Transforming National Security

Precision Strike to Precision Effects

Vision: Broad and Sustained Competitive Advantage
- Strategy
- Capabilities
- Metrics

Globalization II

Information Age

Industrial Age

Terry J. Pudas
Acting Director, Force Transformation
25 January, 2006
Transforming Defense

...The Concept

Elements of Transformation

☑ Continuing process
☑ Creating/anticipating the future
☑ Co-evolution of concepts, processes, organizations, and technology
☑ New competitive areas/competencies; revalued attributes
☑ Fundamental shifts in underlying principles
☑ New sources of power
☑ Culture - attitudes, values, beliefs

- New Strategic Context
- Broadened Threat Context
- Technological Threats Facilitated by Falling Barriers to Competition

"The ultimate competitive advantage lies in an organization's ability to learn and rapidly transform that learning into action."

Jack Welch
New strategic context

- New Theory of War based on information age principles and phenomena
- New relationship between operations abroad and homeland security
- New concept/sense of security in the American citizen

Broadened threat context

- State/Non-State
- Symmetric/Asymmetric
- Traditional/Unrestricted

New technological threats facilitated by the falling barriers to competitive entry

- Immediate accessibility to highly capable low cost IT
- Opens key operational domains to competition: space, sea, cyberspace

To the extent we do not transform, we are at risk
Transforming Defense

...Elements of Strategy

- Transform from Industrial Age to the Information Age
  Implement Network Centric Operations

- Ensure sustained competitive advantage
  Assure Allies
  Dissuade competitive entry
  Underwrite deterrence
  Implement countervailing strategies

- Broaden the capabilities base
  Operational, Technical, Industrial
  Create new competitive areas
  Revalue competitive attributes for the information age
  Decrease capabilities cycle time

- Leverage advantages and opportunities
  Manage the devolution of “sunset” capabilities and processes

Achieve Speed and Agility vice Optimization
Global Trends

Globalization II → Globalization III

Industrial Age → Information Age
Trends in Security Competition

**Information Age**
- Short Cycle Time
- Mass Customization
- Adaptive Planning
- Interdependence

**Globalization II**
*(1947 – 199X)*
- Developed Rules
- Mature Markets
- Narrowing Customer Base
- Security = Defense

**Globalization III**
*(199X – 20XX)*
- Emerging Rules
- Market Opportunities
- New Customer Base Emerging
- Security = All Else + Defense

**Industrial Age**
- Long Cycle Time
- Mass Production
- Deliberate Planning
- Tortured Interoperability
Globalization III

U.S. Military Responses to Situations, 1990-2002

- Evac’s
- Peace/Relief
- Contingency Positioning
- Show of Force
- Combat
Shifting Strategic Imperatives

Industrial Age

Information Age

Security=Defense

Globalization II

Containment

Security=Defense+All Else

Globalization III

Relevancy

Competency

Connectedness
Security Environment

... Four Challenges

- **Irregular**
  Those seeking to **erode** American influence and power by employing unconventional or irregular methods

- **Catastrophic**
  Those seeking to **paralyze** American leadership & power by employing WMD or WMD-like effects in **unwarned** attacks on symbolic, critical or other high-value targets

- **Traditional**
  Those seeking to **challenge** American power by instigating traditional military operations with legacy and advanced military capabilities

- **Disruptive**
  Those seeking to **usurp** American power and influence by **acquiring** breakthrough capabilities

---

No hard boundaries distinguishing one category from another
Capabilities Balance

...Competent and Relevant

Domain of Cooperative Engagement

Winning / Maintaining the Peace
All Sources of Power

Domain of Political Victory

Global Stability

Local Stability

Winning the War

Winning the Battle / Combat
Combat Power

Domain of Strategic Primacy

Strategic Advantage: The Commons
High Seas & Air Above Space Cyberspace

Intervention: Decisive Operations
Land Littorals Low Altitude

Domain of Military Victory
Global Trends... Threats

...Strategic Response

Strategic Capabilities:
- More preventative - less punitive
- Achieve unambiguous warning earlier
- More Special Operations like characteristics
- An intel / surveillance-based force
- Interoperability/interdependence
- Coping with Systems Perturbations

----- [Great Power War?] -----

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<thead>
<tr>
<th>System</th>
<th>State</th>
<th>Individual</th>
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<td>Political Ideology</td>
<td>Hated Dictator</td>
<td>Hated Dictator w/Nukes</td>
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<tr>
<td>Narco-terrorists</td>
<td>Regional Terrorists</td>
<td>International Terrorists</td>
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</table>

* Super-Empowered Individual
Policy Outcome  =  f {Power, Moral Principle}

Event Focused Continuous

Punitive Preventative

Access to Battlespace Access to Political Victory

Citizen Soldier

Volunteer (Recruited) Force → Professional

Warrior + Enforcer + “Systems Administrator”

Projecting Power

Exporting Security

Event Focused

Continuous Preventative

Access to Battlespace

Access to Political Victory

Policy Outcome  =  f {Power, Moral Principle}
The Stabilization Mission Gap

...Traditional Model

Intensity

Major Combat Mission

Nation Building Mission

Planning For Combat

Slow Buildup

Long Conflict

Forces Available For Occupation

Long Term (Civilian Lead)

Duration
The Stabilization Mission Gap

… New Challenges

The Stabilization Mission Gap

Intensity

Duration

Planning For Combat

Fast Buildup

Short War

Few Forces Available For S&R

Long Term (Civilian Lead)

Major Combat Mission

S&R Gap

Nation Building Mission
Intensity

Duration

Planning For Combat And S&R

Fast Concurrent Buildup

Short War

Prompt S&R Operations

Long Term (Civilian Lead)

Major Combat Mission

S&R Mission

Nation Building Mission

The Stabilization Mission Gap

...Transformed S&R Capability
Informing Transformation

...Transactions vs. Resources

Anticipating Perfectly Predictable Surprises
Global Trends and Implications

Policy Choices:

- **Engagement Policy**
- **Substitution of Capital for Labor**
- **Civil Component of National Security**
- **Allied / International Component**

† Excludes Vietnam War
* Total number of response days for all operations by Army, Navy, Air Force and Marines
The Collection – Analysis Gap

...Managing the Inevitable

Policy Choices:
- Automate Triage
- Automate Analysis
- We all become analysts
Military Response to Information Age: Network Centric Warfare

Information Advantage - enabled by the robust networking of well informed geographically dispersed forces

Characterized by:
- Information sharing
- Shared situational awareness
- Knowledge of commander’s intent

Warfighting Advantage - exploits behavioral change and new doctrine to enable:
- Self-synchronization
- Speed of command
- Increased combat power

Information Sharing is a New Source of Power
Learning Rate

Information “Richness”
- Content
- Accuracy
- Timeliness
- Relevance

Information “Reach”

Competitive Advantage
Competing in the Information-Age

...The Power of Network-Centric Operations

Social Domain
Cultural Awareness

Cognitive Domain
Cognitive Advantage
Process Advantage

Information Domain
Information Advantage

Physical Domain
Force Advantage
Position Advantage

Conveyed Commander’s Intent

Plan, Organize, Deploy, Employ and Sustain Cycle

Shared Awareness

Network Centric Operations

Precision Force

Speed and Access

Competing in the Information-Age

…The Power of Network-Centric Operations
Shared Awareness

...The new competitive advantage

**Scenario**

- SBCT attack on Shughart-Gordon
- Certification Exercise (CERTEX) at Joint Readiness Training Center, May 2003

**Hypotheses**

- Stryker Bde NCO capabilities provide significant information and decision superiority and increase force effectiveness and are a source of combat power

**Findings**

- Friendly:Enemy casualty ratio decreased from 10:1 to 1:1
- Increase in Individual/shared information quality from about 10% to ~80%
- Acceleration of speed of command from 24 to 3 hours in key engagement
- Bottom line result: allowed commander ability to control the speed of command
Identify Issues of Regret
... Candidates for Action Now

Warfare Elements

- **Fire** – non-lethals, directed energy, redirected energy
- **Maneuver** – seabasing, vertical battlefield, lift for operational maneuver
- **Protection** – urban operations, “biomedical countermeasures” cycle time
- **C2&C** – joint interdependency vs. interoperability
- **ISR** – demand-centered intelligence, tactically responsive space
- **Logistics** – joint demand-centered logistics

Risk Management (*creating on-ramps*)

- **Joint concept development & experimentation** – short cycle time / rapid iteration, concept-based / technology-enabled
- **Joint training** – live / virtual / constructive / distributed
- **People** – culture and organizations
Technology Trends and Cycles

- Primary Structural Materials: 20-40 years
- Propulsion: 15-25 years
- Weapons: 8-15 years
- Sensors: 3-8 years
- Stealth Concepts: 3-5 years
- Communications: 1-3 years
- IT Software: 1.5-2 years
- IT Components: 0.5-1 year

- Globally available technology
- Our technological advantage comes from speed of systemization
Technology Trends and Cycles

New Opportunities

- Primary Structural Materials: 20-40 years
- Propulsion: 15-25 years
- Weapons: 8-15 years
- Sensors: 3-8 years
- Stealth Concepts: 3-5 years
- Communications: 1-3 years
- IT Software: 1.5-2 years
- IT Components: 0.5-1 year

- Historical Opportunity
- Time and Cost Compression
Focus in designing alternative architectures:

- Low unit cost
- Modularity
- Numbers
- Speed
- Networking
- Sensing
- Innovative designs
- Mass Customization

Preserve Strategic Advantage: innovation & the breadth, depth and diversity of the industrial base
Focus in designing alternative architectures:

- Low unit cost
- Modularity
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Preserve Strategic Advantage: innovation & the breadth, depth and diversity of the industrial base
High Speed at Sea

M-80

LOA 80'-0"
Beam 40'-0"
Tunnel Width (4) 5'-0"
Draft (static) 2'-4"
Displacement 67 MT
Payload 15 MT
Fuel Load 10 MT
Classification ABS
Main Engines 4 x 1650HP C-30 Caterpillars
Surface Piercing Propellers 4
Speed Max @ full load 50-55 knots
Range @ full load & max speed 500 NM
HP Required (total) 6200hp
Clear Height 15'-0"

Payloads 43% of Displacement
11-M RIB or equivalent
UAVs
15 personnel
Stiletto
Project “Sheriff”
...Controlling the Engagement Timelines

The Capabilities
• “Speed-of-light Sensing
• Networked
• Lethal/Non-Lethal Options
• Active/Passive Options
• Kinetic/Non-Kinetic Options
• Survivability

The Technology
• Compact Active-Denial Technology
• Phraselator High-Power Direction Hailer
• Vector-Beam High-Power
  White/IR Spot Light
• Counter Improvised
  Explosive Device (IED)
• Active Protection
• Counter Sniper
• Rapid-Fire Kinetic Weapon
• Multi-Spectral Sensor Suite
• Armor Protection
• Integrated Electronic Warfare Suite
• Net-Centric Technology
Re-Directed Energy

Warfighting Advantage:
- Decrease Engagement Timeline
- Reduce Collateral Damage
- Revalue LOS Only Lasers
- Increase Shots per Laser
- Optimize Beampath Flexibility & Engagement Options

Laser – Relay Mirror – Air Vehicle Technology Pairing
New Logic and Metrics

• Achieve higher **learning rates**
  Co-evolve concepts, capabilities and processes
  Continuous adaptive acquisition and experimentation

• Employ higher **transaction rates**
  Faster cycle times
  Speed of information and operational mobility

• Create and preserve **options**
  Technology on-ramps
  Broaden capabilities base
  Mass customization

• Create overmatching **complexity**
  Scalable
  The small the fast and the many
Transforming National Security

“A Future Worth Creating”

Vision: Broad and Sustained Competitive Advantage

- Strategy
- Capabilities
- Cost/Metrics

Terry J. Pudas
Acting Director, Force Transformation
25 January, 2006
Full Spectrum Effects Platform
Full-Spectrum Effects Platform

‘Sheriff’…non-lethal enablers of lethal force

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<td>BWL</td>
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<td>Laser Dazzler</td>
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<td>Radar (APS)</td>
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<td>MMBJ</td>
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<td>Gunslinger</td>
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- Concurrent protection
- Avoiding irrevocable & unintentional
- Precision categorization
- Discriminate before commit.
- Transformational fire and maneuver
MAHE, Seychelles (AP) – “The crew of a cruise ship attacked by pirates off the coast of Somalia used a sonic weapon to help ward off the attackers, the Miami-based Seabourn Cruise Line said Monday.”  11/8/05

(CNN) – “Law enforcement officers were questioning a Parsippany, New Jersey, man who they say may have pointed a laser beam at an airborne police helicopter Friday night and a Cessna aircraft two nights before, said a spokesman for the Port Authority of New York and New Jersey.” 12/31/04

MAHE, Seychelles (AP) – “The crew of a cruise ship attacked by pirates off the coast of Somalia used a sonic weapon to help ward off the attackers, the Miami-based Seabourn Cruise Line said Monday.”  11/8/05

“More than 400 incidents involving the dangerous practice of shining laser light into aircraft have been reported since 1990, U.S. Department of Transportation Secretary Norman Mineta said at a January 2005 press conference in Oklahoma City.”  1/5/06
“We need a force which is designed and capable of fighting first for information superiority.”
War is more than combat

and...

Combat is more than shooting
Concept/Technology Initiatives

- Operationally Responsive Space-Based System
- Full-Spectrum Effects Platform: Project “Sheriff”
- Tactical Re-Directed Energy
- Advanced Technology Craft Prototype Development & Experimentation

OFT Teamed With
- AF Space Command, AFRL, NRL, NRO, Johns Hopkins Applied Physics Lab, NASA, MIT Lincoln Labs
- Army AMO/CCS, US Army Futures Center, MCWL, NSWC-DD
- Air Force Research Lab/DE/ DDR&E, IDA (JAWP)
- NUWC / NAVSEA Combatant Craft Division, Naval Undersea Warfare Command / CCD, SOCOM, Naval Postgraduate School
Full-Spectrum Effects Platform

‘Sheriff’...plan in action

Office of the Secretary of Defense
Force Transformation

• F-SEP Spiral 0 Integration Complete
• Testing at Dahlgren, Quantico and Aberdeen Dec -Feb ’06.
• Infantry Center Test & Validation March – May ’06.

Acoustics testing

APS Installation

F-SEP Spiral 0 Stryker 2 December 2005
High Speed at Sea

M-80

LOA  80'-0"
Beam  40'-0"
Tunnel Width (4)  5'-0"
Draft (static)  2'-4"
Displacement  67 MT
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HP Required (total)  6200hp
Clear Height  15'-0"

Payloads  43% of Displacement
11-M RIB or equivalent
UAVs
15 personnel
Aircraft Program Trends

Source / Rand Aviation Week & Space Technology
## Navy Program Trends

Based on date first ship in class was launched

<table>
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<tr>
<th>Year</th>
<th>Platform</th>
<th>System (Modules)</th>
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<tbody>
<tr>
<td>1950s</td>
<td>DDG 37, CVN 65, FFG 1, CG 26, AOE 1, AFS 1, FF 1052, CGN 35, AS 33, SSBN 640, LPD 4, PG 84, AGDE-1, SSN 637, AD 37, PGH-2, CV 67, AS 36, SSBN 616, SSBN 627, FF 1040</td>
<td>Increasing defense risk</td>
</tr>
<tr>
<td>1960s</td>
<td>CV 63, SSN 671, CGN 36, AOT 168, DD 963, SSN 685, LHA 1, SSN 688, PHM 1, CGN 38, FFG 7, AS 39, AO 177, DDG 993, SSBN 726, CVN 68</td>
<td>Decreasing capabilities base</td>
</tr>
<tr>
<td>1970s</td>
<td>CG 47, LSD 41, SSN 719, MCM 1, AO 187, SSN 751, LHD 1, DDG 51, AOE 6, MHC 51, PC 1, LPD 17, SSN 774</td>
<td>Broaden the base</td>
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<tr>
<td>1980s</td>
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<td>1990s</td>
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<td>2000s</td>
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<td>2010s</td>
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<td>2020s</td>
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**Navy Program Trends**

**Based on date first ship in class was launched**

- **Platforms**: DDG, CVN, SSN, CG, AOE, AFS, FF, CGN, AS, SSBN, LPD, PG, AGDE, SSN, AD, PGH, CV, AS, SSBN, SSBN, LST, MSO
- **Interfaces**: Decreasing capabilities base, Increasing defense risk, Broaden the base, Manage the risk

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**Notes**

- **AO 149**: DDG 37
- **SS 572**: CVN 65
- **SSN 575**: FFG 1
- **MSO 519**: CG 26
- **DL 1**: AOE 1
- **SS 576**: AFS 1
- **SSK 1**: FF 1052
- **LST 1171**: CGN 35
- **DD 927**: AS 33
- **SSG 574**: SSBN 640
- **SS 204**: LPD 4
- **SSG 577**: PG 84
- **DE 1006**: AGDE-1
- **SSN 578**: SSN 637
- **AO 143**: AD 37
- **SS 580**: PGH-2
- **CV 59**: CV 67
- **SSN 585**: AS 36
- **SSN 571**: SSBN 616
- **SSRN-586**: SSBN 627
- **MSO 508**: FF 1040
- **CGN 9**: MSO 421
- **MHC 51**: SSBN 726
- **SSBN 598**: CV 68
- **AE 23**: PG 92
- **AGSS 569**: LCC 19
- **SS 204**: LST 1179
- **SSG 577**: DD 931
- **PGH 1**: MSO 421
- **SSGN 587**: DDG 51
- **DDG 2**: LPD 17
- **LST 1156**: SSN 774
- **MSO 422**: SSN 774

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**Legend**

- **Standard**
- **Flexible**
This is the age of the small, the fast, and the many.

Small:  Power and size are uncoupled
Fast:    A shorter response with a faster rise time more precisely placed in time and space
Many:   The power of the collective at lower cost over a larger area

Rebalance for the information age

“Demassification” through increased information fractions
Simplification through adaptive relocation of complexity & the human
Networked components vice integrated systems

Operations based on assured access, information superiority,
control of initial conditions and rates of change

A priori access to the domains of conflict
Secure a superior information position and convert it to a competitive advantage
Leverage the path dependency of conflict

Corporate change based on co-evolution and continuous
adaptive acquisition
Payload
- Compliant with standard interface
- On-board processing
- Decision quality data
- Payload isolation (optional)

Core spacecraft (robust to all inclinations and HEO orbits)
- Standard with some modular subsystems
- Flexible propulsion

LV Adapter
- Standard interface
- Softride

Standard Communications
- High speed theater downlink
- JTRS software radio

Operability features
- Standard command and telemetry
- Autonomy
- Self activation / calibration

Rapid integration features
- Pre-qualified components
- Built-in test
- Robust and storable

Flexible data bus / C&DH architecture
- Plug ‘n play switch fabric
- High and low speed digital

Modular Solar Array
- Scalable power
- Adaptable to all orbits

Tailorable Bus Built on Open Common Standards
New Logic and Metrics

...Competency

• Access
  The ability to use military assets, both information and physical, at the best points of effect in hard-to-reach locations even when denial strategies are employed by the enemy;

• Speed
  Minimization of response time from deliberate operational (or strategic) maneuver to stunning tactical swiftness;

• Distribution
  The extent to which firepower, sensors, and other systems are spread over a diverse and geographically dispersed set of assets/platforms;

• Sensing
  The ability to provide information with accuracy, timeliness and relevance, and especially to locate and track fleeting targets;

• Mobility
  The ease and promptness by which military assets can be shifted from one physical location to another; and

• Networking
  The extent to which military assets are connected together through information technology that assures shared awareness and information access.
Why Organization Matters

Organization

- Determines *command relationships*;
- career patterns and professional development
- Establishes *connectivity* between communications nodes;
- Provides *structures* for information exchange requirements
Weapons Employment Time Delay

Offense vs. Defense
- Mobility vs. Shooters
- Stealth vs. Sensors

Envelope management vs. depth of battle
- Stealth & Mobility vs. Engagement Range
- Speed, Time, Timing

Trimming for speed
- Shorten sensor times

C4I Time Delay

Probability of Hit

Target Range (nm)
Western Iraq Case Study

Key Findings to Date

• Western Iraq was the most “networked” theater of operations, operationally and tactically, in the history of warfare.

• **Largest conventional & coalition SOF operation** in the history of warfare.

• **Largest scale use of tactical data-links** in history of warfare.

• Only area of operation in Iraq where Blue Force Tracking information on SOF + conventional ground forces was provided via data link to fixed wing combat aircraft.

• Zero Fratricide: **Only area of operations in Iraq where air-to-ground fratricide was eliminated**
Transformation

Down at the grange they’re teachin’ a new way of plowin’
Ya’ goin’?

Nope!
I already don’t plow as good as I know how ...

www.oft.osd.mil
Operationally Responsive Space

...TACSAT 1

- **Responsive**
  - <2 Yr concept to on-orbit capability

- **Low Cost**
  - Total cost of experiment less than $15M including launch

- **Experiment**
  - UAV Components in Space
  - Space/Air Horizontal Integration
  - Designer Payloads
  - TCP/IP Based: SIPR Net Accessed
  - New commercial launch vehicle

- **Operationally relevant capability**
  - Integrated into Combatant Commanders Exercises/Experiments
  - Time / Capability Trade Off

A capability on orbit within the planning time constraints of a major contingency
Key Barriers to Transformation

...Challenges

- Cultural barriers
  
  *Speed of understanding vs speed of doctrine*
  *Values, attitudes and beliefs*
  
- Physical barriers
  
  *Speed of mass (lift and mobility)*
  *Speed of information (connectivity & interoperability)*
  
- Fiscal barriers
  
  *Willingness and ability to devalue and devolve*
  *Strategic approach to cost*
  
- Process barriers
  
  *Transformation of the management of defense*
Strategic Approach to Cost

Key Elements

- Decrease operational costs
- Achieve better ROI for less
- Broaden the capabilities base
- Create and preserve future options
- Manage divestiture
- Transform non-discretionary areas
- Impose cost to adversary
- Develop counter-cost imposing strategies

New metrics create opportunities for new cost dynamics
Part I: Continuous small steps
  Sustaining
  Evolutionary changes
  Stay on the local maximum

Part II: Many medium jumps
  Explore and expand the local region
  New doctrine / organization / systems

Part III: A few big bets
  Could change DoD
  Change the world
  Create a new game with new rules

“If you are not making any big bets you are a fixed strategic target and at risk.”
Non-Lethal Weapons

...Summary

1. Transformational? - Yes
   - New strategic context (expanded competition-moral principle)
   - Broadens the capabilities base
   - Expanded threat context
     *Allows us to do things we cannot currently do*

2. Do we have the technical ability to create a NLW capability? - Yes - If we choose to do so
   - Demonstrated prototypes currently exist
   - Law enforcement already using
   - Potential NLW utility from ongoing S&T initiatives

3. Do NLWs have military utility? - Unequivocally Yes
   - Need identified and requested in Kosovo
   - Examples of requirement in Iraq

4. Are there impediments to creating/employing a NLW capability? - Yes
   - Structural-Joint S&T
     * Acquisition authority
     * Executive agent/Program office
   - Legal/policy-Reexamine the root decisions upon which the policies and treaties were created/interpreted
   - Cultural-Warrior+Enforcer+”Systems Administrator”
     * Create a constabulary capability (stability and reconstruction)

*War is more than combat and combat is more than shooting*
“If the only person that builds spacecraft for the government is Air Force Space Command, and I go to that warehouse for every product, there is not a lot of competition. There are a lot of well-intending, energetic people, but there is not a lot of competition.”

Gen. James E. Cartwright
Commander, U.S. Strategic Command

Space News, 10 October 2005
New Design Principles

• Capabilities are decoupled from platform

• Power and survivability have been decoupled from size

• Information has been substituted for mass

• Mass customization delivers greater value than mass production

• Networked components outperform integrated systems
Composites Materials
Innovative designs
Networking
Information for mass
Distributed capabilities
Proximate netted sensors
Directed and redirected energy
Robotics

Increased
- Speed
- Survivability
- Sea keeping
- Payload fraction
- Dispersion
- Shared awareness
- Lethality
- Tactical stability

Decreased
- Life cycle cost
- Procurement cost
- Vulnerability
- Manning
- Structural mass
- Infrastructure
Approaches to Logistics

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<th>Mass-Based</th>
<th>Just-in-Time</th>
<th>Sense and Respond</th>
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| • More is better
  • Mountains of stuff measured in days of supply
  • Uses massive inventory to hedge against uncertainty in demand and supply
  • Mass begets mass and slows everything down
    Prime Metric: Days of supply | • On-time is better
  • Inventory is reduced to a minimum and kept moving
  • Uses precise demand prediction and static optimization to purge uncertainty
  • Works great … except when it doesn’t
    Prime Metric: Flow Time | • Agile is better
  • Inventory is dynamically positioned throughout
  • Uses transportation flexibility and robust IT to handle uncertainty
  • Initial S&R models look promising
    Prime Metric: Speed & Quality of Effects |
The Emerging American Military:

- More expeditionary (including lighter, more lethal)
- More networked (more interoperability at the JTF level)
- Designed to leverage the exterior positions (precision from distance as sensors move in)
- Leverages increasingly persistent ISR
- Tighter sensor-shooter timelines (sensing, C2, fly-out)
- Values Information Superiority (information operations)
- Expanded unmanned capabilities
  (UAV, UCAV, UUV, robotics)
The Advance to Baghdad

1. Rate of Advance outruns logistics Communications

2. Logisticians shift to “push” system – use models, Sitreps, to “sense” supply needs

3. Tactical Units shift to cross supply to fill gaps
WHAT’S VALUED
MANEUVER
SENSING
SPEED/ENDURANCE
NUMBERS
RISK TOLERANCE
STAYING POWER
NETWORKING

Assure, Disuade, Deter

Alter Initial Conditions

Defeat

Restore

Transforming Defense

...2nd derivative force

Intensity

Duration
Within the next 10 years, some adversaries will likely have the ability to use long-range precision strike weapons such as ballistic and cruise missiles to deny our use of fixed military infrastructure, such as ports, airfields, and logistical sites.

Source: Thomas G. Mahnken and James FitzSimonds, “Officer Attitudes Toward Innovation”, Naval War College, 2002
Within the next 10 years, some adversaries will likely have the ability to use long-range precision strike weapons such as ballistic and cruise missiles to deny our use of fixed military infrastructure, such as ports, airfields, and logistical sites.

“The Limits of Transformation: Officer Attitudes toward the RMA,” Tom Mahnken and James Fitzsimmons NWC, 2003
Disruptive Security Challenges

...An Approach

- Dissuade Attempts at Disruptive Challenge by Accelerating Transformation
- Narrow Range of Disruptive Challenge with Improved Intelligence
- Improve Responses to Disruptive Challenge with more Force Flexibility
Vision: Broad and Sustained Competitive Advantage

- Strategic Imperative
- New Logic and Metrics
- Technology Opportunities

Terry J. Pudas
Acting Director, Force Transformation
18 January, 2006
Architectural Choices

CENTRALIZED
INTEGRATED
OPTIMIZED
SYSTEMS RISK

DECREASING RETURN
COMMAND DIRECTED

DECENTRALIZED
NETTED
DYNAMIC FITNESS
LOCAL RISKS

INCREASING RETURN
GOAL DIRECTED

Where timing and speed matter

Locating System Complexity
Causes for increased Speed

Incentives:

• The value of time

“Demassification”:

• The devaluing of distance and geography

More direct coupling of input to output:

• The flattened hierarchy
Speed of Effects

NETWORK CENTRIC WARFARE
HIGH RATES OF CHANGE
CLOSELY COUPLED EVENTS
LOCK IN/OUT
SPEED OF COMMAND
SELF SYNCHRONIZATION

DOMAINS OF WAR
BELIEF
LEADERSHIP
UNIT COHESION
MORALE

REASON
SA
COMMS
C2

PHYSICAL
MOVE
STRIKE
PROTECT

Reasons for a force abandoning an attack or a defense

- Orders to Withdraw
- Weather
- Truce/Surrender
- Supply Shortage
- Enemy Reinforced

- No Reserves Left
- Enemy Achieved Surprise
- Enemy Occupied Key Terrain

- Adjacent Friendly Withdrew
- Envelopment, Encirclement, Penetration

Human Behavior Dominates Outcome
Not modeled well
No rigorously quantifiable MOEs
Appreciated by Clausewitz
Basis of Network-Centric Warfare

Readiness = f(cohesion, morale, will, cognition, courage,...)
Project “Sheriff”
...Controlling the Engagement Timelines

**The Capabilities**
- “Speed-of-light Sensing
- Networked
- Lethal/Non-Lethal Options
- Active/Passive Options
- Kinetic/Non-Kinetic Options
- Survivability

**The Technology**
- Compact Active-Denial Technology
- Phraselator High-Power Direction Hailer
- Vector-Beam High-Power White/IR Spot Light
- Counter Improvised Explosive Device (IED)
- Active Protection
- Counter Sniper
- Rapid-Fire Kinetic Weapon
- Multi-Spectral Sensor Suite
- Armor Protection
- Integrated Electronic Warfare Suite
- Net-Centric Technology
Sherriff Video
Full-Spectrum Effects Platform

Active Denial Technology (ADT)

Gunslinger

Laser Dazzler

Long Range Acoustic Device (LRAD)

Speed
Information
Lethal / Non-Lethal
Active / Passive
Kinetic / Non-Kinetic

Bright White Light (BWL)

Mobile Multiband Jammer (MMBJ)

Active Protection System (APS)