



Meet The 2014 Officers



Ann Hodges, President—Ann is starting on her 40th year at Sandia National Laboratories, and is a Certified Systems Engineering Professional. She has a BBA and M.S. in Computer Science from the University of New Mexico. She has over 25 years of experience in systems engineering, software engineering, tailorable policy/practice definition, risk management and project management. She is the Defense Systems and Assessments (DS&A) Strategic Management Unit's (SMU) Mission Assurance systems engineering lead, led the DS&A's PDMLink product data management system design and implementation, led several satellite-related lessons learned analyses, and led the systems engineering-related part of the DS&A SMU Mission Assurance framework. Previously she was the requirements engineering lead on the Nuclear Weapons Complex

transformation requirements for NNSA headquarters' (NA-10) Defense Programs, as well as a team member of the Advanced Strategic Computing requirements engineering effort. She also performed a variety of special analyses, strategic planning and integration activities for NNSA headquarters. Ann helped enrich Sandia's policy on software quality engineering to address CMMI Level 4 using a graded approach, has coordinated software quality engineering training and assessments, and was test and V&V manager for projects/programs such as WIPP, Hanford waste management/storage, Advanced Atmospheric Research Equipment, Advanced Simulation and Computing, corporate business applications, FAA inspector system, and Air Force seismic treaty verification system.

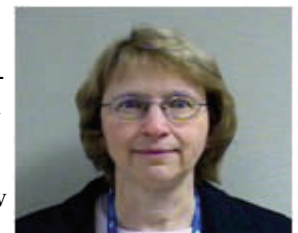
Vision for the Chapter: I want to continue building on the strengths of the Chapter and address some gaps. We have successfully utilized the webinar capability of GlobalMeet, with 8 of 11 of our Chapter talks delivered by remote speakers. This kind of support allows a tremendous expansion of speaker possibilities as well as flexibility for our presenters. This helps us overcome the impact of our large geographic distribution of the Chapter. We have started to include job opportunities in our Chapter Newsletter, and will continue to share opportunities – both career and educational – as we become aware of them. For the coming year, I'd like to focus on outreach – to other INCOSE Chapters, INCOSE Americas Sector, and other professional societies in our region. We currently have a student chapter at UTEP; I'd like to see further expansion to other universities in the Rio Grande "corridor". I want to understand how the Chapter can help you and your career. Feel free to contact me to share your ideas concerning how the Chapter can better serve you, suggestions for speakers and tutorials, and other concerns. ∞

Rick Dove, Vice President, President Elect—Rick has a BSEE from Carnegie-Mellon University, spent his early career as a software systems developer, and then gravitated to start-up and turn-around management. He is CEO of Paradigm Shift International, partner in Kennen Technologies, and adjunct professor at Stevens Institute of Technology. He was co-PI for the 1991 OSD/Navy funded project at Lehigh University that introduced the concept of agile enterprises and systems, and led the subsequent Agility Forum research activity funded by DARPA/NSF. He then organized and led independent collaborative research that identified and developed design principles for agile systems in general, and authored *Response Ability: The Language, Structure, and Culture of the Agile Enterprise*, Wiley 2001. Rick chairs the Agile Systems & Systems Engineering working group and the Systems Security Engineering working group. ∞



Jennifer Turgeon, Secretary—Jennifer is a Principal Member of the Technical Staff at Sandia National Laboratories (SNL). She has worked at SNL for 8 years and previously worked at Lockheed Martin and Honeywell Federal Manufacturing & Technologies. She is a certified Capability Maturity Model Integration (CMMI) Lead Appraiser, and has experience incorporating this model into systems and software engineering environments. Jennifer is also a Six Sigma Green Belt and a certified Scrum Master and Scrum Product Owner. She holds a BS in Computer Science and an MS in Industrial Engineering. She is currently a doctoral candidate in Systems Engineering at Colorado State University. ∞

Mary Compton, Treasurer—Mary has worked at Sandia National Laboratories (SNL) since 1990. She has a BS in Biology, a Masters in Library Science, a Masters in Education in Science Education, and an MS in Software Engineering. Mary started at SNL as a librarian in the Technical Library. In 2001 she transferred to the Science and Engineering Information Systems group as a systems analyst; she wrote requirements for applications that support nuclear weapons work for the NNSA (the Master Nuclear Schedule and the Weapons Information System) and SNL (the Record of Assembly and the Need-to-Know Engine). In October 2010 Mary became a systems engineer in one of the firing set organizations, and in May 2012 she transferred to a group supporting the ground station for a satellite system. Mary was Chapter Secretary 2008-2010, and became Treasurer in 2012.





IW14 INCOSE International Workshop near Los Angeles—25-28 Jan

For updates to this 20 December schedule go to the INCOSE IW14 site.

If you haven't decided about going yet, here are some things to think about ... Unlike INCOSE's annual International Symposium and other conferences, there are no paper, panel or tutorial presentations. Instead, attendees spend 4 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 take improve the discipline.

Working group meetings at IW represent about half of the meetings that occur. The other half, called "core", are associated with INCOSE committee, administration, forward planning, and networking activities. These include plenary sessions, technical operations planning, International Symposium planning with paper/panel/tutorial selections, regional meetings offering collaborating with neighboring chapters, and of course social networking. Some of these core sessions are closed for designated committee members only, but most are open.

If you haven't attended any working group (WG) meetings at one of the INCOSE International Workshops, you should feel comfortable in doing so. They are generally informal gatherings of people interested in talking and hearing about the WG area of interest. Working group activity varies, with mixtures of round-the-room discussion, presentations, break-out workshop sessions, project planning, project work, project updates, symposia on scheduled topics, and more.

Open sessions are the norm, and everyone is welcome to come and participate or simply lurk, whether officially a member of the working group or not. An excellent opportunity to learn what the WG does and decide if you want to join the group. Some WG's, like Biomedical, have closed sessions as well, so if you are a member of a WG you might find additional sessions in the full listing.

All Working Groups at: www.incose.org/about/organization/ti.aspx ∞

Open WG/Workshops	Sat 25Jan	26-Jan	27-Jan	28-Jan
Affordability		1300-1530	0900-1130	
Agile Systems & SE			0800-1700	0800-1200
Architecture		1300-1600		
Automotive WG				0800-1130
Biomedical		1300-1500	0830-1630	
Chapters/WGs Coord	1330-1630		0900-1000	
Competency			1300-1700	0900-1430
Complex Systems		1300-1700	1300-1700	
Corp Advisory Board	1330-1530			
EMEA Chapter Leaders	1030-1200			1000-1200
EMEASEC 2014 Project	1500-1700	1039-1200	1039-1200	1030-1200
Events Info Meeting				1000-1200
Lean SE			0900-1700	
Life Cycle Management			0830-1500	0830-1200
MBSE Biomed Devices			0800-1000	
MBSE Concept Design			1300-1700	
MBSE Initiative				0800-1200
MBSE Model Mgmt			0800-1700	
MBSE PBSE Challenge			1300-1700	
MBSE Sim Interop			1000-1200	
MBSE Usability			1300-1700	
MBSE Workshop	1030-1730	0900-1730		
Measurement				0800-1000
Product Lines			0800-1200	
Requirements	1100-1700	0900-1700	0800-1700	0800-1430
SE Effectiveness		1300-1500		
SE in VSME	1000-1800	0900-1800	1000-1700	
Shared Services				1300-1430
Systems of Systems			0800-1230	0800-1230
Systems Science	1000-1800	0900-1800	0800-1700	0800-1500
Sys Sci Models Wkshp			0830-1200	0830-1200
Sys Sci Processes	1000-1800	0900-1800	0800-1700	0800-1500
Systems Security Eng		0900-1800		
Tools Integ & Interop			1300-1700	0800-1430
Transportation			1300-1430	0800-1500
Working Group Bazaar				1600-1830

IW14: Agile Systems & SE

This WG will meet 27Jan 0800-1700 and 28Jan 0800-1200 PDT with full GlobalMeet coverage. Request IW14 GlobalMeet link from rick.dove@incose.org. WG Share Point site is at: <https://connect.incose.org/tb/ASSE>.

Six Projects to review:

- 11 Essay drafts for the July 2014 INSIGHT issue will be presented by the authors for review and suggestions (most of Monday).

- The Handbook project should have final reviews completed.
- Agile Collaborative Development (lessons learned with 4 test projects).
- Systems Engineering for Software Intensive projects.
- Decision Making Guidance for Applying Agile SE.
- Agile System Engineering Fundamentals—for both agile systems and agile systems engineering .

Plus new projects to consider starting.

IW14: System Security Eng.

26 Jan 0900-1800, GlobalMeet enabled.

Review projects in process:

- The Handbook project.
- The SEBoK project (Systems Engineering Body of Knowledge).

Open major new projects.

- Security questions for the CSEP exam.
- CSEP security extension certification and exam reference document.
- An INCOSE Security Product to be built upon the Lockheed Secure Engineering Assurance Model. ∞



Recent Meetings

Jennifer Turgeon, Sandia National Labs

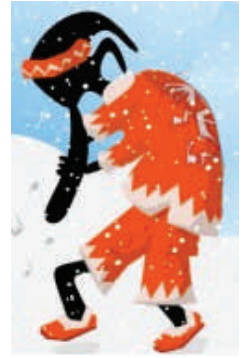
October 2013—Ron Lyells, of Honeywell Aerospace in Albuquerque, spoke to us about INCOSE's Systems Engineering Competency Model, and Honeywell's implementation. While this journey has not yet been completed, Ron shared insights and lessons learned that might be useful to other Enchantment members. This presentation briefly reviewed the INCOSE SE Competency framework, Honeywell's approach to implementation in training and in mechanisms for large scale capture of competency information, their progress to date, and their lessons learned. A copy of the presentation slides are posted on the [Enchantment Chapter](#) website.

November 2013—Dr. Amit Lopes, a Research Assistant Professor in the Research Institute for Manufacturing and Engineering Systems at UTEP, stood in for

Dr. Ricardo Pineda, who was unable to speak as scheduled. This talk illustrated how Service System Engineering can help define, and discover relationships among Service System entities, and address the service-oriented, customer-centric, holistic systems view. Amit suggested that traditional systems engineering practices need to be extended to include service systems entities and relationships. He showed how these concepts are applied across various stages to realize an efficient emergency transport operations system and an energy service provider system.

December 2012—This year's Holiday Social was at the El Pinto Restaurant on December 6. Participants enjoyed a lively conversation accompanied by drinks and a holiday buffet. The highlight of the evening was a talk by David Ackley, an associate professor of computer science at UNM, and an external professor at Santa

Fe Institute. He titled his talk Robust-First Computing: Beyond Correctness and Efficiency, entertaining all of us with a charming exploration of the conflict between efficient but fragile design and robust resilient design. Dave discussed how computer science and engineering have traditionally valued efficiency highly, at odds with robustness over redundancy. He argued we could do better, and illustrated efficiency's costs and implications for computer security and system design in contrasts to an emphasis on robustness. These views won him a "most outrageous paper" award, readable at www.usenix.org/event/hotos11/tech/final_files/Ackley.pdf.



Next Meetings

Jennifer Turgeon, Sandia National Labs

January 8: Science and Engineering Cycles in Initializing Complex Adaptive Systems

Jack Ring, INCOSE Fellow, Systemist, Educe LLC.

Abstract: We will consider the respective contributions of science and engineering in formulating a system and a way of managing their interplay for realizing exemplary systems. The generic challenges of understanding complex, adaptive systems are demystified. Then the distinctions of initializing system adaptivity are described. We close with several aspects of what all this means to your future growth options.

February 12: What Kind of Computer is the Brain?

Chris Wood, Vice President for Administration, Santa Fe Institute.

Abstract: While most scientists agree that the brain "processes information" and many would claim that the brain "computes" in one sense or another, the precise meanings of "information processing" and "computation" in those claims are unclear. In this talk I will address the questions "Does the brain compute?" and "If so, what and how?" The theory of computation is usually expressed as abstractions that are independent of any particular physical realization. However, once an abstract computation is actually implemented it becomes a physical phenomenon and the physical substrate, silicon or brain tissue for example, matters tremendously. I will focus in particular on the question of whether "computational primitives" exist for the brain that are analogous to binary arithmetic and Boolean algebra, which are the "computational primitives" of the digital architectures in our laptops and desktops with which we are far more familiar.

March 12: Simulating Adaptive Project Management

Tyson Browning, PhD, Associate Professor of Operations Management, Texas Christian University.

Abstract: Projects are temporary allocations of resources commissioned to achieve a desired result. Since each project is unique, the landscape between the current state (the start of the project) and the desired state (the successful end of the project) is often dynamic, uncertain, and ambiguous. Conventional project plans define a set of related activities (a work breakdown structure and activity network) with the assumptions that this set is necessary and sufficient to reach the project's desired result. Popular models for project planning (scheduling, budgeting, etc.) and control are also based on a set of project activities which are specified and scheduled *a priori*. However, these assumptions usually do not hold, because, as an attempt to do something novel, the actual path to a project's desired result is revealed only by the additional light provided once the work is underway. This presentation explores a product development process modeled as a complex adaptive system. Rather than pre-specifying which activities will be done and when, we set up a "primordial soup" of activities and simple rules through which the activities can self-organize. Instead of attempting to prescribe an optimal process, we simulate thousands of adaptive cases and let the highest-value process emerge. Analyzing these cases leads to insights about the most likely paths (processes) across the project landscape and the paths' costs, durations, risks, and values. The model provides a decision support capability for project managers and a basis for future studies of agile and adaptive processes.



Student Chapter at Work



Eric Smith, University of Texas El Paso

INCOSE student members were busy this Fall 2013 creating home-grown environmental solutions at the University of Texas at El Paso. Team members worked on a Bike Share System (BSS) which will provide students, faculty and staff with a new transportation alternative after the campus undergoes its Campus Transformation as part of UTEP's Centennial Celebration. BSS team members pictured above include, from left to right: Electrical Engineering student David, Eric Smith (UTEP INCOSE Advisor), EE students Jose, Mario and Ricardo, and INCOSE mem-

bers Ismael Velarde, Luis Hernandez, and Juan Pablo Fernandez, UTEP INCOSE Student Division Vice President.

Work also progressed on the Miner Recycling System (MRS), a project led by UTEP INCOSE Student Division President Juan Carlos Armenta and (pictured above) Juan Pablo Fernandez, Ismael Velarde, Michael Armendariz, Joshua Mendoza, Messina, Ricardo (not pictured below), and Electrical Engineering Lecturer Martin Lazzari. The Miner Recycling System will refurbish and re-vitalize UTEP recycling infrastructure and processes to modern standards.

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Did You Know...

Rick Dove, Paradigm Shift International

Micron, a major memory chip producer, has announced a new memory-based type of processor that can be dynamically configured in an unbounded number (with chips in parallel) of simultaneously active finite state automata. Micron calls it an Automata Processor. Analysts in early press pickup are suggesting it may have dramatic effects in biomedical, security, image processing and other applications that need to rapidly find relevance in vast quantities of streaming data.

Relevance to this Chapter newsletter is that the design patents were developed here in Albuquerque by a retired Los Alamos employee and Chapter member, Curt Harris. Curt presented his early work on the processor logic at a Chapter meeting a few years ago.

There are some suggestion that certain server farm applications may find this processor a superior alternative to conven-

New NON Von Neumann Automata Processor?

tional processors. Micron's own analysis has documented performance superior to GPUs in pattern detection tasks suitable to finite state automata approaches.

A paper and its supplement, to appear in *IEEE Transactions on Parallel and Distributed Systems*, can be found [here](#), with a good technical description of the processor's logical capabilities.

Curt's partners in this venture include three others, two known to this Chapter's members: Jack Ring and Rick Dove. Jack and Rick have been independently pursuing breakthrough applications enabled by this new technology, in anticipation of this long awaited Micron announcement. Jack's principle efforts have been directed at software code validation, Rick's at massive



security-anomaly detection and cortical-like hierarchical sensemaking in big data, with a focus at the moment on zero-day and Advanced Persistent Threat detection.

The Automata Processor will not stand alone as a conventional processor replacement, but will rather function as a coprocessor that enables solutions unsuitable to conventional processors.

For quick employment, Micron will provide the Automata Processors on a standard memory-slot insertion card.

For more info, Google "Automata Processor" for the buzz or visit www.micron.com/about/innovations/automata-processing.

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Just Thinking

Leadership in the SE World

Regina Griego, Sandia National Labs

Think about the bosses or leaders you admire. Did you like them because they were really awesome engineers, because they know your domain (like aerospace) really well, or did it have to do with other traits? Perhaps they were good at listening, or had intuition and skill at protecting, promoting or defending their staff. Well if you are like most people, around 86%, it is what is known as their emotional intelligence that distinguishes leaders.

Daniel Goldman pioneered much of the leadership development material in emotional intelligence. In engineering, it is often the case where engineers are promoted as a result of their engineering or domain expertise, and while these are important and some level of competency is expected, they do not guarantee that a person will be a good leader.

So what does this potentially mean for Systems Engineers? Systems Engineers are technical leaders. The discipline knowledge they have is usually a combination of an engineering discipline, such as Electrical Engineering, and the discipline of Systems Engineering.

There are key concepts that the Systems Engineering discipline offers that

transcends all engineering disciplines, including ways of measuring and handling complexity, and the notion of life-cycle, system boundaries, to name a few.

While Systems Engineers do not have to be experts in the domain they are working, they must work closely with people who are domain experts. It is necessary, however, that Systems Engineers are knowledgeable in the domain they work. But, engineering discipline and domain understanding are simply pre-requisites to being a good Systems Engineer.

What makes a Systems Engineer a good leader? As I reflect on people I have worked with that are good Systems Engineers and good leaders I observe the following. They create vision, momentum and buy-in; they are great at discerning patterns and use those as navigational aides; they have an uncanny intuition about what to pay attention to programmatically or technically; and they understands the limits of the people working on the project. Above all else they have an almost chameleon like sense for communication, that is, they can speak in very technical terms to an RF Engineer, and at the same time communicate the essence of a project to the customer, expertly gauging the political sensitivities.

Systems Engineers deal in complexity. There is never “the” answer; there is only an optimal answer and a less optimal answer in the moment, given a North Star vision that guides them. The answer is neither technical nor programmatic, political

nor people centric, it is all of the above.

Systems Engineers deal in risk and opportunity in all aspects of complex problems that are technical, programmatic, political, and most of all about people. Influencing people is the key in particular: developing a team where you draw out the best in people, allow them to feel challenge and buy-in and to bring their best to solutions. Also influencing how their customers understand what is possible, and creating a sense of partnership.

Influence requires a strong mental model on what is overall workable from a System Engineering perspective, but it requires fluidity in what potential solutions might finally emerge over time.

All of these aspects of being a good leader require good discipline understanding and a good sense of the domain and the goals that the domain aspires to. But most of all, a good leader requires a good sense of leadership.

Leadership in Systems Engineering is essential to navigating the complex, what seem like oppositional forces and constraints of delivering a product or capability, while creating further opportunity for a technical team.

Title does not make a leader. Having the title of manager or Systems Engineer does not make you a leader. But if you have those titles it is very important to pay attention to how you lead.

Are you a good leader? What is your SE EQ? ∞

Faculty Member Receives the Navigator Award for being a Mentor



On October 17, 2013, Rick Dove, Adjunct Professor, Stevens Institute of Technology, School of Systems and Enterprises (SSE) received the Navigator Award for ‘leading the way’ for students in systems engineering. Dinesh Verma, Dean, SSE and Michael Pennotti, Professor, SSE, presented the award to Dove at the SSE Advisory

Board Meeting.

The Navigator Award recipient is a faculty member who provides outstanding support and guidance to students in the systems engineering program. Dove, a distinguished academic and industry expert was selected by the Board for his commitment in mentoring, and in enabling an environment of excellence for the academic and professional development of his students.

In the past five years, under the guidance of Dove, students in the systems engineering graduate program have produced independent projects of brilliant quality, exemplifying the trajectory that Dove has established for his students. With Dove at

the helm, several papers presented by his students have been submitted for academic conferences, and have been published in technical journals. In June 2013, at the International Council on Systems Engineering (INCOSE) International Symposium held in Philadelphia, the Best Paper Award was presented to one of Dove’s student projects.

As Professor Pennotti stated, “Professor Dove is a glorious example of an educator who is a guiding light for his students. The fact that so many students under his mentorship have been successful is the result of a commitment to excellence, on the part of both the student and his or her faculty advisor.” ∞



Resources

From TEDx – Dr. Alistair Cockburn describes how doing design work in teams is a Cooperative Game of inventing, communicating and deciding. Along with that game come certain "rules of the physics" of working together that govern how we play the game well or poorly. [Watch:](#)

www.frequency.com/video/designing-in-teams-alistair-cockburn-at/36835733/-/5-7017272

From TED – Jaw dropping data: different hospitals produce very different results on the same surgical procedures. But patients don't know this, making choosing a surgeon a high-stakes guessing game; and different surgeons don't know this

either. Stefan Larsson looks at what happens when doctors measure and share their outcomes on surgery, to see which techniques are proving the most effective. Could health care get better -- and cheaper -- if doctors learn from each other in a continuous feedback loop? Can you believe this isn't standard operating procedure? Could system security get better and cheaper with a similar approach? [Watch:](#) www.ted.com/talks/stefan_larsson_what_doctors_can_learn_from_each_other.html

New Chapter Members

Francis Peter, Management Sciences

Enchantment Chapter now has 93 active members including 4 Senior Members. We would like to welcome the following new INCOSE members to Enchantment Chapter :

Kendal Hill	Sandia National Labs
Elaine Martinez	Sandia National Labs

The Enchantment sponsored Student Chapter of the University of Texas at El Paso currently has 13 active members. We welcome the following new student members:

Ingrid D. Flores	David Herrera
Alfonso Hidrogo	David Reyes
Carlos A. Barron Valles	

From TED – Dambisa Moyo, international economist, does an enlightening examination of China as the new idol for emerging economies, why this is, where the US differs, and how DARPA and Small Business Innovation Research (SBIR) government funding is a major national economic driver. [Watch:](#) www.ted.com/talks/dambisa_moyo_is_china_the_new_idol_for_emerging_economies.html

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Connect to Your Community of Practice

Chapter meetings with a focus on systems engineering are held monthly on the second Wednesday, except in December. The December meeting is an annual social event, with mingling, dinner, and a speaker chosen for enjoyment by systems engineers and guests alike.

Monthly meetings feature speakers from out-of-town as well as local (more or less) 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 generally lasts until 6:00 pm, carried on GlobalMeet for chapter members 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 GlobalMeet 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.

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Chapter Board

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