

Meet the 2018 Chapter Board



Rick Dove, President—The new year starts and I have some new actions for the year on my list. More actions to come in later Newsletters, but here are three of the moment.

In 2017 our student membership increased while our regular membership decreased. I don't believe the quality of the Chapter's activity was a contributor to the decrease, as we focus on professional development with top speakers, tutorials, working groups featured in the newsletter, and the Socorro Summit. We get good marks all around: Platinum Award from INCOSE 2015 and 2016 (2017 pending), good annual survey appreciation, and little improvement suggestions from members. Perhaps it is members moving out of the territory or changing jobs.

Regardless, I would like to try something new this year to aid recruitment; but not specifically with "why you should join INCOSE" recruitment drives, rather with demonstrations of membership value directly to groups of potential members. To this end I will be proposing to the Board meaningful SE talks over lunch at local organizations, and perhaps at special Chapter free-pizza meetings as well, with a brief-only closing on Chapter membership values. I'll offer speaking topics, and hope some others will as well. And I solicit your other suggestions for meaningful demonstrations of value as well. My goal isn't growth just to satisfy INCOSE growth goals; but rather to increase value to all Chapter members with more members participating and contributing, and more diversity in the membership.

Speaking of diversity, and speaking as a male, I have become particularly sensitized with the news on gender abuse lately as well as the increased call for equality in the work place. I view all of this somewhat differently than I've heard voiced. It is an age old culturally systemic problem, perhaps ingrained when male physical prowess was important for community survival. Unfortunately that pattern of male dominance influenced many patterns of male behavior and thought that persist to this no-wooly-mammoth day. The male assumption and exercise of privilege is unconscious. For an eye opener, especially for the men, see www.ted.com/talks/michael_kimmel_why_gender_equality_is_good_for_everyone_men_included. For the value proposition for changing this, see *Innovation Through Diversity* on page 7 in this Newsletter. So what does this have to do with Systems Engineering? Think about it, and then let's do something about it – hopefully as a highly meaningful and timely Chapter project that kick-starts a broader INCOSE Systems Thinking and Engineered solution.

A related action. Of 13 Chapter Board members all are white and three are female, and the three females are among the highest contributors of time, effort, and value generation. I will work to change that ratio and racial balance. Partly that means new Board candidates need to declare their interest, and partly that means the Board needs to actively recruit appropriate candidates. ∞

Jason Jarosz, VP & President Elect



Jason is a Senior Member of the Technical Staff at Sandia National Laboratories with 9 years of experience in Systems Engineering. Jason's depth of expertise is in the use of SysML tools and MBSE methods. Jason has been an advocate for improving Systems Engineering competency at the labs and is interested in leadership, process management, and influencing the utility and integration of

MBSE tools. Prior to embarking upon a career in Systems Engineering, he worked for 5 years at Sandia as an embedded systems software developer. ∞

Ed Carroll—New Board Member

Ed is a research analyst at Sandia National Laboratories with more than 20 years experience developing data-intensive solutiolytic models for strategic decision making, economic performance analyses, and improved processes for manufacturing and supply-chain management. Ed provided strategic leadership in executive roles in business development for Online Business Systems and Agilis Solutions, as well as technology leadership as vice president of engineering for Egghead.com, director of technology at Nike, and director of software engineering at Boeing. ∞



Continuing Board Members

Bios at www.incose.org/enchantment



Anthony Matta
Sandia Labs

Tom Tenorio
White Sands



Secretary



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Ann Hodges
Sandia Labs

Mary Compton
Sandia Labs

Heidi Hahn
Los Alamos Lab

John Hunter
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Retired Honeywell

Bob Pierson
ATA

Evan Richardson
Sandia Labs

Eric Smith
UTX, El Paso



Jan 8 Abstract-Only Submission for IS18 Presentation (no paper)

Here's your chance to attend IS18 as a speaker—without the need to write a paper. Many employers will cover attendance costs if a presentation is involved.

New for the 2018 Symposium, INCOSE will take presentation-only submissions. Presentations may cover fully developed topics or work in progress. In either case, the presentations should be designed to stimulate thought and discussion around the presentation topic within the audience.

Each abstract (not to exceed 1000 words) will include:

- Description of the presentation topic and approach.
- Brief statement of the reason for submission of the topic as a presentation (not to exceed 100 words).
- Biographical sketch of each presenter (50-100 words each).

Presentations will be delivered in one of two formats: a 30 minute presentation with a 10 minute question and answer segment following, or a 15 minute presentation with a 5 minute question and answer segment following.

For details see: www.incose.org/symp2018/symposium/submit-a-presentation.

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IW18—Why You Should Go

Read the next two pages. The first shows the working group workshops you can attend, the second tells an exuberant story of a first-time IW17 attendee.

If you haven't decided about going yet, here are some things to think about ...

Unlike INCOSE's International Symposium and other conferences, there are no paper or panel presentations. Instead, attendees spend four days working alongside

fellow systems engineers. Systems Engineers at all levels and from all backgrounds are encouraged to engage in working sessions, and contribute their knowledge and experience to improve the discipline. And there are plenary sessions, town hall presentations, and of course social networking and evening socializing.

You will feel comfortable in attending any of the sessions. They are generally

informal gatherings of people interested in talking and hearing about the WG area of interest, and everyone is welcome to come and participate or simply lurk, whether officially a member of the working group or not. Activity varies, with mixtures of round-the-room discussion, presentations, break-outs, project planning, project work, project updates, and more.

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Regina Griego—Chapter Founder—Retiring from Sandia

In a recent note Regina announced her retirement from Sandia ... but not from INCOSE.

It is with mixed emotions that I announce my retirement from Sandia after more than 20 years of service. I started at Sandia in 1983 designing JTAs and other telemetry systems, left for other opportunities in 1988, and returned full time in 2002. I have worked as an engineer in some capacity since 1979 (IBM on magnetic tape drives, remember those things?) and retirement as an engineer is more of a transition.

Sandia has provided me so many great challenges and opportunities. I have many good memories and I am grateful for all the people I have worked with over the years. In particular it has been a pleasure to work on NW Strategy over the last two years with Shawn as my manager. My last day on roll is February 12, 2018, but my last day in the

office will be January 19, 2018.

I am still engaged with the INCOSE Fellows Initiative and plan to be at the IS in July. I will not be attending the IW in January. I plan to stay involved at some level in INCOSE.

My husband Mark and I will continue to maintain our permanent residence in Albuquerque. I love New Mexico and I think Albuquerque is the best city for me. We will travel, but this is home. My personal e-mail is drgriego@comcast.net should you want to send me a note at some time in the future.

Kindest farewell to all, Regina ∞

2017 Enchantment Chapter SEPs New Certs in Blue—Congratulations

Aguilar, Virginia
Bearden, Bill
Mary Compton
DeVilbiss, Nathan
Gruer, Mike
Hahn, Heidi
Hodges, Ann
Hunter, John
Todd Kustra
Matta, Anthony
McGoey, Paul
Mondragon, Oscar
Munoz, Patrick
Phillips, Tim
Smith, Eric
Turner, Rob
Young, Sharissa

Honeywell,
Los Alamos National Laboratory
Sandia National Laboratories
ATA Aerospace
Honeywell
Los Alamos National Laboratory
Sandia National Laboratories
Sandia National Laboratories
Sandia National Laboratories
Sandia National Laboratories
Retired
University of Texas, El Paso
Sandia National Laboratories
L-3 Communications
University of Texas at El Paso
Stellar Solutions
Retired Sandia National Laboratories

CSEP 05/29/2014
CSEP 03/22/2009
ASEP 10/05/2017
CSEP 10/07/2016
CSEP 09/28/2013
ESEP 05/23/2016
CSEP 08/15/2009
ASEP 08/15/2009
ASEP 04/27/2017
CSEP 07/27/2016
CSEP 03/29/2010
ASEP 10/05/2017
ASEP 10/05/2017
CSEP 01/05/2011
ASEP 05/21/2010
CSEP 04/29/2016
CSEP 12/19/2007

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IW18 INCOSE International Workshop Jacksonville — 20-23 Jan

Workshops	Sat 20 Jan	Sunday	Monday	Tuesday
Academic Council			0900-1500	1000-1200
<u>Agile Systems & SE</u>	1030-1700		0900-1700	
Americas Chapter Leaders			1300-1430	
Anti-Terrorism International				0900-1200
<u>Architecture</u>		0900-1700		
<u>Automotive</u>	1300-1500	0900-1700	0900-1500	0900-1200
Case Study (startup)			1300-1500	
Certification Exam		0800-1100		
Chapter Governance & Financial Policies	1530-1630		1300-1400	1030-1100
Competency			0900-1700	0900-1200
<u>Complex Systems</u>		1300-1700	1300-1700	0900-1200
Configuration Management			1330-1500	
<u>Critical Infrastructure Protection/Recovery</u>		1300-1730	0900-1530	0900-1030
Digital Artifacts Workshop		1300-1700	1300-1700	
<u>Empowering Women as Leaders in SE</u>			1530-1800	
Enterprise Systems			1000-1100	
<u>Healthcare</u>	1300-1700	0900-17:00		
INCOSE - PMI Alliance			1000-1100	
Integration, Verification, & Validation				0800-1000
Knowledge Management - Handbook Strategy	1530-1700			1300-1430
<u>MBSE</u>	1030-1700	0900-1700	0900-1700	09:00-1500
MBSE Challenge Team - Production/Logistics			1300-1400	
<u>MBSE Patterns</u>		1300-1700	1300-1700	
<u>Measurement</u>		1300-15:00		
<u>Model-Based Conceptual Design</u>			0900-1600	
NAFEMS-INCOSE Systems Modeling & Simulation			0900-1200	
<u>Natural Systems</u>	1030-1700			
<u>Object-Oriented SE Method</u>				0900-1200
<u>Oil & Gas</u>			0900-1700	0800-1200
<u>Ontology</u>			1300-1700	
<u>PM-SE Integration</u>	1030-1200		0900-1700	
Process Improvement - SE Implementation Guide		1500-1600	0900-1000	
<u>Product Line Engineering</u>		1400-1700		
Professional Training Initiative	1300-1430			
<u>Requirements</u>	1030-1700	0900-1700	0900-1700	0800-1200
Risk Management	1030-1700	0900-1700	0900-1700	0900-1430
Software Intensive Systems (new)		1500-1700	0900-1700	1000-1400
<u>Space System</u>		1000-1100		
<u>Systems of Systems</u>	1300-1500	0930-1500	0900-1730	0900-1330
System Safety (Startup)			0900-1600	0900-1100
<u>Systems Science</u>	1030-1800	0900-1800	0900-1800	0900-1500
<u>System Security Engineering</u>		0900-1700		
<u>Systems Thinking RoundTable</u>	0700-0800	0800-0900	0800-0900	0800-0900
Technical Leadership Institute	1030-1500	1300-1800		1600-1800
Training - Evidence Based SE	1300-1400	1300-1400		
<u>Transformation - Human-Model Interaction</u>				0900-11:30
<u>Transformation - System Engineering Principles</u>			0900-1200	
<u>Transportation</u>			1500-1630	
Very Small Entities	1300-1500			

Take the INCOSE Certification exam at IW18 **FOR FREE** (normally \$80). Sign up on IW17 registration form.
 For updates to this 21 December schedule go to the INCOSE IW17 site. ∞



First Time IW Attendee Exuberance—Uau!

Gonçalo Esteves, John Wiley & Sons



Uau! That's wow in my native Portuguese. I went to my first INCOSE International Workshop (IW) in January 2017. I learned a lot in 4 days and want to share.

For 4 years I've been part of a community that believes Systems Engineering knowledge and its utilization delivers a societal benefit. During my near 15 years of work I've met strange and complex problems, many caused by our inability or unwillingness to see things, or just because the methods were not good for the job. Well from what I've been learning the solution lies in what we are as a whole, and that is quite a thought to handle without knowing principles and methods. Thankfully we have books, courses and amazing people to help move through the chasm.

I met people that work in domains as diverse as space, standards, systems thinking, agile processes, process improvement, automotive, very small entities, healthcare, oil and gas, aerospace, quality, requirements, and at least 10 categories more! For 4 days, with more than 500 delegates, I saw new ways, old ways, and good ways of using Systems Engineering.

I participated in the Healthcare MBSE Challenge Team, focusing on medical devices (use of an infusion pump). My part was to use proper process modeling to understand how medical device manufacturers, hospital personnel, FDA, and the patient can avoid hundreds of deaths, lower double digit billion dollar waste, and ensure compliance with requirements.

Being there I felt like belonging to a club. INCOSE is a professional organization with volunteer based work from many outstanding people (the ones you see in books and others there just to help you), with chapters in many countries and collaborations with other societies and groups.

The variety of subjects and domains, diversity of people coming from all types of engineering, academia, business, and management professions, makes the IW a desirable place to be.

Learning facts – just the simple ones

I learned about a Meta System (google it!) and also engaged with the huge amount of standards that are being developed, saw

how regular people can model anything and make that a living process, discovered what isomorphic processes are and SPT (look it up), and saw an emerging way to treat questioning about infrastructure and systems in a complete and comprehensive way without using engineering(ish), IT (ish), geek(ish) or consultant(ish) ways that set stakeholders off.

The Search for Answers

Being part of the community I can also see its improvement needs. How to demonstrate consistent value of SE? How to educate a wider audience? Does the use of a modeling tool, language, and method describe a Systems Engineer? How ethics in this profession live up to the changes in the world? Is Systems Science a new philosophy of living? How do we make models accessible, usable and useful to all? Why haven't we moved yet to a more model centric approach in Engineering? How do we ensure that a Systems Thinking Philosophy and its child Systems Engineering work so that we deliver the promise of a better world? How does Systems Thinking, Systems Science and Systems Engineering live together, and how to learn this relationship as a practical living tool?

How do I know I'm asking the right questions when working (things always change)? I now have a list of books, sites, papers, and talks on things that matter.

Impressions

I've seen things that made me blush due to their immense quality, depth, and color. It made me think of past work when I could have gone deeper on the subject and not used the obvious as an answer.

In many of the IW sessions the impression was that depth was better than wide-ness and that praxis seemed common among many groups. It made me bring even more home. People do things, many things (manuals, papers, models, presentations, lists, proposals, standards) outstandingly helpful for the complexity and complication of today's projects.

Newcomer's induction

For newcomers there were practical tips delivered by our mentor, all done in a 15 minutes talk and easy follow-ups later: 1) Use the IW like a bazaar; 2) See the themes and go to the sessions; 3) Ask questions, and politely leave if you are not interested; 4) Use the corridor to make contacts engaging in conversation; 5) Go near the self-forming groups outside (they are all welcoming people and will open up

for you to enter); 6) go to the soiree and meet people, go to the bar to have talks; 7) Many things get done outside of the sessions, a paper, an "aha" moment, perhaps a project or just sharing contacts.

I believe IW is a flirtatious, enjoyable game for the purpose of learning more and experiencing advances that benefit there or later for use at work.

The conference looked a bit scary, so for the next one I believe if I sleep more and prepare more on the subjects, I can have a substantial increase in the intake. What I felt was needed is to make the communication jump and say hello, and on the other side there is great welcoming.

Inclusiveness is IW second nature

This interdisciplinary knowledge club's first nature is sharing, the second and most remarkable is an inclusive environment.

Either at the breakfast table, dinner, bar, outside areas, working group sessions, that inclusiveness thing is generally the spirit and practice. People tell their stories "Yes, our friend is an astronaut ... I've started working on a Mars project ... I came here because my CEO would like to see how our strategy stands against these methods... In the Navy we have the need to see phenomena as it is and not like the world thinks of it divided in logical blocks ... I find that I can have contacts here and also know the industry ways." The winner was "The Purpose of Systems Engineering is to do systems we Love" (after a couple hours of talk it felt like a universal law).

Being clear, you can go to a group, listen, ask some questions (no stress really, even if you are a novice), debate societal and business needs, seek clarifications from authors and domain experts, use the social circles walking in and out over a coffee or tea, and keep yourself in update/questioning/listening mode, and all of that by default and welcomed by the participants.

This was a big amount of emotions with many, many interesting talks! Having gained a lot, I've learned that this sharing exercise can be done at any level. It also shows that it is mandatory to keep moving out of the comfort zone and accept challenges when trying to find out what there is to learn. And now—**Prepare for IW 2018!**

Edited with permission from Feb 17, 2017 posting at www.linkedin.com/pulse/millionaires-knowledge-join-inclusiveness-culture-gonçalo-esteves

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2017 Socorro Systems Summit Retrospective

Rick Dove, Paradigm Shift International



Our second successful Chapter Summit, with 49 participants (51 registered). See 2017 Summit proceedings posting under Chapter website Library tab for details.

This year featured a free SEP exam with 18 participants, approximately 40% passed—names withheld but Chapter members that passed are shown on page two of this newsletter.

The after-action evaluation form asked two scorable questions: “Glad you came?” averaged 4.65 out of 5, “Do it again?” averaged 4.60 out of 5. The feedback form also asked what was liked, what was disliked, and suggestions for improvement. That full feedback is on the Chapter website under the Library Tab.

What was liked:

- KEYNOTE SPEAKER!!
- Interesting topics.
- Good collaboration process.
- Interacting with the students.
- Hearing new perspectives.
- Effective facilitators.
- Interaction of participants in work sessions.
- Sharing of personal experiences and expertise.
- Networking and the discussions.
- Doing active exercises.
- Small group interaction.
- The opportunity to speak my mind and throw my 2 cents in.
- Different opinions and perspectives.
- In depth look at the topics.
- Interactivity and contributory opportunity.
- Forum venue.
- Lots of participation and feedback.
- I was amazed at how much ground was covered.
- My expectations were exceeded!
- Interaction with experienced attendees.
- People interactions; campus setting; the technical topics; key-note speaker.

Should we do it again in 2018—perhaps with some topics geared for early-stage SEs and students? This will be decided in late January at the annual strategy Board session. ∞



Agile Security
Workshop Activity



Fail Fast Rapid Innovation Concepts
Workshop Activity



High Performance Teaming
Final Brief Out



Integrating Project Management & SE
Workshop Activity



Problem Space Risk Characterization
Final Brief Out



Quick Reaction Capability
Workshop Activity



SE as Multidiscipline Enabler, Art,
& Science—Final Brief Out



SE Cultural Transformation
Workshop Activity



Anne O'Neil—Keynoting



Ron Lyells—Bob Malins—Jim Moore (Tucson)



Recent Meetings

Ann Hodges, Sandia National Labs

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

October 2017—*Socorro Systems Summit 2017*: A collaborative knowledge exchange, co-hosted by the Enchantment Chapter and the NM Tech EE Dept., was attended by 50 participants (22 students!) at New Mexico Tech on 8 topics: 1) Systems Engineering Cultural Transformation, 2) Agile Security Adaptable to Attack Evolution, 3) SE as Multidiscipline Enabler/Art/Science, 4) Problem Space Risk Characterization, 5) Integrating Project Management and SE, 6) Quick Reaction Capability for Urgent Needs, 7) Fail-Fast Rapid Innovation Concepts and 8) High Performance Teaming. Lively discussions and networking occurred on both days.

October 2017—Dr. Donna Rhodes, principal research scientist in the MIT Sociotechnical Systems Research Center and co-founder/director of MIT's Systems Engineering Advancement Initiative, presented *Why is Human-Model Interactivity Important to the Future of Model-Centric Systems Engineering?* In our envisioned future, engineers, analysts, and decision makers immersed in highly interactive

model-centric environments using digital system models are seen as a primary basis for system decisions.

While significant progress on modeling languages, modeling practices, and modeling methods has been achieved, insufficient attention has been given to the necessary interactivity between humans and models.

In this talk, Dr. Rhodes shared findings and insights from ongoing research on human-model interactivity. The research is motivated by the need to better understand and enable effective "human-model teaming," while drawing from advancements in data science, visual analytics, and growing knowledge of complex systems. Emerging implications for practice extending from the interim findings were discussed.

November 2017—Dr. Cihan Dagli, Professor of Engineering Management and Systems Engineering (EMSE) at Missouri S&T, and Director of the EMSE Smart Engineering System Laboratory presented *Architecting Cyber Physical Systems*. Systems of the future will entail complex logic and reasoning with many levels of reasoning in intricate arrangement. The organization of these systems involves a web of connections and demonstrates self-driven adaptability. They are designed for autono-

my and may exhibit emergent behavior that can be visualized.

These complex adaptive systems have dynamically changing meta-architectures. Finding an optimal architecture for these systems is a multi-criteria decision making problem often involving many objectives in the order of 20 or more. This creates "Pareto Breakdown" which prevents ordinary multi-objective optimization approaches from effectively searching for an optimal solution; saturating the decision maker with large set of solutions that may not be representative for a compromise architecture selection from the solution space. Possible approaches that can be adapted in overcoming this difficulty in architecting cyber physical systems were discussed.

December 2017—Mary Compton, Principal Member of Technical Staff at Sandia National Laboratories, presented *Lions, Zebras and Giraffes, Oh My!* at the Chapter Holiday Social held at St. Claire Winery and Bistro. Mary described how she used systems engineering processes to plan and execute an African safari vacation. 24 participants enjoyed the talk, the snacks, the dinner, the libations and the networking provided by your Enchantment Chapter. ∞

Next Meetings *Ann Hodges, Sandia National Labs*

Jan 10: Cybersecurity for Highly Automated Physical Systems – System Aware Cybersecurity.

Barry Horowitz, University of Virginia, Chair (2009-2017) of Systems and Information Engineering Department .

Abstract: As exemplified in the 2010 Stuxnet attack, it is well recognized that cyber attackers can embed infections in electronic equipment that result in disruptions to the operation of mission critical cyber-physical systems. To combat this threat, a new set of resilience-based cybersecurity solutions is proposed to enhance the security of systems by complementing existing defense-oriented security solutions. These resilience solutions are intended to sustain the operation of critical system functions that have been successfully attacked. Cybersecurity solutions of this type must take into account the specifics of how the system being protected operates, leading to identifying the potential solutions as System Aware Cybersecurity. Based upon a series of results derived from research efforts initiated in 2010, this presentation discusses the opportunity to develop a generally applicable *Smart Sentinel* platform to facilitate the integration of reusable resilience design patterns that protect critical system functions from high risk cyber attacks. Based upon experience and specific results gained from a series of prototype-based operationally oriented technology experiments, the presentation will highlight the critical path importance of coupling research addressing human factors and system-level, model-based solution evaluation tools, to technology-focused research activities.

Feb 14: MBSE Implementation Across Diverse Domains.

Dr. Ron Carson, Seattle Pacific University, Adjunct Professor.

Abstract: This presentation discusses some necessary considerations in selecting MBSE strategy, processes, and tools. These considerations include the variety of organizational products and services, size and complexity of products and services, phases of the life cycle, and organizational knowledge and culture regarding systems engineering, modeling, and complex, data-based-driven tools. Therefore diversity itself is a multi-dimensional function of organizational history and future plans for products, services, and organizational skills. This situation is made more complicated by a desire not to compromise near-term business performance while introducing new organizational capability.

Mar 14: Systems Engineering Transformation.

Troy Peterson, System Strategy, Inc., Vice President; and Director of INCOSE's Transformation Initiative.

Abstract: While complex systems transform the landscape the Systems Engineering discipline is also experiencing a transformation to model based discipline. In alignment with this one of the International Council on Systems Engineering (INCOSE) strategic objectives is to accelerate this transformation. INCOSE is building a broad community that promotes and advances model based methods. This model based transformation is necessary to advance the discipline and handle the seamless integration of computational algorithms and physical components across domains and traditional system boundaries. This presentation will cover current and planned INCOSE activities directed at accelerating this transformation. ∞



Not For Women Only

Heidi Hahn, Los Alamos National Lab

“COACH is a grass-roots organization in the U.S. that is working to increase the scientific success and leadership capacity of women scientists and engineers. One of COACH’s most visible and high-impact activities has been its career building workshops held at several hundred universities and professional society meetings. Since its formation in 1997 over 18,000 researchers, faculty, graduate students and postdoctoral associates from across the U.S. have participated in COACH workshops. The research collaborations, leadership training, career guidance, mentoring and networking opportunities provided in these programs have been shown to greatly enhance the career progress and scientific successes of women scientists who have participated in its programs.

More recently COACH has been work-

ing with scientists and engineers in developing countries to assist in building intellectual and leadership capacity in areas of global need through two types of programs.

The first program involves creating research and educational partnerships between women scientists in the U.S. and those in developing countries through 1-3 day workshops on a scientific topic of mutual interest. Such workshops on a variety of topics have been held in Chile, Argentina, Jamaica, Morocco, Namibia, Laos and Vietnam.

The second program involves offering COACH career building workshops in-country for men and women scientists and engineers on topics that include obtaining research funding from international sources, publishing research results, communicating science effectively to international audiences, career launch and fellowship applications, negotiation and leadership techniques for teachers, researchers and administrators. Such workshops have

been held in countries such as Cameroon, Gabon, Algeria, Tunisia, Morocco, Kenya, Ethiopia, Indonesia, Thailand, India, Mozambique, China and Brazil”

Note to Enchantment Chapter Members

COACH has recently been funded by the DOE Office of Science to extend their work out of academia and into the national laboratories. They start by administering a survey to male and female scientists and engineers, then tailor their workshop offerings to address the issues at the sites identified in the survey (workshops are the second of the two programs described above). They have already been to several DOE sites (Argonne, Oak Ridge, Berkeley, Idaho) and are about to start on NNSA sites – Los Alamos is next, with Sandia sure to follow. Participation is voluntary, but the potential benefits appear to be worthwhile – this is an opportunity for those chapter members who are employees of Sandia or Los Alamos to contribute to furthering the goals of the INCOSE Empowering Women as Leaders in Systems Engineering. ∞

Innovation Through Diversity—The Mix That Matters

www.bcg.com/publications/2017/people-organization-leadership-talent-innovation-through-diversity-mix-that-matters.aspx

Eye opening research linked above makes irrefutable value proposition and case for women in engineering leadership positions. What follows is excerpted from the article.

When companies undertake efforts to make their management teams more diverse by adding women and people from other countries, industries, and companies, does it pay off? In the critical area of innovation, the answer seems to be yes. A study of 171 German, Swiss, and Austrian companies shows a clear relationship between the diversity of companies’ management teams and the revenues they get from innovative products and services.

The political framework of a country (including tax policy and laws relating to antidiscrimination and pay equality) can have a big impact on women’s willingness to work, our study shows. So can structural factors, such as the availability of child-care, and societal values, such as support for women who are career-oriented.

Less important are marketing-oriented initiatives, including attempts to celebrate individual companies’ diversity initiatives at the national level. While they may shine a light on the practices of leading companies, in most countries such awards don’t

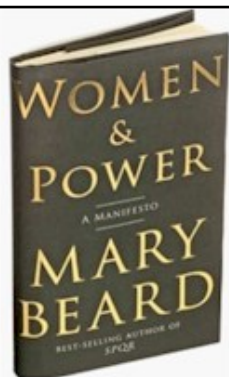
seem to have any real bearing on women’s workforce participation or on other substantive issues, such as women’s ability to receive fair pay or to advance into management.

The evidence also suggests that having a high percentage of female managers is positively correlated with disruptive innovation, in which a new product, service, or business model fully replaces the version that existed before (such as what Netflix has done to DVD rental stores and what Amazon is doing to retail.)

One thing that *doesn’t* seem to have an effect on innovation is the overall percentage of women in a company’s workforce. Only when women occupy a significant share of management positions does the innovation premium become evident: innovation revenues start to kick in when more than 20% of managers at a company are female, our survey shows.

The survey also highlights at least one sizable gap in companies’ efforts to put women in management positions and keep them there. The gap has to do with senior leaders’ commitment to gender diversity. The importance of this is obvious: even small gestures from senior leaders can have considerable influence.

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“At just a little over 100 pages, *Women & Power: A Manifesto* may seem slight, but don’t let its size fool you. This book speaks volumes.” - Sarah E. Bond, *Forbes*

“Mary Beard is a fearless writer with the gift of writing the right book at the right moment.” Diana Athill, *The Guardian*

“A sparkling and forceful manifesto...The book is a straight shot of adrenaline.” Parul Sehgal, *New York Times*

“Troll slayer.” - *The New Yorker*

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SEP Training Nearby

SEP Courses by Certification Training International:

[Course details](#) | [Course brochure](#)

Courses Nearby (but many more other places & dates):

2018 Feb 02-Mar 02	Las Vegas, NV
2018 Apr 02-Apr 06	Denver, CO
2018 May 21-May 15	Austin, TX
2018 Oct 15-Oct 19	Albuquerque, NM

Chapter SEP Mentors:

Ann Hodges alhodge@sandia.gov, Heidi.Hahn@lanl.gov ∞



December Holiday Social at the St Clair—What You Missed

Mary Compton, Sandia National Labs

For the final Chapter activity of 2017, on the 8th of December, 23 of your fellow systems engineers and their guests gathered at the St Clair Winery & Bistro in Albuquerque to celebrate the holidays. Partakers enjoyed renewing old acquaintances and meeting new ones over wine and appetizers.

A presentation summarizing the Enchantment Chapter's 2017 activities was supplied by Rick Dove. Anthony Matta, outgoing Chapter President, introduced new Chapter Board member, Ed Carroll, and the continuing Chapter Officers for 2018.

Names were drawn for gift cards for two Chapter Survey respondents. The winners were Celeste Drewin and Ed Carroll. Anthony also presented gift cards and Certificates of Apprecia-

tion to Rick Dove, Webmaster and Newsletter Editor, and Mary Compton, Treasurer and Chapter event coordinator.

After a delicious three course buffet dinner we were entertained with a lively talk presented by Mary Compton entitled *Lions, Zebras and Giraffes, Oh My! How I used Systems Engineering Processes to Plan and Execute an African Safari Vacation*. Mary discussed her use of the Systems Engineering processes she used to plan and execute an African safari, including: planning, gathering information identifying requirements and constraints, making trade-offs between options, and preparations for executing the trip. Safari photos were used to verify that the trip met her requirements and to validate that she took the right trip based on her requirements. ∞



Lilac Breasted Roller
Tarangire National Park



Lioness Moving Her Cub
Masai Mara



Cheetah on Termite Mound
Serengeti National Park



Enchantress Enchanting
St Clair Enchanteria



Why I Joined the Gang

Rick Dove, Chapter President—Those are our founders on the left, displayed at the social. My initial motivation for joining the gang was networking with them. I got involved slowly, just hanging out for the first year. But I got frustrated with the web-site, complained a lot, and realized complainers have to be fixers.

The gang I joined turned out to be a rock band. I wanted a mission, some learning challenges, and of course, peer approval. Brand respect for the Chapter became my mission. The website and then the newsletter provided a canvas to paint on that helped entice top speakers. Selfishly this was all personal professional development, but complimentary to the Chapter professional development mission for members. You, too, can take advantage of the opportunity. Join the gang. We want you. And the parties are pretty good. ∞





Model-Based Conceptual Design Working Group

Michael Vinarcik, Co-Chair, MBCD WG

The Model-Based Conceptual Design (MBCD) Working Group is one of INCOSE's Transformational Enabler WGs. It was featured in the December 2014 issue of INCOSE Insight (Volume 17, Issue 4); it "...focuses on applying MBSE during the conceptual design phase, with particular emphasis on leveraging a model-based approach from the perspective of an organization that is acquiring a system. This includes support for needs analysis, model-based specifications, and evaluation of model-based solutions. Of keen interest is the need to understand how to apply a model-based approach. This working group can help understand the relevant practices, as well as the impediments and enablers to transitioning to a model-based approach within acquisition."

The MBCD WG was founded in Australia in 2013 and has worked on several projects, including the development of plans for model-centric acquisition, an ontology, a "pain points" survey, and the development of case studies and MBCD goals. The focus of these efforts is to demonstrate practical approaches to defining the problem space, characterizing the

solution space, enumerating stakeholder needs, exploring multiple feasible concepts, and analyzing feasible solutions.

In 2014, co-chairs from the United States became active and the working group has proceeded under joint Australian/US leadership. The WG has undertaken a larger project (under US leadership): to demonstrate MBCD principles by developing a public, non-proprietary model of a notional spacecraft. Based upon published goals and objectives for the Next Generation Mars Orbiter (NeMO), this effort will use state-of-the-art modeling techniques mined from the experiences of the MBSE practitioners that are part of the working group. The model is being developed using MagicDraw and Michael Vinarcik, US co-lead, holds periodic modeling sessions to develop the model and train members on tool use and methods.

Once the model is developed, it will serve as a basis for demonstrating the utility of up-front modeling; it will allow lossless transfer of conceptual and stakeholder information to downstream systems engineering and acquisition activities. The WG intends to share this model with other WGs and solicit their feedback to improve the

information content and modeling techniques.

The Australian co-leads continue to use their connections and strong presence in the Australian systems engineering community to advance MBCD practices and represent content at conferences. They recently held a workshop on "Models across the contractual boundary" as part of the Australian Systems Engineering Workshop held in Brisbane in October.

Members of the MBCD WG will be present at the International Workshop in Jacksonville and would welcome the opportunity to network and discuss opportunities for involvement. An all-day series of meetings will be held on Monday, January 23 (dial-in will be available).

If you are interested in participating in the MBCD Working Group, please contact Quoc Do

q.do@fncaustralia.com.au,

Kevin Robinson

kevin.robinson@dsto.defence.gov.au,

Michael Waite

michael.waite@shoalgroup.com, or

Michael Vinarcik

incose-mbcd@comcast.net.

∞

University of Texas El Paso Student Division on Tour

Jorge Montes, UTEP Student Division Director

On November 16th, 2017, 17 UTEP Engineering Students departed to San Antonio, TX, where they had the opportunity to tour three different manufacturing facilities. The first stop was at the Toyota Motor Manufacturing Texas Inc. (TMMTX), which is a manufacturing and assembly facility of more than 1850 employees located in San Antonio, TX. Both the Tundra and Tacoma pickup trucks are assembled at this facility of more than 2,000,000 square-feet. The tour covered all production areas and processes (except painting and frame metal, for quality and safety reasons) and lasted approximately one hour and thirty minutes.

The second manufacturing facility visited was Avanzar Interior Technologies, which is a Tier 1 supplier of Toyota and is located right next to Toyota's production floor. Avanzar produces interior door panel assemblies, headliners, and complete seat sets for Toyota. The company is one of the best examples of what Just-In-Time really is. The minority-owned business gave students the opportunity to have a better understanding of what value-added and Just-In-Time really mean. The tour lasted approximately three hours.

standing of what value-added and Just-In-Time really mean. The tour lasted approximately three hours.

The last tour was at Mission Foods, which is a well-known Mexican food company, which mainly manufactures tortillas and chips. Students had the opportunity to better understand the safety measures needed to comply with federal regulations and guarantee a quality product. The tour lasted approximately one hour. ∞





Resources

From UTube, watch:
Ready or Not, Here We Come...for You!
 Looking like an iPhone rollout or TED

Talk, this Public Service Announcement from StratoEnergetics is a must see on autonomous drones trained to kill a specific human target.

From TED, watch: *How can groups make good decisions?* Neuroscientist Mariano Sigman has been inquiring into how we interact to reach decisions by performing experiments with live crowds around the world. He reveals an important operable distinction from what you thought you knew about the wisdom of crowds.

Chapter Membership

Jeni Turgeon, Sandia National Labs

Enchantment Chapter now has 79 full members and 50 student members. We welcome the following new full member:

David Sais Sandia National Laboratories

We welcome the following new student members:

Ahmed Abdulmalik	University of Texas El Paso
Mohammad Abutaleb	University of Texas El Paso
Hassan Alajmi	University of Texas El Paso
Naser Alajmi	University of Texas El Paso
Faisal Alanezi	University of Texas El Paso
Bader Alharbi	University of Texas El Paso
Bader Alkandari	University of Texas El Paso
Ebraheem Almohammad	University of Texas El Paso
Fares Alotaibi	University of Texas El Paso
Abdulaziz Alrashidi	University of Texas El Paso
Miguel Castro	University of Texas El Paso
Sergio De La Rosa	University of Texas El Paso
Cesar Guillen	University of Texas El Paso
Joan Isichei	University of Texas El Paso
Sergio Luna	University of Texas El Paso
Valeria Martinez	University of Texas El Paso
Omar Yair Osuna Escobedo	University of Texas El Paso
Adolfo Rubio	University of Texas El Paso

From TED, watch: G.T. Bynum, the 40th Mayor of Tulsa, Oklahoma, discusses *A Republican mayor's plan to replace partisanship with policy*. A real eye-opener. In a funny talk, Bynum shares how he tackled his city's most pressing issues with data and evidence, saying we need to set aside philosophical disagreements and focus on the aspirations that unite us.

From TED, watch: A practical way to help the homeless find work and safety. Albuquerque Mayor Richard J. Berry applied systems thinking when he saw a man on a street corner holding a cardboard sign that read "Want a job." He and his staff started a citywide initiative to help the homeless by giving them day jobs and a place to sleep -- and the results were incredible.

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
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