The Enchanted View

✧ *Thinking about Systems* ✧

2019 Quarter #3

Off to the International Symposium!

Heidi Hahn
Chapter President

It's almost time for the INCOSE International Symposium (IS) and your Enchantment Chapter is well represented once again. Please come out and support your fellow chapter members who are participating in the following panels/presentations:

❖ Monday July 22, 1st up in Track 5 at 10:00 – Rick Dove and Bill Schindel – *Agile Systems Engineering Life Cycle Model for Mixed Discipline Engineering*

❖ Monday July 22, 2nd up in Track 3, also starting at 10:00 (but you can get to both if you watch the clock carefully!) – Heidi Hahn and Ann Hodges – *Integrating Program/Project Management and Systems Engineering in Practice*

❖ Tuesday July 23, 1st up in Track 4 at 13:30 – Mary Compton, Marissa Conroy, Arno Granados, and Evan Richardson – *Applying Model Based Systems Engineering to Reduce Weapon System Development Cycle Time*

❖ Tuesday July 23, 2nd up in Track 1, also beginning at 13:30 (another juggling act required!) – Celeste Drewien, Raymond Wolfgang, and Cheryl Bolstad – *Requirements Efficiency Questionnaire Results*

❖ Wednesday July 24, Track 6 – Panel moderated by Gina Guillame-Joseph with panelists Frederic Autran, Heidi Hahn, Ann Hodges, Mitchell Kerman, and Nick Lombardo – *Implementing Systems Engineering in Early Stage R&D Projects*

❖ Wednesday July 24 2nd up in Track 4 which begins at 13:30 – Oscar Mondragon and Rene Jasso – *INCOSE Handbook V4 to CMMI Development V2.0 Mapping*

The above information was culled from the online technical program. If I have missed anyone, my apologies!

Also, if you plan to attend IS, please send us an email to enchant-bod@incose.org. We may try to have a little get-together while there, and can claim credit for your attendance in our Circle Award application.

Not for Women Only

by Heidi Hahn,
Los Alamos National Laboratory

And speaking of IS, the Empowering Women as Leaders in Systems Engineering (EWLSE) group is planning an informal networking get-together on Wednesday July 24 from 5:15 to 6:15 PM at the Trellises Lounge at the Grand Hyatt Hotel (the conference venue, 18th floor). Attendees will receive one drink ticket and appetizers will be provided. All are welcome! Questions? Contact Alice Squires at alice.squires@wsu.edu.

During the conference, keep a look out for those wearing an EWLSE button to find out more about EWLSE. I'll be sporting one!
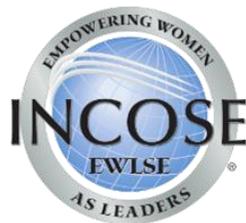
Socorro Systems Summit

by Rick Dove,
Paradigm Shift International

Our third Chapter Summit, with 39 registered participants and 25 or so who toured the Very Large Array (VLA), was well enjoyed by those who attended. This summary gives some quick highlight of what people liked, and you can find more detail in the 2019 Summit proceedings, posted under the Chapter website "Library" tab. (https://www.incose.org/incose-member-resources/chapters-groups/ChapterSites/enchantment/library-and-resources/socorro-systems-summit---2019)

This year featured a free SEP exam with 19 participants, and a well-attended tour of the Very Large Array. The tour featured the VLA data processing facility where details for data analysis and managing the operation were explained.

The after-action evaluation form asked two scorable questions: "Glad you came?" which averaged 4.79 out of 5, and "Do it again?" which averaged 4.63 out of 5.

Attendees could choose from eight topics, participating in four of them on day one in an introductory format, and two of them on day two for a deeper dive. The topics were:

- Mixed Discipline SE Training
- Agile SE in Mixed Discipline Projects
- Full Life Cycle Attention by System Developers
- Problem Space Focus Before Solution Work
- Student involvement in Chapter & Working Group activity
- Verification and validation of SE Models
- Women as leaders in Systems Engineering
- Autonomous systems complexity assessment

What was liked:

- Kerry Lunney's biographical keynote talk.
- The mixture of students and professionals.
- The topics had results I can and will employ.
- Topics were relevant to my work and interaction with INCOSE.
- Well organized meaty topics of interest.
- Diversity of topics we could choose from.
- Good match between number of people and time and topics.
- Diversity of voices.
- "Lightweight" event – short, fairly inexpensive, not overly formal but organized.
- The problem solving and group collaboration process.
- Collaborative focus group participation.
- Meeting experienced people from different industries and parts of the country.
- Open discussion format.
- Self determination of topics, and the development of these topics.
- Opportunity to share ideas and experiences.
- Listening to others and getting to know new people.
- The Day 1 and Day 2 formats.
- Good facilitators.
- Length of sessions was good.
- Friday/Saturday format.
- Thank you for having the paper based exam.
- The VLA tour was amazing.
- I benefitted tremendously from attending.

Picture taking at the summit was a bit sparse, but here you can see attendees touring the inside of one of the antennas at the VLA. For more, see the Chapter website link given above!
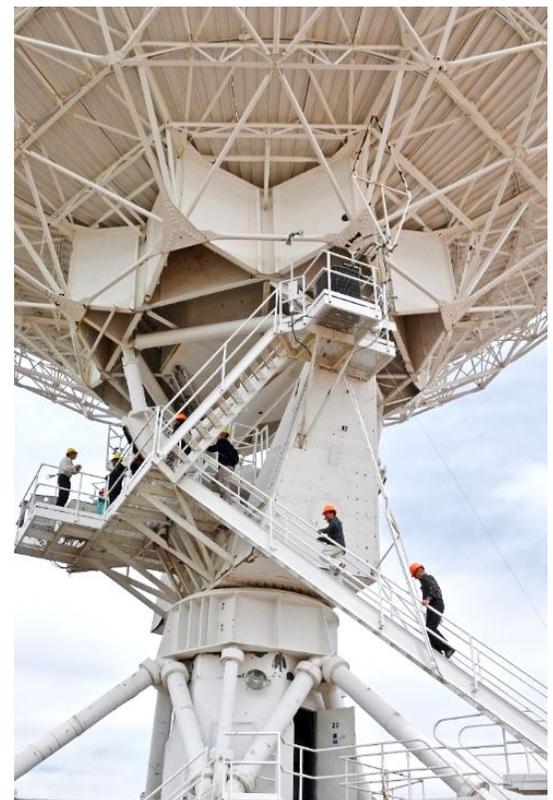
What You Missed...

Recent Chapter Meetings

by Ann Hodges,
Sandia National Labs

❖ **APRIL 2019: Dr. Tina Srivastava**, INCOSE Board of Directors Secretary, co-chair of the PM-SE Integration Working Group and one of the authors and editors of the book *Integrating Program Management and Systems Engineering*, presented *Strategies for Complex Systems Development: Program Management and Systems Engineering.* Every systems engineer must understand key P3M fundamentals in order to critically evaluate and, when necessary, credibly challenge management on potentially unrealistic expectations related to project cost, schedule, scope, and risk. Advanced methods and tools of project management were introduced in the context of managing complex projects. Finally, this presentation discussed strategic issues and scenarios that cannot be fully predicted such as unplanned rework, perceived versus actual progress, and misalignments between work breakdown structures, organizations, and product architectures.

❖ **MAY 2019: Dr. Mike Yokell**, a Lockheed Martin Fellow and Deputy Director, Systems Engineering, presented *System of Systems (SoS) Managerial and Operational Affinity*. Two key characteristics of systems of systems are operational and managerial independence. But what do these terms really mean, and what am I supposed to do about it? This presentation discussed assessing the operational relationships between the constituent systems within a system of systems, and the managerial relationships between the organizations that own them. For each of the relationship types, or affinity options, a framework for tangible, actionable guidance was offered.

❖ **JUNE 2019: Barbara Mills**, a Principal Member of Technical Staff at Sandia National Laboratories, presented *Enterprise Data Management for System of Systems*. She discussed a model-based approach to data design and management for a remote sensing ground station which is being developed as a system of systems. It also discussed the evolution of an enterprise data management approach for that same "system."

Recordings of past chapter meetings are stored in the chapter's website library at:
https://www.incose.org/incose-member-resources/chapters-groups/ChapterSites/enchantment/library-and-resources

Eureka! ...It's ScienceFest!
July 9-14
@ Los Alamos

Our friends in Los Alamos invite us up the hill to the award-winning *ScienceFest*, kicking off with a party on Tuesday, July 9 (complete with music and a "fractal hot air balloon") and continuing through Sunday, July 14. The event celebrates New Mexico's past and present contributions to science, and this year's theme is "Eureka!" During Discovery Day on Saturday, July 13, visitors of all ages can release their inner geek by exploring hands-on science concepts at exhibitor booths, along with music, food, and a beer garden. Where

Last Quarter's Found Object Puzzler: *If you recognized this elegant device as a voltmeter, well hoorah! If that's because you're still using this voltmeter in your lab, you might want to consider putting in a requisition for a newer unit. This particular model was built by Hartman and Braun, circa 1920-1940.*

else are you going to meet the Roger Wiens of Mars Rover Chem-Cam fame, play with an interactive nanomechanics exhibit and load up on LANL-logo gear? Come have your own Eureka moment!

For more info: https://www.losalamossciencefestival.com/

The most exciting phrase to hear in science, the one that heralds new discoveries, is not Eureka but 'That's funny...' – Isaac Asimov

Coming Up Next

Next Chapter Meetings / Events

by Ann Hodges,
Sandia National Labs

❖**JULY 10, 2019: Dr. Heidi Hahn**, ESEP and Senior Executive Advisor to the Associate Laboratory Director for Weapons Engineering at Los Alamos National Laboratory, and **Ann Hodges**, CSEP and Distinguished Member of Technical Staff at Sandia National Laboratories, will present *Systems Engineering for Early Stage R&D Working Group Update.* An INCOSE Early Stage Research and Development Working Group (ESR&D WG) is forming, and several Enchantment Chapter board members are in the thick of it! Heidi Hahn and Ann Hodges teamed with Nick Lombardo of Pacific Northwest National Laboratory and Dr. Mitchell Kerman of Idaho National Laboratory to host an information session at the 2019 International Workshop. Response was overwhelmingly positive, with over 40 people expressing interest. Although we had thought that most of the interest would come from national laboratories and other Federally Funded Research and Development Centers, a wide spectrum of organizations, including academia and industry, were represented. This presentation will discuss the ESR&D WG and initial thoughts on the questions that the Working Group will address:

- What are the challenges in applying SE to early stage R&D?

- When should SE be applied to early stage R&D?

- What SE concepts have the biggest "bang for the buck" in these types of projects?

- Are there triggers that could identify when SE should be applied, e.g., dollar threshold, minimum technology readiness level, stakeholder complexity, etc.?

- Is there a compelling value proposition for "selling" the idea of applying SE to early stage R&D projects?

- How does one go about tailoring SE for these early stage projects that, quite frankly, may not exist for more than a year?

- What SE practices, when applied early in an R&D project, support future growth if there is a desire to "productionize" the R&D's focus area?

❖**AUGUST 9, 2019:** *Summer Social Event* – See below!

❖**SEPTEMBER 11, 2019:** *The 2nd Annual Systems Engineering Challenge Event* will be held at the meeting room in the Nexus Brewery, 4730 Pan American Fwy NE in Albuquerque. Network with your fellow SE professionals to explore SE challenges submitted by Chapter members, and collaboratively discuss the nature of the challenge, brainstorm suggestions to overcome issues and amplify positive aspects. The event includes free appetizers and one free drink. More details are available here. Admission is free, but you must register by September 10, 2019. The event is limited to 35 guests. https://www.eventbrite.com/e/systems-engineering-challenge-event-2019-tickets-63395130542

2019 Enchantment Summer Social

by Mary Compton,
Sandia National Labs

…Local Brews and BBQ!

INCOSE veterans and newcomers are invited to join your fellow chapter members and friends on August 9, 2019 for locally brewed beer and BBQ in the loft of Bow and Arrow Brewery located near downtown ABQ (608 McKnight Ave NW, Albuquerque, NM 87102).

Admission: $10 per person, payable via cash or check at the event—includes BBQ from Kimo's Hawaiian Food Truck and one drink ticket for a glass of beer or wine. Event is limited to 50 people, must be 21 or over to consume alcohol. Guests are welcome. Register via **EventBrite** by August 7, 2019 at 5 pm.

A fine beer may be judged with only one sip, but it is better to be thoroughly sure.
– Bavarian proverb

Western States Regional Conference – Sep 13-15

by Bob Pierson, ATA

INCOSE chapters in the Western United States have teamed up again to organize the Western States Regional Conference. This year it will be held September 13-15 in Los Angeles, CA on the Loyola Marymount campus.

The theme is: ***Systems Engineering Relevance: Time for a Sea Change!***

The Future State of Systems Engineering, according to the INCOSE Vision 2025, will make significant strides in meeting the challenges and needs of the global environment, human and societal needs, policy and business challenges, as well as the technologies that underlie systems. Its relevance and influence will go beyond traditional aerospace and defense systems and extend into the broader realm of engineered, natural and social systems.

The organizers hope that this conference is an opportunity for engineers in the Western U.S. to improve their skill set and expand their network without needing to travel far and wide. Expect keynotes, panels, presentations, and tutorials covering a wide range so f systems engineering issues and applications, plus time for networking and tours.

WSRC2019 has tracks being formed to address SE Application to Healthcare and Medical Devices and SE in Large Observatories being developed to explore the farthest reaches of the universe.

Submit your abstracts to explore areas that benefit or struggle with the application of Systems Engineering. The call for proposals is now out. Likewise there are still opportunities to sponsor the conference activities.

WSRC2019 will also feature an INCOSE SE Professional Development Day (SE PDD). The SE PDD will feature sessions broadcast from LMU to satellite sites on Saturday the 14th of September.

The beautiful Loyola Marymount campus is a few miles north of LAX, on a bluff near the Pacific Ocean. Lodging will be at The Renaissance Los Angeles Airport Hotel with shuttle between hotel and airport and between hotel and conference.

For more information, see
https://www.incose.org/wscrc2019 .

Other Upcoming INCOSE Events

◎ **JULY 10, 2019: WEBINAR: Simulation Modeling for Systems Engineers,** 9:00-10:00 Mountain Time
https://www.incose.org/products-and-publications/webinars

◎ **SEPTEMBER 11, 2019: INCOSE Human Systems Integration 2019 Conference,** Biarritz, France.
https://www.incose.org/HSI2019

◎ **NOVEMBER 12-13, 2019: First Workshop on the application of Artificial Intelligence for Systems Engineering,** Leganés (Madrid), Spain
http://www.kr.inf.uc3m.es/ai4se/

Before we work on Artificial Inteligence why don't we do something about Natural Stupidity?
– Steve Polyak

Looking for a Mentor? Willing to Be One?

INCOSE has announced a **new mentor/mentee program** and has made a half dozen or so mentor/mentee matches since the kick off at the January International Workshop. They have mentors at the ready if you are seeking support. And they'd love to hear from you if you are interested in becoming a mentor. There is a sign-up survey at https://bit.ly/2G6TJPL or you can email incose-mentor@incose.org. What are you waiting for? This could be the start of a whole new phase of your systems engineering career!

The INCOSE Mission
To address complex societal and technical challenges by enabling, promoting, and advancing Systems Engineering and systems approaches

The INCOSE Vision
A better world through a systems approach.

The Enchanted View
⊕ *Thinking about Systems* ⊕

See you at the International Symposium...

29th Annual INCOSE international symposium

Orlando, FL, USA
July 20 - 25, 2019

Found Object Puzzler: *This "object" is more of a force of nature. It "found" one of our board members while they were on the road home and just South of Lubbock, TX. What's the correct name for this object that is a hundred feet tall and moving at 60-70 miles per hour?*

Photo courtesy of Gary Froehlich

New Members:

Please welcome the following new members to our Enchantment Chapter!

David Chacon - Sandia National Labs
Stephen Craft - Los Alamos National Lab
Bradley Drake - Los Alamos National Lab
James Larkin - MEI Technologies
Ted Schultz - Los Alamos National Lab

Enchantment now has 131 members. That includes 109 regular members and 22 student members.

INCOSE has ~17,000 members in 70 countries worldwide.

INCOSE Enchantment Chapter Board and Committee Leads

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The Enchanted View

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Published material does not necessarily reflect the views or opinions of INCOSE, the Enchantment Chapter Board of Directors, or the Editor.

Call or email your news, reviews, announcements, or other contributions and suggestions to the chapter Secretary: Ann Hodges, alhodges@sandia.gov .