

Government Panel: Additive Manufacturing/3D Printing, Rapid Prototyping and Experimentation and Adaptive Force Packaging

Moderator:

Ms. Carmela Keeney, Executive Director of SPAWAR Systems Center Pacific

Panelists:

Mr. Alan Kent, Technical Director,
Naval Undersea Warfare Center Division Keyport

Ms. Jeanette Evans-Morgis, Deputy Commander for Systems Engineering, Interoperability,
Architecture and Technology (SIAT), Marine Corps Systems Command

Mr. Scott Dilisio, OPNAV N42



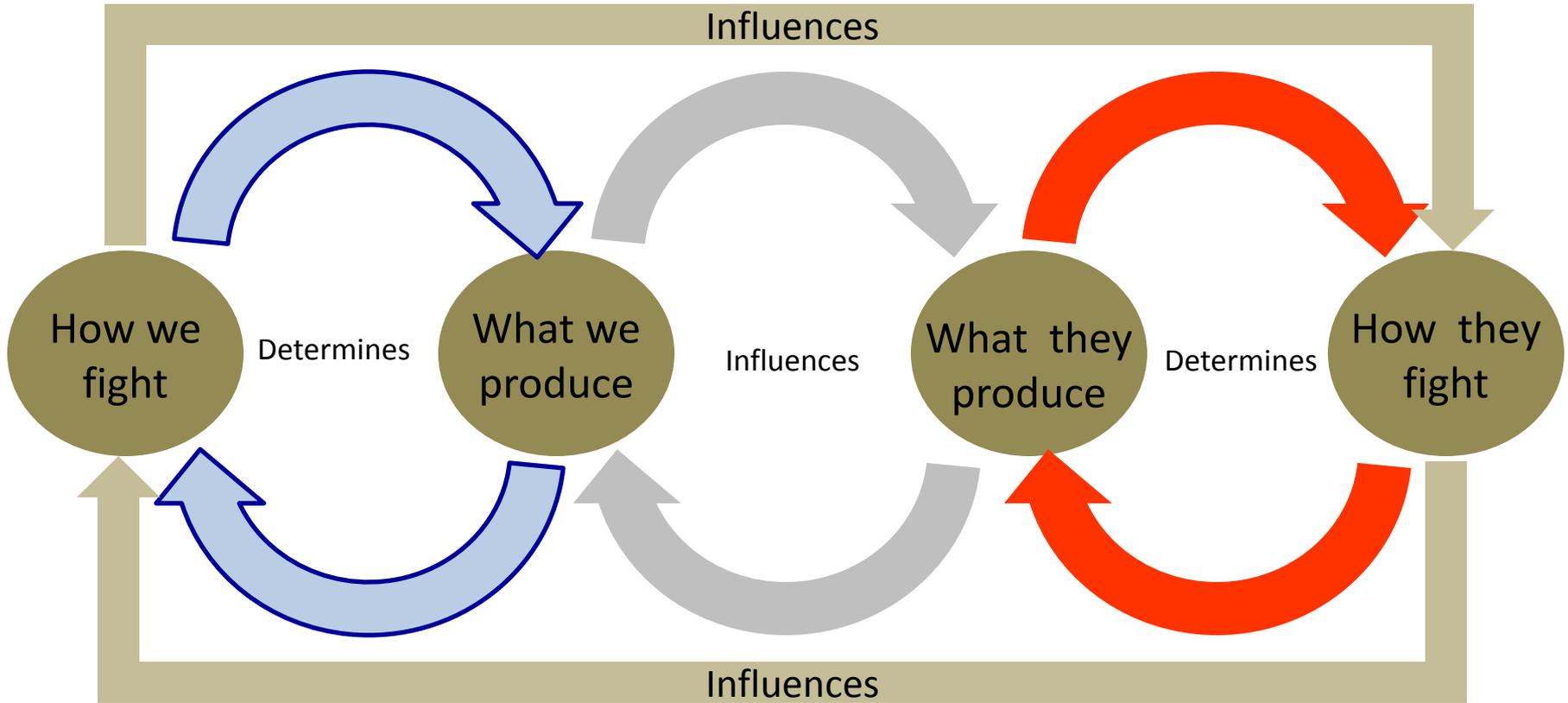
Additive Manufacturing/3D Printing, Rapid Prototyping and Experimentation and Adaptive Force Packaging



Alan Kent
NUWC Division Keyport
Technical Director
24 Aug 2016



Rapid Prototyping Need: A Simple Model



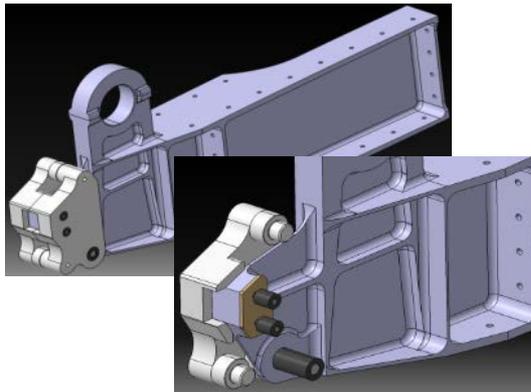
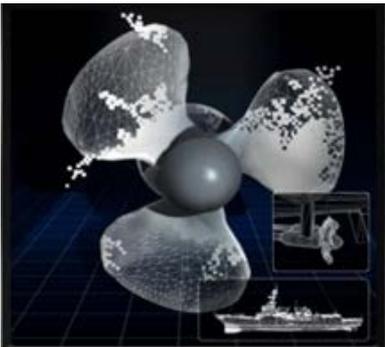
Tech Superiority

f (S&T, Engineering, Innovation) Speed



Rapid Prototyping and Experimentation

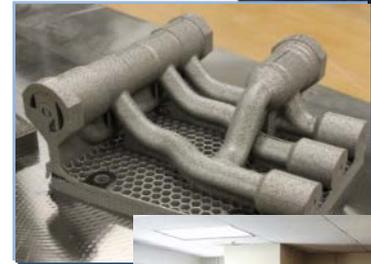
- Strategic initiative by the Navy and Marine Corps to rapidly introduce new warfighting capabilities to the fleet
- Essential element in the Navy's strategy to employ innovative technologies
 - Pace the dynamic threat of our adversaries
 - More quickly address urgent capability needs
 - Accelerate our speed of innovation
 - Rapidly develop and deliver advanced warfighting capability to naval forces.
- Emphasis on “Field Early” or “Fail Fast” – vital lessons learned will enable rapid design iterations





DON Additive Manufacturing

- DON has utilized AM for over 20 years to efficiently and cost-effectively support existing processes
 - Tooling, fixtures, molds, prototypes, etc.
- Recent excitement due to expansion of additive manufacturing to produce end use components.
 - Opens new design space for enhanced warfighting capabilities
 - Will enable on-demand production at the point of need, increasing readiness
- Embedded introductory equipment with our Sailors and Marines
 - Provide tools needed for deck plate innovation
- Enabling technology that will have significant impact on all naval communities
 - Subsurface, surface, air, expeditionary, medical, etc

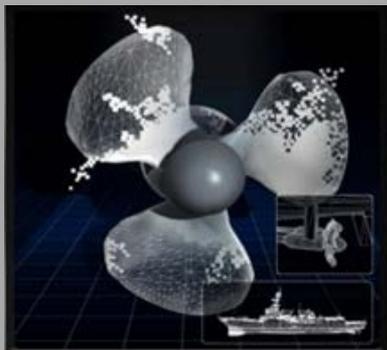




(Some) DON AM Needs

- Development of business models amenable to the industrial base and taxpayer
- Develop ability to rapidly qualify and certify AM components
 - Establish essential variables/parameters for AM processes
 - Establish predictive modeling of links between processing, microstructure and resultant properties
 - Non-Destructive Evaluation techniques
- Digital thread integration
 - Creation of interoperable digital environment
 - Methodologies to ensure cyber secure file transfers
- Develop robust materials and ruggedized equipment amenable to expeditionary AM
- AM/digital design training modules for workforce development

DON is posturing itself to be a networked fast follower





MARINE CORPS SYSTEMS COMMAND
HOME OF THE MARINE CORPS ACQUISITION PROFESSIONALS

NDIA Gold Coast

"INNOVATE, ADAPT & WIN"

ADDITIVE MANUFACTURING IN THE MARINE CORPS

MS. JEANNETTE EVANS-MORGIS

**CHIEF ENGINEER OF THE MARINE CORPS AND
DEPUTY COMMANDER SIAT, MARINE CORPS SYSTEMS COMMAND**

AUGUST 24TH, 2016



MARINE CORPS SYSTEMS COMMAND

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MISSION

Mission

To serve as the Department of the Navy's systems command for Marine Corps ground weapon and information technology system programs in order to equip and sustain Marine forces with full-spectrum, current and future expeditionary and crisis response capabilities.

Commander's Priorities

Our Work Environment

Executing to Plan

Our Professional Credibility

Preparing for the future

MCSC

"Marine Corps Systems Command is a team of Acquisition Professionals united by a common purpose—being prepared for the future, while providing our Marines affordable and capable systems in a timely manner—and possessing a strong sense of esprit de corps."

- Commander's Intent, Brig. Gen. Shrader

MCSC Engineering Competency Mission

Help Programs Succeed Through Application of Disciplined Systems Engineering





- **Rapid pace of technology makes it difficult to provide the most current weapon systems in a timely manner**
- **Innovative thinking within Marine Corps Acquisition, in partnership with Industry, will be critical to dominating the 21st Century battlefield**
- **Additive Manufacturing offers new opportunities and challenges for expeditionary capabilities**





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Command Wide Innovation Efforts





- ▶ **Prototyping and modelling**
- ▶ **Innovation Primer**
- ▶ **Address DMSMS issues & Critical Low Density Parts**
- ▶ **Flatten Expeditionary Supply Chain**
- ▶ **Manufacture what can not be created by traditional methods today**





MUCH HAS CHANGED. ADDITIONAL POSSIBILITIES EXIST.

2000

COST

\$5,880.00

WEIGHT

41.36 lbs



- Greater Fragmentation Protection
- 7.62 Protection - Head and Torso
- Flash Flame protection
- Anti-Vector Capability
- Anti-bacterial Capability
- Better Durability
- Eye Protection
- Knee and Elbow pads

2016

COST

\$17,845.96

WEIGHT

113.47 lbs



INDUSTRY DAY
30 Aug 2016 @ MCB Quantico Va.
(Gruntworks) 0830-1500

www.marcorsyscom.marines.mil/InfantryEquippingChallenge



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MPC Vendor Demonstrator Vehicles



UNCLASSIFIED



MPC -TD



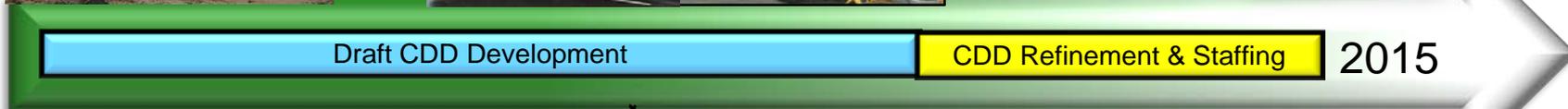
Vendor Demonstrator Vehicles



ACV 1.1 CDD



2008



2015

Capability Development
IPT - Requirement / CDD
Development
MCOTE
PP&O
CD&IO
PM AAA

Swim, HFE, Blast
Demonstrations

JROC
Approved
CDD

NATC-Tech Demonstrator
TD results confirmed CDD requirements could be met with a single vehicle using existing technologies and primarily commercial equipment

Industry MPC Demonstrations

- Low Cost to Gov't / IRAD
- Vendors Brought Own Vehicles
- Gov't provided results back to Vendors
- Further informed Draft CDD

USD AT&L

- Satisfied Competitive Prototyping statutory requirement
- Skipped TMRR Phase
- Approved Entry at MS B



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Opportunity



MODERN DAY MARINE

Sept. 27^{to} 29th

Marine Corps Base Quantico

<http://www.marinemilitaryexpos.com/>

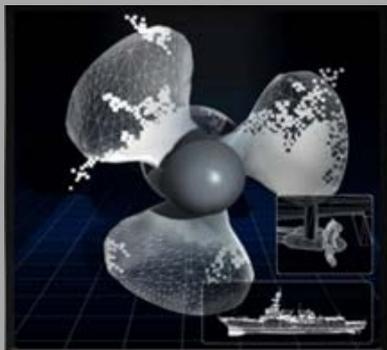
Contact MCSC OSBP for information about the Small Business Pavilion



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Adaptive Force Packaging Navy Gold Coast 2016

Mr. Scott DiLisio
OPNAV N42
22-25 August 2016





What is an Adaptive Force Package?

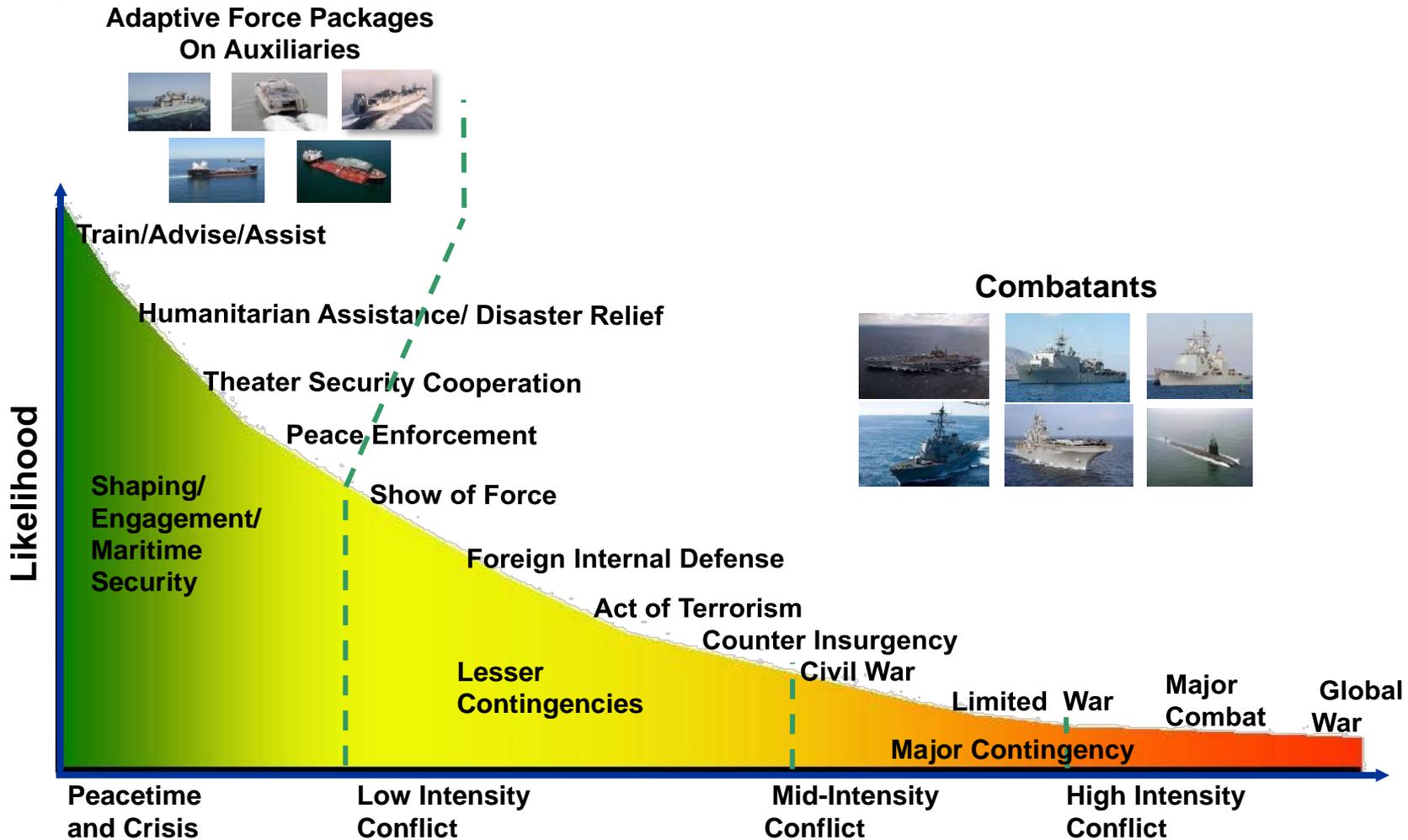
- Scalable and tailorable capabilities that can be deployed to accomplish an assigned mission
- Examples include:
 - A Maritime Prepositioned Force (MPF) Roll-On/Roll-Off ship with an embarked USMC Crisis Response Force Package
 - A Joint High Speed Vessel conducting Theater Security Cooperation
 - A Maritime Expeditionary Security Squadron operating with a U.S. Coast Guard port security unit
 - An MPF Combat Logistics Support Ship with USMC forces embarked to provide Humanitarian Assistance/Disaster Relief
 - A riverine boat detachment with USCG Law Enforcement Detachment



ADAPTIVE FORCE PACKAGES ARE NOT PLATFORM DEPENDENT



AFP Employment Across Range of Military Operations (ROMO)



Adaptive Force Packaging = Getting more from our platforms = Reducing demand for combatant support of lower ROMO operations



Adaptive Force Package Concept

- Adaptive Force Package concept takes a system of systems approach by using existing Programs of Record
- Adaptive Force Packages provide increased capability to the Warfighter regardless of employment platform
- Capabilities identified for use not limited to a single service
- Potential for cost savings by packaging Programs of Record vice developing new capabilities



DEVELOPMENT OF ADAPTIVE FORCE PACKAGES IMPROVES CAPABILITIES IN INNOVATIVE AND AFFORDABLE WAYS



Adaptive Force Packages



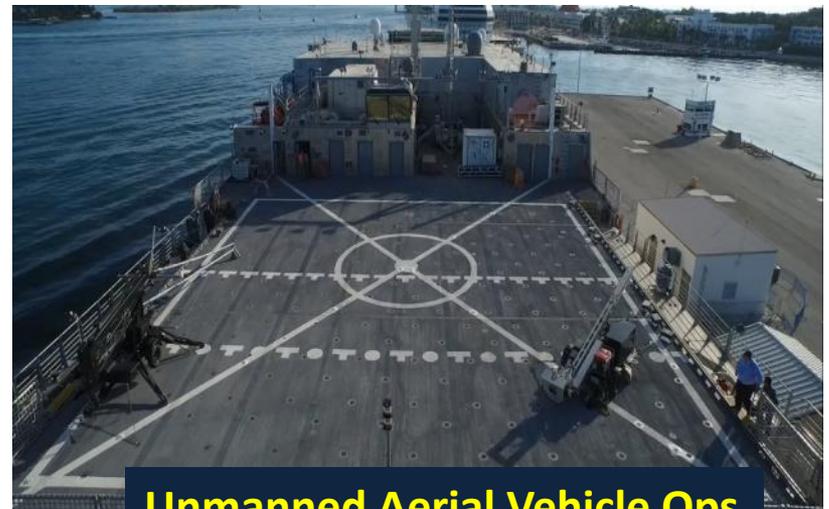
Unmanned Surface Vehicle Ops



MV-22 OPS on Combat Logistics Support Ships



Sea-Basing Skin to Skin Ops



Unmanned Aerial Vehicle Ops



Summary

- Leverage existing integrated commercial/small business processes and procedures to rapidly support delivery of AFP capability to the joint warfighter
- AFP concept challenges traditional operational behaviors by leveraging tailorable, scalable mission focused packages to depressurize demand on combatants
- Success of AFP systems requires flexible, open-architecture influenced programs capable of being integrated rapidly in support of mission requirements



THE VERSATILITY OF AFPs PROVIDE UNIQUE OPPORTUNITIES TO SUPPORT A WIDE RANGE OF OPERATIONS



QUESTIONS?

