A.9. Test & Evaluation: Advancing Strategy

Test &Evaluation : Advancing Defence T&E Strategy. Testing is a well-established systems engineering process, but systems assurance across the integrated capabilities for Defence are becoming more challenging. This stream invites contributions that realize the complexity of integrated force packages drives a need to improve T&E of systems-of-systems at Joint Force Level.

Lead: Contact the Technical Committee if you can assist in Chairing this session
Domains: Defence, Test & Evaluation, Strategy

Submissions Summary:

1. Decision-Supporting Capability Evaluation throughout the Capability Development Lifecycle (Full Paper)
2. Advance Modeling and Simulation in Acquisition Test and Evaluation (Full Paper)
3. A T&E Code of Practice advancing in an emergent digital world (Panels and Workshops)
4. UAS Test Ranges - Design concept for flight test ranges & access pathways (Paperless Presentations)
5. The Defence Test and Evaluation Strategy (Paperless Presentations)
6. Advancing Digitally Enabled T&E (Paperless Presentations)

20598 Decision-Supporting Capability Evaluation throughout the Capability Development Lifecycle

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Keywords: decision support,evaluation,T&E continuum,model-based systems engineering,operational & technical capability evaluation

Type: Full Paper
Stream submitted: A.9. Test & Evaluation: Advancing Strategy

Overview: For T&E to provide the most relevant information for developing and fielding capabilities to meet mission needs, planning should focus on gathering data for capability evaluation and decision-support. We propose an expansion of US DoD's acquisition cycle mandated Integrated Decision Support Key (IDSK) to Decision Support Evaluation Framework (DSEF) which guides a structured decision-evaluation-data critical thought process throughout the full capability development lifecycle. - Context: IDSK guides data collection from test and modeling and simulation (M&S) events for an acquisition systems operational and technical capabilities evaluation for operational, programmatic, and technical decision-support throughout acquisition lifecycle. As T&E expands outside the confines of the acquisition cycle to the full capability lifecycle, the DSEF provides the same expansion of the tests evaluation and decision-support. - Purpose: Inmoving from IDSK to DSEF, we must scale from the acquisition cycle to the full capability development cycle. The art and critical thought in developing a DSEF is properly stating the decision space (i.e., What decision needs to be made? When does the decision need to be made? What is the essence of the information needed by the decision-maker to make an informed decision?) and aligning it with the appropriate capability evaluation and data sources. We describe the decision space as a concept moves from early capability development planning, through S&T and P&E, to PoR and Operational SoS Architecture mission delivery. - Approach: Through analysis of the various stages in the capability development process, we've defined classes of decisions, decision-supporting questions, and capability evaluation strategies. - Insights: The value of the DSEF is two-fold. First, the DSEF thought process guides the capability evaluation planning focused on informing decisions. Second, the DSEF process guides wargames and exercise planning with a more rigorous focus on gathering the data needed for evaluation and decision-support.

20671 Advance Modeling and Simulation in Acquisition Test and Evaluation

Jason Daly 1, David Wells 1, Melissa Wong 1, Angel Cortes-Morales 1, Luis Cortes 2, MITRE, McLean, VA, United States Technical Solutions Division, Huntington Ingalls Industries, Corona, California, USA

Keywords: Test and Evaluation,Modeling and Simulation,Acquistion,verification and validation,digital engineering

Type: Full Paper
Stream submitted: A.9. Test & Evaluation: Advancing Strategy

Modeling and simulations (M&S) is an integral component of the U.S. Department of Defense's focus for delivering integrated, network-centric systems-of-systems (SoS) that provide the materiel solution to needed capabilities. M&S assists developers and decision makers in a wide range of technical processes like analysis of alternatives, concept development, requirements evaluation, production and manufacturing, test and evaluation (T&E), integration, training, logistics, and risk management as well as in assessing the capability over the entire operational space. M&S will continue to grow as a critical component of an overall test program strategy. In this presentation we examine the current state of M&S in acquisition T&E, as viewed from the lens of a small number of acquisition programs, and provide some useful hints to advance and get the most of its application. Specifically, we provide a perspective on the role of M&S in the T&E strategy, the sufficiency of M&S processes, identify gaps in M&S verification and validation (V&V), report on methods used for assessing model maturity, and identify digital engineering strategies that could help improve M&S V&V over the lifecycle.

20864 A T&E Code of Practice advancing in an emergent digital world

Malcolm Tutty 1, ITEA, ITEA Southern Cross Chapter, Canberra, Australian Capitol Territory, Australia

Keywords: T&E Code of Practice,novel approaches,ground and flight test,experimentationtest and evaluation

Type: Panels and Workshops
Stream submitted: A.9. Test & Evaluation: Advancing Strategy

Workshop on Round Tables. The International Test & Evaluation Associations Southern Cross Chapter held a Panel/Workshop at the SETE 2022 and ITEA 40th Annual Symposiums focused on the potential and need for the development of an T&E Code of Practice to complement the SESA / INCOSE Systems Engineering Body of Knowledge (SEBOK) using a Model-Based Systems Engineering and T&E approach or MBSETE. ITEA proposes to leverage INCOSE SEBOK material to underpin key principles. Based on these Panels/Workshops, ITEA have agreed to develop a T&E Code of Practice that would be suitable for many engineering and scientific disciplines including aerospace, cyber, modelling, simulation, Intelligent and Autonomous Systems, defence, network-enabled and autonomous weapons and future potentially disruptive technologies. Collaboration with SESA and INCOSE is strongly supported by ITEA. The SETE 2024 workshop will discuss and confirm the over-arching principles of T&E which are being proposed in The ITEA Journal International Test and Evaluation Association in June 2024. The workshop will also review The Technical Cooperation Programs (TTCP) Guide to Experimentation (GUIDEx, 2005) see Slim GUIDEx 2004 Dec 2004 (dodccrp.org) and subsequent similar developments for suitability and applicability to the T&E and MBSETE communities advancing in the digital world. 60-90 Mins

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20696 UAS Test Ranges - Design concept for flight test ranges & access pathways

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Keywords: UAS,flight test range design,CASA JARUS SORA

Type: Paperless Presentations
Stream submitted: A.9. Test & Evaluation: Advancing Strategy

In Australia there is no dedicated flight test range or facility available for civil UAS test and development. UAS operations are expanding and continue to demand focus from the regulators to safely blend UAS and manned aircraft activity. Currently every activity requires an application to CASA for approval to conduct the planned activity and each of these can take a protracted time which can delay the development cycle. As UAS become more present in the skies, there is the need to assess, test and evaluate larger and larger platforms safely. Whilst it may be possible to test small UAS of modest speed close to larger city centres, the testing of platforms over 150kg and that operate at higher speed or higher altitudes, need access to areas of ground and airspace where the risk can be managed. This study provides a methodology that can be used to select an area to set up a flight test range. The methodology will be presented and then the process applied to the QFTR in Cloncurry as an exemplar but provides the final step - suggested pathways for range access. QinetiQ have developed this process and continue to work with CASA on this and other strategies to promote safe test of UAS platforms in Australia.

20764 The Defence Test and Evaluation Strategy

GPCAPT Steve Young, CSM, GAICD 1, Department of Defence, Canberra, ACT

Keywords: Test and Evaluation,Strategy,Implementation,Enterprise,Plan

Type: Paperless Presentations
Stream submitted: A.9. Test & Evaluation: Advancing Strategy

Australias rapidly changing strategic environment requires the Australian Defence Force to field increasingly complex capabilities over the coming decades. Advances in technology are changing the nature of the systems, and systems-of-systems that are subject to test and evaluation (T&E) to assure their fitness-for-purpose. Individual platform testing follows a well-established systems engineering process, but technologies like artificial intelligence and machine learning require the development of new test techniques. New technologies also enable novel, more efficient test methods. The growing complexity of integrated force packages also drives a need to improve T&E of systems-of-systems at the Joint Force Level. To meet Defences contemporary T&E needs, the Defence T&E Strategy was released on 24 August 2021. The Strategy aims to deliver a modern and networked T&E capability that underpins risk-based capability decisions and is actively supported by a strong sovereign base. The Strategy is currently in its second phase, modernising governance and conduct of T&E. This briefing will provide insights into the implementation of the Defence T&E Strategy under Horizon 2, and will invite discussion on challenges and opportunities presented by new and emerging technologies as well as visions of what the future Australian Defence T&E Enterprise should be.

21261 Advancing Digitally Enabled T&E

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Keywords: Digital T&E,undersea command,control and communications,undersea surveillance,Maritime Robotics

Type: Paperless Presentations
Stream submitted: B.9. Test & Evaluation of Systems of Systems

QinetiQ is effectively engaged in exploitation of digital Test and Evaluation (D T&E) to support our customers challenges and delivering capability in their undersea warfare missions. QinetiQs Underwater Robotics team has been working to provide complex state-of-the-art digital T&E capabilities to support undersea surveillance, undersea combat and undersea command, control and communications. These capabilities have enabled deployment of maritime systems with reduced inherent risks of losing or grounding valuable assets, supported underwater navigation and tracking with seamless communication among Maritime Autonomous Systems in challenging underwater and littoral environments. Through global collaboration in integrated autonomous systems and acoustic communication, QinetiQ has provided significant cost savings in field trials by reducing the risks of mission failures thereby helping our customers to train like you fight and ensuring success of critical missions.
