Multi-Domain Operations Workshop

Optimizing the Test & Evaluation Process for Multi-Domain Operations

Pre-Workshop Tutorials are a separate fee from the Workshop.
Single Tutorial - $205, Two Tutorials - $385

19-July Tutorials

8:00 a.m. – 12:00 p.m. Morning Tutorials

Cybersecurity for Telemetry Systems

Brian L. Simonin, Southwest Range Services

Cybersecurity is now a complete requirement for all Telemetry sensors on our test ranges. This Short Course will cover what is Cybersecurity and RMF and how does this impact deploying Telemetry software and instrumentation on the range. It will also cover the process of integrating equipment on a Test Support IP Network and the requirements that you must undergo to ensure your systems are secure, compliant, and operational for a myriad of mission activities. Class slides have been approved by the WSMR Cybersecurity Office for Telemetry vendor dissemination. However, the slides may be adapted for other enclaves such as Optics, Radar, GPS, and Real-Time operations.

Laser System Propagation T&E Challenges

Douglas Nelson, PhD, Teknicare, Inc., Senior Combat Engineer and Mark Stevens, P.E., Naval Postgraduate School, Senior Lecturer

An introduction to the challenges of testing and evaluating the propagation of Laser Systems. An overview of the basic physics and terminology of these systems is included. The unique propagation effects of Laser Systems are also discussed to provide a foundation for test objectives. Test and evaluation needs for propagation of Laser Systems including diagnostic beam propagation and atmospheric measurements are briefly examined.

Statistical Test and Analysis Techniques (STAT) for T&E

Mark Kiemele, Ph.D., Air Academy Associates

Statistical test design optimization is the offspring of Design of Experiments (DOE) and is a method that can and should be used not only in the design and development of systems, but also in the modeling and validation of system of systems. Building useful prediction models and then validating them can ease the burden of making tough decisions. This tutorial will focus on the use of DOE and regression analysis in a wide variety of applications, from screening to modeling and on to validation testing. This presentation will start by addressing the basics of DOE and why it is different from other data analytic techniques, following it

with examples that span the gamut, from flight test to cyber testing. It will also cover the necessary statistical tools and techniques that should be applied in consonance with DOE. There are no pre-requisites for this tutorial, as the analysis will be demonstrated via computer.

T&E as a Part of Agile Development

Robin Poston, PhD - System Testing Excellence Program, University of Memphis, and Wayne Dumais - Deputy T&E, Department of Homeland Security (DHS)

To discuss T&E in support of agile development, we need to explore the sequence of the evolution of the agile methods, rationale for the application of different methods, compare traditional and agile software development approaches, discuss research conclusions regarding the agile method's impact on software performance, review benefits and challenges of agile, and appreciate the fit of agile methods with Systems Acquisition Life Cycle. Furthermore, in this tutorial we will also discuss when to use agile, the role of the tester on agile projects, and various kinds of testing applicable to agile software developments.

1:00 p.m. – 5:00 p.m. Afternoon Tutorials

Planning for Agile T&E in a Government Framework

Hans Miller, The MITRE Corp.

This course provides a framework and guidance for programs transitioning to an agile construct or new programs established with an agile construct. The intended audience includes requirements managers, program managers and test managers executing DoD programs; however, the overall principles could apply to multiple agencies. This course is not a singular solution for agile testing; it acknowledges the different approaches needed for different programs and is intended to provide students with an understanding of concepts that can be tailored to their specific program. This course will walk through characteristics of agile process and where it does and does not apply to help inform expectations. It will cover US code, OSD and service policy as it applies to agile testing to allow greater flexibility. The core of the course covers upfront planning and strategy considerations for successful testing; requirements, contracting, infrastructure investments, automation and test execution. It concludes with approaches on how to translate that strategy into concise, timely, and relevant documentation from the TEMP, test plan, and test reporting.

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Fundamentals of Aeronautical Ground Telemetry Systems

Mark McWhorter, V.P. of Sales & Marketing, Lumistar Inc.

This course will present a high-level overview of the fundamental design of a typical range telemetry data ground system. Topics to be discussed will include the major sub-systems and components used, such as auto-track antenna, multicoupler, receiver/combiner, demodulation, bit synchronization, data recording and playback, time, decommutation and simulation, and real-time displays of telemetered parameters. The student will be exposed to a few mathematical exercises, such as "link analysis" calculations to help determine the "sensitivity" of the ground station and resultant system tradeoffs. A section on system calibration and periodic maintenance will be presented. After having completed the course, the student will have a better understanding of concepts related to RF and data processing of flight telemetry on the ground side.

TRMC Solutions for MDO and Distributed Testing

Gene Hudgins, JMETC/TENA Team, Test Resource Management Center

The Test and Training Enabling Architecture (TENA) was developed as a DoD CTEIP project to enable interoperability among ranges, facilities, and simulations in a timely and cost-efficient manner, as well as to foster reuse of range assets and future software systems. TENA provides for real-time software system interoperability, as well as interfaces to existing range assets, C4ISR systems, and simulations. TENA, selected for use in JMETC events, is well-designed for its role in prototyping demonstrations and distributed testing.

Established in 2006 under the TRMC, JMETC provides readily-available connectivity to the Services' distributed test capabilities and simulations. JMETC also provides connectivity for testing resources in the Defense industry and incorporation of distributed testing and leveraging of JMETC-provided capabilities by programs and users has repeatedly proven to reduce risk, cost, and schedule. JMETC is a distributed LVC testing capability developed to support the acquisition community during program development, developmental testing, operational testing, and interoperability certification, and to demonstrate Net-Ready Key Performance Parameters (KPP) requirements in a customer-specific Joint Mission Environment.

JMETC is the T&E enterprise network solution for secret testing, and uses a hybrid network architecture – the JMETC Secret Network (JSN), based on the SDREN. The JMETC MILS Network (JMN) is the T&E enterprise network solution for all classifications and cyber testing. JMETC provides readily available connectivity to the Services' distributed test capabilities and simulations, as well as industry test resources. JMETC is also aligned with JNTC integration solutions to foster test, training, and experimental collaboration.

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TRMC Enterprise Big Data Analytics (BDA) and Knowledge Management (BDKM) has the capacity to improve acquisition efficiency, keep up with the rapid pace of acquisition technological advancement, ensure that effective weapon systems are delivered to warfighters at the speed of relevance, and enable T&E analysts across the acquisition lifecycle to make better and faster decisions using data that was previously inaccessible, or unusable. BDA is the application of advanced tools and techniques to help quickly process, visualize, understand, and report on data. JMETC has demonstrated that applying enterprise-distributed BDA tools and techniques to T&E leads to faster and more informed decision-making that reduces overall program cost and risk.

TRMC has been working with Joint Staff and Air Force JADC2 Cross-Functional Teams (CFTs) regarding JADC2 and Multi-Domain Operations (MDO), to inform them on TENA/JMETC and other TRMC capabilities that could be leveraged to support the emerging Joint Staff Joint Domain Environment (JDE). Additionally, TRMC has been engaged with Army Futures Command (AFC) throughout the year in a number of areas including assessing TENA/JMETC Support coupled with Big Data Analytics (BDA), expanding OSD TRMC collaboration and cooperation to other mission areas including, but not limited to, Cyber, BDA, Knowledge Management (KM), Machine Learning (ML), and Artificial Intelligence (AI).

This tutorial will inform the audience as to the current impact of TENA, JMETC, and BDA on the T&E community; as well as their expected future benefits to the range community and the warfighter.