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Keep up with the latest news and events at our public [INCOSE TGCC Website](#)

To find TGCC Program presentations and other chapter information at [TGCC INCOSE CONNECT SharePoint](#) (member's only)

For any comments or suggestions about this newsletter please e-mail our Communications Director, [Kevin Orr](#). We value your feedback.

For any other general comments, suggestions, or questions please email to tgcc.incose@outlook.com

President's Corner

Tony Williams, Antony.g.Williams@nasa.gov

Great things happened at the 2016 INCOSE International Symposium in Edinburgh, Scotland, let me tell you all about it. But first check out the view from the hotel. (Ok, admit it – castles are cool)



I really had an exceptional experience, and participated in a variety of ways. I served as a paper reviewer prior to the symposium; as a panelist in the “practitioner challenge” – a workshop within the symposium where participants applied an enterprise architecture methodology to solve a semi-notional problem – protecting the earth from asteroids; Session chair for two papers regarding architecture development; not to mention as a attendee and participant in a number of excellent paper sessions. One highlight was that I was able to accept the 2015 Chapter Bronze Award for the Texas Gulf Coast Chapter, Kudos go to Ben Edwards, Chapter President in 2015 when we earned this prestigious award. Two topics of particular interest to me that I wanted to share: First – perhaps only in my perception – but I believe I’m observing evolution in the Model Based Engineering Community. While full end-to-end implementations with detailed SysML modeling with deep project

penetration is still a major theme, I also noted an element of ‘right-sizing’ MBSE, or MBSE-lite – where discussions included ways to simplify the MBSE data schema, for example.

This resonates well with my personal experience in MBSE within JSC projects. A Second note of interest is the inauguration of the Oil and Gas working group within INCOSE, which has obvious relevance to the Houston Texas area.

Next Year’s conference will be in Adelaide, Australia. Based on the energy and value I felt at the Edinburgh IS 2016, I feel very confident the IS 2017 is going to be the place to be in July 2017.

Two other quick notes to pass on before I end this note:

- 1) Now is the time to step forward if you are interested in leadership roles in INCOSE TGCC for 2017. We’ll be assembling our candidate platform in the next month or so. Please contact me or Robbie McAfoos, 2017 TGCC President, if you are interested.
- 2) Stay tuned – we’ll be having another joint professional society holiday mixer in December. Last year we jointly celebrated the season with AIAA, SWE, and MAST, and a good time was had by all. Looking for a repeat this year!

Regards,

Tony

TGCC Programs

Tim Brady, timothy.k.brady@nasa.gov

July 2016

Topic: [System Engineering in Healthcare at MD Anderson Cancer Center](#)

Presenter: Jeremy Meade and David Bivens from MD Anderson's Healthcare Systems Engineering Department.



We had a great turn out for this program, was delighted to have the folks from MD Anderson come inform TGCC on how they apply Systems Engineering. Really enjoy seeing the different perspectives from other industries and how we can all learn from each other.

August 2016

Topic: [What do the terms Verification and Validation Really Mean?](#)

Presenter: Lou Wheatcraft, from Requirements Experts

Lou presented to an audience of about 22 folks, all about Verification versus Validation and how they are defined to avoid using interchangeable. Lou went into the how the terms are defined by various standards. Lou engaged the audience with an interactive discussion surrounding the different interpretations and posing situational concepts of meeting one but not the other and

whether or not it can be considered a successful project.

Also at this presentation, we celebrated the INCOSE Outstanding Service Award he received at IS 2016. Lou received this awarded in recognition for his long term leadership and contributions to the Requirements Working Group including creation of the Requirements Guides.



During the August Program Tony Williams was able to present the TGCC Chapter Award to past President Ben Edwards, pictured below. TGCC received a Bronze award during the INCOSE IS based on 2015 chapter activities.



September 2016

Topic: [Systems Engineering Lessons from the Fram Expedition to the North Pole](#)

Presenter: Dr. Stan Love, NASA Astronaut



Our September Program, featured STS-122 veteran NASA astronaut Dr. Stan Love. In addition to his spaceflight experience, Dr. Love has participated in expeditions in the Arizona desert and Antarctica to research extreme environments on earth as an analog to space exploration. Dr. Love reviewed the 1893 mission by Norwegian explorer Fridtjof Nansen who set out to conquer the North Pole by deliberately trapping a purpose-built ship, the *Fram*, in the Arctic icepack and exploiting the natural movement of the ice to simply drift to 90 degrees North. In 1893, a time when most polar expeditions ended in failure and death, Nansen's team didn't reach the Pole, however the members of the expedition established a new "Farthest North" record and returned safely to be hailed as heroes. Dr. Love reviewed how the systems engineering lessons from the *Fram* expedition could be a useful model for future flights into deep space. A crowd of about 30 enjoyed Dr. Love's visual presentation. Dr Love shared that some of the interesting successes from *Fram* could be applied to a long duration space mission.



October 2016

Topic: SEing your MBSE Deployment

Presenter: David Long, Vitech Corp and INCOSE past-president

November 2016

Presenter: Dawn Schaible, NASA Deputy Chief Engineer

December 2016

Topic: Holiday Mixer

TGCC Communication

Kevin Orr, txorrhome@gmail.com



NEW: TGCC Twitter
Follow us @tgcc_incose.
This avenue will mainly be used for program announcements and cancellations.

As always contact us at tgcc.incose@outlook.com for any other chapter questions/comments.

Membership at a Glance

Kevin Orr, txorrhome@gmail.com

At the beginning of 2016 TGCC membership stands at 85 active members. Current membership is at 106 active members

We would like to start by welcoming our eight newest members that have joined in the second quarter of 2016.

Welcome new members, so glad to have you and do not hesitate to contact us with questions.

Welcome

Aiste Aleksandraviciene
Andrew Beal
Richard Broderick
David Dean
Michael Hardy
Andrei Loutchouk
Marco Lozano
Jeffery Martinez

Congratulations to our latest System Engineering Professional (ASEPs, CSEPs, and/or ESEPs), who completed the certification process this quarter. What an accomplishment.



George Salazar (ESEP)
Chun Yau (CSEP)
Cody Bryant (ASEP)

Did you know..

11% of TGCC membership is made up of active student members?

To join/renew INCOSE see: [INCOSE Membership](#)

And to join TGCC just select it as your chapter, no additional cost or commitments.

Note: Joining as a Corporate Advisory Board (CAB) member allows limited access and is not a chapter membership. Is your company a CAB member? Check here:

<http://www.incose.org/ChaptersGroups/CAB>

Spotlight– Bob Gates

Bob took out some time for us to “get to know” him.

Q: Why did you join INCOSE/TGCC?

A: I joined INCOSE/TGCC based on a career/personal development action from my Booz Allen boss. Our company is very involved in supporting and promoting System Engineering (SE) and prior to joining I had 10+ years of large scale System Engineering experience. Our company was also creating a core competency and center of excellence for System Engineering that I wanted to help mature.

Q: How long have you been an INCOSE/TGCC member? Share something from when you first joined. How is the organization/chapter different today?

A: I have been an INCOSE/TGCC member since 1997, so almost 20 years. For the first 10 years I

was not very active and attended a meeting here and there. Over the last 10 years, I have been a lot more active, becoming an Expert System Engineering Professional (ESEP) and participating as a TGCC Board member.

I have seen INCOSE change over the years, but have really noticed in the last 10 years that INCOSE has put a lot of stock at the world level and accomplished a lot universally. They have really expanded System Engineering across regions and industries, while only slightly needing to modify the System Engineering process to be more inclusive. I have also noticed the INCOSE leadership really influencing the annual goals and working to be world class.

Q: What do you expect to get out of INCOSE/TGCC?

A: I was certainly expecting a raise 😊 as the INCOSE membership and involvement was tied to one of my career/personal development goals as mentioned above. From the TGCC level, I was certainly expecting to get exposure into other industries (outside of aerospace where I am working). I have really seen the current TGCC leadership reach out to other industries as evidenced by our ever expanding monthly programs. Thru all my learning from other like-minded SE folks, the common theme is that we all have committed and work to make project/programs successful.

Q: What benefits have you seen by being a member of INCOSE/TGCC?

A: The biggest benefit that I have seen by being a member of INCOSE/TGCC is the networking benefit. I have been able to meet a lot of folks that I may have never come across had I not joined. Through the network of others I have also seen how they apply SE to their work as well as how other industries use SE tools. And with many industries seeing the reduction of budgets, I have seen how much more the industries rely on the SE processes to do more with less. Which is what many of us already knew 😊 just takes time for others to see it sometimes.

Q: Have you served on the TGCC Board? What capacity? Share the experience.

A: Yes, I am serving on the TGCC board in the Secretary position for 2016. I have found the experience to be very cool and interesting. I like being involved and help shape the chapter's vision. I find the TGCC leadership to be very professional, very passionate about SE, and full of SE experience and corporate knowledge. I have really enjoyed being part of seeing the TGCC leadership make progress against the goals that have been set out for this year.

Q: Has your Systems Engineering perspective changed since joining or being involved in INCOSE/TGCC?

A: Yes, absolutely I have grown a lot and become more structured in the SE process as well as understanding better how the SE process may be tailored for any given application. When I first joined INCOSE/TGCC, I was introduced to the "vee" model and I tried to fit everything into that model with no tailoring. Over the years I have discovered not everything has to be done if it does not make sense and based on the size/contract/complexity of the project. I have also noticed that I can put words to my experience. Before I tried to explain the SE process based on the type of work I did (as if SE only applied to aerospace), now I explain the SE process based on what it is and how it applies across multiple industries.

Q: What has been your best project to apply System Engineering on?

A: The best project I have ever worked has been the International Space Station. I have spent most of my career on this project and have seen SE applied at many phases. I am currently assisting with the next exploration phase for NASA which is the Cislunar Prephase A studies, and we are in the early development cycle with it. I am looking forward to moving into the full up System Engineering phase in the near future. I always enjoy the broad aspects that SE brings to projects, from "herding the cats", to balancing a system solution while keeping the end goal in mind.

Q: What advice would you give to new/junior System Engineers?

A: The advice that I would give a new/junior System Engineer would be to try not to shape your career based on the textbook of what a System Engineer is/does. Always look for opportunities. Capitalize on what you learned from a previous experience and roll it forward. I've always felt that you should be guided by two rules:

Rule #1: If you do not know, ask...raise your hand and say I need to know more.

Rule #2: If asked, then do all you can to help.

Q: Do you have a System Engineering Professional Certification? What level? Has that helped you in your career? Explain.

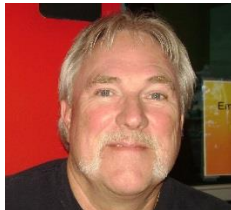
A: Yes, I currently hold an Expert System Engineering Professional (ESEP) Certification and I feel it has been beneficial to my career. Within my company I am recognized as a SE Expert and get to work on critical projects, proposals, and help others obtain SE certifications. The certification can give an increased self-worth that is not easily obtained when it's really hard to explain to folks what you do for a living.

Q: Share something fun from over the years related to INCOSE/TGCC.

A: At the time this seemed pretty fun and exciting, but looking back now it was also a bit scary. One of my first SE assignments was testing underground nuclear experiments in the desert. On one event we anticipated the yield to be about 1 megaton of equivalent TNT. It took a few months to dig the cavern, over a mile below surface thru bedrock, and set up the monitoring equipment. By design the event would seal radiation from the collapsing material around the core, it was known that the EM Pulse would shut down all the air condition units (keep in mind we were already in the dessert) and if we didn't recover our data quickly we could lose the engineering measurements of the test (keep in mind this was before Wi-Fi). We would set up at our muster station as our safe area to wait until

we got the ‘all clear’ from the radiation safety team. Well from our muster station, just a few seconds after the event, we could see the resultant shock waves 8-10 foot high, lifting the roads like ocean waves and knocking us to the ground along the way. It was amazing to see how something we think is so solid (earth) become so flexible (we kind of felt a little too close to the action so our technical planning was a bit off), after the ground motion stopped we noticed the road we had to use to recover our data received very little to no damage. It was also enlightening to see that other uses were being considered with this level of power other than destruction. We were studying how this type of event (and the resultant sink hole) could be used to create valleys for water source redirection.

Bob Gates Bio:



I have been with Booz Allen Hamilton (BAH) for 23 years working in the Manned Space Flight industry specifically on the International Space Station. My background is Systems Engineering and I’m an INCOSE Expert Systems Engineer Professional (ESEP). I have degrees in Laser and Electro Optics, Electronic Systems, Electronic Communications and Behavior Psychology. Previous to BAH I worked with Nuclear Event testing, Satellite Control and Space Shuttle Payload integration. I’m currently the BAH Program Manager on the International Space Station (ISS) Mission and Program Integration (MAPI) contract. For the past 6 years I have been helping to develop Systems Engineering capability and staff within BAH.

TGCC Highlights

TGCC at 2016 INCOSE International Symposium

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TGCC had a few members present papers at the INCOSE International Symposium.

Jason Baker and Patrick Ferraioli, presented “[Systems Architecting for a Retrofittable Subsea System Application](#)”. Below they are pictured with TGCC President Tony Williams.



Patrick Ferraioli, Jason Baker, and Tony Williams at IS

Systems Architecting for a Retrofittable Subsea System Application

Jason Baker (Transocean) - jason.baker@deepwater.com
 Patrick Ferraioli (Transocean) - Patrick.Ferraioli@deepwater.com
 Luis Pereira (Transocean) - Luis.Pereira@deepwater.com
 Abram Hudson (Barrios Technology) - Abram.Hudson@barrios.com

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Abstract. This paper highlights a model-based systems engineering (MBSE) approach tailored to the unique complexities of developing a consistent functional and physical architecture for retrofittable subsea equipment used in offshore deepwater operations. A new architecture in this application must satisfy demanding requirements in safety, reliability, availability, maintainability, retrofitability, deployment timelines, and interface compatibility. Additionally, the new architecture must be defensible against the industry’s decades-long established regulatory, cultural and technological legacies. To objectively design within these constraints, a system model was developed iteratively using both bottom-up and top-down analysis to define a complete functional and physical architecture. Inconsistencies between the functional and physical models encountered are resolved through detailed functional analysis and product realization process. The hybrid bottom-up, top-down approach employed, supports continuous stakeholder validation and requirements verification. The tailored MBSE approach and conceptual functional and physical models are presented.

Bill Haskins, presented “[Implementing a Structured Verification Framework to Improve Verification Requirements Quality](#)”

Implementing a Structured Verification Framework to Improve Verification Requirements Quality

William Haskins (Boeing) - william.r.haskins@boeing.com

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Abstract. Verification is a process for developing evidence to show that the design satisfies the requirements. The verification process starts early in a development program and the verification requirements are defined in the verification text of a requirements document, as defined in MIL-STD-961, Defense and Program-Unique Specifications Format and Content. Papers have been written to describe how to develop quality design requirements to ensure the requirements are unambiguous and verifiable, as required by ISO/IEC/IEEE 29148:2011 and related commercial and military standards, but few papers have been written to describe how to develop quality verification requirements for each design requirement. This paper describes a formal structured verification framework for developing consistent, high-quality verification requirements, which includes using specific sentence structures to write the verification requirements with mandatory and optional elements.

TGCC was presented with a Bronze chapter award at the 2016 IS for their chapter contributions in 2015. Information about chapter awards can be found at [INCOSE Chapter Awards](#).



Volunteer's needed for TGCC Systems Engineering Conference

TGCC is in the early planning stages of a one day System Engineering conference for the late spring of 2017. The conference will include participation from the newly created INCOSE Oil & Gas Working Group. The conference vision is to provide a forum for dialogue between aerospace and oil and gas SE practitioners, specifics are in work now. Volunteer opportunities are available.

If you would like volunteer to help the chapter put this on, please send us an email with your area of interest to tgcc.incose@outlook.com.

Joining TGCC Board

Robert McAfoos, robert.mcafoos@barrios.com

We are collecting nominees for the 2017 TGCC Board, if you would like to be a Board member please send an email to tgcc.incose@outlook.com and include the position you would like to fill. The current board includes the following positions: President, Vice President, Secretary, Programs, Membership, Treasurer, Webmaster and Communication. We are also considering creating additional board positions for conference leadership and for industry liaisons.