**June 2012**
**Volume 4, Issue 2**

2010 & 2009 Silver Chapter Circle Award Winner

2008 Bronze Chapter Circle Award Winner

# THE PRESIDENT'S CORNER

As usual I have left this till almost the last minute and I'm trying to write this column while the family tries to get ready for our annual vacation. Given that I'll need to be brief.

There have been a few exciting developments affecting the chapter over the last few months. First of all our chapter was invited to attend the annual AIAA picnic at the NASA picnic grounds. This has been a long time in the making and I hope this paves the way to more interaction with the local AIAA chapter. Thanks to Chris Pestak for helping to make this happen. In addition many of you know we have a long-standing initiative to reach out to the greater Cleveland technical community to promote systems engineering. Our efforts have been not gotten a lot of traction yet but several high profile companies have reached out to our chapter to learn more about systems engineering and we've begun a dialog with them to see how we might help each other. We'll continue to report on this as things progress.

I would also like to congratulate every one for a job well done in helping the chapter earn a silver circle award. This is quite an accomplishment for the chapter and demonstrates the chapter's commitment to furthering the goals of INCOSE.

Finally I would once again encourage everyone to come out to a chapter meeting. We have a solid lineup for the remainder of the year. In July we will be hosted by parker Hannafin at their

corporate office in Mayfield. August will see chapter members who attended IS2012 in Rome provide their overview of the symposium. Charles Wasson will be presenting a tutorial on states and modes in September. The remainder of the year will see an update from the Power and Energy Working group as well the postponed student event at Akron University in October. We'll wrap up the year with a social event in December. Hope to see you at one or more of these events.

In closing I hope everyone has a great summer. As always I am available to discuss ways in which the chapter can continue to be a valuable resource for systems engineering.

Sincerely,
Joel Knapp

# Are you published?

It has been proposed that we add a new feature to our Chapter Website to publicize the work of the authors in our midst. The Board of Directors feels it is important to recognize those of us who have authored books, papers and other system engineering related products. We would like to start by providing a bibliography of published works of our members and if they are already available somewhere electronically, we will include a link. We debated including electronic copies, if authors were willing, but that would require additional bookkeeping due to processes associated with Intellectual Property rights. So to get started, we are going to keep it simple.

If you have authored a book, paper, or other product that you would like to have listed, please email dennis.rohn@incose.org the bibliographical information and, if it is already publically available on a website, the web address for it. And for everyone, take a look at the website over the next few months as this information gets added to see the products that fellow members have produced.

# Systems Engineering Book of Knowledge

As you may have seen, version 0.75 of the Guide to the Systems Engineering Body of Knowledge (SEBoK) was released in a wiki format recently at www.sebokwiki.org. This is the third release of the SEBOK, a product of dozens of systems engineering experts from around the world. Version 1.0 is in work, but they re still accepting comments. See the wiki for more information.

This Guide to the Systems Engineering Body of Knowledge (SEBoK) defines and organizes the knowledge of the SE discipline, including its vocabulary, concepts (glossary), methods, processes (glossary), practices, and tools. It does not attempt to reprint all SE knowledge, which is far too large and dynamic to be captured in any single place. Rather, the SEBoK is a guide for the user in finding and understanding the literature about SE that has been separately published in books, articles, websites, and other generally accessible resources.

The SEBoK is one of two products being developed by the Body of Knowledge and Curriculum to Advance Systems Engineering (BKCASE) Project. The other product, the Graduate Reference Curriculum in Systems Engineering (GRCSE) uses the content of the SEBoK to define a core Body of Knowledge to be included in graduate SE curricula. The GRCSE is not a standard, but a reference curriculum to be tailored (glossary) and extended to meet the objectives of each university's graduate program.

# MBSE Tutorial being offered in Troy, MI

The Michigan Chapter is sponsoring a tutorial: An Introduction to MBSE using SysML on August 17, 2012. Sanford Friedenthal, one of the leaders in MBSE, is teaching the tutorial. This tutorial provides a high level overview of the Systems Modeling Language (OMG SysML™) and a

model-based systems engineering (MBSE) method called OOSEM. The overview of SysML includes an introduction to some of the key language concepts associated with the 4 pillars of SysML needed to describe the system requirements, behavior, structure and parametrics. The overview of the MBSE methodology highlights how systems engineering with SysML is used to perform typical systems engineering activities such as stakeholder needs analysis, requirements analysis, logical and physical architecture design, and supporting trade studies and analysis. A MBSE tool will also be demonstrated. This overview enables the participant to understand the scope of this approach to MBSE so they can begin to explore its applicability to their problem domain. For information and to register, see http://120817incosemi.eventbrite.com/.

This tutorial is being held in collaboration with the Michigan Chapter NDIA GVSETS conference (at the same venue, August 14-16).

# Paper Reviewers are Always Needed

Have you ever gone to a conference and felt disappointed at the quality of the papers presented? INCOSE needs your help to review papers for the International Symposiums. It is still several months away from when papers will be submitted for IS2013, but why not submit your name now and not at the last minute. Paper reviews typically occur during the month of December. Each paper is required to have three to five people to review it. Why not help make IS2013 in Philadelphia one of the best Symposiums yet.

If you are interested, you can submit your name to Christine.kowalski@incose.org with the following information:
1. Provide a short bio that outlines your qualifications, knowledge and experience, and nominate your subject areas. Please see below for categories (this information will be used for the paper-reviewers allocation);
2. Indicate your preference in reviewing papers, tutorial or panel, or any combination of submissions; and
3. Advise whether you have or do not have an EasyChair account. (if this is your first time, you would not)

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**NEEDS YOU!**

Categories
AS01 Transportation & Storage
AS02 Government, Defense & Security
AS03 Information & Communications
AS04 Energy
AS05 Consumer Products & Services
AS06 Biomedical, Health & Social Services
AS07 Enterprise & Environment
AS08 Infrastructure & Resource Mgmt
AS09 Other Application Sectors
SEE01 Systems Thinking
SEE02 Complexity Science
SEE03 Systems Dynamics
SEE04 Systems Science
SEE05 Requirements Elicitation & Mgmt
SEE06 Architectural Design

SEE07 System Integration
SEE08 Verification / Validation
SEE09 Transition / Operation / Maintenance
SEE10 Project Planning/Assessment/Control
SEE11 Decision Analysis / Management
SEE12 Cause Analysis
SEE13 Risk / Opportunity Management
SEE14 Configuration / Information Mgmt
SEE15 Measurement
SEE16 Reliability/Availability/Maintainability
SEE17 Logistics / Supportability
SEE18 Environmental Compatibility
SEE19 Human Factors / HIS
SEE20 Resource Management
SEE21 Safety / Security

# Recent Chapter Meetings

## March 20, 2012

Leaders of the INCOSE Power and Energy Systems Working Group (PESWG) gave two presentations:

"PESWG: IW2012 Outbrief" by John Juhasz

John reported his observations on INCOSE and the 2012 International Workshop (IW2012):

- What is INCOSE? (Mission, Vision, and Goals)
- Evolution of INCOSE Membership: Growth to 8,000 members since 1991 reflects a serious interest in Systems Engineering, and a passion for better solutions.
- The INCOSE mission is accomplished by INCOSE's Technical Operations ("TechOps") structure, which is currently supported by 39 INCOSE Working Groups.
- IW2012 had 331 attendees, representing 15 countries.
- The very popular Model-Based Systems Engineering (MBSE) Workshop attracted 170 people—more than 50% of the total IW attendees.
- The PESWG made its "IW debut" at IW2012, with ~17 people at the session.
- The PESWG Member Roster currently lists 51 people who have at least expressed interest in the activities and objectives of this Working Group.
- The PESWG Organizational Structure addresses: General (Fossil), Nuclear, Renewable, Distribution, Storage, and End Use.
- "PESWG Plans and Vision" by Ray Beach

Ray discussed:

- Why is PESWG relevant to INCOSE?
  - Energy is the engine that has driven all of man's progress.
  - Cheap energy is central to U.S. economic dominance.
  - Historically, the rapid exploitation of energy resources led to unexpected consequences. The need for effective, cradle-to-grave SE is now apparent. Thus, the PESWG Charter.
- Why is PESWG relevant to NASA GRC and the C-NO Chapter?
  - Most of the fundamental papers on power electronics resulted from work done at NASA Lewis Research Center (later, GRC), which began as NASA's Energy Conversion Center. From the days of SCRs and bipolar transistors, to MOSFETs and IGBTs, GRC has played a lead role within NASA, for power.
  - NASA's Advanced Modular Power System (AMPS) Program develops power

components that can be applied modularly, across all space vehicles. This effort addresses the problem of unique power subsystems that have been very costly and typically had short lives.

- The power architecture of the International Space Station (ISS) is similar to that of a power utility system, with multiple interconnected systems, parallel sources, large peak-to-nominal operating requirements, and multiple distribution paths to loads. Thus, the tie-in to The Smart Grid is "Advanced Power Grid Hierarchy": energy storage via battery or flywheel, dependably supplied through multiple channels of managed electrical power distribution.

- At Case Western Reserve University (CWRU), beginning in the 1960s, Irv Lefkowitz pioneered a scheme for optimizing the power grid by means of a systems-oriented computer control hierarchy. Work on advanced control functions continues at NASA GRC.

- Where can PESWG take us?

  - Autonomous Power System for Manned Deep Space Mission. This unique, very difficult application requires tremendous long-term reliability of an untended system. NASA GRC and Northeast Ohio are positioned to lead, for such advanced power systems.

  - Utilizing INCOSE and PESWG to expand beyond boundaries: terrestrial (utility, DOE); DoD; and International.

- The developing PESWG Roadmap:

  - Near Term

    - Development of the PESWG Member Roster.

    - Energy Speaker Series (sponsored jointly with CWRU).

    - IW2013: PESWG Workshop combined with NASA Workshop.

  - Mid Term

    - INCOSE Midwest Energy Conference and IECEC and JPC (Summer 2014)

  - Far Term

    - ISxx and Space Power Workshop

    - Bring the Space Power Workshop back from Los Angeles; retain as an Ohio-based workshop (Cleveland and Dayton).

- Need to develop strategy with Ohio organizations to enable regional benefits: Cleveland is the biggest growth venue in the biomedical field (the Cleveland Clinic and CWRU expanded from $50M/yr to $250M/yr, in just four years). We could do the same for power, in connection with the Smart Grid.

## April 17, 2012

This C-NO Chapter Meeting was an informal social event, held at Fat Head's Brewery & Saloon, in North Olmsted.

Though no particular program was planned, with Chuck Alexander, Ray Beach, and John Juhasz holding forth, parts of the discussion naturally centered on activities and plans of the INCOSE Power and Energy Systems Working Group.

There wasn't a dull moment during the entire dinner, which included appetizers generously provided by the C-NO Chapter (at the kind suggestion of President Joel Knapp).

## May 31, 2012

At the thoughtful suggestion of Christopher J. Pestak, the Northern Ohio Section of the American Institute of Aeronautics and

Astronautics (AIAA) kindly invited INCOSE C-NO Chapter Members and guests to the AIAA-NOS Annual Picnic, for a joint event held on the Picnic Grounds at NASA Glenn Research Center.

We enjoyed grilled bratwurst, hamburgers, chips, pretzels, beer, and soda—all generously supplied by the AIAA Section. (It was great fun to draw Holy Moses White Ale from the tap installed in the trunk lid of Chris Pestak's Brownsmobile.)

We witnessed expressions of gratitude for the AIAA Members who conduct the annual Young Astronaut Day program at NASA GRC. Ray Lugo (NASA GRC Director) attended the picnic and praised the good work of the AIAA Section.

Many thanks to Peggy Cornell and Chris Pestak, for so graciously hosting the joint picnic—a fine opportunity for INCOSE C-NO folks to meet kindred spirits in AIAA.

Photo credit: Joy Wolfe

- Bill Klinger
  INCOSE C-NO Chapter Secretary

# Did you know

INCOSE has a number of technical products that can be helpful in the formation of a Systems Engineering Team. These products include:

- Systems Engineering Capability Assessment Method
- Systems Engineering Leading Indicators
- Systems Engineering Competencies Framework And Assessments

Whether your group is new to SE or would just like to improve their SE competencies, INCOSE can help. See INCOSE.org for more information.

# Like us on Facebook

If you are on Facebook, search for Cleveland-Northern Ohio INCOSE Chapter and "like" us. And of course don't forget to check our website for information and updates.
http://www.incose.org/cleveland/index.htm

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