Lessons Learned from Estimating Non-Standard Equipment (NSE)

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Outline

- NSE Background and Studies
- Estimating Challenges
- Conclusions
- Special Thanks and Questions

Introduction to NSE

- Unconventional warfare required the DoD to develop new strategies to support the warfighter
  - DoD purchased Non-Standard Equipment (NSE) to fill technology gaps
  - Tens of billions of dollars invested in lifesaving equipment

Boomerang Gunfire Detection

M160 Mine Clearance Robot

PSS-14 Mine Detector

Characteristics of NSE

- Rapid design and use of Commercial Off-the-Shelf (COTS) systems
- Rapid production and deployment
- Sustainment in theater, often by Original Equipment Manufacturer (OEM) or Contractor Logistics Support (CLS)
- Primary focus on immediate threat, not necessarily cost or configuration

Current State of Wartime NSE

- US operations have ended in Iraq and are drawing down in Afghanistan
- Phase out of Overseas Contingency Operations (OCO) funding, ending in FY16 (or sooner!)
  - Most NSE programs do not have line items in the base budget
- Development of requirements for NSE future is ongoing
  - Assessment of what capabilities should be retained
  - Transition of retained equipment to traditional lifecycle process
  - Or: storage/disposal
- Result: Equipment is returning to CONUS without fully defined guidance

"Requirements and funding are everything"
– Jeff McLean, TACOM ILSC

Case Study 1: Robots

Small Unmanned Ground Vehicle Robots

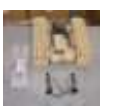
Vehicle Transportable | **Soldier Portable** | **Ultra-Light**

Talon IV

PackBot FasTac

SUGV 310 Mini-EOD

First Look



Dragon Runner

- COTS systems sent to theater for Route Clearance and Explosive Ordnance Disposal (EOD) missions
- Managed by Robotics Systems Joint Project Office (RSJPO)
- 7,000+ systems procured, primarily from Qinetiq and iRobot
- Plan to retain 1,500-2,700 bots in five models as bridge strategy

Case Study 2: MRAP

Mine Resistant Ambush Protected Vehicles

MATV UIK

MaxxPro Dash ISS

MaxxPro LWB Ambulance

- Urgent need development/procurement to protect soldiers and convoys in theater from IEDs and attacks
- Joint program purchased over 20,000 vehicles from seven manufacturers in 20 configurations
- Plan to retain 8,585; three models in seven configurations

Relevant Studies

Robots: Two related Cost Benefit Analysis (CBA) studies for RSJPO

- CBA 1 focused on storage vs fielding/sustainment: provide potential sustainment plan and funding justification
- CBA 2 focuses on transition of NSE to new organization and resulting sustainment bridge

MRAP: Support to PM MRAP for two concurrent tasks

- Cost Analysis Requirements Description (CARD)
- Program Office Estimate (POE) to support affordability analysis

NSE Estimating Challenges

- Programmatic issues
- Configuration and Reset
- Storage
- Sustainment
- Other Elements

NSE Estimating Challenges

- **Programmatic Issues**
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Program-Specific Details – Robots

- Ground robots still relatively new in DoD
- NSE robots bridging to Program of Record (PoR) replacements
  - No "home" organization without PoRs
  - Requirement for PoRs still being defined/approved
  - Number/mix of NSE bots keeps changing
- Short Economic Useful Life (EUL) (5 or 10 years)
  - Retaining older technology
  - Risk of obsolescence and diminishing manufacturing sources
- Few peacetime analogies available for data sources

Program-Specific Details – MRAP

- MRAP Study III provides plan for retained quantity and fielding
- Retained MRAPs are displacing a select number of vehicles
- Key Leader Vehicle (KLV) configuration filling new requirement as a platform for Army WIN-T
- 30 year EUL after reset/upgrade is complete
- Higher protection levels than many comparables

Full Materiel Release (FMR)

- Army issued policy requiring FMR for all fielded NSE
- Requires type classification, logistics demos, training plans, tech data package, technical manuals, testing

Robots:

- CBA 1 included estimate for FMR and potential rationale for proposing waiver
- CBA 2 assumes some FMR activities completed

MRAP:

- Tech manuals to be completed (last remaining condition to achieve Full Material Release)

Funding

- As OCO funds expire, MRAP and Robots need to be added to Army base budget

Robots:

- Funding cannot be provided without a home organization
- Without precedent and PoRs to bridge to, difficult to find organization to absorb NSE robots
- Goal of CBA 2 is to provide path to parent organization

MRAP:

- Goal of ongoing Affordability Estimate is to finalize requirement for 8,585 retained systems and attain base budget funding stream

NSE Estimating Challenges

- Programmatic issues
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Configuration – Return from OCONUS

- Configuration and equipment condition are not well-tracked in theater

Robots:

- Many return with missing parts (controllers, arms, tracks, manuals, etc.)
- 45% Talon IV have outdated lead-acid batteries

MRAP:

- Disposition of Government Furnished Equipment (GFE) is in question
- Enduring configurations approved by Vice Chief of Staff of the Army 14 Mar 2013

Configuration – Reset/Upgrade

- After wartime usage, retained NSE requires reset
- OCO funding can be used to cover reset costs (while supplies last)

Robots:

- Annual wartime repair cost actuals used to assume reset; upgrades include power mast
- All robots require new batteries and CONUS radios

MRAP:

- Reset to completely serviceable condition (Army 10/20 + maintenance standards)
- Modifications based on Engineering Change Proposals (ECPs)

Configuration – GFE

Robots:

- GFE usually provided by receiving unit (cameras, accessories, etc.)

MRAP:

- GFE is a significant cost driver
  - "A-Kits" (standard brackets & cables)
  - "I-Kits" (vehicle-unique mounts)
  - "B-Kits" (actual GFE end item)
- Final MRAP configurations are still being refined
- GFE needs to be reset (or purchased) and sustained
- Some GFE items no longer in production

NSE Estimating Challenges

- Programmatic issues
- Configuration and Reset
- **Storage**
- Sustainment
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Storage

- Potential for NSE to be retained in storage
- Care of Supplies in Storage (COSIS) for items in depot float or long-term storage

Robots:

- In CBA 1, explored "cold storage" of all retained robots
- Sierra Army Depot stores non-COSIS items for free after receipt

MRAP:

- 65% of vehicles going into Army Prepositioned Stock (APS) and other storage
- Facility requirements for APS locations TBD

NSE Estimating Challenges

- Programmatic issues
- Configuration & Reset
- Storage
- **Sustainment**
- Other Elements

Sustainment Concept – **Robots**

- Wartime sustainment reflected extraordinary support
  - Tech/Trainer contractors were stationed with each unit
  - PM-run Joint Robot Repair and Fielding (JRRF) activity provided parts, depot-level support, upgrades, and electronics repair
- CBAs to provide guidance on sustainment concepts
  - Retain contractor-based JRRF
  - Convert JRRF to organic
  - Enlist existing depot
  - Utilize maintenance operations at each base

Sustainment Concept – MRAP

- Again, wartime sustainment not reflective of realistic post-war operations
- Plan is to convert to traditional organic support
  - "Green Suit" field level maintenance
  - Depot Level Maintenance at … depots
- Analogies from existing vehicles sufficient for estimates
  - Requires assumptions about COSIS level of stored vehicles

Interim Sustainment

- Sustainment required after fielding while Army finalizes logistics chain

Robots:

- Purpose of CBA 2 is to determine a feasible bridge sustainment until PoRs come online
- Existing JRRF potentially could support, but still requires parent organization

MRAP:

- Interim CLS provided by Field Service Reps (FSRs), often from OEM
- Can only be funded with procurement and must be completed one year after FMR

Sustainment – Initial Parts

- Most initial Authorized Stockage Lists (ASLs) fulfilled using parts on hand
  - Large stocks remain from wartime
  - Can cannibalize parts from non-retained vehicles

Robots:

- Supply chain and parts obsolescence must be captured in risk calculations

MRAP:

- Exception: MATVs need full set of ASLs
- ASLs are required for vehicles going into APS but not other storage

Sustainment – Parts

- Typically use OPTEMPO to estimate parts costs
  - Miles or hours (cost per mile or cost per hour)
- Wartime OPTEMPO not representative of peacetime mission (training)

Robots:

- Cost per bot per year from JRRF CONUS training/repair at Ft Leonard Wood (not based on OPTEMPO)

MRAP:

- Can use historical data from similar vehicles until CONUS data is available
- Still need to generate cost basis
- Additional challenge: Reserve/National Guard OPTEMPO

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Training – **Robots**

- In Theater, Tech/Trainers on-site with units, JRRF provided support & maintenance training
- Now, difficult to find training proponent for NSE robots
  - Need organization to perform New Equipment Training (NET)
  - Very small user base footprint to keep up user and maintainer training
  - Army TRADOC Engineer, EOD & Route Clearance schools provide mission training only

Other Cost Elements

Other elements estimated did not necessarily present NSE-unique challenges or were out of scope

- Selection & Disposal from theater
- Systems Engineering/Program Management
- Manpower
- Special Tools
- Fielding and Transportation
- Software/Post-Deployment Software Support (PDSS)
- Overhaul
- Disposal & Environmental

Conclusions

- Actuals from NSE wartime operations were often not useful for estimating peacetime sustainment
  - DoD should require consistent data collection & oversight for NSE in the future
  - But: alternative methodologies will still be required
- Army small robots provide a particular estimating challenge
  - Lack of precedent
  - Changing requirements
  - Obsolescence issues
  - Funding uncertainty

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QUESTIONS?