Implementation of Design for Demil (DFD) in the Joint Services

15th Annual Global Demil Symposium and Exhibition
Indianapolis, IN

14 - 17 May, 2007

Mr. Gary Mescavage
Bldg. 321
ARDEC - Picatinny Arsenal, NJ
07806
(973) 724-3349
gary.mescavage@us.army.mil
Presentation Outline

- Why DFD?
- DFD IPT
- Implementation Strategy
- Challenges
- Recent Accomplishments
- Conclusion
Why Design for Demil?

- Traditionally, munition designers focus on item performance & may not be aware that design decisions can lead to difficult demil problems at the end of the item’s life cycle.

- In the past, OB/OD “took care of the problem”.

- Munition design historically had little impact on the ability to conduct effective and efficient demil (OB/OD).

- But things have changed ...
Design decisions made early in the life cycle now have a significant impact on end of life cycle demil operations!

**Why DFD?**

- Reduced OB/OD
- Advanced Demil Tech.

**Life Cycle Costs**

- R&D Cost
- Procurement Cost
- Operation & Support Cost
- Disposal Cost

**Why DFD is a proactive approach to addressing future demil challenges.**
Design decisions made early in the life cycle now have a significant impact on end of life cycle demil operations!

**Why DFD?**

- Reduced OB/OD, Advanced Demil Tech.
- Life Cycle Cost
- Environment
- Resource, Recovery, & Recycling (R3)
- Safety
- Readiness
- Systems Engineering

**DFD** is a proactive approach to addressing future demil challenges.
Design Impact on Demil

**ADAM MINE**
A depleted uranium (DU) salt in the molding compound is requiring $700K of additional equipment for the demil process.

**HARM WDU-21B NAVY WARHEAD**
Smaller fill hole makes washout more difficult in WDU-37B
Improved HARM; internal conduit traps explosives; PBXN-107 loaded binder does not melt.

**SUP CHARGE**
No glue ... easier disassembly!
Design Impact on Demil

SPARROW 17A/B WARHEAD

JOINT AIR-TO-SURFACE STANDOFF MISSILE (JASSM)

14 ft
Design for Demil Policy

DoDI, 5000.2
At the end of its useful life, a system shall be demilitarized and disposed in accordance with all legal and regulatory requirements and policy relating to safety (including explosives safety), security, and the environment. During the design process, PMs shall document hazardous materials contained in the system, and shall estimate and plan for the system’s demilitarization and safe disposal.

AMC-R 75-2/NAVSEAINST 8027.2A/AFLCR 136-5/ MARCORSYSCOMO 8020.1
Purpose: “... to the maximum extent possible, ammunition be designed for demilitarization and also requires the development of a formal demilitarization plan ....”
Design for Demil Implementation

- DFD a key strategic goal of the PEO Ammo approved PM Demil Strategic Plan.
- Multi-Service DFD Integrated Process Team (IPT) chartered to establish a DFD program.
  - Acquisition and demil are represented
Design for Demil

Goal

- Demil is a life cycle requirement that typically is inadequately addressed in the design phase.
- Goal: Influence munitions design early in the life cycle to incorporate demil considerations & positively impact future demil execution.
AT&L Life Cycle Mgt Framework

Integrated Defense Acquisition, Technology, & Logistics Life Cycle Management Framework

Disposal

Most Acceptable
- Recycle/Reuse
- Reprocessing
- Disposal

Least Acceptable

Most Acceptable
Acquisition Players

DEFENSE ACQ’N BOARD

PROJECT MANAGER

Government “Defines”

RD&E CENTER

Industry “Designs”

CONTRACTOR
DFD Challenges

- Design driven by performance, budget & schedule constraints.
- Development PM doesn’t pay for demil.
- Demil doesn’t occur for 10+ years after an item is fielded.
- Requirement must be measurable and verifiable.
- PMs aren’t aware of the need to DFD.
## Demil Plan vs Design for Demil

<table>
<thead>
<tr>
<th>Demil Plan</th>
<th>≠</th>
<th>Design for Demil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typically done late in the design</td>
<td></td>
<td>Done throughout design</td>
</tr>
<tr>
<td>Prescribes a procedure for demil</td>
<td></td>
<td>Influences the design for efficient demil</td>
</tr>
<tr>
<td>Afterthought</td>
<td></td>
<td>Forethought</td>
</tr>
<tr>
<td>Reactive</td>
<td></td>
<td>Proactive</td>
</tr>
</tbody>
</table>

Demil Plans can encourage but do not assure design for demil!
DFD Essential Program Elements

- **Lessons Learned**: Design recommendations from demil execution experience
- **Metrics**: Verify accomplishment.
- **Policy**: Impose the requirement
- **Contractual Requirement**: Translate the requirement to the defense contractor.
- **Munitions IPT Participation**: Get involved “In the trenches”.
- **Tools**: Provide practical help (web based handbook).

**ACQUISITION COMMUNITY AWARENESS AND IMPLEMENTATION**

**PROGRAM OVERSIGHT**

- Lessons Learned
- Metrics
- Policy
- Contractual Requirement
- Munitions IPT Participation
- Tools
Recent Accomplishments
Recent Accomplishments

- **Lessons Learned**: Reviewed Tow Missile, Sparrow Warhead, JASSM Missile
- **Policy**
  - DoD5000 – Requires demonstration of Life Cycle Cost impact
  - NAVAIR – Incorporating DFD into a policy memo, “Systems Requirements Review”, and Systems Engineering Process
- **Metrics**: Concepts under development
- **Munitions IPT Participation**: Involved with IMS program; others pending
DFD is Achievable!

- DFD represents a cultural change.
- Inclusion of non-performance disciplines into the acquisition process is not unprecedented.
- The Multi-Service program implemented through the DFD IPT will provide strategic influence to assure effective DFD.
- Change can be expected to occur slowly.
- Forethought during the munitions design process will positively impact the demil legacy left behind, with little cost or performance impact.