INCOSE Chesapeake Chapter
International Council on Systems Engineering

E-Newsletter

May 2013
• Back Issues
• Forward to Friend

President's Point of View

Systems Engineering and Community Resilience

Dr. William Ewald - INCOSE CC President
wewald@jhu.edu

We are all aware of recent disasters that have been occupying the attention of newspapers, magazines and television commentaries. Some are natural disasters such as the destruction wrought by hurricanes, tornados, and tsunamis. Others are the result of humankind such as the Newtown shootings, the fertilizer plant explosion in Texas, the terrorist bombings in Boston, and collapsing buildings. There are many others I'm sure you could name. Community resilience is a measure of the sustained ability of a community to utilize available resources to respond to, withstand, and recover from adverse situations such as natural and human caused disasters (as defined by Rand Corporation).

Community resilience depends upon a number of critical domains and elements. These include (among other domains) the community's physical infrastructure, service infrastructure, process infrastructure, communication infrastructure, legal infrastructure, social infrastructure, and economic and resource capital (Johns Hopkins University). Each of these represents a complex system at work that lends itself to a systems engineering methodology. The interaction between and among these domains complicate the situation in the sense that we now have systems of systems working in a constantly changing and frequently unpredictable fashion.

Given this complexity, there are numerous ways in which systems engineers can add value to the efforts by Federal, State and Community leaders as they grapple with the Community Resilience issue. Space dictates that we can name only a few examples. Too often, there are communication, nomenclature, and terminology disconnects within and between domains – this is true for any complex program or project – much less predicting and recovering from disasters. An essential first principle is to establish the nomenclature and terminology that support clear unambiguous communication and definition of the system(s), its functions, components, operations and associated processes. In this sense, the systems engineer must play the essential role of translator. Left to their own devices, most

In Vol. 4 Issue 5

This is the monthly newsletter for INCOSE Chesapeake, a local chapter of INCOSE International. We are a not-for-profit organization dedicated to providing a forum for professionals practicing the art and science of Systems Engineering in the Northern& Central Maryland & Southern Pennsylvania area.

Mark your Calendars with these upcoming events:

professionals (including engineers at times) are held hostage by their own histories, cultural, and language biases.

It seems to me another area that could provide enormous benefits in developing community resilience is modeling, simulation and prototyping. These techniques facilitate the development of complex and costly enabling systems which allow validation of the system's concepts, or supports training of personnel (disaster preparedness, first responders) in ways that would otherwise be cost prohibitive. Also, systems engineers use modeling and simulation to manage the risk of failure to meet system(s) mission and performance requirements. In this sense, the system engineer is a coordinator of this form of analysis that is best conducted by subject matter experts who develop and validate the models, conduct the simulations, and analyze the results. As a matter of interest, Johns Hopkins is in the process of developing a conceptual model toward a community resilience index that attempts to define resilience as the ability to continuing to function over time.

Post event functioning is viewed as an outcome (or set of outcomes) that results from structures and processes (explicit, implicit, and latent) possessed by the community. In my opinion, incorporating a systems engineering perspective would fit nicely into the Hopkins effort. Another specific effort that ties in with community resilience is the Global Earth Observing System of Systems (GEOSS) which has as its goal the achievement of comprehensive, coordinated, and sustained observations of the Earth system in order to improve monitoring of the state of the Earth, increase understanding of Earth processes, and enhance prediction of the behavior of the Earth system.

INCOSE has had a representative on this effort for many years due to the visionary perspective of our past and present INCOSE leaders. Having said the above, I believe systems engineers (and INCOSE) have a meaningful and vital role to play in the strengthening of community resiliency throughout the globe. We need to establish a beachhead in this arena, which (with some exceptions) is dominated by the academic community, think tanks, and public institutions. There is no reason why our Chapter can't take the INCOSE lead in moving this idea forward. Any takers? We've already demonstrated that we are visionaries, translators and coordinators by virtue of our Chapter members' history and experience in systems engineering.

Bill Ewald - INCOSE Chesapeake Chapter President

Return to top

Dinner/Lecture 15 May 2013 (6:00 – 8:00 pm)

Maryland Greenhouse Gas Reduction Act

INCOSE International Symposium
Philadelphia, PA
June 24-27, 2013

INCOSE International Symposium

The Chesapeake Chapter is always looking for volunteers to speak at our upcoming meetings! Please contact our 2013 Programs Director, Dr. Alex Pavlak, if you would like the opportunity to speak or can recommend someone.

The Chesapeake Chapter of INCOSE is proud to recognize the following organizations for sponsoring our endeavors to expanding the understanding and appreciation of Systems Engineering in the local area:

Booz | Allen | Hamilton

The Institute for Systems Research
A. JAMES CLARK SCHOOL OF ENGINEERING

clovis
A Division of Eliassen Group

serco
Bringing service to life

Dr. Robert M. Summers, Secretary, Maryland Department of the Environment

Presentation: Maryland's Greenhouse Gas Reduction Act of 2009 set a goal of a 25% reduction in GHG emissions by 2020. Building on an initial report by Governor O'Malley's Climate Change Commission published in 2008, the current 2013 plan, will support a green economy, improve air quality, aid in restoring the Chesapeake Bay and promote renewable energy. The Plan's 150-plus programs and initiatives will also aid in expanding the State's economy. The Regional Economic Studies Institute (RESI) analysis of the Plan finds positive economic results for both jobs and economic output for the period of analysis from 2010 through 2020 for an additional net benefit of $7.1 billion in economic output and roughly 42.7 thousand jobs. RESI uses the discipline of "Environmental Economics" to assign value to external costs that may not be included in free market analysis. **Speaker:** Robert M. Summers, Ph.D. was appointed Secretary of the Maryland Department of the Environment by Governor Martin O'Malley on April 28, 2011. Dr. Summers leads the Department's planning, regulatory, management and financing programs to protect public health, ensure a safe and reliable water supply, restore and protect air quality, water quality, wetlands and waterways, clean up contaminated land and ensure proper management of hazardous and solid wastes. Dr. Summers has served the citizens of Maryland for 28 years in various capacities within Maryland's progressive and nationally recognized environmental programs, with emphasis on scientific and technical issues related to water pollution control, drinking water protection and federal, State and local government environmental laws and regulations.

Location: **Applied Physics Laboratory, Johns Hopkins University**; 11100 Johns Hopkins Rd Laurel MD 20723 (Main Entrance – Lobby 1)

>>Download the Meeting Flyer Here<<

Return to top

Don't Miss next month's Dinner/Lecture 19 June

Logistics of Disaster Recovery

Mr. Chuck Willis

Presentation: Baltimore Gas and Electric (BGE), an Exelon Utility, distributes electric power from substations to the consumer and distributes natural gas from the City Gate to the consumer. 1999 was a pivotal year for storm and emergency planning at BGE. While Y2K contingency planning was up and running, the 1999 Ice Storm and Hurricane Floyd struck. The Y2K Team continued their work after 2000 becoming the Business Continuity Organization and institutionalizing contingency planning throughout the Company. This lecture explains the BGE Incident Command System, how it was developed and evolved over the past 13 years. A key part of the system is the Electric Delivery Emergency Response Plan (EDERP) was first released in 2000 and has evolved

This Newsletter is to serve our members and is open to all for contributions. Do you have an interesting idea for an article? A review of a new book related to engineering? Let us know. We'd love to hear about. It may wind up in a future issue of our Newsletter.

Return to top.

over the years in response to lessons learned. This lecture discusses lessons learned from Irene, one of the most severe events in BGE's history, as well as Snowmageddon, the Derecho and Hurricane Sandy. **Bio:** Chuck Willis is a Senior Engineering Technical Analyst in Electric Systems Operations and Planning at BGE. He received his BS and MS degrees in Management from University of Maryland University College. Chuck graduated from the US Navy's Nuclear Power Program and served on the USS Nautilus from 1974 through 1980. He joined Baltimore Gas and Electric in 1982 starting his career at Calvert Cliffs Nuclear Power Plant. Chuck has worked in a variety of roles at BGE including Nuclear Training, QA/QC, as the Project Manager for BGE's Federal Utility Privatization Program and as Functional Project Manager for the upgrade of BGE's Outage Management System. Chuck has spent the last several years in BGE's Restoration Services organization.

>>Check out the Event Flyer Here<<

Return to top

Did you miss last month's lecture?

Radical Leadership: Practices for Building Innovative and Adaptive Environments

Dr. Suzette Johnson

Improving innovation and increasing productivity are critical for survival in today's fast-paced working environments. To remain competitive engineering teams must deliver a continuous flow of value desired by our customers. The challenge we often face is the ability to modify culture and change behavior to exploit the practices that develop an innovative and adaptive organization focused on meeting mission success. This presentation identifies principles and practices that have been proven successful and build the foundation for innovation and adaptability.

>>Check out the complete write-up on the event<<

>>Download Presentation Here<<

Return to top.

Anne Arundel County Regional Science & Engineering Fair INCOSE Awards

Representing the INCOSE Chesapeake Chapter, Don Gantzer and Don York served as judges at the 2013 Anne Arundel County Regional Science and Engineering Fair. Over 200 students from middle school to high school presented projects. Project categories included Behavior and Social Sciences, Computer

Science, Engineering Materials and Bioengineering, Electrical and Mechanical Engineering, Energy and Transportation, Environmental Sciences, Environmental Mangement, Medicine and Health Sciences, Physics and Astronomy and Mathematics. The Chapter presented awards to the three projects which best portrayed systems thinking and a systems engineering approach to solving their problem.

The winners were:

1st Place ($100)	Kirah Strandquist	How Safe is Your Cell?
2nd Place ($75)	Emma Berger	The Clean Green Machine
3rd Place ($25)	Nabbas Mughal Kyle Yamaguchi	The Effects of Free Antivirus Programs

The Chesapeake Chapter takes an active role in its involvement in STEM (Science, Technology, Engineering and Mathematics) activities and in mentoring students. Anyone interested in participating in future Chapter STEM events please contact Don Gantzer at (410) 956-1562 dongantzer@comcast.net.dongantzer@comcast.net

Return to top.

Upcoming Events

- May 4: Agile Workshop *Dr. Suzette Johnson, Northrup Grumman Corporation*
- May 15: Maryland Greenhouse Gas Reduction Act, *Dr. Robert Summers, MD Department of the Environment*
- June 19: Logistics of Disaster Recovery, *Mr. Chuck Willis, BGE*

Keep up with the latest news and events. Find out about our new Board of Directors. Explore our extensive library of previous lectures from our Monthly Dinner Meetings. Learn of the Benefits of Joining INCOSE. Check out Systems Engineering education in the local area. All this and more awaits you at our INCOSE Chesapeake Chapter Website.

For any comments or suggestions about this newsletter please e-mail our President, William Ewald or our Communications Officer, Oren Eisner. We value your feedback.