Life Cycle Demilitarization Considerations for IM Development

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Abstract #14103
SMCA & PM Demil Mission

• Single Manager for Conventional Ammunition (SMCA)
  - Established to gain efficiencies in the procurement, production, and demilitarization of conventional ammunition for all Military Services (DODD 5160.65)

• PEO Ammo delegated as SMCA Executor in 2002; OPM Demil established to execute the demil mission.

Our Mission:
Perform Life-Cycle Management for Demilitarization of Conventional Ammunition for the Department of Defense

All Services – All Conventional Ammo Currently Over 7,000 DODICs
A Demilitarization Challenge

$x \cdot (1.82)^3 > \$3.3B$

 LIABILITY (& Growing)
How do I demil this stuff?

- Affordable – Cost Efficient
- Operations Safety
- Environmentally Compliant – Friendly
Demil Stockpile & Cost Growth

Total Conventional Ammunition Stockpile*

Demil 34%

*Covered Tonnage at Depots

<table>
<thead>
<tr>
<th>Year</th>
<th>Demil Stockpile (000 tons)</th>
<th>Actual</th>
<th>Forecast</th>
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Conventional Ammo Stockpile Growth

Demil Cost Growth ($/Ton)

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<tr>
<th>Year</th>
<th>Cost ($/Ton)</th>
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Actual
Forecast


$0 $500 $1,000 $1,500 $2,000 $2,500 $3,000

93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11
How Demil is Done

Stratification Process:
- Use items to support training/testing
- Cross Level within DoD
- Offer to Other Government Agencies
- Foreign Military Sales
- Free transfer to Allies
- Into Demil Account (B5A)

Percentages reflect FY11; includes organic and commercial
Closed Disposal Technology

Technology Thrust Areas:
- Disassembly
- Removal
- Recovery & Reuse
- Destruction
- Waste Stream Treatment
Future Challenges: A Case for DFD

- Increasingly more complex munitions – IM, for example
- Existing demil infrastructure does not work – new development, technologies, or materiel solutions
- Designs not lending to efficient demil, increased cost

A holistic approach during development is needed to gain efficiencies – Design for Demil!
Design for Demilitarization (DFD)

• DoD is a **strong advocate** for application of DFD.
• DFD is **early consideration** of demil impacts in design – provides opportunity to gain life cycle cost reductions
  – Use existing infrastructure vs new capital investment
  – Demil process efficiency and economical recycling/reuse
  – Reduced environmental & safety impacts
  – Ultimately – expedited stockpile reduction and logistics enabler
• DFD includes heavy emphasis on **Systems Engineering** –
  – incorporation of demil along with other requirements

**Implement Early to Maximize Benefit**
DFD Policy

**DODI 5000.02**
- “During the design process, PMs shall ... plan for demilitarization”
- “… demilitarization shall be considered during system design.”

Published OSD/Services Policy:
- USD (AT&L) Policy Memorandum
- DoD I 5000.02
- Defense Acquisition Guidebook
- DoD I 5160.68, SMCA Instruction
- AR 70-1, Army Acquisition Policy
- DA PAM 70-3, Army Acquisition Procedures
- OPNAVINST 4520.1B, Navy Demil Policy
- AFMC I 21-131, Demil Requirements
- MARCORSYS COM 8020.1, Demil Requirements

**OUSD(AT&L) Policy:**
“… include in ... acquisition documentation ... how (you) ... intend to address demilitarization design requirements throughout system design.”
DFD Implementation

- Integrate demil throughout standard acquisition activities – programmatic and technical
  - Tech Dev/Acquisition Strategy
  - SOW/Specs/Source Selection
  - Systems Engineering & Tech Reviews
  - Test & Evaluation
  - Program IPT representation
  - Program/Milestone Reviews
  - Life Cycle Cost estimates
  - Demil Plan
Technical Considerations

• Energetic Fills
  − Ease of removal and processing (e.g. melt cast vs cast cure)
  − Economical reuse/recycle (e.g. explosive separation from binders)

• Engineering Design (Venting, Warhead, Packaging, etc.)
  − Ease of disassembly
  − No special tools required

• General
  − Efficiently accommodate demil technology
  − Ensure safety for demil operators

Performance is paramount, but life cycle should not be neglected; DFD can be low cost if done early
IM Example

Now: Autoclave Melt-Out

New IM Round: M1123 (IMX-101)

Future: Modified Autoclave

Added Costs:
- Develop new fixtures & procedures
- Capital investment @ multiple depots

Other More Complex Munitions:
- Need entirely new processes/facilities
- Lost value (inability to reuse explosive)
- Difficult disassembly

EOD Challenge too!
DFD IPT & Outreach

• Joint Service IPT developing DFD guidance, tools, & resources

• DFD Handbook in 2012
  – Provides acquisition guidelines, technical best practices, policy reference, and demil tutorial

• Acquisition “Roadshow” in 2012

• Metrics/oversight process in development; coordinating with OSD
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