BMDO'S CHALLENGE...

- Develop an FoS Interoperability Testing Approach that
  - Ensures the TMD Building Blocks "Plug and Flight"
  - Accommodates Time Phased Development of Systems
  - Verifies FoS Interoperability Throughout Its Life

FY 99 FY 00 FY 01 FY 02 FY 03 FY 04 FY 05 FY 06 FY 07 FY 08 FY 09

PATRIOT
Advanced Capability 3
Navy Area
THAAD
Navy Theater Wide
ABL
Arrow Interoperability

FUE - First Unit Equipped
IOC - Initial Operational Capability
ROC - Required Operational Capability
BMDO STRATEGIC PLAN

• Mission Essential Task
  "Develop And Enable Deployment Of A Cost-effective And Affordable Interoperable Theater Air And Missile Defense (TAMD) To Meet The Evolving Missile Threat To Deployed U.S. Forces, Friends, And Allies."
  - Objective – Show Significant Progress In Satisfying CINC's Warfighting Needs As Identified By The Threshold Values In The CRD

• Subobjectives
  - Enable Deployment By Helping CINC's Prepare For Current And Future TMD Operations
  - Address TMD FoS Deficiencies Identified By The Warfighters With Material And Nonmaterial Solutions
U.S. FoS RATIONALE REMAINS UNCHANGED

Threat Uncertainties
- Range / Altitude
- Quantity (Raid / Campaign / Time On Target)
- Warhead Design (Conventional / WMD)
- Technology (Low Signature / Maneuver / Velocity)

Defense Dynamics
- Layering / Tiering
- Military And / Or Civil Defense
- Joint Coalition Synergies
- No Notice / Short Notice / Build Up

Budget Constraints
- Force Reductions
- Acquisition Goals
U.S. FoS RATIONALE REMAINS UNCHANGED

Threat Uncertainties
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U.S. FoS RATIONALE REMAINS UNCHANGED

Defense Dynamics
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THE TMD FAMILY OF SYSTEMS

- PATRIOT
- Navy Area
- THAAD
- ABL (USAF Funded)
- BM/C³
- Navy Theater Wide
- Block I
- Block II
- MEADS
- Arrow
- Attack Operations
- Space Sensors

Battle Management / Command, Control And Communications
## FLIGHT TEST SCHEDULES

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<th>Year</th>
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<td>SIT II (IMPACT 98)</td>
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STANDARD MISSILE EVOLUTION

LEAP KW

New Fuze

Faster Autopilot

Third Stage Rocket Motor

SM-3

Block IVA

Block IV

Maintain Standard Missile Heritage
## THAAD SYSTEM

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</table>
AIRBORNE LASER (ABL)

TMD ABL Engagement Geometry

Nominal Burnout

80 sec
70 sec
52 sec
42 sec

Cloud Break

Target Kill

Laser Beam On
Pressurized Tank Ullage Volume

Energy On Target
Over Time Causes
Catastrophic Tank Rupture

40,000 ft - 45,000 ft Altitude
AIRBORNE LASER (ABL)
EXIT CRITERIA

Proof Of Principle

FLAGE / SRHIT
Two Intercepts

Standard Missile Heritage

HEDI

LEAP
Standard Missile Heritage

PDRR

Ground Test

PAC-3 (ERINT)
4 / 4 / 3

NAD
4 / 2 / 1

THAAD
10 / 7 / 1

NTW ALI
TRT

4

Key
Program

Validates Performance

Total

4

EMD

Intercepts For LRIP

Ground Test

PAC-3
18

NAD
35

THAAD
22

NTW
20

Simulation

Full Rate Production

Simulation

HWIL

HWIL

1 ABT
2 TBM
FY 99 Start

TBD
TBD

TBD
TBD

TBD

Validates Performance And Productibility

Flights Conducted / Intercept Attempts / Intercepts
FoS CONCEPT

- The FoS is an evolving flexible configuration of interoperable TMD weapon system, C^2 centers, and external sensors.
- CINC's select and deploy systems to meet theater-unique needs.
- Keep pace with the threat.

Interoperability is critical to FoS "plug and fight" strategy.
THE LEAN MISSILE INITIATIVE

- **Baseline**
- **Base Unit Target Cost Curve Remains Fixed Throughout Production**
- **Improved Performance**
- **Successive Targets Set By Performance**

The graph illustrates the cost and quantity variations over different production phases (FRP I to FRP VII).
<table>
<thead>
<tr>
<th>Operational Capability</th>
<th>Military Benefit</th>
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<tr>
<td>Situational Awareness</td>
<td>• Minimize Blue Casualties</td>
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<td>• Maximize Blue Commanders Confidence</td>
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<tr>
<td>Planning</td>
<td>• Maximize Ops Tempo, Economy Of Force And Assets Defendable</td>
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<tr>
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<td>• Minimize Enemy Courses Of Action</td>
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<tr>
<td>Communication Information</td>
<td>• Maximize Freedom Of Action During Deployment, Maneuver, And Engagement</td>
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<tr>
<td>Management</td>
<td>• Minimize Blue Commander’s Risk</td>
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<td>Air Space Coordination</td>
<td>• Minimize Blue Casualties</td>
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<tr>
<td>Engagement Coordination</td>
<td>• Minimize Force Structure And Weapons Expenditure</td>
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<td>• Maximize Preferential Engagement</td>
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<tr>
<td>Weapon Control</td>
<td>• Maximize Assets Defendable</td>
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<td>• Maximize Force Structure Combat Power</td>
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<tr>
<td>Operational Support</td>
<td>• Maximize Blue Commanders Confidence</td>
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