Autonomic Capabilities and Logistics Transformation

United States Army
Logistics Integration Agency

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Outline

- The Objective Force and Future Logistics
- Logistics Demand Drivers
- Army Autonomic Logistics Efforts
- Where We Are Going
Objective Force Operational Environment Maneuver Concept

Concept of Operation
- Deploy rapidly from strategic distance
- Ready to Fight shortly after arrival
- Develop the situation out of contact (COP)
- Maneuver to a position of advantage
- Acquisition and lethality overmatch
- Operator Crew Chief (Maintainer)
Objective Force Maneuver Sustainment

Combat Replenishment Ops
- Quick/in-stride within Battle Rhythm
- Between support section & platform
- Replenishment -- Remail, refuel, Cross-level supplies & On-board spares
- Class VIII re-supply, transfer, or evacuate casualties

Mission Staging Operations
- Intense, time-sensitive, planned, deliberate – all preparations for upcoming mission
- Executed within the maneuver commander’s battle rhythm
- Resupply & Regenerate combat power during significant mission transitions

150km Radius Area of Interest

100km Radius Area of Influence

Edgewood Arsenal

Dover

Edgewood Arsenal

Sustainment Replenishment Operations
- “Pit-stop” Operations
  - Deliberate & Hasty
  - In-stride, in Battle Rhythm
- Focused rearm, refuel, fix, medical
- Personnel replacements as needed

Richmond
Future Army

Logistics Environment

Logistics Transformation Imperatives

- Enhance Strategic Responsiveness:
  - One Brigade in 96 hours
  - One Division in 120 hours
  - Five Divisions in 30 Days

- Reduce Combat Zone CSS Footprint

- Reduce Cost of Logistics Without Impacting Warfighting Capability or Readiness

Future Environment

- Provide Maneuver Sustainment from Strategic Distances
  - Anticipate the Need
  - Provide at Critical Time, Place

- Fight Shortly After Arrival – Sustainment Fully Integrated into Combat Maneuver

- Operationalize Sustainment to Match Unit of Action OPTEMPO and Mission
  - Sustainment OPTEMPO = Maneuver OPTEMPO

Essential Qualities

- Employment Shortly after Arrival

- In Combat Zone, Equal in Mobility & Agility to Combined Arms Counterparts

- Distribution Based

- Joint, Interagency, Combined Interoperable

- Common Logistics Operating Environment
  - Anticipatory, Platform-Soldier Based

- Reduced Need for Maintenance
  - “Pit-stop” Engineering & Crew Chief
  - Embedded Diagnostics & Prognostics

Responsiveness in Building & Maintaining Combat Power
Leveraging Autonomic Capabilities

- Commonality of Major Systems
- Increased Availability
- Reliability & Maintainability, Embedded Diagnostics & Prognostics
- Responsive, Capable Log C²
- Intermodal Transfer Distribution
- Precision Air Drop
- Robotics
- 50% Reduction in Size
- Reduced Battlefield Distribution
- Power & Energy
- Reduced Battlefield Distribution -- Water, Food
- Increased Pk, Smaller, Smarter, Multi-functional Munitions

Demand is a Function of Platforms and Operational Employment

Sustaining The Transforming Army

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Increased Availability

- **Reliability & Maintainability**
  - “Smart” Materials
  - Design Technologies
  - Commonality Across Platforms

- **Prognostics**
  - Autonomous System “Health Monitoring”

**Platform & Soldier Level Assessment**

**Army Efforts to Achieve This Endstate:**
- Common Logistics Operating Environment
- Tactical Logistics Data Digitization
- Stryker Demo
- Future Combat System

**Sustaining The Transforming Army**

**Intelligent Decision Support Tools**

- Future Component Failure
- Current Consumable Status
  - Ammunition
  - Water
  - Fuel

**Crack Detection Within a Structural Member**

- On-board Processing & Fusion of Select Sensor Array Data
- Using Artificial Intelligence
- Physics-of-Failure Based

- Tactical Support Plan
- Scheduled Maintenance
  - Parts
  - Consumables

- Self-Reporting Prognostic & Diagnostic Knowledge

- Objective Force
Global Log C2

- Knowledge Based
- Integrated Enterprise
- Common Relevant Operating Picture
- Knowledge Creation & Management
  - Near Real-Time Status of Platforms and Soldiers
  - Intelligent Decision Support Systems
- Bandwidth
- Enables Integrated, Responsive Support
  - Agile, Intuitive, and Adaptive
  - Full Spectrum Operations
- Focus: Improving & Accelerating the Decision-Action Cycle

Army Efforts to Achieve This Endstate:
- Army Enterprise Integration Office
- Logistics Common Operating Picture
- Theater Log C2
- Automatic Identification Technologies
- Standard Army Retail Supply System-Business Process Server
- Movement Tracking System/Defense Transportation Reporting & Control System

Sustaining The Transforming Army

See First
Understand First
Act First
Finish Decisively
Distribution

- **Airdrop**
  - Soft Landing Technologies
  - Precision Guidance
  - Rapid Rigging-Derigging Technologies

- **Intermodal Interfaces**
  - Configured Load Planning Capability
  - Shorten Times to Perform
    - Weigh-In-Motion
  - Modular to Deliver Configured Loads

- **Robotics**
  - Leader-Follower
  - Embedded MHE on Platform
    - Articulated Arm
    - Tied to Load Planning Capability
  - Unmanned Aerial Delivery
  - Reduced Manpower

**Army Efforts to Achieve This Endstate:**
- Pegasus
- Smart Distribution
- Leader-Follower Robotics

Sustaining The Transforming Army
Where We Are Headed

- Autonomic Capabilities Transform Logistics Demand Drivers to Meet Objective Force Requirements:
  - Ensure Availability Through Reliable Equipment and Prognostics
  - Anticipate and Predict Logistics Need Through Global C2
  - Provide End-to-End, Global, Seamless Continuum for Distribution

- The Army is Integrating Autonomic Capabilities into the Logistics Systems of Tomorrow
  - Fielded Capabilities Need to be Translated from Concepts

- Anticipatory, Predictive Logistics – Achieving the Full Spectrum of Sense & Respond

- Need Industry Help to Solve Demand Reduction for Future & Current Platforms through Autonomic Technologies
  - New and Novel Technologies
    - Leverage Civilian Technology Advances
  - Innovations and Expertise in Manufacturing/Remanufacturing Processes
  - Agreed-Upon Business Rules
  - That result in:
    - Reduced Demand
    - Efficient, Effective Processes