The Enchanted View

— Thinking About Systems —

2018 Q3

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www.incose.org/enchantment

News on Chapter Director Elections

Rick Dove, President—
Regularly we hold Chapter Officer and Director elections in November, with a ballot sent out in October, and nominations sought in September.

We hope to do a few things differently this year.

The first is to give you a heads up now so you can consider joining the team and indicate interest in being nominated to Ann Hodges at alhodge@sandia.gov.

The second is to add some non-voting director positions for people who will accept a specific Chapter-betterment responsibility of choice, and have a voice at Board meetings. Attendance can be in person or via GlobalMeet the fourth Wednesday of every month from 4:45-6:00 PM. Additionally we hold a half day, all afternoon, combined annual planning and board meeting generally in January on a convenient day. Voting members are necessarily limited as a quorum can be hard to achieve if the number of voting members is too large. This can be your opportunity to see how the board works and preparation for a voting position.

The third is to be sensitive to the officer and director constituency for gender, SE experience years, and organizational type. Currently among 14 directors (one non-voting), we have 10 men and 4 women, and consider that our main initial diversity focus. As to SE experience years, roughly speaking we have 10 highly experienced and 4 lessor experienced—which may not be a bad balance, but we are debating it. As to organizations and types, Sandia holds 8 of 14 positions which approximates their Chapter membership percentage, and in general the remainder represent a reasonable mix of organizational types; but we watch it. ∞

Summer Social—Party With the Sharks—July 18, 2018

Mary Compton, Sandia National Labs

On Wednesday, July 18, 2018, 6:00 - 9:00 PM at the Shark Reef Café, 2601 Central Ave NW, Albuquerque, NM mingle with fellow chapter members and friends with a cocktail, some food, and a view of the Shark Tank at the ABQ BioPark Aquarium. Confer with colleagues about a marine-related systems engineering problem posed by the Enchantment Chapter Board!

Admission is $10 per person, payable via cash or check at the event, includes a dinner buffet, served *6:00 PM – 7:30 PM*, and 1 drink ticket for guests 21 and over. Beverage Service is from *6:00 PM – 8:30 PM.* Advanced registration is required. Register via EventBrite by July 11th at 12 noon. Event limited to the first 50 participants. For more information contact Mary Compton, mlcompt@sandia.gov or 505-845-9268. ∞

CHAPTER HELP NEEDED!

Chapter Social Event Coordinator—Proposes venues and nature of Summer and Winter social events (with suggestions), negotiates venue after Board approval, provides budget info, and coordinates/produces the event.

Chapter Tutorial Coordinator—Not responsible for obtaining tutorial topics and leaders. Is responsible for negotiating Spring and Fall tutorial venues, providing budget info, and coordinating/producing the event after Board approval.

Mentoring and documented methods for both positions.
Contact Anthony Matta: armatta@sandia.gov. ∞

Chapter Systems Engineering Challenge Event—August 8, 2018

Ann Hodges, Sandia National Labs

Come establish and strengthen connections with your regional SE Community of Practice! This 1.5 hour event will feature SE challenges that a Chapter Member wants to collaboratively discuss with other Enchantment Chapter event participants—on the nature of the challenge and a brainstorm of suggestions for overcoming them. A challenge can be at any scope level—interpersonal, project/program, enterprise, regional. *Consider this an open call for Challenge topics.* If you have ideas, send them to Ann Hodges at alhodge@sandia.gov by close of business Friday, August 3. In your submission, please include the verbiage you want shared for your challenge, and how you want to be identified as the submitter (anonymous is fine). A summary of the outcome of each challenge will be included in the September 2018 Enchantment Chapter Update email message.

We have a separate room reserved at the west end of Nexus Brewery, 4730 Pan American Freeway NE suite D, Albuquerque NM 87109. The event will be on an RSVP basis since the room only holds 35 comfortably. No more than one guest per participant, please. Register by EventBrite HERE.

Doors will open for the event at 5:15pm, with event action from 5:30pm-7:00pm. Appetizers and 1 drink ticket will be provided by the Chapter. ∞

Model Based Systems Engineering Tutorial—What You Missed

Mary Compton, Sandia National Labs

On May 10-11, 2018 the Enchantment Chapter sponsored a two-day tutorial on Model Based Systems Engineering at the Workforce Training Center in Albuquerque, NM. The tutorial was presented by Matthew Hause, PTC Engineering Fellow and GTM Technical Specialist, the co-chair of the UPDM group a member of the OMG Architecture Board, and a member of the OMG SysML specification team.

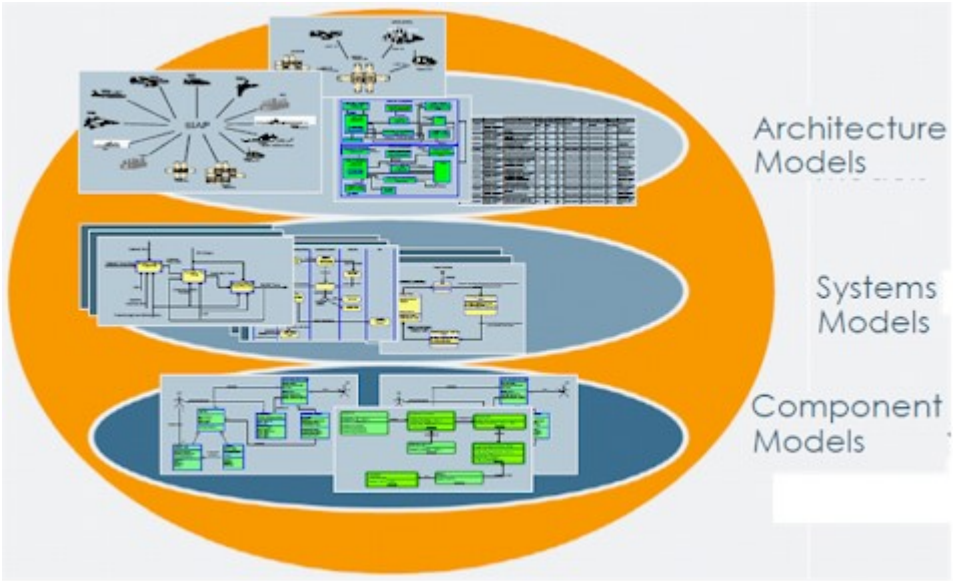
The course content included: (1) essential SysML concepts, terminology and notation; (2) the purpose and use of SysML diagrams; (3) how SysML diagrams are organized and the relationships between diagrams; (4) how to create SysML models; (5) how SysML models can feed into software design; and (6) how Enterprise models can feed into system design.

This tutorial demonstrated how to apply SysML modeling techniques for system engineering activities on a variety of project types and sizes. Case studies were used to illustrate best practice, lessons learned, and actual ROI from government and industry organizations. It also included an overview of the Systems Modeling Language (SysML) and Enterprise Modeling.

Group exercises were used to ensure the students understood each set of concepts. Attendees worked in small groups to complete several exercises modeling an unmanned aerial vehicle at three different levels (see figure) for coastal emergency response missions. These exercises provided hands-on experience applying the techniques and re-enforcing the concepts.

The hit of the day was the Foreign Object Atomizer that one group included in their UAV component-level model.

∞



Modeling at Multiple Levels of the System

INCOSE | WSRC Western States Regional Conference

Western States Regional Conference
September 20-22, 2018 – Ogden, Utah

The INCOSE western U.S. chapters cordially invite you to the Western States Regional Conference (WSRC).

Hosted by: INCOSE Wasatch (Utah) Chapter, with participation from western U.S. chapters.
Featuring: Technical presentations, working group activities, panel discussions, workshops, chapter leader meetings, networking events, SEP Beta Exam, and much more.
A Great Opportunity: High quality learning, networking, collaborating--all in the majestic Wasatch Mountains.
Venue: Orbital ATK Conference Center, located in scenic Ogden Canyon.

The WSRC Website is at https://incose-wsrc.eventbrite.com.

Please check back often for the latest news and updates.

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Know someone looking for local NM space system work in a dynamic small business environment?

ATA and ATA-Aerospace are seeking candidates for openings in Albuquerque for both engineers of space/electro-optical instruments and systems engineers with experience to help guide space/electro-optical instrument development. For more info, see: www.atacorp.com/careers.html. ∞

SEP Training Nearby

SEP Courses by *Certification Training International:*

Course details (more dates/locations)

Courses Nearby (somewhat):

2019 Feb 11-Feb 15	San Francisco, CA
2019 Aug 12-Aug 16	Austin, TX

Chapter SEP Mentors:
Ann Hodges alhodge@sandia.gov, Heidi Hahn hahn@lanl.gov

Free SEP certification exam at IS18 in Washington DC
on Sunday July 8. Sign up on registration form.

∞

Recent Meetings

Ann Hodges, Sandia National Labs

Presentations and recordings are in the Library at www.incose.org/enchantment.

April 2018—Dr. Steve Jenkins, California Institute of Technology, Jet Propulsion Lab, Principal Engineer in the Formulation and Systems Engineering Division, presented *Is Systems Engineering Really Engineering?*

Steve assured us that the question is rhetorical, and that he means "how do we ensure that systems engineering really is engineering? He noted that Engineering is a creative process, and that the objective of engineering is to bring about a desired state of the world, typically through the creation of artifacts that use scientific principles to nudge the state of the world in a desired direction. There are fundamental principles that distinguish engineering from other creative activities such as painting and writing. Steve explored and considered the degree to which systems engineering does or does not respect them.

Steve spoke a lot about rigor, and that engineering analysis is distinguished by is reliance on science and mathematics to achieve rigor. Look up his presentation in the Chapter site library for details.

Steve concluded that systems engineering really is engineering to the degree that it achieves rigor through description and analysis, and that MBSE as a systems engineering practice achieves rigor through precise language for description, mathematical abstractions for analysis, and effective automation.

May 2018—Matthew Hause, PTC Engineering Fellow and GTM Technical Specialist, presented a two day tutorial on Model Based Systems Engineering. See article on page 2 for what you missed.

May 2018—Ron Lyells, Retired Honeywell and Chair of the Agile Systems and Systems Engineering working group, presented *Creating Decisions Guidance for Applying Agile Systems Engineering*.

Ron shared initial findings from an Agile Systems and Systems Engineering working group project that is the topic of an IS18 paper as well.

As awareness of agile system principles begins to take hold, and promulgation of agile software techniques continues, systems teams, projects, and organizations are often faced with the question as to whether they should adapt agile systems practices into their programs and processes. In trying to answer that question, teams are faced with other questions that need to be answered as well. These include what is motivating the decision, where should agile principles be applied, and how much agile is necessary.

Ron presented work accomplished to date on applying the OODA loop process, coupled with some simple tools, to help teams, projects, and organizations answer those questions.

Tools that are now available from this project include a prototype Assessment Form and a Stability-Predictability Grid Assessment Form. Employing these tools on a real example for providing group discussion leading to decisions took approximately 12-16 hours.

June 2018—Dr. Cheryl Bolstad, Sandia National Laboratories, Human Factors, presented *Best Practices for Achieving Requirements Efficiency*.

Cheryl shared the results of a literature review that draws from external sources, such as peer-reviewed journal and conference proceedings, to reveal inefficiencies, challenges and problems experienced in requirements engineering and management processes (REMP) and seek recommendations and solutions for overcoming them and reducing lengthy REMP timelines while ensuring quality in the process. The purpose of the literature review was to understand where gains in efficiency might be realized, and to understand best practices and lessons learned for general requirements management and for requirements elicitation, specification, analysis, derivation and decomposition, validation and verification, and change control.

As requirements engineering and management processes (REMP) for complex hardware systems continue to mature, a major goal is to reduce the long timelines for generating and distributing requirements to system and component engineers.

See the presentation in the Chapter site library for details, but here are Cheryl's conclusions briefly for gaining requirements process efficiency:

- Avoid Big Up Front Requirements
- Front load the requirements process to ensure earlier V&V and avoid late requirements changes.
- Manage requirements volatility and change. ∞

Next Meetings

Ann Hodges, Sandia National Labs

Jul 18: Summer Social at Shark Reef Café—Party with the Sharks.

Produced by Mary Compton, Sandia National Labs.

Event: 6:00— 9:00 PM at the Shark Reef Café, 2601 Central Ave NW, Albuquerque. Mingle with fellow chapter members and friends with a cocktail, some food, and a view of the Shark Tank at the ABQ BioPark Aquarium. See article on page 1 for details and registration info.

Aug 8: Chapter Systems Engineering Challenge Event.

Organized by Ann Hodges, Ed Carroll, and Bob Pierson.

Event: 5:30—7:00 PM at Nexus Brewery, 4730 Pan American Freeway NE, suite D, Albuquerque. Featuring SE challenges that Chapter Members wants to collaboratively discuss with other event participants—on the nature of the challenge and a brainstorm of suggestions for overcoming them. See article on page 1 for details and registration info.

Sep 12: Agile SE Processes 201—Problem Space Derived Solution Requirements.

Rick Dove, Paradigm Shift International.

Abstract: The definition of agile systems engineering is rooted in what it does, not how it does it. What it does is respond effectively in a life cycle environment that is capricious, uncertain, risky, variable, and evolving. How it does that is a product of analyzing response requirements dictated by the nature of the life cycle environment. The design and evolution of an operationally effective agile systems engineering process is itself a systems engineering activity, one that requires an attentive emphasis on problem space characterization and ongoing evolution. This presentation will cover methods for developing and maintaining problem space characterization, and identifying and tracing the life cycle response requirements dictated by that characterization. If you don't know where you are going, any road will do. Process examples analyzed in the INCOSE Agile Systems Engineering Life Cycle Model project will demonstrate the application of these methods. ∞

Not For Women Only

Heidi Hahn, Los Alamos National Lab

As some of you may know, I run a program here at Los Alamos called Future Female Leaders in Engineering (FFLIE), which is a pipeline program for undergraduate female engineering majors that gives participants summer internships and specialized professional development and networking activities, then pays for their graduate education through their Masters degrees, before bringing them on as regular employees.

I will be presenting a paper on the professional development curriculum for the first year students, titled *What Can You Learn About Systems Engineering by Building a Lego™ Car?*, at IS2018. Here's an excerpt of the abstract: During their first year, FFLIE students receive training on LANL's Mission Assurance Program, which involves the integrated application of systems engineering, project management, and engineering quality and rigor to ensure mission success.

The instruction is organized around the system development project life cycle and emphasizes activities and artifacts associated with the various life cycle phases. A home improvement project (adapted from Braakhuis, Janssen, Koudenburg, de Liefde, Malotaux, Rens, and Stevenson, 2010) with cartoons that animate the scenario is used in a series of table-top exercises to illustrate various points. The training culminates with a project—building a car for a Lego™ Derby race—on which the students demonstrate skills they had just learned in the classroom instruction.

The paper briefly reviews the instructional content, with an emphasis on the activities and artifacts exercised in the Derby project; provides lessons learned; and concludes that there's a lot one can learn about SE by building a Lego™ Derby car if the experience is properly structured! Overviews of FFLIE students' learnings about requirements, measures of performance, trade studies, and verification and validation are provided.

A few of the take-aways:

- It is harder to write a good set of requirements than you would think, and you only gain an appreciation for this after you've tried to do it.
- Write measures of performance (MOPs) as you develop requirements; if you can't write a MOP for a requirement, the requirement is probably not well specified.
- It pays to develop measures of performance that can be verified early in the development process as well as after the product has been realized—an extension of the measure twice, cut once principle.
- Trade studies don't have to be scary – we're doing them all the time in our heads! SE just asks that they be documented.
- Configuration management doesn't have to be scary, either—put a date on the cocktail napkin you hatched your idea on and paste it into your lab notebook; make changes in a different color and initial and date them as well.
- Take care to ensure that verification measurements are accurate indications of the characteristic being verified—one racer was disqualified for failing to meet the ground clearance requirement after she had verified the dimension at a place that was not the lowest part of the car.

This project would be easily transferrable to teaching middle schoolers SE concepts without using a lot of jargon. And, with some slight modifications to make it less girly-focused, it could be equally appealing to girls and boys.

I can make the materials available to anyone who wants them—though not with the supplies needed to make the cars!

Come to the IS presentation (Monday, July 16 at 11:30 am) or contact me at hahn@lanl.gov to learn more. ∞

Join Up! Empowering Women as Leaders in Systems Engineering

Alice Squires, EWLSE Chair

We invite men and women to join EWLSE to advocate for women as leaders in systems engineering.

Sign-up through www.incose.org and be added to the EWLSE email distribution list and gain access to the Empowering Women area on INCOSE Connect.

- Login to your member account.
- Select Welcome <your name> top right.
- Select Profile Home.
- Scroll to My Committees/Working Groups and select Browse/Join a Working Group.
- Select 'Empowering Women.
- Scroll down to Committee Tasks and select Join this Working Group.

∞

What Does a Scientist Look Like?

When asked to draw a scientist, school-age kids in the United States are increasingly sketching women. That's the main conclusion of a new study that compiled information about 20,860 pictures drawn by students age 5 to 18 over 5 decades. http://onlinelibrary.wiley.com/doi/10.1111/cdev.13039/full

In the 1960s and 1970s, less than 1% of students depicted scientists as female. But the percentage of women in the "draw a scientist" sketches—like the one pictured, drawn by a third grade girl in San Antonio, Texas—has reached an estimated 34% by 2016.

When looking at drawings penned by girls: About 1% drew women in the first 2 decades—but in the past decade more than half have drawn women, reports *Child Development*. ∞

Systems and Software Interface Working Group

Stu Bergstrom, Gentex Corporation and Member SaSiWG

The charter has been granted, and the campaign begins! The Systems and Software Interface Working Group (SaSIWG) has embarked upon a new endeavor. The goal: to develop a set of principles and guidance for identifying, and reducing, the risks arising from the interfaces between systems and software engineering.

Systems engineers and software engineers work in parallel or in sequence on innumerable products across every industry, but ensuring the two are working in concert presents myriad challenges. In many organizations, roles and responsibilities are not clearly delineated between disciplines, resulting in wasted effort (at best) and technical gaps and misunderstanding (at worst). In the longer term, these blurred lines can result in lasting disharmony, increasing even further the chances for issues to develop.

On the bright side, the systems engineering and software engineering disciplines are ripe with opportunities to find common ground.

Enter the SaSIWG working group. Its purpose has been formalized as a mission "to understand, clarify, and work to resolve issues with the systems-software interface that challenge our ability to engineer today's and tomorrow's systems. These interfaces include physical, logical, data, and human aspects." The need for an INCOSE working group to identify solutions to the system-software interface was identified as one of the top six needs of Corporate Advisory Board members.

It must be noted that SaSIWG does not include in its scope the integration of systems engineering and software engineering; it will address instead the challenges associated with the interfaces between the distinct disciplines.

The SaSIWG is co-chaired by Sarah Sheard, Ph.D (Software Engineering Institute at Carnegie Mellon Univerity), Mike Pafford (Whiting School of Engineering at Johns Hopkins University), Edmund Kienast (Australian Digital Health Agency), and Joe Marvin (Prime Solutions Group, Inc.)

"Having worked in organizations whose first name was 'software' for 16 years, I have seen closely many discrepancies in what systems engineers and software engineers assume and know, in addition to how they feel about the other's tasks and work," Dr. Sheard offered when asked what motivated her to take a lead within the group. "Many of these are problematic, and I want to move INCOSE to grasp the problem and own it, rather than be dragged around by the problem as it gets bigger."

The roots of the SaSIWG took hold through discussions at the INCOSE 2017 International Symposium in Adelaide, Australia. Following the Symposium, SaSIWG members elaborated the motivation for such a working group and identified key points of consternation in a paper entitled "INCOSE Addresses Systems and Software Interfaces". The group will present the paper at the 2018 International Symposium in Washington, D.C.

During the INCOSE 2018 International Workshop (IW2018) the SaSIWG continued expanding upon the points raised in the paper. The group began formulating a survey that they will use to collect best (and worst) practices as well as general observations about how systems and software engineers (and departments) interact in various industry organizations. The survey will be targeted not just at software engineers and systems engineers already working closely with software, but also at INCOSE Corporate Advisory Board (CAB) members and members of other INCOSE working groups.

The SaSIWG further plans to develop probing material, some of which might be submitted for publication in many venues, including the INCOSE Insight Magazine, providing digestible and applicable guidance and analysis. Topics could include:

- the impetus for tackling the systems-software interface challenge
- teaching software engineering to systems engineers – and vice-versa
- case studies of successful – or not – interactions between systems and software engineers
- relationship between Systems Engineering and Software Engineering Bodies of Knowledge
- similarities and differences in systems architecture and software architecture techniques
- facilitation of the systems-software interface through effective tools usage
- best practices in hand-off between disciplines in formal processes

At IW2018, the keen awareness of challenges in the systems and software interface rallied over 20 IW attendees into active participation in the nascent working group. In fact, membership already approaches 50 INCOSE professionals, including 27 core members who have committed to spend at least 5 hours per month progressing SaSIWG goals. During IW2018, the SaSIWG identified opportunities for collaboration with other working groups including MBSE Patterns, Object Oriented Systems Engineering Method, Architecture, Tools & Database, and Agile SE.

The Systems and Software Interface Working Group is off to a running start, and it needs your help. The SaSIWG is looking for more INCOSE members to help achieve its goal of improving systems-software interaction. Intermediate to expert level systems engineers in both process development and product development roles can get involved immediately by contributing your observations on this interaction in your current and previous organizations. Experience performing software engineering is especially valuable. Knowledge of INCOSE working group processes in general will help ensure progress in the right direction.

There's no need to wait until the INCOSE 2018 International Symposium to get involved. The SaSIWG meets monthly by teleconference, with regular attendance by members from the United States, Europe, and Australia.

Contact any of the SaSIWG Co-chairs by e-mail to get on the next call:

- Sarah Sheard, Ph.D, sheard@sei.cmu.edu
- Mike Pafford, mepafford@verizon.net
- Edmund Kienast, edmundkienast@bigpond.com
- Joe Marvin, JoeMarvin@psg-inc.net

"I want to establish the SaSIWG as a center of expertise in these interfaces," Dr. Sheard remarked. "I would like to understand patterns of system-software interfaces, and put out products that systems engineers can use to educate themselves and their work groups about software—so they can stay in charge of the big picture."

For more information on the Systems and Software Interface Working Group (SaSIWG), including a pre-symposium sneak peek at the SaSIWG paper, "INCOSE Addresses Systems and Software Interfaces," please visit the SaSIWG space on INCOSE Connect HERE

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An MBE Manifesto

Ed Carroll, Sandia National Labs

In April, 2018, a small group of systems engineers, scientists, and researchers assembled at the 19th International Federation for Systems Research (IFSR) Conversation in Linz, Austria, to use systems analysis methods to model a Systems Engineering approach that would optimize modern model-based engineering methods and tools.

One result of that Conversation was a manifesto on model-based engineering. The purpose of the manifesto is to summarize and make explicit key values and principles motivating the transformation to model-based engineering (MBE). While we started with the concept of model-based systems engineering, we now feel that the values and principles in the manifesto are relevant to all engineering disciplines. We will present the manifesto at the upcoming 2018 INCOSE International Symposium, with the specific intent to seek feedback and input from across the INCOSE community.

The IFSR Conversation

Conversations were introduced by Bela H. Banathy around 1980 as an alternative to the classical conferences. In a Conversation a small group of scientists meets for several days to discuss in a self-guided way a topic of scientific and social importance. No papers are presented; the participants discuss their topic face-to-face. Teams of four to eight members meet for five days to develop conceptual models and intensify their understanding of the session topic. After the Conversation the teams document their findings in the proceedings of the Conversation. The manifesto is the output from the sesson that discussed Data Driven Systems Engineering Approaches at the 2018 Conversation.

Data Driven Systems Engineering Goals

This Conversation session explored the application of analytic and modeling techniques to the Systems Engineering problem space. Systems Sciences can be described as the application of a systematic approach (systems thinking) that includes tools and techniques from systems analysis, data analysis, computer science, efficiency/ecology, human factors, systems dynamics, and complexity theory towards topics in nature, society, health, and engineering.

The application of systems science toward engineering the total system, particularly the analysis of high fidelity data to drive engineering decisions in complex systems, systems of systems, and massively complicated systems is of particular interest.

Research shows that many of the systems we take for granted, such as automobiles and airplanes, and the infrastructures that support these systems are becoming increasingly more complicated. The automobile of today contains over a million lines of code (LOC); an airplane can contain over 10 million LOC. At the same time, economic and political pressures are being applied to drive down cost and reduce schedules. Systems analysis and data analytic methods are being used effectively in many business use cases. Systems Engineering is held responsible for the understanding and control of complex systems.

Systems Engineering as an engineering discipline is based on assumptions from supporting disciplines such as systems analysis, systems science, and systems thinking. Therefore, it should be natural to think of Systems Engineering as being data driven. However, experience finds the contrary. Engineering programs are often based on the processes, organization, technology and product plans of previous programs, whether (or not) those past programs were successful. And little consideration is given to whether those past program processes, tools, technology, people, or organizations are optimally suited for the new product or processes.

If Systems Engineering is a true engineering discipline, then we should use our Systems Engineering methods to design our engineering programs. That is, to use systems analysis and modeling methods to systematically model and optimize the program approach.

Agenda:

In the months prior to the Conversation, the team collaborated extensively on the agenda. The final agenda that emerged encouraged conversation flowing through the S*Space paradigm, starting with the system model of the target system (S1), working upward toward the model of life cycle domain system—the system that manages the target system model (S2), and then on to the model of system of innovation—the system that evolves the life cycle domain system (S3).

Subtopics included:

- Model Credibility
- SE knowledge Representation (Ontology)
- Constraint Definition
- What is the Smallest Model?
- Using Data
- Model Patterns, or Pattern-based Systems Engineering (PBSE)
- Model Integration/Continuous Integration
- Configuration Management of Models
- Modeling Support of an Agile Method
- Culture Change—A Model-based Manifesto

We successfully culminated this weeklong conversation with a Value Statement and Model-based Engineering (MBE) Manifesto. The value statement is below.

We will nail the full manifesto (values plus principles) to the front door at the INCOSE IS 2018, in Washington D.C. We sincerely hope to start a conversation, receive feedback and input to the manifesto. While we recognize that not everyone will share our views or appreciate the nuance of our wording, our hope is that the MBE manifesto will embody our full collective values and principles on where the engineering industry is moving forward into the next decades.

Contributors:

- Edward R. Carroll, Sandia National Labs
- Dana Grisham, Sandia National Labs
- Nancy Hayden, Sandia National Labs
- Eliot Rich, University at Albany, SUNY
- Frank Salvatore, Engility Corporation
- Bill Schindel, ICTT System Sciences
- Chris Schreiber, Lockheed Martin
- Sharon Trauth, Sandia National Labs ∞

Resources

From TED, watch: *How Thinking Works*. Dr. Derek Cabera and wife Laura are the authors of *Systems Thinking Made Simple: New Hope for Solving Wicked Problems*. Derek is a recognized expert in metacognition (thinking about thinking), human and organizational learning, and education. Derek discovered DSRP Theory (watch the video). In this talk he explains the imperative for making it part of every students' life (consider yourself a student).

From TED, watch: *The Surprising Science of Alpha Males*. In this fascinating look at the "alpha male" [and the "alpha female"], primatologist Frans de Waal explores the privileges and costs of power while drawing surprising parallels between how humans and primates choose their leaders. His research reveals some of the unexpected capacities of alpha males -- generosity, empathy, even peacekeeping. "Someone who is big and strong and intimidates and insults everyone is not necessarily an alpha male" de Waal says.

From Carnegie Mellon University, watch: *Collective Intelligence*. Anita Whoolley is Associate Professor of Organizational Behavior and Theory at Carnegie Mellon University. Her research interests include collaborative analysis and problem-solving in teams; online collaboration and collective intelligence; and managing multiple team memberships. With surprising findings from data on several hundred teams, this talk is about collective intelligence, how it affects team success, and how to build smarter teams. One finding, mixed gender teams with 50% or more female members do better. Bottom line, high performing teams are based on no stars and no drags, and everyone has effective collaboration skills.

From Sci-News, read: "The brain's basic computational algorithm is organized by power-of-two-based logic," according to a neuroscientist at Augusta University's Medical College. "Intelligence is really about dealing with uncertainty and infinite possibilities," he said. "It appears to be enabled when a group of similar neurons form a variety of cliques to handle each basic like recognizing food, shelter, friends and foes." ∞

Chapter Membership

Jeni Turgeon, Sandia National Labs

Enchantment Chapter now has 87 full members and 58 student members.

We welcome the following new full members:

Dulce Barrera	Sandia National Labs
Cheryl Bolstad	Sandia National Labs
Nannan Cao	Sandia National Labs
Sebastian Quimbay Nolasco	Sandia National Labs
Jacquelyn Rambo	Sandia National Labs
Diego Vera	Stoneridge
Adam Williams	Sandia National Labs
Lauren Zuckerberg	National Radio Astronomy Observatory

We welcome the following new student members:

Mohammed Alhajry	University of Texas El Paso
Jose Hernandez	University of Texas El Paso ∞

Connect to Your Community of Practice

Chapter meetings with a focus on systems engineering are held monthly on the second Wednesday, except when social events occur, with mingling, dinner, and often a speaker chosen for enjoyment by systems engineers and guests alike.

Monthly meetings feature speakers from out-of-town as well as local subject matter experts on topics of relevance.

On occasion, special facility tours are arranged, sometimes as the monthly meeting, and other times on a separate schedule.

Chapter meetings begin at 4:45 pm. After chapter news, announcements and introductions, the presentation and discussion lasts until 6:00 pm; and are carried and recorded as a web meeting for anybody to access who can't attend in person.

Tutorials with coverage on topics of interest are arranged approximately twice a year. Delivered by experts in the field, tutorials range from 1/2 day to day+ durations, and generally involve a tuition.

Mix with people who have the same professional interests as you do, but with a diversity of perspective beyond daily workmates. It comes in handy when you need help or answers to questions outside your accumulated experience, need a connection at another organization, or simply want some mind stretching thought.

Meeting announcements, event notices, and web-meeting links routinely go to all INCOSE members within the Chapter's geographic territory; as well as to names on a special *information* list open to one and all. Sign up for the *information* list with a request to the Chapter secretary listed below. ∞

Chapter Board

Rick Dove	President	575-586-1536	dove@parshift.com
Anthony Matta	Past President	575-915-6800	armatta@sandia.gov
Jason Jarosz	VP/President Elect	505-844-6671	jpjaros@sandia.gov
Ann Hodges	Secretary	505-844-6284	alhodge@sandia.gov
Mary Compton	Treasurer	505-845-9268	mlcompt@sandia.gov
Ed Carroll	Director	505-284-2698	ercarro@sandia.gov
Heidi Hahn	Director	505-665-4606	hahn@lanl.gov
John Hunter	Director	505-284-6053	jahunter@me.com
Ron Lyells	Director	505-263-1893	rlyells@aol.com
Bob Pierson	Director	505-767-1210	bob.pierson@atacorp.com
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