

1 PURPOSE

Initial experiences with autonomous systems, especially within the Department of Defense (DoD), have demonstrated that typical test and evaluation methods and practices are not responsive to development cycle times or end user knowledge needs and that independent and objective test and evaluation is not being sustained throughout the life cycle. The practice of systems engineering must produce not only a model of an intended system but also a set of criteria for evaluating the efficacy of such model and of the system, once realized and throughout its operational usage.

The Autonomous Systems Test and Evaluation Working Group, ASTEWG, intends to develop and promote principles, practices and examples that produce confident prediction, assessment and diagnosis of autonomous system(s) effects and capabilities, whenever and wherever needed.

2 GOALS

- Clarify the meaning and implications of autonomy, autonomous systems and systems of autonomous systems.
- Clarify the meaning of and challenges involved in independent and objective estimation, whenever and wherever, of the expected operational effects of autonomous systems and systems of systems in anticipated missions, environments and engagements.
- Identify the implications on systems praxis of creating testable autonomous systems.
- Identify the implications on systems praxis of creating test and estimation systems, whenever and wherever.
- Compile vignettes, cases and tutorials that exemplify the problematic situation and instances of useful responses.
- Measurably affect the ASTE knowledge and capabilities of INCOSE members.

3 SCOPE

The ASTE WG strives to encompass as broad a spectrum of

- kinds and degrees of autonomy,
- kinds of autonomous systems usages, e.g., DoD, DHS, medical, industrial, commercial, transportation, communication, etc.,
- kinds of test and evaluation and effects estimation, and
- spectrum of practitioners who are empowered with ASTEWG knowledge and tools.

4 SKILLS AND EXPERTISE REQUIRED

The ASTEWG seeks members with:

- Expertise in SE of implicit (context sensitive) systems
- Motivation to participate in action research
- Bias toward prototyping examples

Discovery and adoption of knowledge acquisition, interpretation, production, conveyance, and utilization tools

5 MEMBERS, ROLES AND RESPONSIBILITIES

The ASTEWG leadership, members and a brief description of their responsibilities are as follows:

- Lead: Jack Ring
 - o Responsibilities: Foresight and Motivation of participants.
- Co-Lead(s): Thomas Tenorio
 - o Responsibilities: Timely status reporting to Tech Ops. Timely communication across WG. Act in the absence of the lead.)
- Co-Lead(s): Don Greenlee
 - o Responsibilities: Quality of WG products and communications.
- Board Sponsor(s)/Champion(s): Assistant Director, Technology Enablers
 - o Please see Tech Ops charter
- Members: Please see www.groups.google.com/group/astewg

6 OUTCOMES (PRODUCTS/SERVICES)

- Tutorials at 4 ITEA Conferences in 2009 and 2010
- Paper at NIST System of Systems Conference, 2009
- Paper at INCOSE-LA Mini-Conference, 2010
- Paper at NIST PerMIS Workshop, 2010
- Presentation to Enchantment Chapter, 2010
- Demonstration of selected tools, e.g. CMap
- Participation in PATFrame reviews, 2010, c.f., web.mit.edu/patframe/

7 APPROACH

- Use groups.google.com/group/astewg to include members who are not yet INCOSE members
- Develop a list of shared tenets regarding a) autonomy, b) estimation of operational effects and c) preferred ways of working in our group
- Monthly teleconference, meetings at IW and IS
- Papers, panels and tutorials at INCOSE, ITES, IEEE, ISSS, IIE and others
- Papers in appropriate journals
- Poll INCOSE members to discern trends in their awareness and appreciation of and preference for recommended principles and practices.

8 MEASURES OF SUCCESS

- Intensity of participation by members
- Variety of participants
- Effect on INCOSE members

9 RESOURCE REQUIREMENTS

Infrastructure for monthly telemeetings



INCOSE Autonomous Systems Test and Evaluation Working Group, ASTEWG, Charter

Ability to poll INCOSE members twice yearly
\$4,000 annually for stipends, two each \$2,000 stipends for guest speakers at IW and IS sessions

10 DURATION

Complete by 2015.

11 SIGNATURES

Enter the signature block of the submitter

Date

1st Level of Approval

Assistant Director, Technology Enablers

Date June 19, 2011

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

Chairman, INCOSE Technical Operations

Date

Revision History

<u>Date</u>	<u>Revision</u>	<u>Description</u>	<u>Author</u>
	1.0	Initial Draft.	
June 19, 2011	1.1	Approved	John Nallon