Focus Area Forum:
Warfighter Performance
5 November 2014

Welcome!
Admin overview by CAPT Rob Palisin
Assistant Chief of Naval Research
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Thank You For Coming!

Half of participants are from outside DoD

External Attendee Analysis

- .com
- .mil
- .edu
- .org
- .gov
Warfighter Performance Focus Area Review

5 November 2014

RADM Matthew L. Klunder
Chief of Naval Research
ONR’s Mission

DISCOVER
DEVELOP
DELIVER

Innovative science and technology (S&T) to meet the needs of Naval forces today... and for tomorrow...
ONR Investment Strategy

S&T Focus Areas:

- **Warfighter Performance**
- Autonomy & Unmanned Systems
- Assure Access to Maritime Battlespace
- Information Dominance - Cyber
- Expeditionary & Irregular Warfare
- Power Projection & Integrated Defense
- Platform Design & Survivability
- Power & Energy
- Electromagnetic Maneuver Warfare

- **STEM**
- CNO's Quick Reaction Efforts (S2F/CRIC)

- Approved by UNSECNAV, ASN(RDA), VCNO, ACMC
- Revised every two years
Today’s Objectives

- Engage Stakeholders
- Assess Current Investment Strategy
- Develop Common Vision of the Future

**Warfighter Performance Focus Area**

- People are the Critical Elements of Operational Systems
- Enhance Warfighting and Warfighter capability

- **Warrior Resilience**
- **Fleet Integrated Training, Experimentation, and Planning**
Strategic Overview of Warfighter Performance S&T Portfolio

5 November 2014

Terry Allard, PhD, SES
Head, ONR34 Warfighter Performance Department
Naval S&T Strategic Plan Focus Area

- Human-System Design & Decision Support
- Bio-Engineered Systems
- Manpower, Personnel, Training & Education
- Warfighter Health and Survivability

Naval Warfighter Performance
ONR Focus

- Fleet Integrated Synthetic Training and Testing Facility: FIST2FAC
- Live, Virtual, Constructive Aviation Training – Cooperative Engagement, EMW
- Near Real Time Mission Planning

Forum Outcomes

- Increased awareness of scope
- Showcase Current S&T
- Dialogue on Future Directions

Format

- ONR FITEP vision
- Panel: S&T and Acquisition Perspectives
- Posters and Demonstrations
Warrior Resilience

The ability to withstand, recover, and grow in the face of stressors and changing demands

ONR Focus
• Mind & Body: Physical, Cognitive, Medical
• Training, Protection, Treatment
• Fleet and Force

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• Increased awareness of scope
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Format
• Overview of ONR Warrior Resilience
• Panels: Practitioner and Program view
• Posters and Demonstrations

Total Force Fitness Framework

Chairman’s Total Force Fitness Framework,
J-7 Distribution: A, B, C, S. CJCSI 3405.01
1 September 2011, Directive Current as of 23 Sep 2013
Warrior Resilience: Programs, Challenges, Opportunities

5 November 2014

Peter N. Squire, PhD – ONR30
Expeditionary Maneuver Warfare and Combating Terrorism Department
Program Officer, HPT&E Thrust Area
Definition of “Resilience”

The ability to withstand, recover, and grow in the face of stressors and changing demands.¹, ²

¹ Chairman’s Total Force Fitness Framework, J-7 Distribution: A, B, C, S. CJCSI 3405.01, 1 September 2011, Directive Current as of 23 Sep 2013

² Uniform Definition of Resilience and Programmatic Definition of Resilience For Department of Defense, Memorandum for National Guard / Army / Navy / Air Force / JCS, 11 Jun 2014.
Resilience Framework

**Total Force Fitness Framework**

- Social
  - Social support
  - Task cohesion
  - Social cohesions
- Behavioral
  - Substance abuse
  - Hygiene
  - Risk mitigation
- Physical
  - Strength
  - Endurance
  - Flexibility
  - Mobility
- Environmental
  - Heat/Cold
  - Altitude
  - Noise
  - Air quality
- Nutritional
  - Food quality
  - Nutrient requirements
  - Supplement use
  - Food choices
- Psychological
  - Service values
  - Positive beliefs
  - Meaning making
  - Ethical leadership
  - Accommodate diversity
- Medical
  - Access
  - Immunizations
  - Screening
  - Prophylaxis
  - Dental
- Spiritual

**Service Level Initiatives**

- Marine Total Fitness
- Navy Operational Stress Control
- Air Force Resilience Initiatives
- Army’s Comprehensive Soldier Fitness

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1 Chairman’s Total Force Fitness Framework, J-7 Distribution: A, B, C, S. CJCSI 3405.01
ONR S&T Opportunities for Warrior Resilience

- Stress Response and Mitigation
- Musculoskeletal Injury Prevention
- Heat Strain
- Altitude Exposure
- Circadian Disruption, Sleep Loss & Fatigue Mitigation
- Human Physiology Models
- Undersea Medicine
- Gut Microbiome
- Automated Medical Care
- Hemorrhage Control & Resuscitation
- Noise-Induced Hearing Loss
- Blast / TBI

Performance | Health Protection | Treatment
ONR: A Unique Research Hub

Resilience Gov’t Communities
- ASD(R&E) Armed Services Biomedical Research Evaluation and Management
- ASD(R&E) Human Systems
- Human Performance Optimization Working Group
- Defense Medical R&D Joint Planning Committees
- Military Communities, e.g. Research Physiologists

Stakeholders
- USMC: e.g., Training and Education Command, Manpower and Reserve Affairs
- Navy: e.g., Navy Bureau of Medicine and Surgery, Navy Expeditionary Combat Command
- SOCOM: e.g., Marine Corps Forces Special Operations Command, Naval Special Warfare

Office of Naval Research (ONR)

Code 30 Expeditionary Maneuver Warfare and Combating Terrorism Department
Code 34 Warfighter Performance Department

Performers
- Academia
- Industry
- Government Labs
The Practitioner Level Perspective on Resilience S&T

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Peter Squire, PhD – ONR30
Tim Bentley, PhD – ONR34
Panel Questions

1. What is/are your vision(s) for Warrior Resilience? What are the challenges ahead? Can you provide specific examples/anecdotes?

2. How are ONR S&T investments fitting into your vision(s)? What is the value of S&T in that vision? What are we doing well? What are some opportunities for improvement?

3. What places / activities are good common grounds for examining the challenges and opportunities in resilience; e.g. training, education, boot camp, etc.?
The Program Level Perspective on Resilience S&T

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Peter Squire, PhD – ONR30
LCDR Chris Steele, PhD - ONR34
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Strategic Overview of Warfighter Performance S&T Portfolio

Afternoon Session:
Fleet Integrated Training, Experimentation and Planning

5 November 2014

Terry Allard, Ph.D., SES
Head, ONR34 Warfighter Performance Department
Naval S&T Strategic Plan Focus Area

- Human-System Design & Decision Support
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Simulation-Based Training

Multi-Mission, Multi-Platform, Multi-Echelon Simulation-Based Training

**Overall Benefits**
- Maintain hard-won Operational Skills with realistic scenario simulation
- Enable Risk-Taking in Training and Mission Rehearsal
  - Explore the edges of operational performance
- Extend Training Ranges virtually
- Reduce Costs of Live Assets in training

**Skill Assessment**
- Scale training to individual, team, battle group
- Enable individualized, self-paced learning
- Automated performance / readiness assessment

**Scenario Simulation**
- Explore problem space with scenario authoring tools
- Agile representation of evolving threats
- Artificially Intelligent Blue, Red and White Force entities
- Explore new Concepts of Operation / Experimentation
Multi-Mission, Multi-Platform, Multi-Echelon Simulation-Based Training / Scenario-Based Planning

**ONR Focus**
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- Panel: S&T and Acquisition Perspectives
- Demonstration and discussion
Technological Foundations for Fleet Synthetic Training-LVC

Innovative Research to address Priority Fleet Training Requirements

Briefers: Harold Hawkins
Glenn White
Ami Bolton

ONR34 Warfighter Performance Department

5 November 2014
FIST2FAC on Ford Island, Pearl Harbor

Fleet Integrated Synthetic Training & Test Facility
Recent Training System Development and Assessment Activity at FIST2FAC

- Synthetic training system development for export
  -- FST, ATGPAC/CNSP, TACTRAGRUPAC

- On-site integrated synthetic training for CSG Command/staff

- Training system demonstration to potential Fleet customers

- Experimentation (gain/loss/modification/what-ifs)

- Integration of synthetic training system components developed by industry partners

- Training system calibration
  -- SME-set performance standards

- Scenario-based training effectiveness evaluation

- Performance metrics development and validation
Recent Contributions to Fleet Training and Analysis

- Multi-mission Maritime Operation Center (MOC) Commander-level training provided to COMPACFLT (CTF 519) by USFF (Pacific Reflection)
- Multi-mission Warfare Commander Seminar training capability developed at FIST2FAC deployed to TACTRAGRUPAC San Diego and coming soon to DESRON 15 in Yokosuka
- Developed Virtual Carrier Platform (VCP) enabling realistic and robust Sea Combat Commander participation from the CVN (Zulu Space(s)) in Fleet Synthetic Training (FST)
- Developed Virtual Ship Platform (VSP) to demonstrate capability of CRUDES unit to deploy constructive and virtual helicopters to execute ASW, ASuW, and FAC/FIAC Anti Swarm Defense in FST events
- Created a constructive Bravo, Romeo & Sierra Simulation (BRASS) to be used for the development of low cost platform(s) enabling helicopter participation in FST events
- Created Virtual Bravo tactical team trainer (BATT) to demonstrate “Integrated” CRUDES and Helicopter synthetic training capability in ASW and FAC/FIAC
- Afloat Training Group (ATG) is planning to use the PACT3 at FIST2FAC for FST-U training and certification instead of a MH-60R TOFT (Lack of Capacity and Capability)
- Supported 3rd FLT Sea Shield Experimentation (ASW) Assessment in RIMPAC 14
The Future: Networked FIST2FAC

FIST2FAC

Systems
- NCTE Operational Node
- NCTE RDT&E Node
- Communications Suite
- JSAF
- GCCS
- SDREN

Live Training Event

Virtual Air ASW Platform

Instrumented Underwater Range Tracking and Acoustic Information

SDREN
Secure defense research & engineering Network

NCTE

Partner Nations

Japan
S. Korea
Singapore

Research & Development Data Repository

Academia (UARCs) and others in S&T Community
Live, Virtual, Constructive (LVC) Training

Dr. Ami Bolton, ONR Program Officer
ONR341 Human & Bioengineered Systems Division
ONR34 Warfighter Performance Department
5NOV2014
“The cost to operate present and future platforms - combined with advanced capabilities that are rapidly exceeding the capabilities of our current training ranges - demands that we innovate in combining live, virtual, and constructive training.” - The Vision of Naval Aviation 2025
Path Forward for S&T Focused on LVC Integrated Mission Level Training

Virtual Constructive Representations on Live Avionics Displays (VCR LAD): Integrating virtual & constructive entities on aircraft displays over range communications to produce safe & effective training during blended LVC events.


Unmanned Aerial Systems Interface, Selection & Training Technologies (U-ASISTT); Dynamic, Adaptive & Modular Agents for UAS (DyAdaM)
- Generate Realistic Synthetic Entities from Raw Sensor Data

Environment Designed to Undertake Counter A2AD Tactics Training & Experimentation (EDUCAT²E)
- Enable Affordable Scenario-based Training, Mission Rehearsal & Experimentation in A2AD
- Increase Realistic Red-Blue Forces Interaction without Manually Intensive Behavior Definition for Emerging Mission Sets
- Performance Metrics for Objective Assessment of Readiness Levels & Trend Tracking

Project X: Define Current Training Gaps & Develop Classroom-based Prototype

Fleet Integrated Synthetic Test & Training Facility (FIST²FAC)

VV&A Behavior Models for A2AD Theater Level Training

Performance Spec. for SIM & Range Upgrades & Safety of Flight Protocols

CQ System Performance Spec. & Decision-Quality Performance Measurement Tools

VV&A Behavior Models for NIFC-CA Tactical Behaviors

DISTRIBUTION STATEMENT A. Approved for public release; Distribution Unlimited. ONR 3 November 2014- Case No: 43-644-14
NIFC-CA is a complex Family of Systems...

- Urgent need for Models and Measures for training & CONOPs development!
- LVC S&T development, demonstration and experimentation to occur at FIST2FAC for both FTA and FTS.
“In concepts such as Air-Sea Battle, EM-cyber operations are used to attack an adversary’s whole kill chain … we will expand the use of EM-cyber ‘training ranges’ to gain proficiency in conducting these operations …”

Panel Questions

The organizations represented on the panel this afternoon play critical roles in providing synthetic-LVC training to the Navy and Marine Corps.

1. Briefly describe the role your organization plays in this enterprise? How is your organization coordinated with others represented here?

2. What is your vision for the future of Naval synthetic-LVC training? What are the challenges ahead?

3. How are ONR investments fitting into your vision? What are we doing well? What are some opportunities for improvement?
Mission Planning Application

5 November 2014

Dr. William “Kip” Krebs
ONR34 Warfighter Performance Department
Office of Naval Research
Capable Manpower FNC

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VADM Donnelly ltr to CNR (Ser N00/00269, 22 Jul 08) … “improve warfighter decision making abilities at every level. Develop technologies and processes that enable rapid and effective decision making. Information display is a key component.”
MPA Highlights

✓ PMS-425 (Submarine Combat System Program Officer) transitioning MPA to production via Advanced Processor Build (APB-13 and APB-15)

✓ Used by the April 2014 Submarine Command Course

✓ PMS-425 will back fit MPA on TI-12 platforms

✓ PMS-425 installing a limited MPA version in SSBN’s combat system upgrade

✓ Installing MPA on USS Mobile Bay (CG-53)

✓ Being considered as the surface Navy's path ahead for planners
Mission Planning Application Demonstration