

NDIA

32nd Annual National Test & Evaluation Conference

*"Strategic T&E Collaboration:
Government & Industry Partnering to
Achieve Decisive Operational Advantage"*



Onsite Agenda

March 6-8, 2017

San Diego Marriott Mission Valley, San Diego, CA

LOCATION

San Diego Marriott Mission Valley
8757 Rio San Diego Drive
San Diego, CA 92108
(619) 962-3800

ATTIRE

Appropriate dress for the conference is business for civilians and class A uniform or uniform of the day for military personnel.

ID BADGE

During conference registration and check-in, each attendee will be issued an identification badge. Please be prepared to present a valid picture ID. Badges must be worn at all conference functions.

SPEAKER DONATION

In lieu of speaker gifts, a donation will be made to the Fisher House Foundation. For additional information, please visit:
<http://www.fisherhouse.org>

MONDAY, MARCH 6, 2017

1:00 PM - 6:30 PM

Registration

Rio Vista Salon Foyer

12:30 PM - 3:00 PM

Offsite Tour

SPAWAR Systems Center Pacific

**Ticket Purchase Required*

SPAWAR Systems Center Pacific's mission is to conduct research, development, delivery, and support of integrated command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR), cyber, and space systems across all warfighting domains.

3:30 PM - 6:30 PM

ICOTE Meeting

Cabrillo 2

**Invitation Only*

TUESDAY, MARCH 7, 2017

7:00 AM - 5:00 PM

Registration

Rio Vista Salon Foyer

7:00 AM - 8:00 AM

Networking Breakfast

Cabrillo Ballroom

8:00 AM - 8:15 AM

Introduction & Opening Remarks

Rio Vista Salon

- Mr. Joe Manas, *Chief Systems Test Architect*, Raytheon Company; *Chairman*, NDIA Test & Evaluation Division

8:15 AM - 9:15 AM

Keynote Address

Rio Vista Salon

- Rear Admiral Paul Sohl, USN, *Commander*, *Operational Test & Evaluation Force*, U.S. Navy

9:15 AM - 10:00 AM

Featured Speaker

Rio Vista Salon

- Col Hans Miller, USAF, *Division Chief, Policy, Programs & Resources*, U.S. Air Force

10:00 AM - 10:30 AM

Networking Break

Rio Vista Salon

10:30 AM - 12:00 PM **Featured Panel: Hypersonics T&E**

Rio Vista Salon

Moderator: Mr. Larry Graviss, *President*, Eagle Engineering Group

- Mr. Mike Johnson, *Engineering Fellow*, Raytheon Company
- Dr. Edward Kraft, *Associate Executive Director of Research*, University of Tennessee Space Institute
- Dr. Miles Palmer, *President*, 8 Rivers Capital
- Dr. Nathan Tichenor, *Research Assistant Professor*, Texas A&M University
- Col Timothy West, USAF, *Senior Materiel Leader, Test Operations Division*, Arnold Engineering Development Complex

12:00 PM - 1:30 PM **Walter W. Hollis Award Luncheon: Presentation for Outstanding Lifetime Achievement in Defense Test & Evaluation**

Cabrillo Ballroom

Awarded to Mr. John Wallace, U.S. Army Aberdeen Test Center

1:30 PM - 3:00 PM **Autonomous Vehical T&E Panel**

Rio Vista Salon

Moderator: Mr. Reed Young, *Program Manager, Robotics and Autonomy*, Johns Hopkins University Applied Physics Laboratory

- Dr. David Bossert, *Director, Corporate Technology Area*, Raytheon Company
- Dr. Katherine Lemos, *Director, Autonomy*, Northrop Grumman Corporation
- Mr. Chris Mazur, *Range Sustainability*, Test Resource Management Center

3:00 PM - 3:20 PM **Networking Break**

Rio Vista Salon Foyer

3:20 PM - 4:10 PM **Featured Speaker: Cyber T&E**

Rio Vista Salon

- Mr. Pete Christensen, *Director, National Cyber Range*, Test Resource Management Center
- SES Danny Holtzman, USAF, *Technical Director, Cyber*, U.S. Air Force
- Mr. Tomas Wissink, *Director, Integration and Test*, Intervise, Inc.

4:10 PM - 5:00 PM **Featured Panel: Cyber T&E**

Rio Vista Salon

Moderator: Mr. Pete Christensen, *Director, National Cyber Range*, Test Resource Management Center and Mr. Joe Manas, *Chief Systems Test Architect*, Raytheon Company; *Chairman*, NDIA Test & Evaluation Division

- Mr. Mark Bradbury, *Engineering Fellow*, Raytheon Company
- SES Danny Holtzman, USAF, *Technical Director, Cyber*, U.S. Air Force
- Mr. Alex Hoover, *Deputy Director, Cybersecurity Programs, Office of Systems Engineering*, U.S. Department of Homeland Security
- Mr. Drew Schaffner, *Systems Security Engineer*, Northrop Grumman Corporation
- Mr Randy Smith, The Boeing Company

5:00 PM - 6:30 PM **Networking Reception (HOSTED BEER & WINE)**

West Lawn

ADVERTISING

Advertise in *National DEFENSE* magazine and increase your organization's exposure. *National DEFENSE* will be distributed to attendees of this conference as well as other NDIA events. For more information, contact Ms. Kathleen Kenney, Director, Sales at 703-247-2576 or kkenney@ndia.org.

PROCEEDINGS

Proceedings will be available on the web through the Defense Technical Information Center (DTIC) two weeks after the conference. All registered attendees will receive an email notification once the proceedings are available.

SURVEY

A survey will be e-mailed to you after the conference. We would appreciate your time in completing the survey to help make our event even more successful in the future.

WEDNESDAY, MARCH 8, 2017

7:00 AM - 5:00 PM

Registration

Rio Vista Salon Foyer

7:00 AM - 8:00 AM

Networking Breakfast

Cabrillo Ballroom

8:00 AM - 8:15 AM

Introduction & Opening Remarks

Rio Vista Salon

- Mr. Joe Manas, *Chief Systems Test Architect*, Raytheon Company; *Chairman*, NDIA Test & Evaluation Division

8:15 AM - 9:15 AM

Keynote Address

Rio Vista Salon

- Mr. Robert Miele, *Executive Technical Director/Deputy to the Commander, Test & Evaluation Command*, U.S. Army

9:15 AM - 10:00 AM

Featured Presenter

Rio Vista Salon

- Dr. Steve Hutchison, *Director, Office of Test & Evaluation*, U.S. Department of Homeland Security

10:00 AM - 10:30 AM

Networking Break

Rio Vista Salon Foyer

10:30 AM - 12:00 PM

Featured Panel: Test Range Efficiency Panel

Rio Vista Salon

Moderator: Mr. Brendan Rhatigan, *Deputy Site Director, F-35 Integrated Test Force*, Lockheed Martin Corporation

- Mr. John Gurka, *Head, Sea Range Operations Division*, Naval Air Warfare Center
- Mr. Darrin Loken, *Chief, Radio Spectrum Branch*, Test Resource Management Center
- Mr. Henry Melton, *Department Manager, Flight Test Engineering*, Northrop Grumman Corporation
- Mr. David Silsbee, *Scheduling Supervisor*, OSOS, Edwards Air Force Base

12:00 PM - 1:30 PM

Tester of the Year Awards Luncheon

Cabrillo Ballroom

1:30 PM - 2:00 PM

CONCURRENT SESSIONS

Autonomous Vehicle Track: Unmanned & Autonomous Systems Test Program Strategy

Balboa 1

- Dr. Robert Grabowski, *Research Engineer*, The MITRE Corporation

T&E Best Practices Track: The New Normal - Continuous Testing by T&E

Rio Vista Salon

- Mr. Thomas Wissink, *Director, Integration and Test*, Intervise, Inc.

2:00 PM - 2:30 PM

CONCURRENT SESSIONS

Autonomous Vehicle Track: Testing UAV Autonomy Algorithms in Complex Operating Environments

Balboa 1

- Mr. Bill D'Amico, *Principal Professional Staff*, Johns Hopkins University Applied Physics Laboratory

Sys of Sys, STAT, M&S Track: Computational Prototyping Environments (CPEs) -- A Strategy for the Cost Effective Acceleration of DoD Weapon Systems Development

Sierra 6

- Mr. Earl Wyatt, *President*, E. Wyatt & Associates Consulting

T&E Best Practices Track: Lessons Learned in Planning and Executing F-35 Full Weapon System Testing

Rio Vista Salon

- Mr. Brendan Rhatigan, *Deputy Site Director, F-35 Integrated Test Force*, Lockheed Martin Corporation

U.S. Department of Homeland Security Track: Explosives Simulant Verification and Validation

Santa Fe 3

- Mr. Robert Klueg, *Branch Chief, Spectroscopy Technologies Developmental Test and Evaluation*, U.S. Department of Homeland Security/S&T/CDS/TSL

2:30 PM - 3:00 PM

CONCURRENT SESSIONS

Autonomous Vehicle Track: Testing, Evaluation and Control of Heterogeneous Large-scale Autonomous Vehicles

Balboa 1

- Dr. Abdollah "Ebbie" Homaifar, *Director*, Autonomous Control and Information Technology Institute
- Dr. Ali Karimoddini, *Deputy Director, TECHLAV*, DoD Center of Excellence in Autonomy

Sys of Sys, STAT, M&S Track: The Air Force Vision for Capability Development - From Concept to T&E

Sierra 6

- Mr. Dave Panson, *Electronics Engineer*, U.S. Air Force Office of Strategic Development Planning & Experimentation

T&E Best Practices Track: Role of the Cyber T&E Range Executive Agent

Rio Vista Salon

- COL Chip Ferguson, USA (Ret), *JMETC Program Manager*, DoD Test Resource Management Center

U.S. Department of Homeland Security Track: Results of Improved Collaboration Between Explosives Equipment Vendors and DT&E Engineers

Santa Fe 3

- Mr. Michael Snyder, *Branch Chief, X-ray Inspection Technologies Developmental Test and Evaluation*, U.S. Department of Homeland Security/S&T/CDS/TSL

CONTACTS

Mr. Joe Manas

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Architect

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NDIA EVENTS

Please visit the NDIA
website for a complete
listing of the events we
offer.

NDIA website:

<http://www.ndia.org/events>

3:00 PM - 3:30 PM

Networking Break

Rio Vista Salon Foyer

3:30 PM - 4:00 PM

CONCURRENT SESSIONS

Autonomous Vehicle Track: Warfighter Trust in Autonomy

Balboa 1

- Sgt Jonathan Gillis, USMC, U.S. Marine Corps
Warfighting Laboratory
- Capt Michael Malandra, USMC, U.S. Marine Corps
Warfighting Laboratory

Sys of Sys, STAT, M&S Track: Combinatorial Testing for Link-16 Test and Evaluation

Sierra 6

- Mr. Timothy McLean, *Senior Technical Advisor*,
Test Engineering Branch, U.S. Marine Corps
Tactical Systems Support Activity

T&E Best Practices Track: Translating End Product Verification Requirements Into Enabling Product

Rio Vista Salon

- Mr. Wyatt Brigham, *Engineering Manager*, *Test
Planning and Requirements Section*, Northrop
Grumman Corporation

U. S. Department of Homeland Security Track: Development Test and Evaluation (DT&E) Bottle Liquid Scanner (BLS) Program

Santa Fe 3

- Mr. Michael Barrientos, *Certification Readiness
Test Lead*, *Bottled Liquid Scanner Systems*,
U.S. Department of Homeland Security/S&T/
CDS/TSL

4:00 PM - 4:30 PM

CONCURRENT SESSIONS

Autonomous Vehicle Track: Formal Methods for Verification and Testing of Autonomous Systems

Balboa 1

- Dr. Christopher Rouff, *Researcher*, Johns
Hopkins Applied Physics Laboratory

Sys of Sys, STAT, M&S Track: Cyber DT&E

Sierra 6

- Maj Paul Keener, USMC, *Cyber DT&E Lead*,
U.S. Marine Corps Tactical Systems Support
Activity

T&E Best Practices Track: Successful Distributed and Cyber Testing with TENA and JMETC

Rio Vista Salon

- Mr. Gene Hudgins, *Director*, *Test and Training
Environments*, TENA/JMETC

U.S. Department of Homeland Security/ U.S. Department of Defense Track: Case Study in DoD/DHS Partnership

Santa Fe 3

- Mr. John Beck Jr., *Deputy Director, Land Systems Operational Test and Evaluation Authority*, U.S. Department of Homeland Security, U.S. Customs and Border Protection
- Mr. Terry Murphy, *Deputy Director, Policy & Workforce Development*, U.S. Department of Homeland Security

4:30 PM - 5:00 PM

CONCURRENT SESSIONS

Autonomous Vehicle Track: Test and Evaluation of Autonomous Systems: Challenges and Opportunities of Evaluating Trust

Balboa 1

- Mr. Donald Strausberger, *Principal Research Engineer*, Georgia Tech Research Institute

Sys of Sys, STAT, M&S Track: Estimating Variability of Injuries in Underbody Blast Live-fire Testing for Evaluating Modeling and Simulation

Sierra 6

- Mr. Brian Benesch, *Mechanical Engineer*, SURVICE Engineering Company

T&E Best Practices Track: Applying the Gaps Model of the Service Industry: Five Ways that Prevent Test & Evaluation from Meeting Customer Expectations

Rio Vista Salon

- Mr. Allan Alfara, *Systems Test Engineer*, Northrop Grumman Corporation

DARPA Track: DARPA Robotics Challenge : Ten Years of Lesson Learned Put into Action

Santa Fe 3

- Mr. Jim Pippine, *President*, Golden Knight Technologies

5:00 PM

Conference Concludes

WALTER W. HOLLIS AWARD

for Lifetime Achievement in Defense Test & Evaluation is presented to

Mr. John R. Wallace

With a career focused on automotive systems, Mr. Wallace developed, implanted, and led the advancement of multiple generations of instrumentation integrated onto Department of Defense (DoD) platforms. This effort has resulted in better testing and evaluations of the entire wheeled and tracked vehicle inventory.

Mr. Wallace directed the development of the "Black Box" acquisition system that gathers real-world data on vehicles deployed to the combat zones. The U.S. military is constantly looking for ways to increase the survivability and effectiveness of vehicles in the combat theaters. To that end, he led the development of a unique data acquisition system, the "Black Box," that constantly captures automotive data, and captures ballistic shock data if a vehicle encounters a hostile threat such as a mine, improvised explosive device (IED), or explosively-formed penetrators (EFP). These black boxes are already in-theater, primarily installed in Mine-Resistant, Ambush-Protected vehicles, acquiring data that is being analyzed at ATC.

He proved the utility of simulated fire control testing using a laser spot against a curved target. This served as the basis for ATC's Moving Target Simulator. For many decades, fire control performance was assessed by firing many rounds against various targets in various moving and stationary configurations, which was very effective, but time and ammunition-consuming. Mr. Wallace was the Lead Instrumentation Engineer who devised a process in which a laser spot projected against a curved screen was used to replicate a moving target, allowing extensive testing without actually firing the weapons and saving a great deal of money in the process. This success eventually led to the construction of the Moving Target Simulator. The system was taken to another range that Mr. Wallace developed, the Live Fire Evasive Target. This consisted of an outdoor laser which projected a spot against a reflective target. The intent was to confirm firing control performance documented indoors by firing a limited amount of rounds against an outdoor target. The indoor/outdoor process has been exceptionally successful, saving the government over \$50 million in ammunition costs and providing far larger quantities of statistical data than previously available.

Mr. Wallace also campaigned for the Roadway Simulator and the Accelerated Vehicle Durability Simulator test capabilities. The Roadway Simulator has saved the acquisition process millions of dollars by taking test vehicles off the road and putting them in a simulated test environment, reducing test costs and shortening the test time. The Accelerated Vehicle Durability Simulator will provide highly accelerated life testing for large, wheeled vehicles that will reduce testing timelines by a factor of four and test cost by a factor of five. This simulator will extend capabilities widely used in the automotive industry to military platforms to benefit the Department of Defense.

He has provided leadership in the establishment of a cyber testing capability for the U.S. Army at APG. His ability to anticipate the future mission allowed him to develop a comprehensive proposal for building a cyber capability for the DOD. Leveraging his professional network and partnerships with other tenants at APG, he ensured that the capability provides the ability to measure the cyber resiliency of multi-commodity systems as they move through the acquisition life cycle.

Mr. Wallace developed a partnership with the Test Resource Management Center to develop a cutting edge data analysis capability titled Collected Operational Data Analytics for Continuous Test and Evaluation. This effort seeks to leverage historical data collected in theater to support continuous system improvement while providing valuable knowledge to a next-generation system's acquisition. As development progresses, federated distributed data repositories will enable execution and automated search scenarios that cannot occur today, providing analysts and program managers a means to reuse data collected within other programs. Program offices will have the invaluable opportunity to identify problems earlier in the acquisition lifecycle when they are cheaper to fix and will be a lower risk to both program schedules and Warfighters. This capability fits into ATC's Data Collection Reduction Analysis

and Visualization processes that ensure the customers receive the necessary data in time to make valuable program decisions.

He directed development of the capability to conduct dynamic underbody mine blast testing. Mr. Wallace's desire and commitment for increasing the operational realism of developmental testing and his quest to "test as we fight" drove the development of a capability to conduct an underbody mine blast event against a moving vehicle. This is extremely important because our Warfighters suffer the majority of IED attacks while they are moving. The static tests conducted over the past several decades have produced valuable data to evaluate system and crew survivability from the initial blast loading. However, the contribution of the forward momentum of the target vehicle to the vehicle and occupant responses to the blast event was lacking from the results. The findings of two technology feasibility demonstrations conducted to date on a moving vehicle show that the vehicle and occupant responses differ between a static versus a dynamic event.

Mr. Wallace has served as a key leader in the development of body armor methodologies, chain-of-custody technologies, range/facility development, and new technology implementation. The effectiveness of body armor testing by private sources came under increased scrutiny by Congress and the DoD that resulted in a large portion of body armor testing that migrated back to the government, and ATC assumed responsibility for it. Mr. Wallace increased the capacity of ATC to handle body armor workload. He provided critical technical oversight to the creation of 11 ranges focused strictly on body armor testing. The ranges have been augmented with state-of-the-art instrumentation to ensure timely and accurate assessments of the items under test. ATC's high quality repeatable test processes and equipment are now the government and industry gold standard for body armor testing.

He designed, obtained funding and built the Automotive Technology Evaluation Facility (ATEF) that, for the first time, provides the Army a capability to conduct and sustain multi-surface high-speed testing of vehicles. Mr. Wallace understood the importance of being able to test all military vehicles, to include tanks, at their required top speeds and at a sustained speed. Prior to ATEF, high speed testing could not be performed at a sustained speed due to the design of the test courses available. Additionally, his design includes a track that has different surfaces to simulate the varied environments that Soldiers may encounter.

Mr. Wallace created a partnership with the U.S. Army Research Laboratory (ARL) to develop expedient armor and integrate armor packages onto combat vehicles to provide protection for our Warfighters. IEDs and EFPs were having a major impact on U.S. Warfighters in Iraq and Afghanistan. At an ATC range facility, ARL and ATC would devise armor and materiel solutions against these threats. Once a successful recipe was devised, ATC personnel would integrate this solution onto vehicles used in theater. Additional ranges at ATC were modified to accommodate IED/EFP testing, including instrumentation on crew survivability. This effort had a major positive impact in protecting America's Warfighters.

Mr. Wallace's outstanding professional skill and ceaseless efforts will impact ATC, the U.S. Army, and the U.S. Department of Defense for years to come. His unwavering dedication and mission focus has proven to be vital to ATC; ensuring the organization remains relevant and prepared for the future. His exceptionally outstanding service and myriad of contributions, coupled with a tireless devotion to duty, a strong love for this country, the Soldiers who protect it and the civilians that work to protect Soldiers' lives, have made ATC the Army's most diverse and highly skilled test center.

TESTER OF THE YEAR AWARDS *for outstanding achievement in Test & Evaluation in 2016*

The Tester of the Year Awards are presented to outstanding individuals in the field of Test & Evaluation for acknowledgment of their accomplishments as a Civilian Tester, Military Tester, or a Contractor Tester. Each Tester of the Year was nominated by their organization and selected by the Office of the Secretary of Defense or one of the Military Service Test & Evaluation Departments in light of their achievements.

CONGRATULATIONS TO ALL WHO ARE BEING AWARDED ON THE MERIT OF THEIR **2016** ACCOMPLISHMENTS

UNITED STATES AIR FORCE

- ▶ Military: MSgt Justin A. Hudson, USAF
- ▶ Civilian: Mr. James M. Bonn
- ▶ Contractor: Mr. Terry L. Grosseohmig

UNITED STATES MARINE CORPS

- ▶ Military: Maj John Dirk, USMC
- ▶ Civilian: Mr. Joseph K. Hottendorf
- ▶ Contractor: Mr. Jeffery A. Laird

UNITED STATES ARMY

- ▶ Military: LTC Andrew Koschnik, USA
- ▶ Civilian: Mr. Kevin L. Creekmore
- ▶ Contractor: Mr. Nicholas P. Thompson

UNITED STATES NAVY

- ▶ Military: LCDR Daniel J. Bellinghausen, USN
- ▶ Civilian: Mr. Joseph L. Thiering
- ▶ Contractor: Mr. Bryan L. Smith

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