STANDARD FORWARD OPERATING BASE DESIGNS INCORPORATING DoD AND ARMY EXPLOSIVES SAFETY REQUIREMENTS

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# Standard Forward Operating Base Designs Incorporating Dod And Army Explosives Safety Requirements

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**ABSTRACT:**
See also ADM002313. Department of Defense Explosives Safety Board Seminar (34th) held in Portland, Oregon on 13-15 July 2010, The original document contains color images.

**SUBJECT TERMS:**

<table>
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<tr>
<th>a. REPORT</th>
<th>b. ABSTRACT</th>
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**LIMITATION OF ABSTRACT:**
SAR

**NUMBER OF PAGES:**
14
OUTLINE

- Background
- Why?
- DoD Policy
- Quantity-Distances
- Summary
BACKGROUND

- Need for Training FOB
- Fort Lee → TRADOC → HQUSACE
- USATCES determined need for standardized Combat FOB designs
- September 2007, funding was provided by the Defense Ammunition Center in McAlester, OK
- AFCS program was developing standard FOBs in modular packages
- USAESCH and USATCES applied explosives safety criteria to FOBs designed by AFCS
WHY IT’S IMPORTANT
WHY IT’S IMPORTANT

BEFORE

AFTER
WHY IT’S IMPORTANT
WHY IT’S IMPORTANT
DoD POLICY

Expose the minimum number of people for the minimum amount of time to the minimum amount of explosives consistent with safe and efficient operations.
QUANTITY-DISTANCE BASICS

- Inhabited Building Distance (IBD)
  - Overpressure and fragmentation
- Public Traffic Route Distance (PTRD)
  - 60% of IBD
- Intraline Distance (ILD)
  - Related operations
- Intermagazine Distance (IMD)
  - Explosives storage/holding areas
  - Prevent prompt propagation
## QUANTITY-DISTANCE BASICS

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<th>Distance (ft)</th>
<th>Effects</th>
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<tr>
<td>0</td>
<td>TOTAL DESTRUCTION</td>
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<tr>
<td>342</td>
<td>KILLED</td>
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<tr>
<td>560</td>
<td>SERIOUS INJURIES</td>
</tr>
<tr>
<td>750</td>
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<td>1,250</td>
<td>INJURIES POSSIBLE</td>
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### Effects
- **Personnel**
  - Killed by blast
  - Severely injured or killed by blast and fragments
- **Aircraft**
  - Destroyed by blast and fragments
  - Overturned or crushed
- **Vehicles**
  - Destroyed by blast
- **Buildings**
  - Destroyed by blast

### Total Destruction
- **30,000 POUNDS**
- Ammunition (AMMO STG) propagated 340 feet without immediate propagation.

### Pressure
- **IMD(U)** (Instantaneous Maximum Detail) 8.0 PSI
- **ILD(U)** (Instantaneous Linear Detail) 3.5 PSI
- **PTRD** (Peak Total Pressure) 2.3 PSI
- **IBD** (Instantaneous Blast Wave) 1.2 PSI

**NOTE:**
- Delayed Propagation (possible from fire and firebrands) is possible.
- Prompt Propagation (sympathetic detonation) of PACKAGED AMMO is not likely.

**COMBAT EFFECTIVE:**
- Operational

**NOT MISSION CAPABLE:**
- Moderate damage
- Extensive body damage
- Major airframe damage

**DESTROYED:**
- Operational
- Major structural damage, fragment penetration possible
- Vehicle minor fragment damage possible
- Buildings damaged - 5% of replacement cost

**Minimally Blasted:**
- Vehicle minor fragment damage possible
- Buildings minor damage

**Blast Only:**
- Vehicle minor fragment damage possible
- Buildings damaged - 20% of replacement cost

**Building Only:**
- Vehicle minor fragment damage possible
- Buildings damaged - 50% of replacement cost

**Vehicular Blast:**
- Vehicle minor fragment damage possible
- Buildings damaged - 90% of replacement cost

**Blast + Clothing:**
- Vehicle minor fragment damage possible
- Buildings damaged - 100% of replacement cost
POTENTIAL EXPLOSION SITES

- Combat Loaded Vehicle Parking
  - Stalls separated by earth-filled barrier units

- Ammunition Holding Areas
  - Bays separated by earth-filled barrier units

- Small Arms Ammunition Storage
  - Constructed using MILVANs
  - Can be placed anywhere
### C10.T1.
DoD 6055.09-STD

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| 500       | 16      | 48      | 95      | 591     | 886     | 66      |
| 226.8     | 4.8     | 14.5    | 29.0    | 180     | 270     | 20      |
| 700       | 18      | 53      | 107     | 591     | 886     | 66      |
| 317.5     | 5.4     | 16.2    | 32.5    | 180     | 270     | 20      |
| 1,000     | 20      | 60      | 120     | 591     | 886     | 66      |
| 453.6     | 6.1     | 18.3    | 36.6    | 180     | 270     | 20      |
| 1,500     | 23      | 69      | 137     | 591     | 886     | 66      |
| 680.4     | 7.0     | 20.9    | 41.9    | 180     | 270     | 20      |
| 2,000     | 25      | 76      | 151     | 591     | 886     | 66      |
| 907.2     | 7.7     | 23.0    | 46.1    | 180     | 270     | 20      |
| 3,000     | 29      | 87      | 173     | 591     | 886     | 66      |
| 1,360.8   | 8.8     | 26.4    | 52.8    | 180     | 270     | 20      |
| 5,000     | 34      | 103     | 205     | 591     | 886     | 66      |
| 2,268.0   | 8.4     | 31.3    | 62.5    | 180     | 270     | 20      |
| 7,000     | 38      | 115     | 230     | 669     | 1021    | 20      |
| 3,175.1   | 11.7    | 35.0    | 70.0    | 204.0   | 306.0   | 20      |
| 8,818     | 41      | 124     | 248     | 751     | 1146    | 20      |
| 4,000     | 12.6    | 37.8    | 75.6    | 229.0   | 343.4   | 20      |
SUMMARY

- Given available real estate, explosives safety criteria applied to FOB layout
- QDs based on contingency standards in Chapter 10 of DoD 6055.09-STD Chapter 10
- 150- and 600-man standardized FOB designs produced
- Physical demarcations instituted
- Troop surge considered
- Completed standards included in Theater Construction Management System database
- For information, contact the US Army Technical Center for Explosives Safety
Questions?