Midwest Gateway Newsletter

International Council on Systems Engineering

INCOSE Midwest Gateway 2012 Elections

It's that time of year again, where your local chapter of INCOSE is looking for motivated Systems Engineering Leaders to become candidates to run for election to serve on the MGC of INCOSE Board of Directors (BOD).

INCOSE Midwest Gateway Leadership BOD open positions include:

President Elect – Acts as a Vice President

- 3 year commitment – president elect in 2013, President in 2014, and Immediate past president 2015.

Secretary – Takes minutes at monthly BOD meetings

2 year term, 2013-2014

2012 International Symposium, International Council on Systems Engineering (INCOSE)
By Barb Sheeley

The 2012 INCOSE International Symposium was held in Rome, Italy July 9-12. The objective of this conference is to exchange information about state-of-the-art systems engineering definition and practice. 450 systems engineers from over 50 different countries attended this year's conference. Boeing was one of two (along with IBM) platinum conference sponsors. Boeing attendees included:

- Christi Gau Pagnanelli, BDS Director of SE
- Barbara Sheeley, IPA Program Manager
- Leroy Hanneman, BCA SE Function
- Scott Occhiuto, BCA SE ATF
- Ron Carson, BDS SE TF and INCOSE Fellow
- Mike Gehringer, BDS SE Philadelphia, and INCOSE 2013 Chair
- Ben Spencer, Enterprise Exhibits.

Christi, Barb and Ron presented a paper titled "Model-Based Systems Engineering in an Integrated Environment". This paper summarizes the approach that the IPA (Integrated Product Architecture) is using to implement MBSE at Boeing. Following the presentation, many organizations, including JPL, Honda, Rockwell Collins, Israel Aerospace Industries, and EADS, approached us and indicated that they had an interest in adopting a similar approach.

High-speed rail as a mode of transportation received much attention at the conference, both as an important current technology investment and as an area of SE concentration in Europe and Asia.

A large percentage of the papers presented discussed MBSE. Most of

2012 Symposium cont'd

these presentations included use of SysML. SysML was cited as being used because "it is what is available". Eclipse and MagicDraw were mentioned most frequently as the MBSE modeling environment and SysML tool, respectively. There was much discussion around the limitations and concerns of using SysML for MBSE, including issues with tailoring and providing governance for larger programs, difficulty in coming up to speed in using it, and difficulty in using SysML diagrams as a communication vehicle. Many organizations expressed the sentiment that there are many challenges in implementing MBSE and cultural change resistance is strong.

INCOSE information, including proceedings from past symposia, are available on the INCOSE website. The 2012 symposium proceedings will also be available at http://www.incose.org/ProductsPubs/symposia/ipub.aspx

For more information, contact Barb Sheeley at Barbara.j.sheeley@boeing.com

or Ron Carson at Ronald.s.carson@boeing.com.

Elections cont'd

Director(s) – Run the MGC committees and handle special projects, Promote chapter programs (i.e. Outreach and Lunch meetings)

2 positions, 2 year term, 2013-2014

For more info on elections or to become a candidate, please contact John Headrick at john.headrick@incose.org or Mike Mobley at michael.mobley@incose.org

Latest Research on Improving Systems Engineering Highlighted at CSER2012
By Bob Scheurer

March 19-22, 2012
Hilton St. Louis at the Ballpark, St. Louis, Missouri

Recognizing the vital role that systems engineering (SE) plays on programs, universities and research organizations from around the world have been meeting annually at the Conference on Systems Engineering Research (CSER) to share individual and collective advancements. This year's 10th annual conference was hosted in St. Louis by Missouri University of Science & Technology to review "New Challenges in Systems Engineering and Architecting." Themes included Complex Systems, Model-Based Systems Engineering, Systems Thinking, Systems Architecting, Trade Space Optimization, Risk, Affordability, Energy Systems Applications, and more. A primary objective was to push the boundaries of technology and research to meet the challenges imposed by new demands in today's shifting technical and economic environments. In addition to the paper presentations, other major speakers over the three-day conference addressed subjects on "Preparing the Next Generation of Engineers", the "Workplace of Tomorrow", and contingency planning.

One of the prominent subjects of this year's conference was a detailed review of an emerging body of work called BKCASE (Pronounced "Bookcase"), or Body of Knowledge and Curriculum to Advance Systems Engineering. This collaborative effort, lead by Stevens Institute of Technology and the Naval Postgraduate School, defines a Systems Engineering Body of Knowledge (SEBoK) and a Graduate Reference Curriculum for SE (GRCSE, or "Gracey" as it's affectionately called). SEBoK, currently at V0.75, features seven (7) sections covering 28 knowledge areas discussing 121 topics with 200 primary references and a glossary of 400 terms. Meanwhile, GRCSE, currently at V0.5, has seven sections which provide Systems Engineering curriculum developers with guidance on topics such as course objectives, outcomes, entrance expectations, curriculum architecture, and assessment.

These products are intended to unify the essential understanding of SE, both as generally practiced as well as taught in Masters degree programs. All major SE professional societies, including INCOSE, NDIA, and IEEE, reportedly
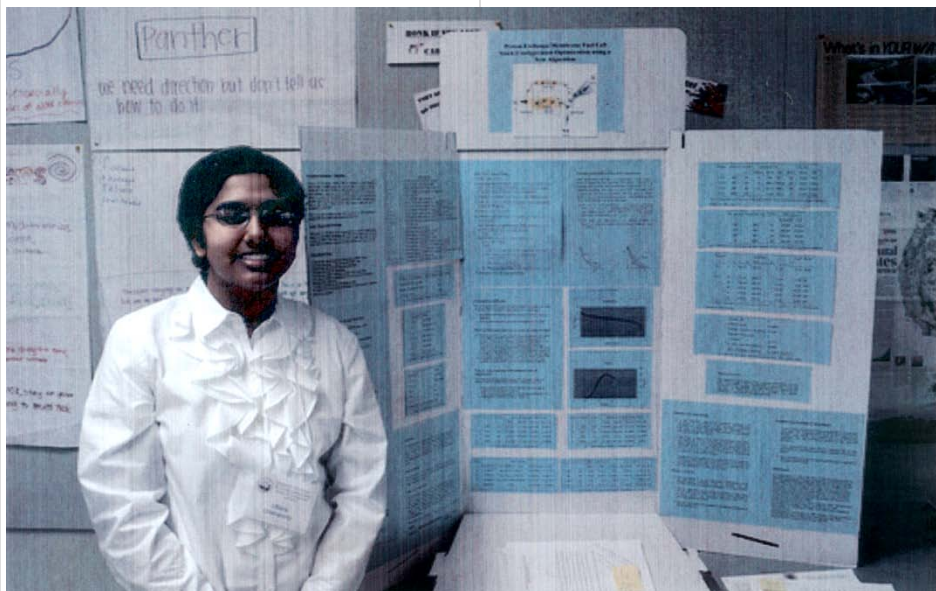
CSER2012 Sponsors

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Academy of Science St. Louis Science Fair Award
By Dale Waldo

The Gateway Chapter of INCOSE sponsored an award at this year's Academy of Science St. Louis Science Fair. The INCOSE Award was a $50 MOST Missouri 529 College Savings Plan Contribution + an INCOSE Recognition Plaque. The Award was presented to Uttara Chakraborty for her project titled *Proton Exchange Membrane Fuel Cell Stack Configuration Optimization using a new Algorithm.*

Uttara, who is in 11th grade, also went on to be awarded the Google CS Connect Award of $10,000 at the 2012 Intel International Science and Engineering Science Fair in Pittsburgh, Pennsylvania.

Uttara Chakraborty at the St. Louis Science Fair

CSER2012 Cont'd

support this work, as does the DoD, Systems Engineering Research Center, and numerous industry partners. Look for the V1 release of these products before the end of 2012. In the meantime, members of industry are invited to review and comment on the incremental releases
(ref: http://www.bkcase.org/).

Several panel discussions and many compelling papers were presented on various SE subject matter. Foremost among those were "*A Framework for Resilience Thinking*", "*Practical Measurement of Complexity in Dynamic Systems*", and "*Advancing the Development of Systems Engineers Using Process Simulators.*" For access to these and all papers presented at CSER2012, which are published in Procedia Computer Sciences and now freely available, see: http://www.sciencedirect.com/science/journal/18770509. For specific insights into the conference itself, see http://cser.mst.edu.

Quote of the Day

Acquire new knowledge whilst thinking over the old, and you may become a teacher of others.

-- Confucius

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