National Defense Industrial Association Tactical Wheeled Vehicles Conference 9-11 May 2016

Keynote Speaker

MG Robert "Bo" Dyess, Jr.

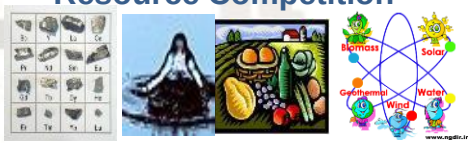
Deputy Director, Army Capabilities Integration Center

U.S. Army Training and Doctrine Command

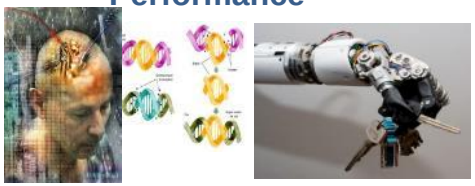
ARCIC POC: Mr Bob Simelaro, 757-501-5548

12 Trends We Are Watching

Climate Change/ Resource Competition



Increase level of Human Performance



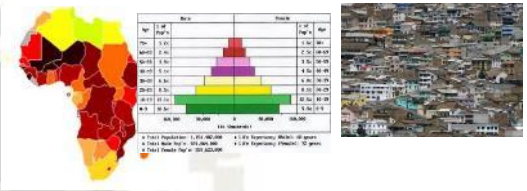
Cyber & Space

Economic Rebalancing

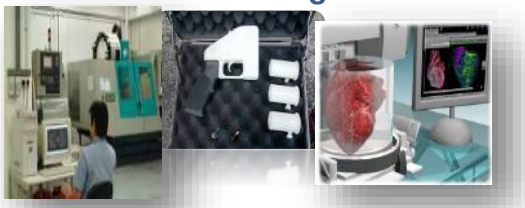
Human Computer Interaction

Artificial Intelligence

Demographics and Urbanization



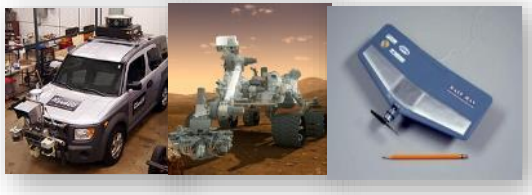
Technology, Engineering & Manufacturing



Big Data

Collective Intelligence

Robotics



Power Generation & Storage

Army Operating Concept Technology Focus Areas

- *Mobile Protected Precision Firepower* - lighter weight and lower volume platforms with increased firepower, protection and survivability.

- *Lethality and Effects* - focus on developing munitions, platforms, sensors, targeting, and mission command systems that provide the commander the ability to overmatch the enemy while employing lethal and nonlethal force with precision and discrimination.

- *Logistics Optimization* - to improve the Army's ability to conduct expeditionary maneuver and sustain high tempo operations at the end of extended supply lines, the Army increases logistical efficiencies and unit self-sufficiency.

- *Autonomy-enabled Systems* - the application of emerging technology creates the potential for affordable, interoperable, autonomous, and semi-autonomous systems that improve the effectiveness of Soldiers and units. Autonomy-enabled systems will deploy as force multipliers at all echelons from the squad to the brigade combat teams.

- *Expeditionary* - use of unmanned platforms in mounted and dismounted maneuver formations will lead to smaller, mobile, and transportable manned and unmanned vehicles, enabling greater expeditionary capability.

The U.S. Army's advantage over enemies depends in large measure on advanced technology and the Army must fit machines to Soldiers rather than the other way around

How Can Industry and Science & Technology Help?

The Army is working with joint partners, industry, and key stakeholders developing future force capabilities with the following technological first principles in mind:

- Emphasize integration of technology with Soldiers and teams
- Simplify systems and integrate Soldier training into design
- Maximize reliability and reduce life cycle costs
- Design redundant systems that improve effectiveness under conditions of uncertainty
- Develop systems that degrade gracefully
- Maintain foundational knowledge to reduce the opportunity for surprise
- Reduce logistical demands
- Anticipate enemy countermeasures
- Ensure interoperability
- Consider scale and organizational implications

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Building the Future Force: Concepts to Capabilities

AOC, Functional and Operational & Organizational Concepts

Think

Establish a sound conceptual foundation for Army modernization

Concepts	Describe how future forces will fight and win; provide intellectual foundation for modernization. Consider: • Threats/Enemies/Adversaries • Missions • Technology • History/Lessons Learned
Required Capabilities	Capabilities our Army must possess to accomplish missions across the range of military operations.

Force 2025 Maneuvers: the Army's Campaign of Learning

Learn

Conduct rigorous experiments, wargames, and assessments to learn in a focused, sustained, and collaborative manner

Warfighting Challenges	Provide analytical framework for learning in a focused, sustained, and collaborative manner.
Gaps Opportunities	Use experiments, wargames, assessments, and experience to identify capability gaps and opportunities to achieve overmatch.
Solutions (DOTMLPF-P)	Develop solutions in near- (2015-2020), mid- (2020-2030), and far- (2030-2040) terms to ensure future force combat effectiveness.

Capabilities Needs Analysis

Analyze

Focus prioritized efforts on first-order military challenges

Risks & Trades	Conduct rigorous analysis to identify top priorities and ensure sound investments in future capabilities.

Extension of Army Staff

Implement

Deliver integrated DOTMLPF solutions to improve combat effectiveness of the current and future force

Warfighting Capabilities	Collaborate to implement strategies and resource capabilities to ensure current and future force readiness.

Timeline of Trends to 2050

Science & Technology

3D Printing Reduces Supply Chain

Wireless Electricity Eliminates Tether to Infrastructure

Hypersonic Missiles, Directed Energy and Rail Guns Mitigate A2/AD

High Speed Rail In U.S. Reduces Transport Time

Hypersonic Passenger Planes…30 Min to Cross Atlantic

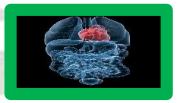
Nano Swarms Redefine Mass & Precision

Driverless Vehicles Increase Efficiency in Transportation Delivery

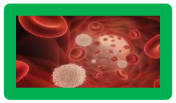
Robot Efficiencies Reduces Human Capital on Battlefield

Fully Autonomous Intelligent Military Aircraft

Society



Complex Organs Grown From Stem Cells Prolongs Life



Nanoparticle Therapy Becomes New Antibiotic

Alzheimer Cure Increases Working Age

Robots Reduce Need For Unskilled Labor

Stem-cell Pharmacies Cures For Genetic Diseases

Russia Population Drops 10%...Over 20% Never Experienced Communism

Youth Bulges in Weak African States Creates Instability

Genetically-Altered Babies Increases Lifespan, Physical, Cognitive Abilities

Age Mitigation Allows Longer, More Productive Work life

2015 — 2020 — 2025 — 2030 — 203 — 2040 — 2045 — 2050

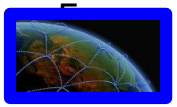
Information

100 Petaflop Super Computer Speeds Enables Big Data Decisions

Quantum Communication Enables Unbreakable Encryption

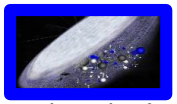
Holographic TV Increases Training Realism

Haptic Sensors Enable Bionic Devices



Internet of Things Allows Remote Operation of Most Devices

Terabit Internet Speeds Improves Data Collection



Teleportation of Organic Molecules Enables Medical Transport

Human-Machine Interface Connects Human Thought to the Network

The Strategic World

India Becomes Most Populous Country Exports Labor Market

Global Multipolar System Reduces Hegemony

BRIC GDP Overtaking G7 Changes Economic CoG

Increased Migration Causes Conflict in Africa & Europe

Ice-free Arctic Shortens Transport Time

Lake Chad Disappearance Affects 68 Million

Super Hurricanes Threaten Coastal Cities

9B Global Population Strains Resources To Support

NIC MEGATRENDS

- *Individual Empowerment*
- *Diffusion of Power*
- *Demographic Patterns*
- *Food, Water, Energy Nexus*