LoCo (BLU-126/B)

Quick Response Application of Insensitive Munitions (IM) System Solutions: An example of applying lessons learned to a successful, quick, low-cost IM improvement

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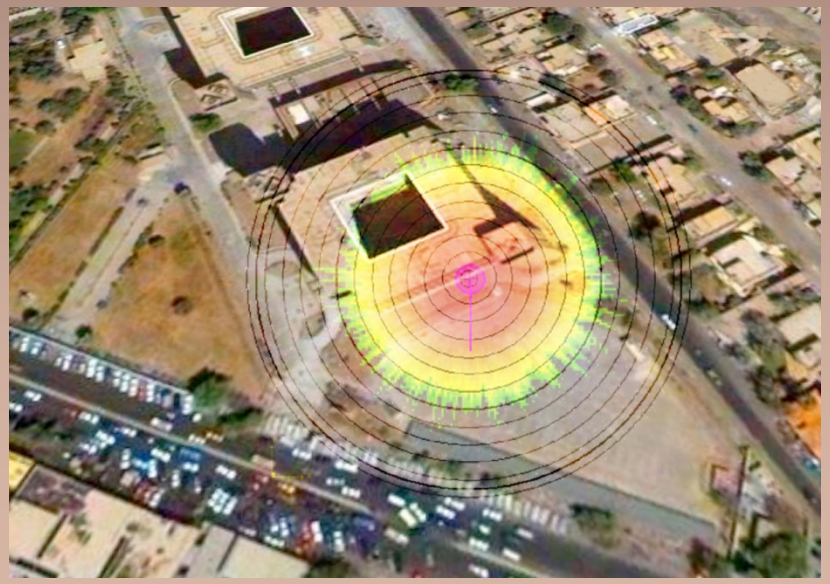
Need

- Need for an air-delivered, precision-guided munition with reduced collateral damage effects
- Quick response project ~ 13 months
- Provide near-term solution



NAVAIR

Executive Summary
TimeLine

- PMA-201 Proposal Request Nov 05
  - Provide a Low Cost CD Solution
    - Minimize Logistical Impact
    - Deliver PDP in 18-24 mths
    - Under $5M
- Mk-82 "LoCo" Concept Selected
  - Project Started Dec, 2005
    - Phase I completed July 2006
    - Phase II Design Qual & Prd Verification (45 units) Completed Dec 2006
    - Phase II FAAT Completed March, 2007
    - IOC March 2007 (First 180 units Delivered)
    - Full Rate Production ~Completion June 2007

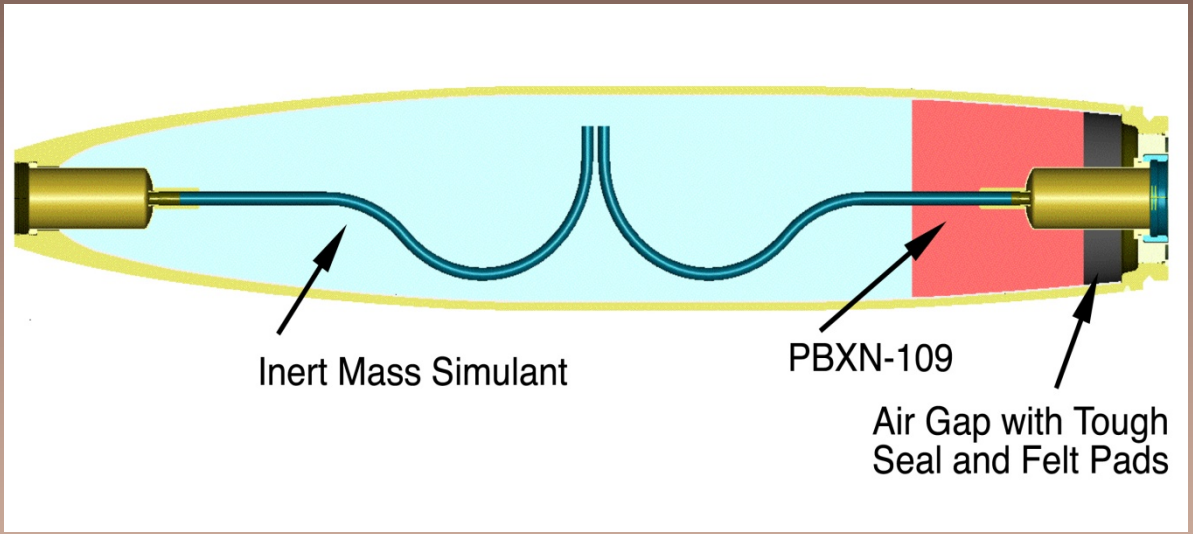
Lesson 1

NAVAIR

IM Lessons Learned

1) **You must have IM expertise/leadership on the team immediately**
   a) Understand the IM requirements
   b) PM may or may not have awareness of IM specifics, but needs the expertise to navigate the IM process
2) **Plan the Plan…KISS….Work the Plan**
   a) Understand the Objectives
   b) Get early concurrence from IM Authorities
   c) Program IM credibility at risk if not well thought out and/or followed
3) **Properly Resource the IM plan**
   a) Understand the Limitations
   b) Funding and Schedule
   c) Personnel & Test Hardware
4) **Team work**
   a) Understand the Agreements
   b) Communications & Project Management

Final LoCo BLU-111 Modification For Final Scoring



- **Reduce HE load to ~ 30 lb**

Design Guidelines

- Remain compatible with approved BLU-111 fuzing, guidance kits, and operational flight programs
- Maintain existing BLU-111 flight characteristics
  - Maintain existing aerodynamic shape
  - Maintain existing mass properties
- Minimize logistic footprint and remain compatible with existing BLU-111 shipping pallet
- Incorporate qualified IM technologies from BLU-111
  - Accept existing BLU-111 IM status for initial build

BLU-126/B IM Strategy

- Based on Parallel BLU-111 IM Project
  - Reduced HE load ~30lbs = No Worse Than Existing BLU-111
  - Limited Production
  - Incorporate Proven BLU-111 IM Technology when ready
- IM Authorities Notified and Briefed Early
  - IMO, NOSSA, WSESRB
    - "No Worse Than" BLU-111 Strategy
    - Incorporate IM Technology for Full Production
- WSESRB Approved Limited One Time Production
  - Several White Papers Required…Was Not Easy

Lesson 1

Lesson 2

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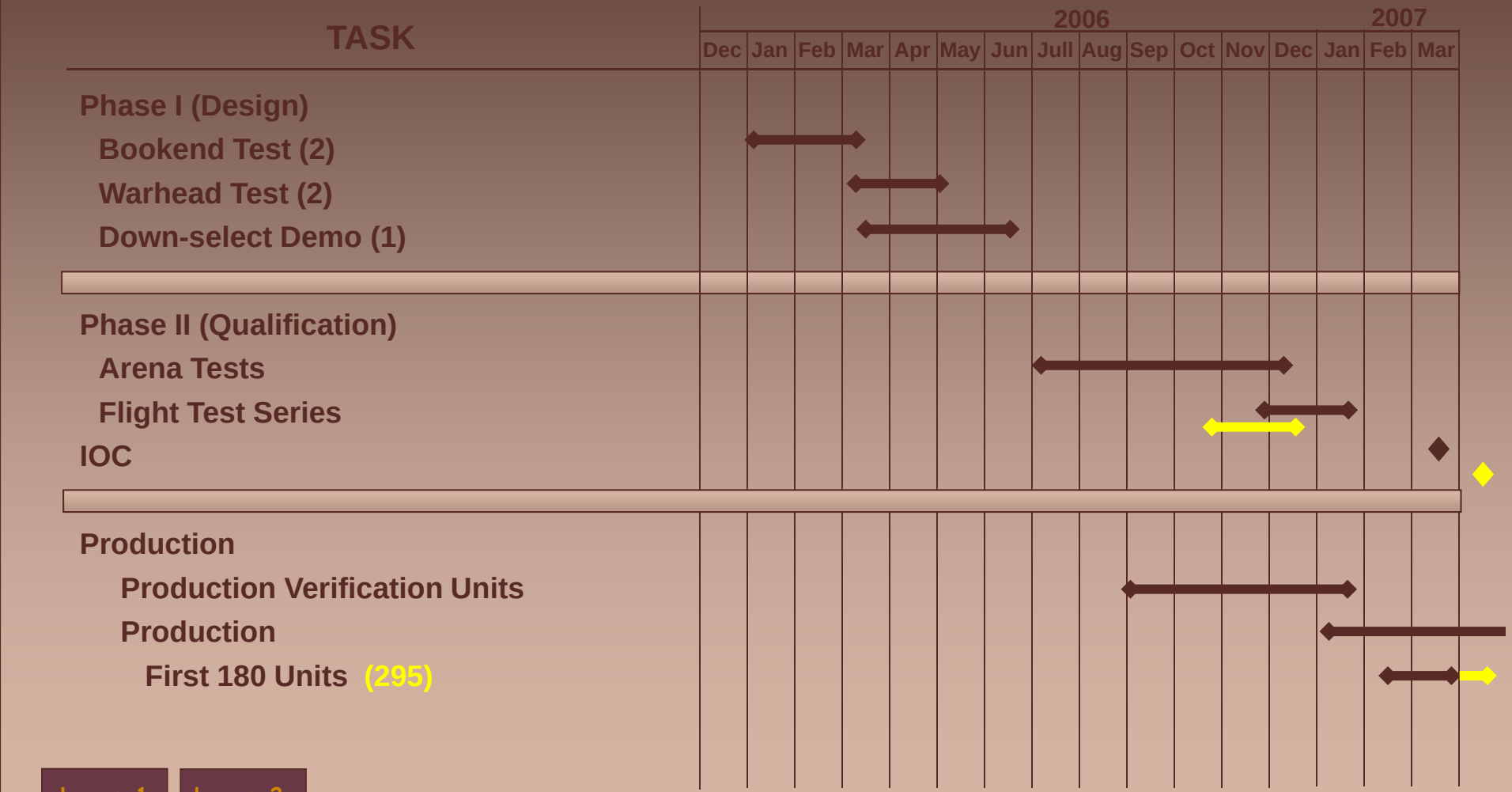
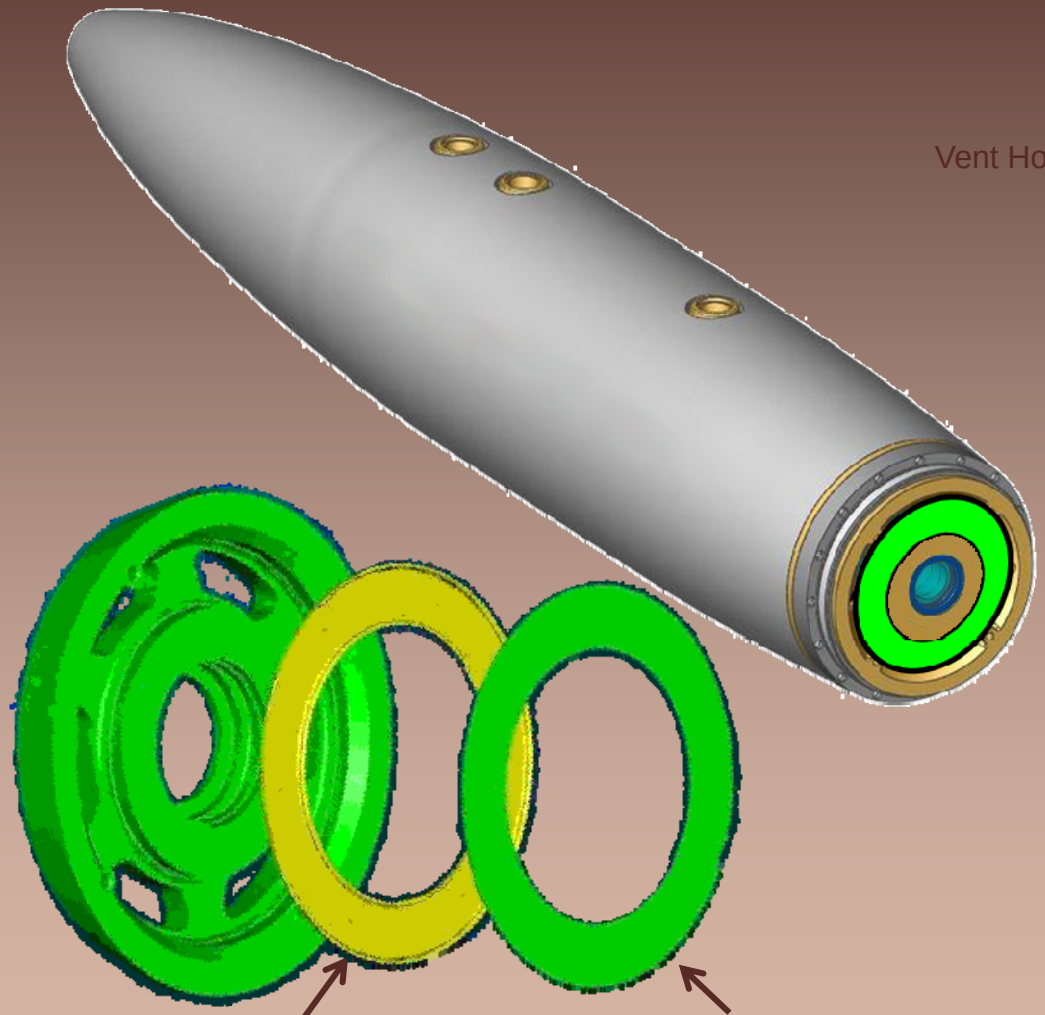
Project Schedule



Lesson 1 Lesson 2

BLU-111 Qualification



Vent Holes

BLU-111 after FCO with Vented Base Plate

BLU-126A/B IM Strategy

- Based on Qualified BLU-111B/B & C/B (new IM designs)
  - Incorporate New IM Technology, Reduced HE load ~30lbs = No Worse Than New IM BLU-111B/B & C/B
  - Incorporate Proven BLU-111 IM Technology for Full Production
  - Proposed Tailored IM Test Strategy

Test	No Test
❑ 2 - SCO	❑ FCO
❑ 2 - FI	❑ BI
❑ 1(2) - SR	❑ SCJ

- IM Authorities Notified and Briefed Early
  - IMO, NOSSA, WSESRB
    - ➢ Concurred with Tailored IM Test Strategy

Lesson 1 Lesson 2 Lesson 3

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Building Demonstration Test






Test Item Description: • Baseline design with ~ 30 lb PBXN-109

Lesson 1 Lesson 2 Lesson 3 Lesson 4

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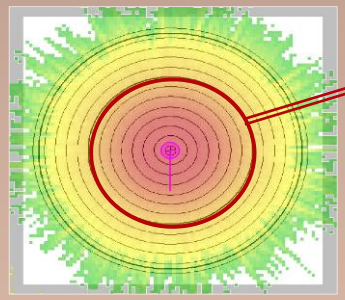
BLU-126/B Summary

- On schedule
  - 13 months - TDP
  - 16 months - IOC
- Phase I Concept Feasibility
  - Met Requirement
- Phase II: March 07
  - Flight Test Complete
- IOC: April 2007
  - Initial Production 295 Units
- Production: May 2007
  - Completed Delivery
  - Mfg Cost ~ BLU-111

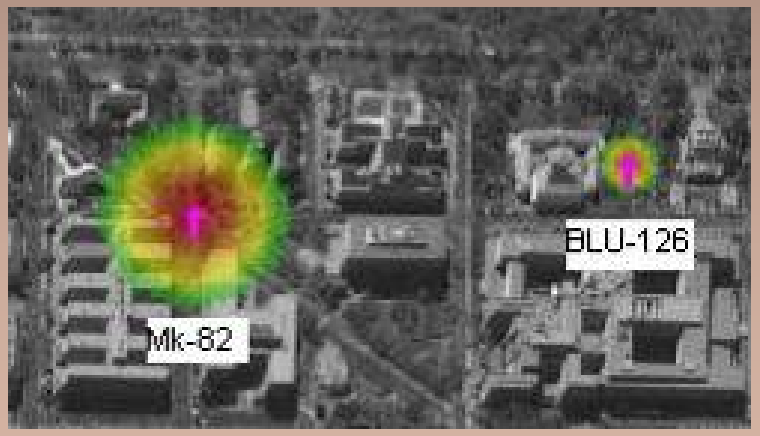
BLU-111



90° Impact

Analysis / Comparison

1st Test Iteration



Analysis / Comparison

Final Tactical Configuration

LoCo RDT&E Lessons Learned

1) Having an UNS will expedite the process, <u>just</u> meeting a GAP requirement will not

2) Professional network vital in getting things done quickly

3) Plan for the "Unplanned"…..

   the obvious is not always obvious

4) TDP ≠ PDP

Questions

CURRENT IM STATUS OF GENERAL PURPOSE BOMBS

Incremental Improvements

1950's to 1980's

Change in Explosive

Late 1980's

Change in Mechanical Design Aft &/or Fwd Venting

Today

	FCO	SCO	BI	FI	SR	SCJ
MK 82 (500lb) Tritonal/H-6	(F)	(F)	(F)	(F)	(F)	(F)
MK 83 (1000lb) Tritonal/H-6	(F)	(F)	(F)	(F)	(F)	(F)
MK 84 (2000lb) Tritonal/H-6	(F)	(F)	(F)	(F)	(F)	(F)
BLU-111A/B (500lb) PBXN-109	IV	IV/V	V	V	(F)	(F)
BLU-110A/B (1000lb) PBXN-109	IV / V	V	IV	V	(F)	(F)
BLU-117A/B (2000lb) PBXN-109	IV	IV	IV	V	(F)	(F)
BLU-111B/B & C/B (500lb) PBXN-109	V	IV	V	IV	(F)	I
BLU-126A/B (500lb) w/30# PBXN-109	V	IV/V	V	V	(F)	(F)
BLU-110B/B & C/B (1000lb) PBXN-109	V	III	IV	V	(F)	(F)
BLU-117B/B & C/B (2000lb) AFX-795	V	V	III	III	(F)	(F)

(F)/I	Detonation/Failure
III	Explosion
IV	Deflagration
V	Burn
(F)	Predicted by Analysis – No Test

FCO – Fast Cook-off
SCO – Slow Cook-off
BI – Bullet Impact
FI – Fragment Impact
SR – Sympathetic Reaction
SCJ – Shaped Charge Jet