

AEGIS BALLISTIC MISSILE DEFENSE



Aegis BMD Overview to the National Defense Industrial Association

*RDML Joe Horn
Aegis BMD Program Executive*

13 July 2010

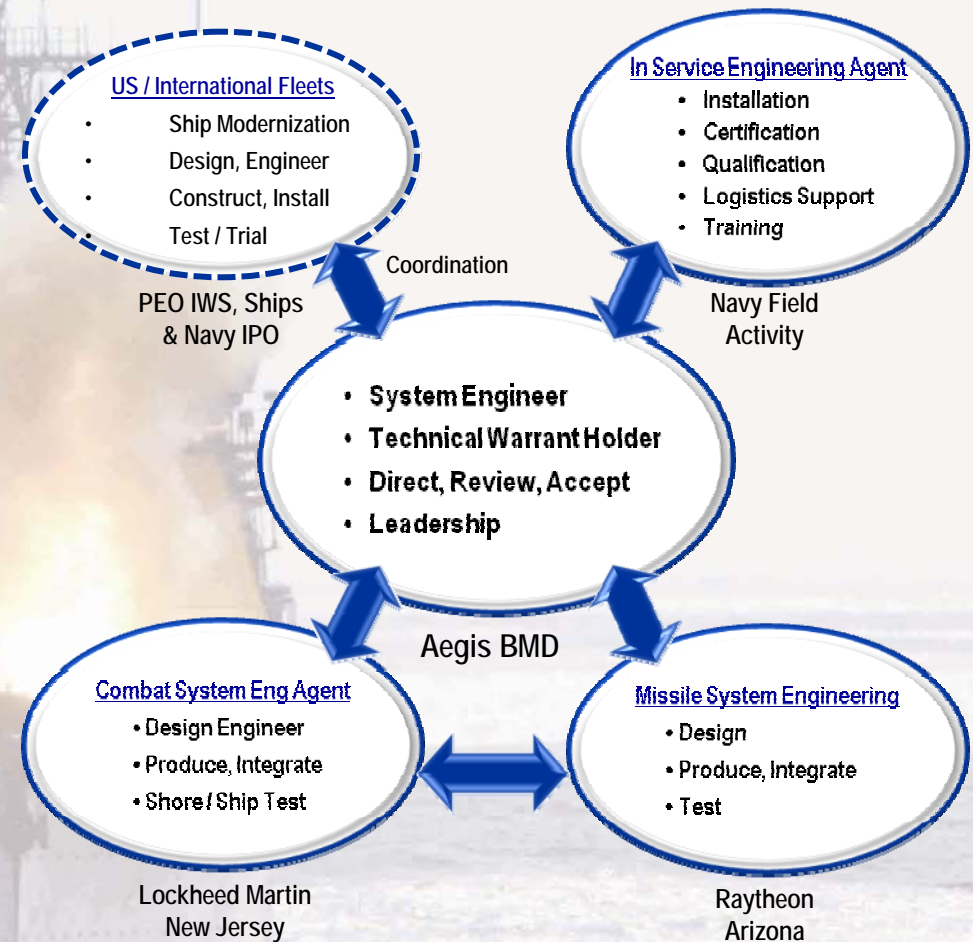


Aegis BMD: Who We Are

Aegis BMD

We Are:

- The BMD Hybrid Program Directorate located on NSWC Dahlgren
 - 239 Government Employees
 - 70 Navy Billets / 169 MDA Billets
- The team that engineered and conducted the satellite shoot down with 45 days notice
- The team that achieved the first operationally certified BMD system out of the MDA
- The team that delivered the Aegis BMD Weapon System and SM-3 missiles ahead of schedule
- The team that has adapted 30 years of technological advances to the evolving demands of Air & Ballistic Missile Defense

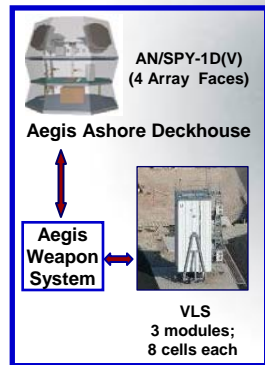




Aegis BMD Program

Aegis BMD

Launch on Remote (Aegis BMD) 2006
Launch on Remote (BMD Sensors) 2008
Engage on Remote 2015+



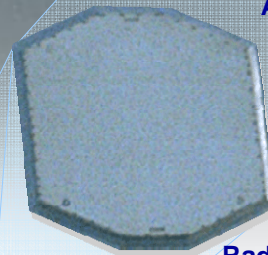
Aegis Ashore
2015+
Hawaii Test Site
2013

Open
Architecture
2012

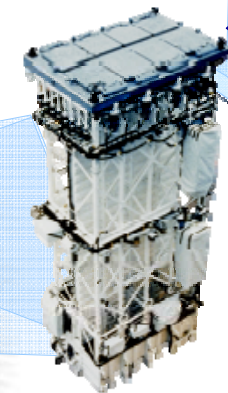
Link 16



Aegis Ballistic Missile
Defense Signal
Processor (BSP)
Upgrade 2010
(Testing)



Radar System
AN/SPY-1

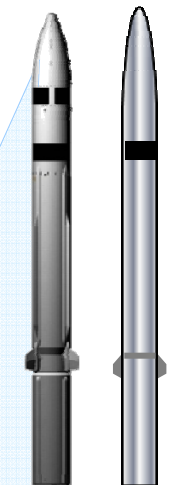


Vertical Launching
System Mark 41

SM-3



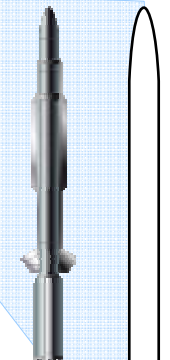
Blk I / IA / IB
2004/2006/2013



Blk IIA Blk IIB
2015+ 2020

SM-2 TBD

Sea-
Based
Terminal



Blk IV
2008
Near
Term

2018
Far
Term

Quantities

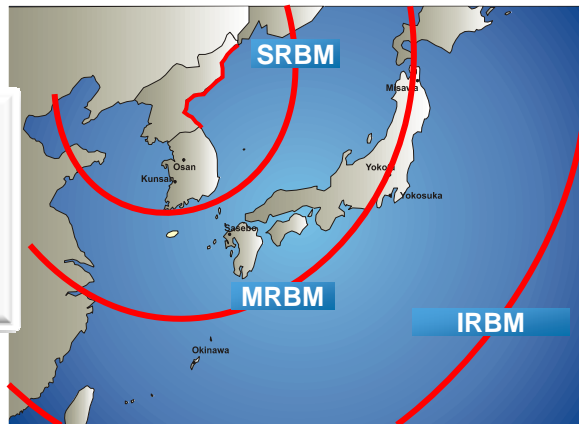
	PB10 Thru 2015	PB11 Thru 2015
	5	9
	22	28
	212	292
	2	3



Aegis BMD's Role In The BMDS

Aegis BMD

Midcourse Engagement Capability with SM-3 Defeats Short, Medium & Some Intermediate Range Ballistic Missiles

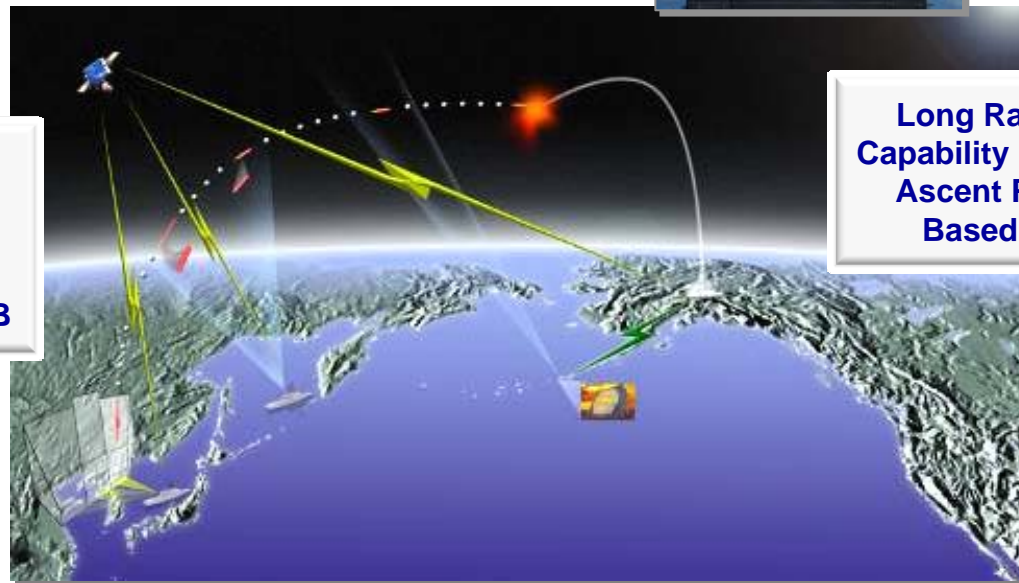


Limited Terminal Defense Capability Defeats Short Range Ballistic Missiles



Long Range Surveillance & Track Capability Detects and Tracks in Early Ascent Phase Providing Forward Based BMDS Sensor Support

Future Adding Early Intercept Capability Anti-ICBM w/SM-3 Blk IIB



Proven Against Single Salvo, Dual Salvo & Separating Targets

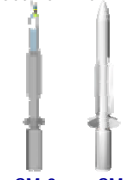
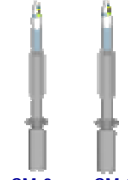
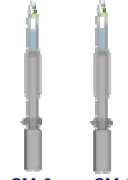
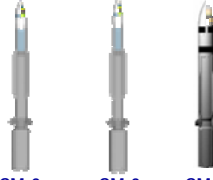
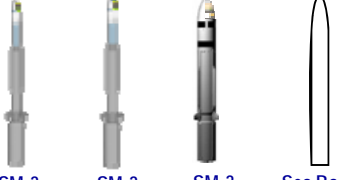




Aegis BMD PB-11 Capability and Capacity Program of Record

Aegis BMD

[Signature]
CAPT Joe Hill
Aegis BMD Technical Director
Date: 05/04/10

PAA Phase I	PAA Phase II		PAA Phase III	
Aegis BMD 3.6.1	Aegis BMD 4.0.1	Aegis BMD 5.0	Aegis BMD 5.1	Aegis BMD 5.2
Deployed Now <ul style="list-style-type: none"> SRBM, MRBM, Limited IRBM Defense & LRS&T Initial LOR SM-3 Blk IA Engage Capability Sea-Based Terminal  <p>SM-3 BLK IA SM-2 BLK IV</p> <p>Initial 2-Tier Fleet BMD Capability</p> <p>Deployed Now OTE Assessment 2008</p>	2012 Certified for Initial Use <ul style="list-style-type: none"> SRBM, MRBM, Limited IRBM Defense & LRS&T Enhanced LOR WILDCAT SM-3 Blk IB  <p>SM-3 BLK IA SM-3 BLK IB</p> <p>Improved Fleet BMD - No Terminal</p> <p>OTE Assessment 2014*</p>	2014 Certified for Initial Use <ul style="list-style-type: none"> SRBM, MRBM, Limited IRBM Defense & LRS&T LOR WILDCAT  <p>SM-3 BLK IA SM-3 BLK IB</p> <p>"In Stride Fleet BMD"</p> <p>OTE Assessment 2016*</p>	2016 Certified for Initial Use <ul style="list-style-type: none"> SRBM, MRBM, Enhanced IRBM & Some Limited ICBM Defense Engage on Remote - SM-3 Blk IIA  <p>SM-3 BLK IA SM-3 BLK IB SM-3 BLK IIA</p> <p>Third Generation Fleet BMD</p> <p>OTE Assessment 2018*</p>	2018 Certified for Initial Use <ul style="list-style-type: none"> SRBM, MRBM, Enhanced IRBM & Some Limited ICBM Defense Engage on Remote Sea Based Terminal  <p>SM-3 BLK IA SM-3 BLK IB SM-3 BLK IIA Sea Based Terminal</p> <p>Improved 2-Tier Third Generation (Adds Back Terminal)</p> <p>OTE Assessment 2020*</p>

* Final Dates Pending Negotiation with DOTE

PBR-11	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18
SM-3 Blk IA	80	106	112	112	112	112	112	112	112
SM-3 Blk IB	1	4	16	42	108	180	252	324	324
Total Cumulative Deliveries SM-3	81	110	128	154	220	292	364	436	436

PB-11 Aegis BMD Ship Capacity Profile					Includes Navy Transferred Funding Contribution				
Aegis BMD Ships ***	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18
3.6.1	20	21	23	23	19	16	11	9	6
4.0.1	0	2	4	6	9	7	7	7	6
5.0	0	0	1	3	8	14	20	22	25
Total	20	23**	28**	32	36	37	38	38	37
+ USN New Construction						38	41		
Aegis Ashore Sites (24 SM-3)						1	1	1	2

*CG 70 Not BMD Certified Until 3rd Qtr 2011

***Cumulative

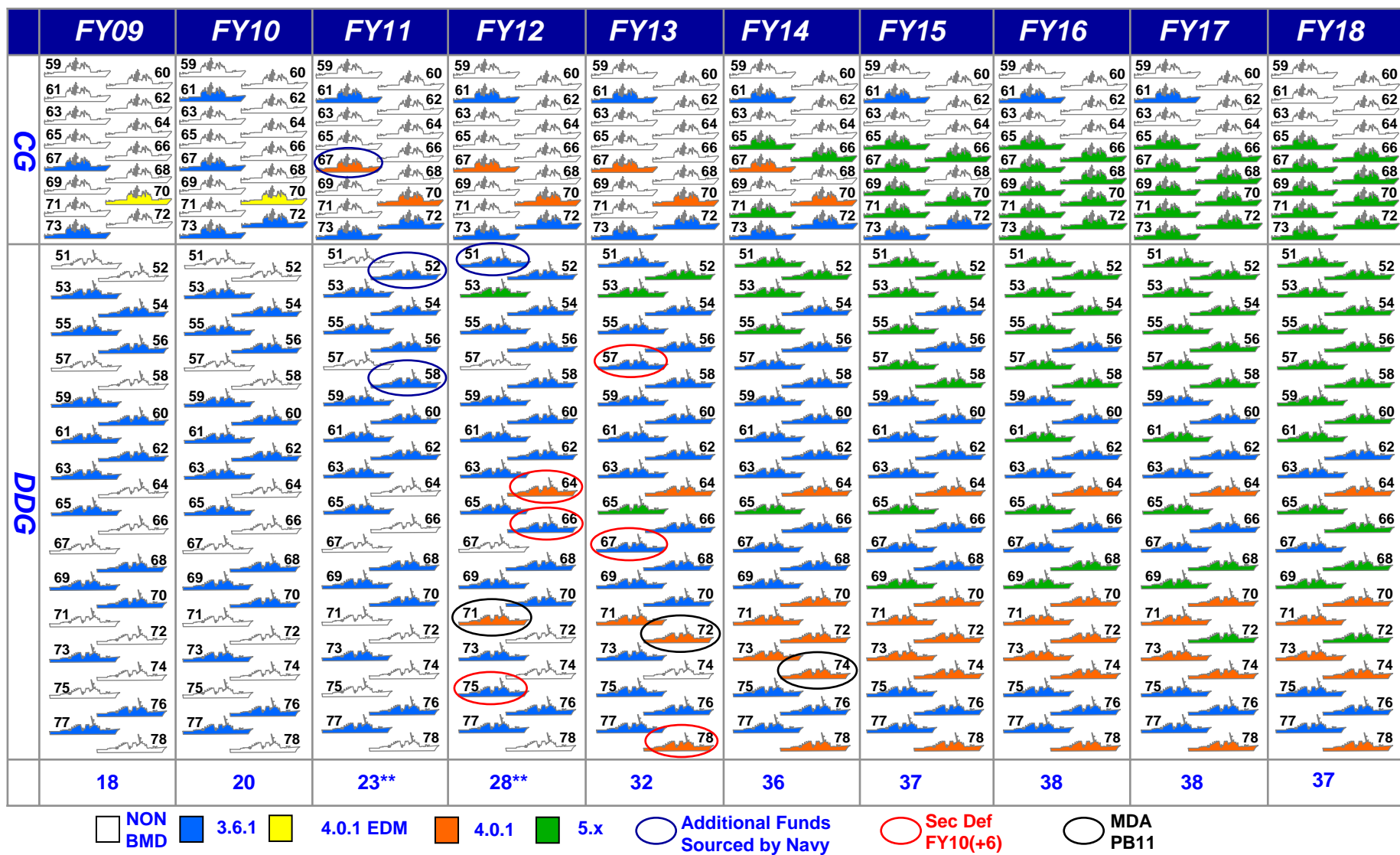
**Includes Navy Transferred Funding Contribution
3 Ships in FY11 (One Upgrade), 1 Ship in FY12

AB20105CC001
As of 4 May 2010



PB-11 w/ Additional Navy Funding Aegis BMD Ship Fielding Plan

Aegis BMD

*CG 70 Not BMD Certified Until 3rd Qtr 2011**Includes Navy Transferred Funding Contribution
3 Ships in FY11 (One Upgrade), 1 Ship in FY12

FOR OFFICIAL USE ONLY

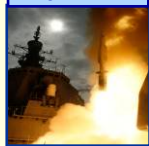


Aegis BMD Firing Operations

Aegis BMD

Foreign Military Sales

17 Dec 07
JFTM 1



- First Firing from Japanese Destroyer

19 Nov 08
JFTM 2



- First Japanese No-Notice Launch
- Separating Target

27 Oct 09
JFTM 3



- Engage Separating Warhead with SM-3 Blk IA

Terminal Defense

5 June 08
FTM 14



- Engage SRBM w/ SM-2 Blk IV

26 Mar 09
Stellar Daggers



- Simultaneous BMD/ AAW Engagement

Homeland Defense

GT-180 Glory Boost



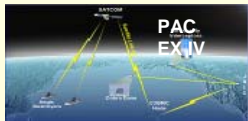
IFT-9/10



PAC EX I, II, III



First ICBM Tracking:
19 Sep 02



PAC EX IV

Oct 2008 COMOPTEVFOR Found:

“The Aegis BMD System is Operationally Effective and Operationally Suitable”

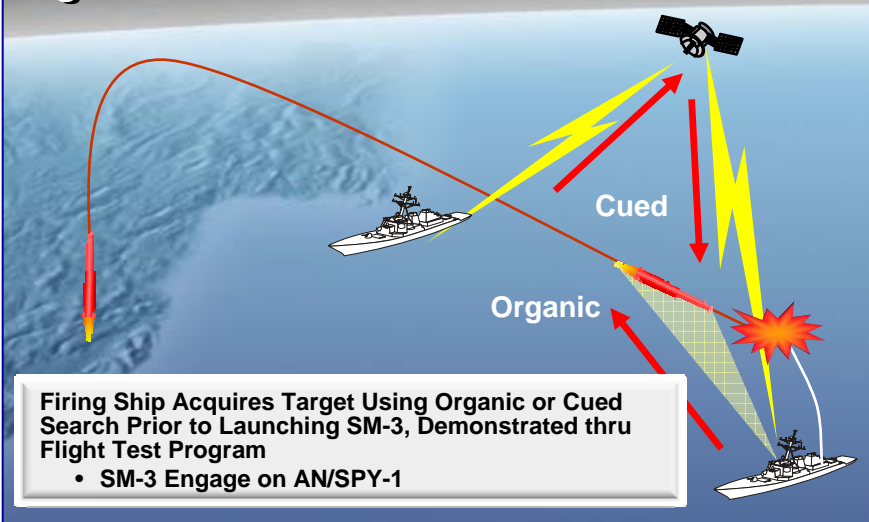
Aegis BMD Firings Successes
17 for 20 SM-3
3 for 3 SM-2



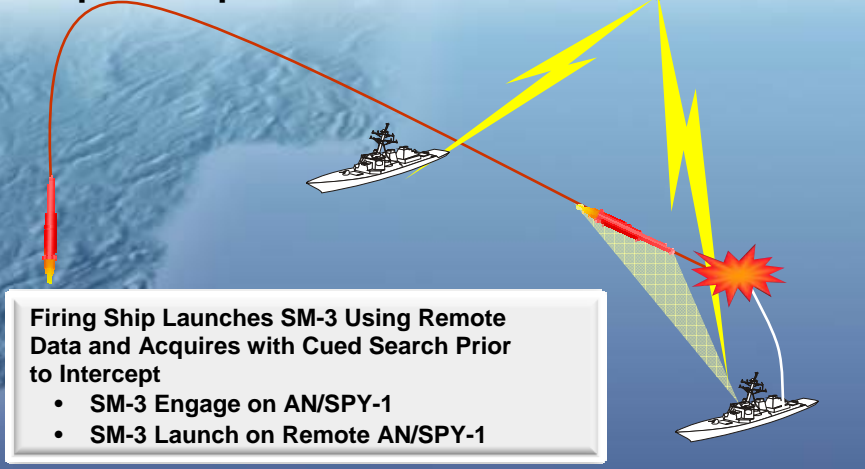
Aegis BMD Engagement Mode Exploit Organic and Off Board Sensors

Aegis BMD

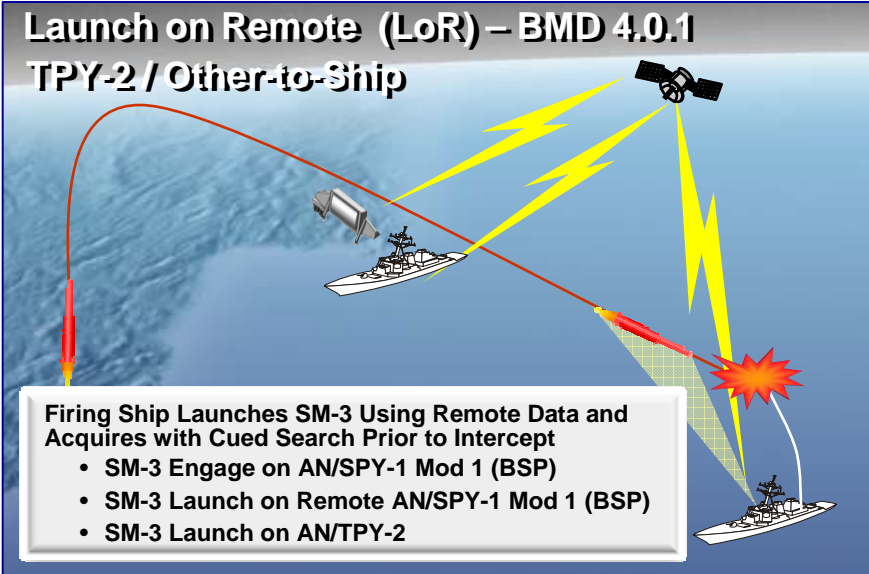
Organic and Cued – BMD 3.6.1



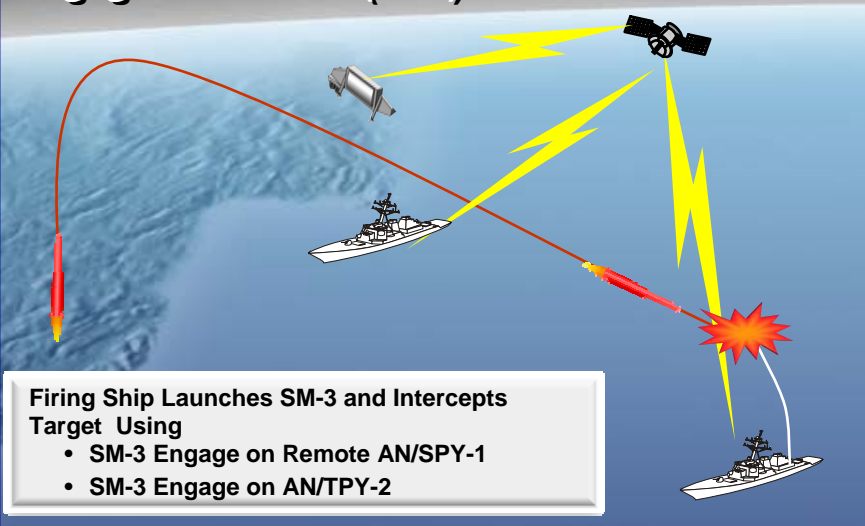
Launch on Remote (LoR) – BMD 3.6.1 Ship-to-Ship



Launch on Remote (LoR) – BMD 4.0.1 TPY-2 / Other-to-Ship



Engage on Remote (EoR) – BMD 5.1





Aegis BMD 3.6.1 & SM-3 Block IA Currently Fielded System

Aegis BMD

Aegis BMD 3.6.1 Computer Program and Equipment System:

Approach: Modify Existing Ship Systems

Threats: Short to Intermediate Range
Ballistic Missiles



Initial Launch on Remote

Operational: Retain Multi Mission Capability

Cost: \$10-15M per Ship

Quantity: 19 (as of 3/10)

Provider: Lockheed Martin, NJ & Navy Field
Activities/Labs

SM-3 Block IA Missile:



Approach: Add 3rd Stage & Kill Vehicle to
Existing SM-2 Blk IV Booster Stack

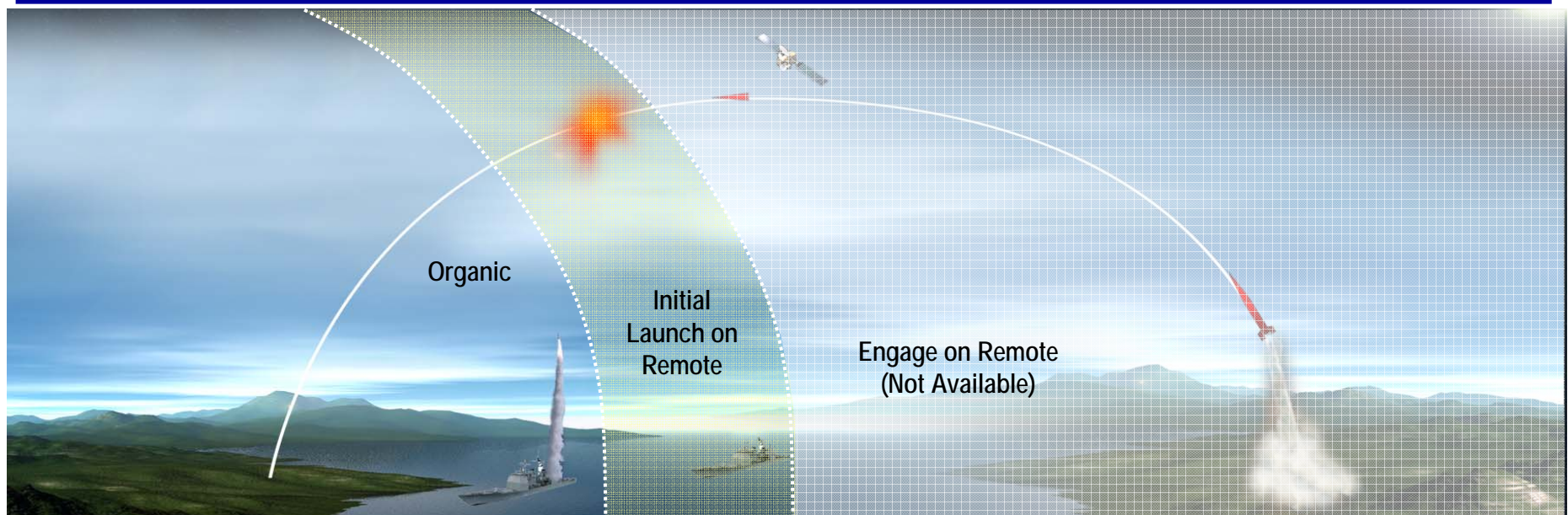
Battle Space: Above the Atmosphere

Threats: Short to Some Intermediate Range
Ballistic Missiles

Cost: \$9-10M Each

Quantity: 61 (as of 4/10)

Provider: Raytheon, Arizona & Navy Field
Activities/Labs





SM-3 Block IA Flight Test History

Aegis BMD

FTM-10 June 2006



FTM -11A
Summer 2006 (Classified)



FTM -11 Nov 2006
(Failed Launch - Logic Error
on Ship)

FTM-11 (Redo)
April 2007



FTM-12
June 2007



FTM -13 Nov 2007
(Dual Salvo/Dual BMD Skills)



JFTM-1 Dec 2007



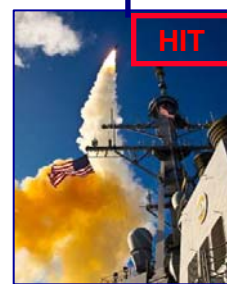
Burnt Frost Feb 2008



JFTM-2 Nov 2008



FTM-17 Jul 2009



JFTM-3 Oct 2009



**SM-3 Block IA is 10/11 in Flight Tests.
Aegis BMD 3.6/SM-3 Block IA Overall is 10/12**

NOTE: FTM-15 is FOTE Conducted by PACOM



Aegis BMD 4.0.1 & SM-3 Block IB 2nd Generation System

Aegis BMD

Aegis BMD 4.0.1 Computer Program and Equipment System:

Approach: Improve Shipboard Signal & Data Processing

Threats: More Sophisticated Short to Intermediate Range Ballistic Missiles



Launch on Remote

Operational:

- Increased Raid Density
- Flexible Firing Doctrine

Cost: \$45-\$55M

Quantity: 1 Test Ship

Provider: Lockheed Martin, NJ & Navy Field Activities/Labs

Status: Initial At-Sea Testing Underway, Available Late 2011

SM-3 Block IB Missile:

Approach: Improve SM-3 Kill Vehicle Seeker & Engine

Battle Space: Above the Atmosphere

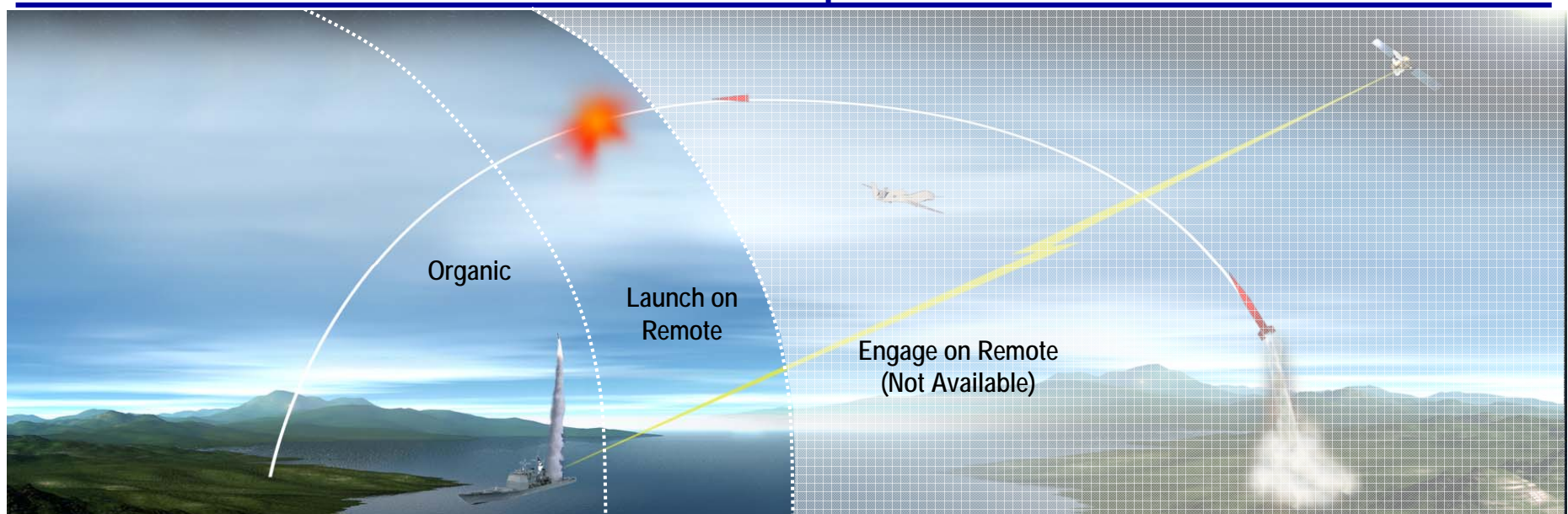
Threats: More Sophisticated Short to Intermediate Range Ballistic Missiles

Cost: \$12-\$15M (est.)

Quantity: >300 Planned, Test Rounds Being Fabricated

Provider: Raytheon, Arizona & Navy Field Activities/Labs

Status: First Flight Early CY2011
IOC 2013





Aegis BMD 5.1 & SM-3 Block IIA 3rd Generation System

Aegis BMD

Aegis BMD 5.1 Computer Program and Equipment System: :

Approach: Modify Existing Systems to Fly SM-3 Blk IIA & Use Off Board Sensors for Engagement

Threats: More Sophisticated Short to Intermediate Range Ballistic Missiles plus Some ICBMs



Engage on Remote

Operational: Flexible Firing Doctrine

Cost: \$23M

Quantity: TBD

Provider: Lockheed Martin, NJ & Navy Field Activities/Labs

Status: Development, IOC 2016/17

SM-3 Block IIA Missile:

Approach: Increased Reach & Velocity
Biggest Missile Compatible w/Mk41 VLS

Battle Space: Above the Atmosphere

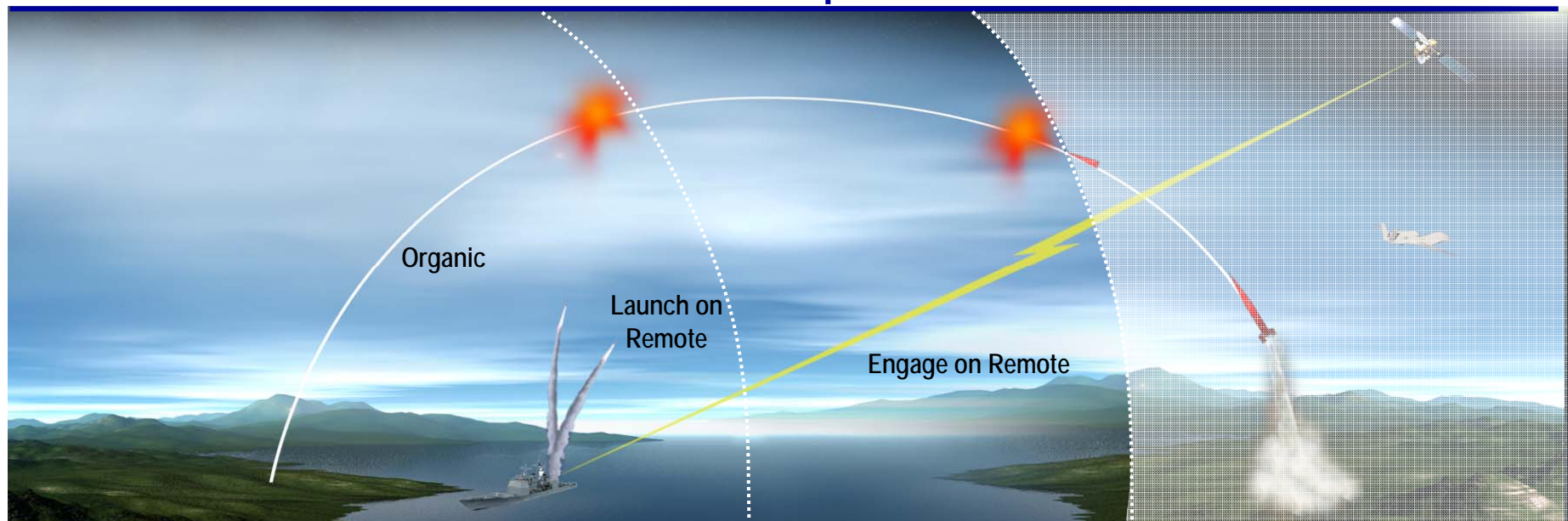
Threats: More Sophisticated Short to Some Intermediate Range Ballistic Missiles, Plus Some ICBMs

Cost: ~\$15M

Quantity: TBD

Provider: Joint U.S. & Japan

Status: Development, 1st Flight Late 2014

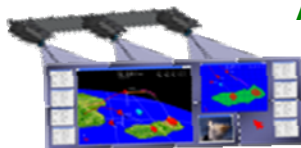




Aegis Ashore Configuration

Aegis BMD

Aegis Display System Mark 8 Mod 1



- ACB12 Computer Program
- Three screen variant provides additional display area
- Video wall

Weapon Control System Mark 9 Mod 6



- ACB12 Computer Program
- SM-3 Launch on Remote (AN/SPY-1, AN/TPY-2, ABIR, Space Assets)
- SM-3 Block IB

Kill Assessment System

- Uses FCS Mark 99 Mod 8
- System Receives Kinetic Warhead Downlink
- Supports Kill Assessment



Standard Missile (SM-3) Block IB

- 2 Color Seeker
- Throttleable Divert/Attitude Control System (TDACS)



Vertical Launching System (VLS) Mark 41 Mod 2

- Supports any SM-3 Missile – Any Cell
- Relocatable



Command & Decision System Mark 3 Mod 6

- ACB12 Computer Program
- Joint Tactical Terminal
- Integrated Mission Planner

Radar System AN/SPY-1D(V)



- ACB12 Computer Program
- Multi Mission Signal Processor (MMSP)
- Integrated Satellite System Calibration Computer

Aegis Combat Training System Mark 51 Mod 4

- Supports BMD Training



Operational Readiness Test System

- Supports BMD Equipment
- Supports All In-Service Equipment



Tactical Data Links

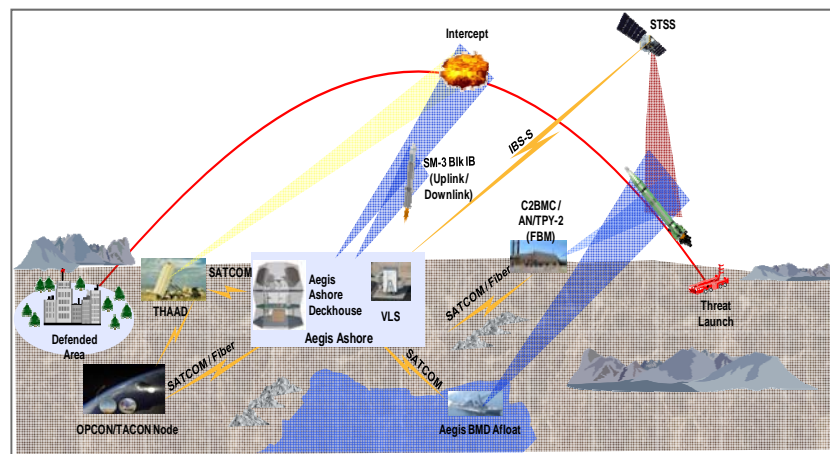
- Common Data Link Management System (CDLMS) 3.7.1
- Upgrade to Support Joint Range Extension (JRE)



Deckhouse

- Houses Aegis Combat System
- Relocatable

Green – Common with DDG 113





Strengthening International Cooperation

Aegis BMD

- **Added BMD Capability to 3 Kongo Class Ships on Schedule**



- 4th Ship Complete this Fall
- Total FMS Value \$1.3B

- **Testing with Maritime Allies**



- HNLMS TROMP December 2006



- SPS MENDEZ NUNEZ June 2007





Top Management Focus Areas

Aegis BMD

- **Adequate Aegis BMD Ships and SM-3 Rounds to Meet Demand**
- **Successful Development of “Second Generation” Aegis BMD System**
- **Transition from SM-3 Block IA to SM-3 Block IB Manufacturing**
- **Successfully Navigate Complex Technical and Managerial Challenges Associated with Multiple Development, Production, Installation and Operational Transition Activities**
 - Migration to Open Architecture
 - SM-3 Block IIA Cooperative Development Project
 - Fire Control Using Netted, Off Board Sensors
 - Phased Adaptive Approach Phase One



Aegis Ballistic Missile Defense

Aegis BMD



Forward...At Sea...On Patrol

Enabling Capabilities, Providing Options for U.S. and Allies