

1 PURPOSE

Expand the practice of architecture in Systems Engineering and advance the body of knowledge. Architecture is an integral part of the concepts and practice of Systems Engineering and must evolve with the ongoing advancements in Systems Engineering. Therefore a standing working group is needed to facilitate and focus ongoing advances in Systems and Systems of Systems Architecture and to support collaboration both across INCOSE and with other international bodies that have a common interest.

2 GOAL

The stakeholders of this WG are the practitioners and researchers in Systems and System of Systems Architecture. Over the past three years the ISO working group JTC1/SC7/WG42 has been a 'customer'. And on-going collaborations with the IEEE and the OMG have been established over the past two years. In the upcoming year, the AWG will also be seeking closer collaborations with other WGs and Initiatives within INCOSE.

Specific on-going goals the INCOSE AWG seeks to accomplish are:

- Advance and evolve the architecture body of knowledge
- Promote the use and practice of architecture principles in systems engineering
- Share best practices for the use of architecture in systems engineering projects
- Develop the practice of architecture within AWG members' home organizations
- Expand the effort in architecture related standards and specifications.

The goals are accomplished by establishing specific outcomes each year at the INCOSE IW.

Accomplishments and products for the previous and current year may be found in Section 6.

3 SCOPE

The AWG will address the domain of Systems and Systems of Systems Architecture as it relates to Systems Engineering and System of Systems Engineering.

4 SKILLS AND EXPERTISE REQUIRED

The skills and expertise that will be required for success include knowledge and experience in systems and systems of systems architecture and engineering. Practitioners, domain experts and researchers are all needed to support the work. Over the past six years these have been available to the AWG by drawing from a core body of members who undertake the work and its planning, and from a larger body of members who volunteer on an ad hoc basis to help the WG. The outside collaborations that have been established with the IEEE are needed to attract researchers and this has proved to be a successful strategy. The outside collaborations that have been established with the OMG are needed to give commercial impact to the WG outputs through the open specification of tools and technologies.

5 MEMBERS, ROLES AND RESPONSIBILITIES

- Lead: Professor Charles Dickerson
 - o Provide overall guidance and structure to the AWG and facilitate the standing up of and support of AWG groups in local INCOSE chapters
 - o Promote advances and evolution of the architecture body of knowledge
 - o Support architecture related standards (Chair Maths SIG in OMG)
 - o Increase the practice in AWG members' home organizations
 - o Status reporting to the Assistant Director for Knowledge
- Co-Lead: Professor Dimitri Mavris
 - o Promote use and practice of architecture
 - o Share best practices for the use of architecture
- Co-Lead: Dr. Mike Wilkinson
 - o Chair of the UK Chapter AWG
 - o Support architecture related standards and practices (Support ISO/IEC WG42)
 - o The co-lead shall be responsible to act in the absence of the lead.
- Board Sponsor(s)/Champion(s): (If applicable) <name>
 - o Responsibilities
 - o (e.g. The Board sponsor shall be responsible for resource advocacy and status reporting to the INCOSE BOD and external stakeholders.)
- System of Systems Knowledge Network: Professor Michael Henshaw
 - o Collaborative with IEEE
 - o IEEE System of Systems Engineering Conference (annual)
- Senior INCOSE members who actively participate
 - o Dr. Mark Maier
 - o Dr. James Martin
 - o Dr. Ricardo Valerdi
- Members actively making direct contributions (previous year and current)
 - o Ms. Mary Bone (IEEE/SoS)
 - o Ms. Anne Carrigy (IEEE/SoS)
 - o Mr. Glenn Callow (IEEE/SoS)
 - o Dr. Rob Cloutier (IEEE/SoS)
 - o Dr. Judith Dahmann (IEEE/SoS)
 - o Dr. Scott Duncan (IEEE/SoS)
 - o Mr. David Emery (MBSE)
 - o Ms. Kelly Griendling (MBSE/ROSETTA)
 - o Mr. Matthew Hause (MBSE/OMG)
 - o Dr. Prem Jain (IEEE SoS)
 - o Mr. Peter Korfiatis (IEEE/SoS)
 - o Mr. Mario Kupries (MDA/MBSE)
 - o Dr. Ron Williamson (MBSE/OMG)

- Mr. David Wright (TBD)
- UK Chapter AWG Members; Dr. Mike Wilkinson, Chair
 - Dr. Peter Bryant (Co-chair)
 - Mr. Dave Mawby (Co-chair)
 - Professor Stuart Arnold (Work stream Lead)
 - Dr. Michael Emes (Academic Lead)
 - Dr. Paul King (Work stream Lead)
 - Mr. Henry O’Grady (Work stream Lead)

Over the past six years the INCOSE AWG has accomplished tasks by maintaining a larger body of members who are practitioners who volunteer on an ad hoc basis to help the working group on as needed basis. Because the membership and size of this larger group fluctuates from year to year, this larger list of members has not been included in the membership list of this Charter.

6 OUTCOMES (PRODUCTS/SERVICES)

Accomplishments and products 2009/2010

- 2009 INCOSE UK Chapter Autumn Assembly Plenary
- 2010 INCOSE IW presentation to MBSE Initiative
- AWG Session in 2010 IEEE SoSE Conference

UK Chapter AWG specific accomplishments and products 2009/2010

- Z-Guide on Architecture
- Support to ISO/IEC WG42 (42010)
- Eusec 10 paper
- Academic studies into Architecture Belief Systems

Publications 2009/2010

- *The Art of Systems Architecting, 3rd Edition*. Mark Maier
- *Architecture and Principles of Systems Engineering*. Dickerson and Mavris
 - Note: this graduate level textbook shares best practices that promote the use and practice of architecture in systems and systems of systems engineering.
 - The book is based on course material and research from both universities.

Accomplishments and products 2011/2012

- Introduction of Relational Viewpoint on Systems Engineering (ROSE)
- Sharing ROSE Technology Tradeoff Analysis environment (ROSETTA) best practices
- AWG Session in 2011 IEEE SoSE Conference
- Requirements relational traceability specification with OMG
- With the IEEE establish the System of Systems Knowledge Network and support a Systems of Systems Engineering road map for research and development.

UK Chapter AWG specific accomplishments and products 2009/2010

- Work stream on Enterprise Architecture
- ‘How To’ Guide for Belief Systems
- White paper on the relationship between SE and Architecture

7 APPROACH

The INCOSE AWG meets twice yearly at the INCOSE International Workshop and the International Symposium. AWG Leadership functions in a peer relationship with decisions and responsibility by mutual agreement. Meetings are held via WebEx and Teleconference. Work streams are normally initiated by the Leadership of the WG and are then self-organized. As with all volunteer organizations, accountability cannot be dictated and we rely on the professionalism of the WG members to accomplish our goals.

The UK Chapter AWG meets quarterly at agreed upon sites in the UK. They have established their own independent but coherent approach. Continuity with the INCOSE AWG Leadership is accomplished by the Chair of the UK Chapter AWG being a Co-leader of the (at large) WG.

Future local chapter WGs will also establish their own approaches and continuity with the (at large) WG will also be accomplished by appointing the local Chair as a Co-leader of the INCOSE AWG Leadership.

8 MEASURES OF SUCCESS

The overall measures of success for the WG include the:

- Quality of the membership and its leadership
- Advances made by the WG in the architecture body of knowledge
- Utility and impact of WG outcomes to practitioners and researchers
- Quality and timeliness of products/services under development
- Number of recognized institutions and enterprises involved in the WG
- Number of local chapter WGs
- Internationalization of the WG

9 RESOURCE REQUIREMENTS

The resources required at this time are websites both public and private for managing and sharing WG information and outcomes. The best solution would be a properly structured Wiki.

10 DURATION

This Charter will remain in effect until rescinded by the signatories.

11 SIGNATURES

C.E. Dickerson

Date

31st January 2011

1st Level of Approval



Date

August 23, 2011

Technical Director, INCOSE

2nd Level of Approval (Note this will be added by the INCOSE Technical Director when deemed appropriate.)

Chairman, INCOSE Board of Directors

Date

Revision History

<u>Date</u>	<u>Revision</u>	<u>Description</u>	<u>Author</u>
31.01.2011	1.0	Initial Draft.	C.E. Dickerson