every continent.

He is also a founding partner of FutureLab Consulting, a strategy and technology firm that develops advanced AI solutions for global enterprises. He is Co-Chair of the Innovation Council at RedTeam Engineering, and in 2017-2018 he served as Innovation Coordinator at SUNY's Fashion Institute of Technology in New York.

Langdon has also written many highly acclaimed books. His most recent titles are *The AI Nation* and *The AI Future*, key works that examine the future of AI and its critically important strategic implications. His breakthrough white paper, "Business Model Warfare" is a landmark reference in the innovation field, and is now a renowned book. His book *Fourth Generation R&D*, coauthored with William L. Miller, is considered a classic in the field of R&D management, and other recent books include *Hello, Future! The World in 2025*, and *Net Zero City*.

He is formerly Senior Practice Scholar at the Ackoff Center of the University of Pennsylvania. He has taught MBA courses in innovation and strategy at the Ecole Nationale des Ponts et Chaussées in Paris and Universidad de Belgrano in Buenos Aires, and has lectured at universities on 4 continents. He earned his Master's Degree in Urban Studies at the London School of Economics.

You can learn all about his work, publications, and keynote speeches at www.LangdonMorris.com.

Tuesday - Jon Reijneveld

Jon Reijneveld is the Co-Founder and Chief Engineer at The Exploration Company (TEC), where he leads the engineering team in designing, developing, and

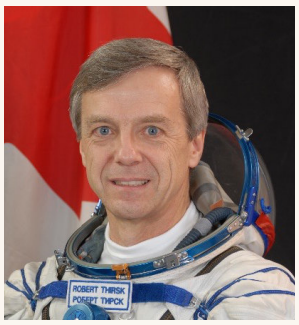
Back To Table of Content

operating innovative space capsules. With a master's degree in aerospace engineering from Delft University of Technology (TU Delft), Jon has specialized in space systems engineering.

Jon's career began at Airbus in Munich, where he worked on the European Data Relay System, managing the software for the control of the space and ground segment. He later joined the Orion Service Module (SM) team at Airbus Bremen as Deputy Chief Engineer, playing a crucial role in the qualification of the first module and leading the launch preparation campaign for Artemis I at Cape Canaveral.

Driven by a passion for advancing the space ecosystem in Europe, Jon co-founded TEC. Under his leadership, the engineering team at TEC implements practical systems engineering practices to rapidly produce innovative designs. TEC successfully launched its first capsule in July 2024 and is preparing for the launch of its second capsule in the summer of 2025. Jon and his team are currently working on their third capsule, Nyx Earth, with a planned demonstration flight to the ISS in 2028.

Wednesday - Dr. Robert Thirsk



Dr. Robert Thirsk received degrees in Mechanical Engineering, Medicine and Business Administration from the University of Calgary, MIT and McGill University. Bob has flown on two spaceflights: a mission aboard the shuttle *Columbia* and an expedition aboard the International Space Station. Although he is now retired from active duty, he continues to promote a role for Canada in the delivery of remote health care to astronauts who will someday venture to deep space on missions of discovery. Bob advocates for a national economy based upon exploration, innovation and lifelong learning.

Thursday - Dr. William (Willy) Donaldson

Dr. Donaldson is an Associate Professor of Management at Christopher Newport University, the Director of the CNU Luter Business Institute, and the Director of the Biotechnology and Management Program. Willy has over 35 years of experience as a board member and CEO, has been President of 8 companies, and helped start dozens of others. He has over 30 years of experience in higher education. Willy is the Founder and President of Strategic Venture Planning, a management consulting firm that assists boards, investors, families, and senior management teams to maximize results.

Dr. Donaldson's research interest areas include Enterprise Management Systems, Corporate Universities and their impact on performance, Family business issues, dynamics, and transitions, Entrepreneurship and Innovation, Systems Thinking, and Corporate Governance and Board Performance.

Willy is the author of *Simple_Complexity: A Management Book for the Rest of Us: A Guide to Systems Thinking*, and *Estimated Time of Departure: How I*

Talked My Parents to Death: A Love Story. He is the guest editor for a two-part Symposium for the *Journal of Leadership Studies* on leadership and systems thinking.

In addition to the keynote speakers, we received an astounding number of quality submissions that our technical program committee is working hard to process. More details will be released soon, including papers (research and practice-focused), tutorials, panel discussions, and presentations. Stay tuned to the International Symposium webpage for updates as the program is finalized.

Ottawa: A Capital Experience (In-Person and Virtual)

This year, we're heading to the beautiful capital of Canada – Ottawa! Known for its stunning architecture, vibrant arts scene, and rich history, Ottawa offers a unique backdrop for our symposium. From exploring Parliament Hill to strolling along the Rideau Canal, attendees will have plenty to see and do outside of the conference sessions.

For those unable to travel, we're delighted to offer a robust hybrid experience. Our dedicated virtual track will ensure that online attendees don't miss out on any of the action. Virtual participants will have access to all keynote sessions, plus exclusive virtual-only presentations, breakout sessions, and networking opportunities. We're committed to making this a truly inclusive event for everyone.

Sponsorship Opportunities: Partner with INCOSE

The INCOSE International Symposium relies on the generous support of our sponsors to make this event a success. We offer six distinct sponsorship levels, each designed to provide valuable visibility and engagement opportunities for your organization. Whether you're looking to showcase your latest products and services, network with potential clients, or simply demonstrate your commitment to the advancement of systems engineering, we have a sponsorship package to meet your needs and budget. Contact sponsors@incose.net today to learn more about how you can become a sponsor!

Plan Your Trip (or Virtual Attendance)

Ready to join us in Ottawa (or online)? Visit our Symposium webpage for all the essential information you need, including:

- Hotel accommodations with exclusive group-rate discounts
- Travel tips for getting to and around Ottawa
- A "Convince Your Boss" toolkit to help you justify the value of attending to your employer

Don't miss this chance to be part of the premier systems engineering event of the year. We look forward to seeing you in Ottawa or online!

HUNTSVILLE, AL — INCOSE-HRC and IEEE are proud to present the **2025 MBSE Symposium: Transforming the Digital Enterprise**, a premier event bringing together industry leaders, engineers, and experts in **digital engineering and Model-Based Systems Engineering (MBSE)**. Scheduled to take place in **Huntsville, Alabama**, this highly anticipated symposium will explore the latest advancements, methodologies, and challenges shaping the future of digital engineering.

Event Overview

Attendees will engage in two full days of **keynote speeches, panel discussions, technical paper presentations, and networking opportunities**. The symposium will provide a platform for discussions on cutting-edge MBSE applications and emerging requirements impacting the **Defense, Space, and Aviation sectors**.

Keynote Speakers

The event will feature distinguished keynote speakers:

- **Daniel Hettema** (Director of Digital Engineering, OSD) – Digital Transformation in the DoD
- **Galen Valentine** (Model Trust, Bell Helicopter) – Ensuring Model

Credibility in Aviation & Defense

Highlighted Topics

This year's symposium will cover critical topics, including:

- Lessons from MBSE Leaders
- Mission Engineering & Modular Systems
- Digital Thread Audits & Airworthiness Compliance
- Future of MBSE & AI Integration
- Security Concerns in Digital Transformation
- Advances in Model-Based Systems Engineering & Future Trends
- Adoption of SysML 2.0
- Artificial Intelligence for Systems and Software Engineering (AI4SE)
- Building the Future MBSE Workforce

Who Should Attend?

The 2025 MBSE Symposium is

designed for professionals and students passionate about digital engineering and MBSE, including:

- Digital Engineering Practitioners
- Systems Engineers and Software Engineers
- Decision-Makers and Program Managers
- Researchers and Academics
- Students exploring MBSE, digital transformation tools, and methodologies

Networking Reception – May 21st | 16:30 - 18:00

A special evening reception will be held on **May 21st**, offering attendees the opportunity to **network with industry leaders, fellow professionals, and keynote speakers** such as **Daniel Hettema**, Director of Digital Engineering, Modeling & Simulation, DoD Research and Engineering (OUSD(R&E)). This reception will provide a unique opportunity to exchange ideas, collaborate, and strengthen connections within the MBSE and digital engineering community.

Stay Connected – Reserve Your Spot Today!

Space is limited, so early registration is encouraged. Visit the event website for more information on registration, sponsorships, exhibitor opportunities, and paper submissions for possible presentation at the symposium.

📍 **Event Website:** https://www.ndiatennvalley.org/2025MBSE
📄 **Call for Abstracts:** https://easychair.org/cfp/2025mbse
🔗 **Join & Follow the MBSE Huntsville LinkedIn Group:** https://www.linkedin.com/groups/13150308/

Join us in **Huntsville, AL**, for an in-depth discussion on digital engineering, MBSE methodologies, and the technologies driving the future of the digital enterprise!

Media Contact:
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David.bath@incose.net
256-527-5303

Back To Table of Content

INCOSE HEALTHCARE WORKING GROUP'S 10TH ANNUAL SYSTEMS ENGINEERING IN HEALTHCARE CONFERENCE

Mark your calendars for the 10th Annual Systems Engineering in Healthcare Conference! Join us as we celebrate a decade of advancing the practice of systems engineering in the healthcare industry. This year's conference, themed "Advancing the Practice of Systems Engineering in the Healthcare Industry," promises to be an engaging and informative event, bringing together experts and practitioners from across the healthcare spectrum.

Keynote Presentation: "Why Systems Engineering is Critical to the Future of Healthcare"

We are honored to welcome Jim Peichel, VP, Cardiac Implantables Technology Development Center, Medtronic's Cardiac Rhythm Management, as our keynote speaker! Mr. Peichel's extensive experience in developing life-saving cardiac technologies provides him with a unique perspective on the challenges and opportunities facing the healthcare

industry. His keynote presentation, "Why Systems Engineering is Critical to the Future of Healthcare," will highlight the importance of interdisciplinary innovation through a system thinking approach, blending engineering, with clinical expertise to solve the industry's toughest challenges. Reconnect with the value that the systems engineer brings as important advancements are brought to life. Don't miss this opportunity to hear from a leading expert in the field!

Conference Highlights:

- LEARN, CONTRIBUTE, COLLABORATE: The conference offers a dynamic blend of learning, contribution, and collaboration opportunities.
- Tutorials: Deepen your knowledge on April 29th with focused tutorials on critical topics.
- Multi-Session Learning Tracks: Explore diverse areas of interest from April 30th – May 1st through concurrent sessions.
- Collaboration Sessions: Contribute to shaping the future of the community by participating in interactive collaboration sessions.

Conference Tracks:

This year's track-invited speakers cover a wide range of relevant topics, including:

- **Beyond the System:** David Long, INCOSE past President, Director for Strategic Integration and President, Blue Holon "Succeeding Beyond the System: Embracing the Socio and the Technical"
- **AI/ML:** Steve Zielinski, Vice President of Systems and Software Engineering at Future Cardia "Peering into the Crystal Ball: The Future of AI/ML in Healthcare Technologies"
- **Cyber Security:** Michelle Jump, CEO MedSec "Emerging Topics in CyberSecurity"
- **Digital SE:** Joseph Green, Distinguished Engineer and Technical Fellow, Chief Systems Engineer, Patient Care Systems and Software, Medtronic, "Engineering the Leap: Model Transformation as a Springboard to Digital Engineering"

Event Details:

- Date: April 29th - May 1st, 2025
- Time: 8:00 AM - 5:00 PM CT (US)
- Location: Crowne Plaza Suites Msp Airport, 3 Appletree Square, Bloomington, MN 55425

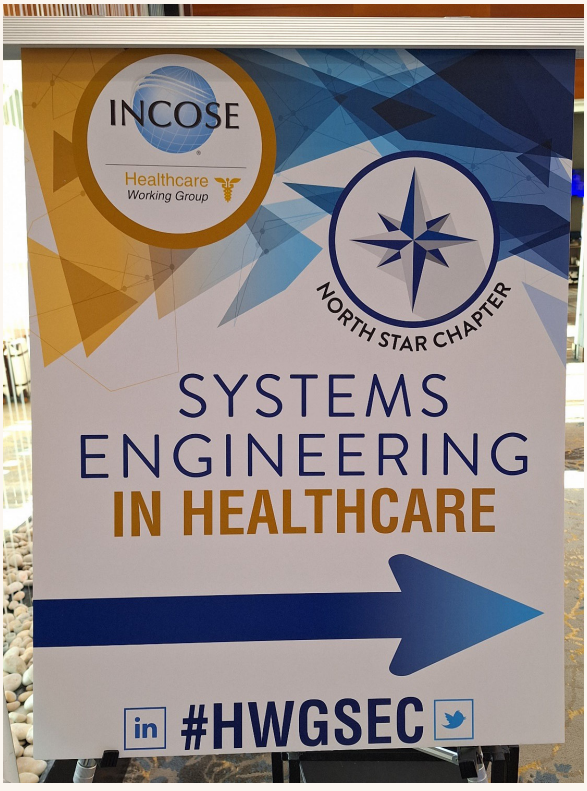
Who Should Attend?

This conference is a must-attend for:

- Systems Engineers
- Product Developers and Testers
- Certifiers
- Leaders of organizations developing complex healthcare products and services
- Professionals involved in Healthcare IT systems, medical devices, and healthcare delivery organizations

We look forward to seeing you in Bloomington!

REGISTER NOW



Back To Table of Content

EVENT SCHEDULE

18-21
MAR, 2025

CONFERENCE ON SYSTEM ENGINEERING RESEARCH 2025 (CSER2025)

MAR 18, 2025 8:00 AM - MAR 21, 2025 5:00 PM ET

18
MAR, 2025

INCOSE SEATTLE METRO CHAPTER: MARCH 2025 GENERAL MEMBERSHIP MEETING

6:00 PM - 8:00 PM PT, BELLEVUE, USA

19
MAR, 2025

WEBINAR 180: EMPOWERING SYSTEMS ENGINEERS AND PROJECT MANAGERS: UNLOCKING THE POTENTIAL OF DESIGN STRUCTURE MATRICES

11:00 AM - 12:30 PM ET

19
MAR, 2025

INCOSE NORTH STAR: COMMONSENSE AUTONOMOUS DRIVING

6:00 PM - 8:00 PM CT, ROSEVILLE, USA

20
MAR, 2025

INCOSE FINGER LAKES CHAPTER MEETING: MARCH 2025

6:00 PM - 7:30 PM ET

24 MAR, 2025

SE LAB DEMO DAY 009: THE 5 BIGGEST TIME KILLERS IN (AUTONOMOUS DRIVING) DEVELOPMENT AND HOW TO SOLVE THEM WITH SE

11:00 AM - 12:00 PM ET

25 MAR, 2025

INCOSE VIRTUAL CAREER FAIR 2025

11:00 AM - 2:00 PM ET

27 MAR, 2025

INCOSE GREATER PHILADELPHIA: MODEL-BASED ACQUISITION USING REFERENCE ARCHITECTURES AND PATTERNS

7:00 PM - 8:30 PM ET

29 MAR, 2025

INCOSE LOS ANGELES CHAPTER: REQUIREMENTS, A COMPREHENSIVE OVERVIEW

9:00 AM - 12:00 PM PT

29 MAR, 2025

INCOSE LA: TUTORIAL – REQUIREMENTS: A COMPREHENSIVE OVERVIEW

9:00 AM - 10:00 AM PT

01 APR, 2025

AEIS (INCOSE SPAIN): INGENIERÍA DIGITAL: ASEGURA LA TRAZABILIDAD COMPLETA EN SISTEMAS COMPLEJOS (SOS)

3:00 PM - 4:00 PM ROMANCE STANDARD TIME

02
APR, 2025

INCOSE NORTH STAR: APRIL LEADERSHIP MEETING

6:00 PM - 7:30 PM CT, RICHFIELD, USA

09
APR, 2025

INCOSE ENCHANTMENT: THE ADVANTAGE OF MODEL BASED SYSTEMS ENGINEERING AND PERFORMING MODEL-BASED DESIGN REVIEWS

4:45 PM - 6:00 PM MT

14
APR, 2025

SE LAB DEMO DAY 010: CATIA STIMULUS: REQUIREMENTS-IN-THE-LOOP SIMULATION FOR THE END-TO-END VALIDATION OF EMBEDDED SYSTEMS

11:00 AM - 12:00 PM ET

17
APR, 2025

INCOSE FINGER LAKES CHAPTER MEETING APRIL 2025: SYSTEMS ENGINEERING IN THE AGE OF ARTIFICIAL INTELLIGENCE

6:00 PM - 7:30 PM ET

23
APR, 2025

MBSE-CON (MODEL BASED SYSTEMS ENGINEERING CONFERENCE)

8:00 AM - 5:00 PM CT, ORLANDO, USA

26
APR, 2025

LA STRATEGIC PLANNING MEETING 2025 Q1

9:00 AM - 5:00 PM PT

28
APR, 2025

SE LAB DEMO DAY 011: FROM ROADMAPS TO REALITY: ADVANCING SYSTEMS ENGINEERING WITH INNOSLATE

11:00 AM - 12:00 PM ET

29
APR, 2025

HEALTHCARE WORKING GROUP: 10TH ANNUAL SYSTEMS ENGINEERING IN HEALTHCARE CONFERENCE

2025 8:00 AM - 5:00 PM CT
BLOOMINGTON, USA

29
APR, 2025

INCOSE NORTH STAR: SAVE THE DATE: NSC RECEPTION/SOCIAL FOR SYSTEMS ENGINEERING IN HEALTHCARE CONFERENCE

5:30 PM - 6:30 PM CT
BLOOMINGTON, USA

07
MAY, 2025

INCOSE NORTH STAR: MAY LEADERSHIP MEETING

6:00 PM - 7:30 PM CT
RICHFIELD, USA

12
MAY, 2025

SE LAB DEMO DAY 012: REQTIFY: CONNECTING THE DOTS BETWEEN REQUIREMENTS MANAGEMENT, MODELING, SIMULATION, TESTS & CAD SOLUTIONS, TO ESTABLISH END-TO-END TRACEABILITY

11:00 AM - 12:00 PM ET

21
MAY, 2025

2025 MBSE SYMPOSIUM – TRANSFORMING THE DIGITAL ENTERPRISE

8:00 AM - 5:00 PM CT, HUNTSVILLE, USA

02-04
JUN, 2025

NORDIC SYSTEMS ENGINEERING (NOSE) TOUR 2025

2025 8:00 AM - 5:00 PM CT, BLOOMINGTON, USA

04
JUN, 2025

INCOSE NORTH STAR: JUNE LEADERSHIP MEETING

6:00 PM - 7:30 PM CT, RICHFIELD, USA

11
JUN, 2025

KONGSBERG SYSTEMS ENGINEERING EVENT (KSEE) 2025

JUN 11, 2025 3:00 PM - JUN 12, 2025 12:00 PM PT

26-31
JUL, 2025

INCOSE'S 35TH ANNUAL INTERNATIONAL SYMPOSIUM 2025

JUL 26, 2025 - JUL 31, 2025, OTTAWA, CANADA

INCOSE Members Newsletter

Publication of the International Council on Systems Engineering

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Publication Schedule: The INCOSE Member Newsletter is published four times per year. Article and advertisement submission deadlines are as follows:

- Q1 2025 Newsletter: 15 February 2025
- Q2 2025 Newsletter: 15 May 2025
- Q3 2025 Newsletter: 15 August 2025
- Q4 2025 Newsletter: 15 November 2025

For further information on submissions and issue themes, visit the INCOSE MarCom website: www.incose.org/marcom

Who are we?

INCOSE is a 26,500+ 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. All views expressed in this Newsletter are the writers' own and do not reflect the views of INCOSE.

Graphic Designer: Anthony Abi Badra

INCOSE

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