

Missile Defense Program Overview For The European Union, Committee On Foreign Affairs, Subcommittee On Security And Defence



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28 JUN 07

**Dr. Patricia Sanders
Executive Director
Missile Defense Agency**



In Just The Last Year

- **North Korea's and Iran's accelerated missile development and testing...terrorists attacking Israel with rocket salvos**
- **Unprecedented pace of fielding, deployment, and support of an integrated missile defense capability**
- **Missile defense operational transition and alert to meet an uncertain threat**
- **Very successful test program – intercepts against short-, medium- and long-range targets in the atmosphere and in space**
- **Development program that is on track with knowledge points, budget and schedule**
- **Dramatic increase in global cooperation in missile defense by our international partners**

A New Era In Missile Defense...Just In Time



North Korean Ballistic Missile Threat

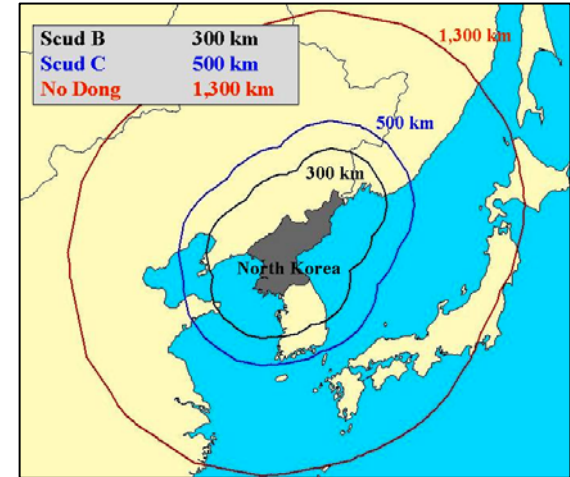
- 500 Scuds (300-500 km)



No Dong

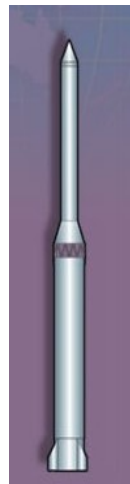
- No Dong (1,300 km)

- Reaches Japan and all South Korea
- Scaled-up Scud technology
- Flight-tested in May 1993 and July 2006



- Taepo Dong-1 Space Launch Vehicle

- Flight tested 1998
- Third stage failed, but first two stages demonstrated several key technologies required for an ICBM, including stage separation



- Taepo Dong-2 SLV/ICBM

- 2-stage: 10,000 km
- 3-stage: 15,000 km
- 4 JUL 06 test failed shortly after launch



- Believed to be developing IRBM (3,200+ km range)
 - A qualitative improvement in performance



North Korean Ballistic Missiles

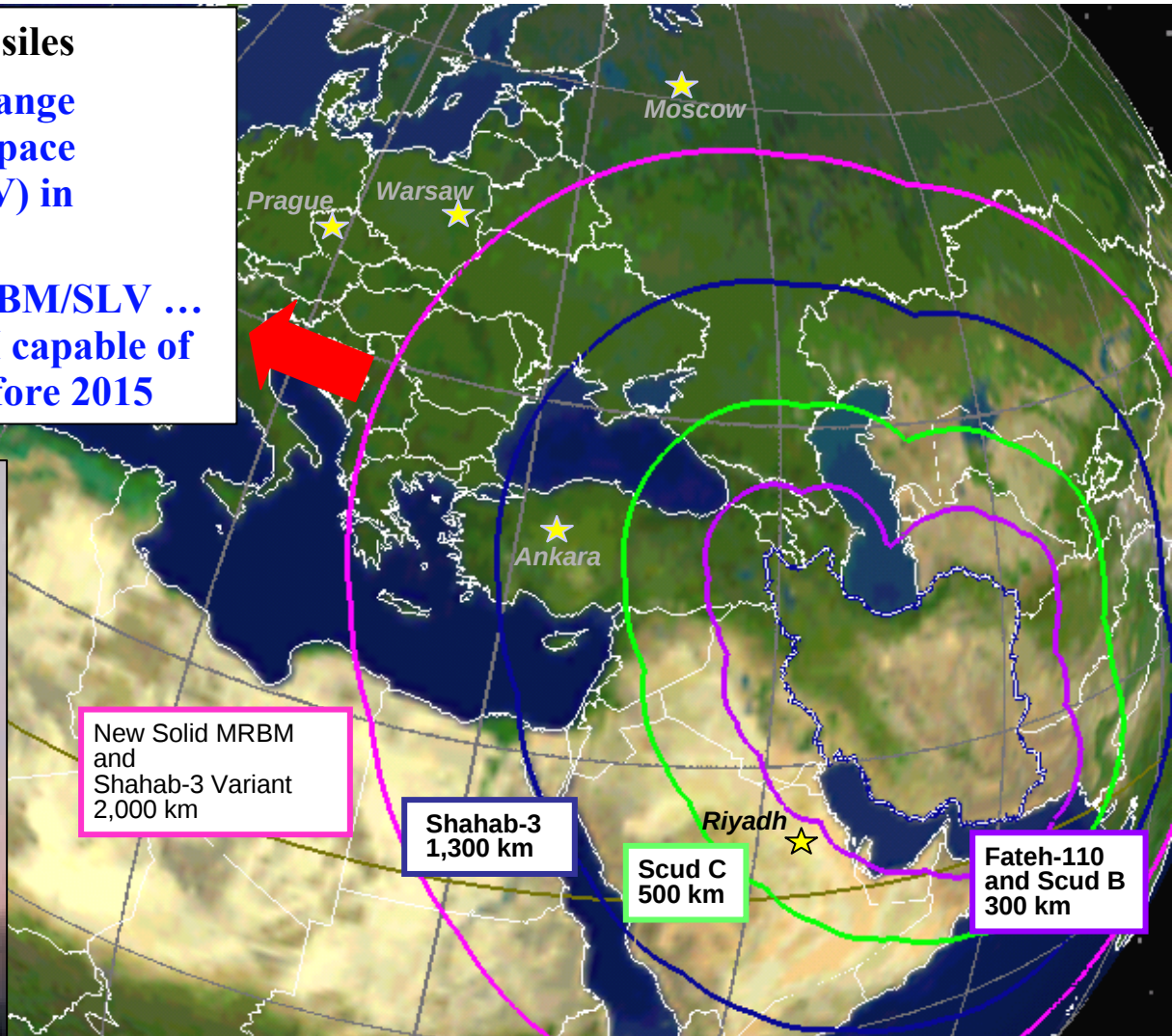




Iranian Ballistic Missile Threat

- **Long-Range Ballistic Missiles**

- **New Intermediate Range Ballistic Missile or Space Launch Vehicle (SLV) in development**
- **Likely to develop ICBM/SLV ... could have an ICBM capable of reaching the U.S. before 2015**

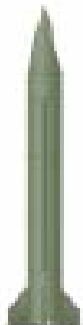




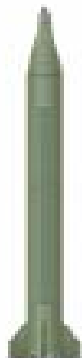
Iranian Ballistic Missiles

Iranian missile capability likely to accelerate due to

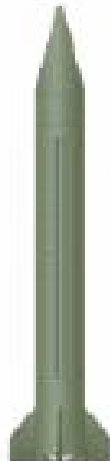
- Technology transfer
- Proliferation / purchases
- Foreign assistance



Scud B
1980s



Scud C
1990s



Shahab 3
1990s



Iranian
SLV
UNK



BM-25*
UNK

* Der Spiegel reports that
Iranians own the BM-25 IRBM



Iranian Nobel Prophet 2 Exercise

November 2006



VM308



Ballistic Missile Defense Policy And Mission

Policy

- “... The United States plans to **begin deployment** of a set of missile defense capabilities **in 2004**. These capabilities will serve as a **starting point** for fielding improved and expanded missile defense capabilities later.
- ... **Missile defense cooperation** will be a feature of U.S. relations with close, long-standing allies... protecting not only the United States and our deployed forces, but also friends and allies...”

Mission

- Develop an integrated layered Ballistic Missile Defense System
 - **To defend the United States, its deployed forces, allies and friends**
 - **From ballistic missiles of all ranges**
 - **Capable of engaging them in all phases of flight**

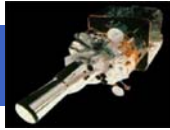
Strategy

- Provide initial protection of the United States from North Korea, partial protection from Iran; protect deployed forces, allies, friends
- Complete protection of the United States from Iran, expand coverage to allies and friends



Integrated Ballistic Missile Defense System

Sensors



Defense Support Program



Space Tracking And Surveillance System



Sea-Based Radars



Forward-Based Radar With Adjunct Sensor



Midcourse X-Band Radar



Early Warning Radar

Boost Defense Segment



Midcourse Defense Segment

Terminal Defense Segment



Airborne Laser



Kinetic Energy Booster



Aegis Ballistic Missile Defense / Standard Missile-3



Multiple Kill Vehicle



Ground-Based Midcourse Defense



Terminal High Altitude Area Defense



Sea-Based Terminal



Patriot Advanced Capability-3

Command, Control, Battle Management & Communications



NMCC USSTRATCOM USNORTHCOM USPACOM EUCOM CENTCOM



Missile Defense Tests

- **16 test successes in last 17 flight tests (with two no tests)**
 - **Aegis Standard Missile-3 intercepts of separating and unitary targets (November 2005, June 2006, April 2007)**
 - **Successful Terminal High Altitude Area Defense (THAAD) intercepts of unitary targets (July 2006, January 2007, April 2007)**
 - **Successful intercept of target with long-range interceptor (September 2006)**
- **Upcoming tests in 2007**
 - **Terminal High Altitude Area Defense intercept in space of short-range unitary target at Pacific Missile Range Facility**
 - **Four Aegis Standard Missile-3 intercept tests against short-and medium-range targets, including engagement by a Japanese destroyer**
 - **Two intercept tests of long-range ground-based interceptors**
- **Successful in-flight tests of the Airborne Laser Targeting System (March and May 2007)**
- **Successful launch of Near Field Infrared Experiment satellite (April 2007)**

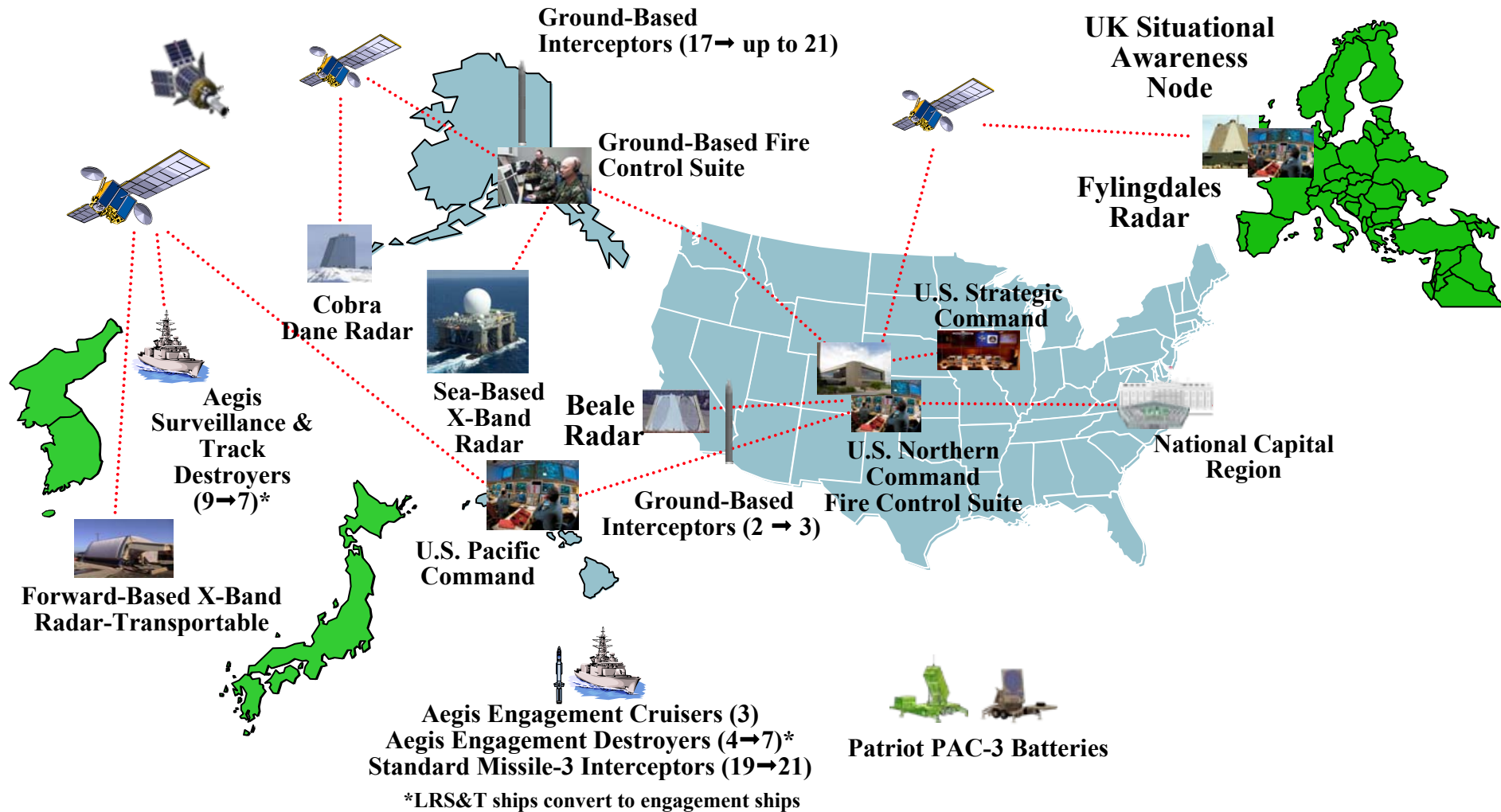
27 of 35 Hit-to-Kill Intercepts In Low And High Endo-atmosphere, Midcourse And Terminal Exo-atmosphere Since 2001





System Configuration

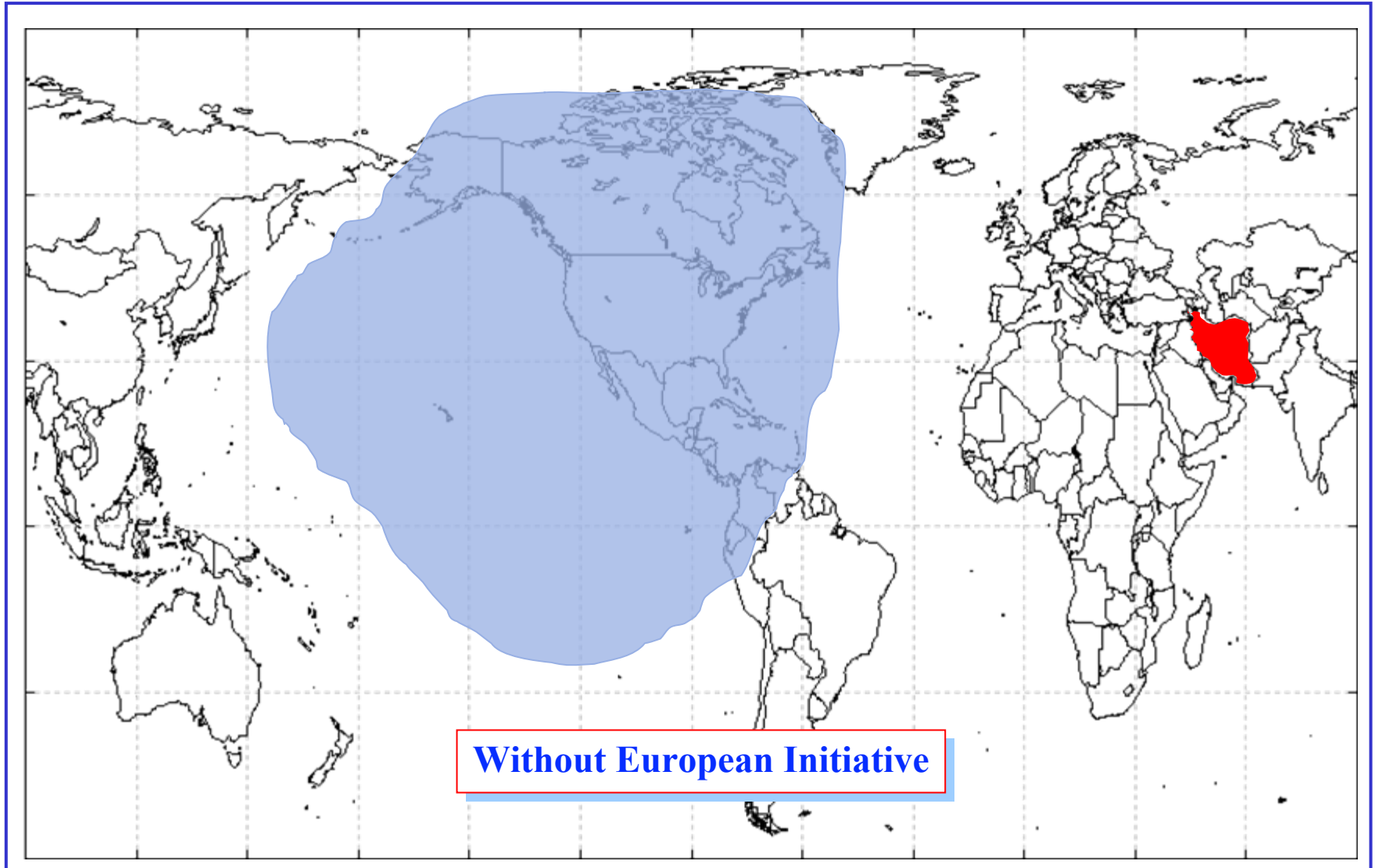
End June 2007 → End 2007



None Of This BMD Capability Existed In June 2004

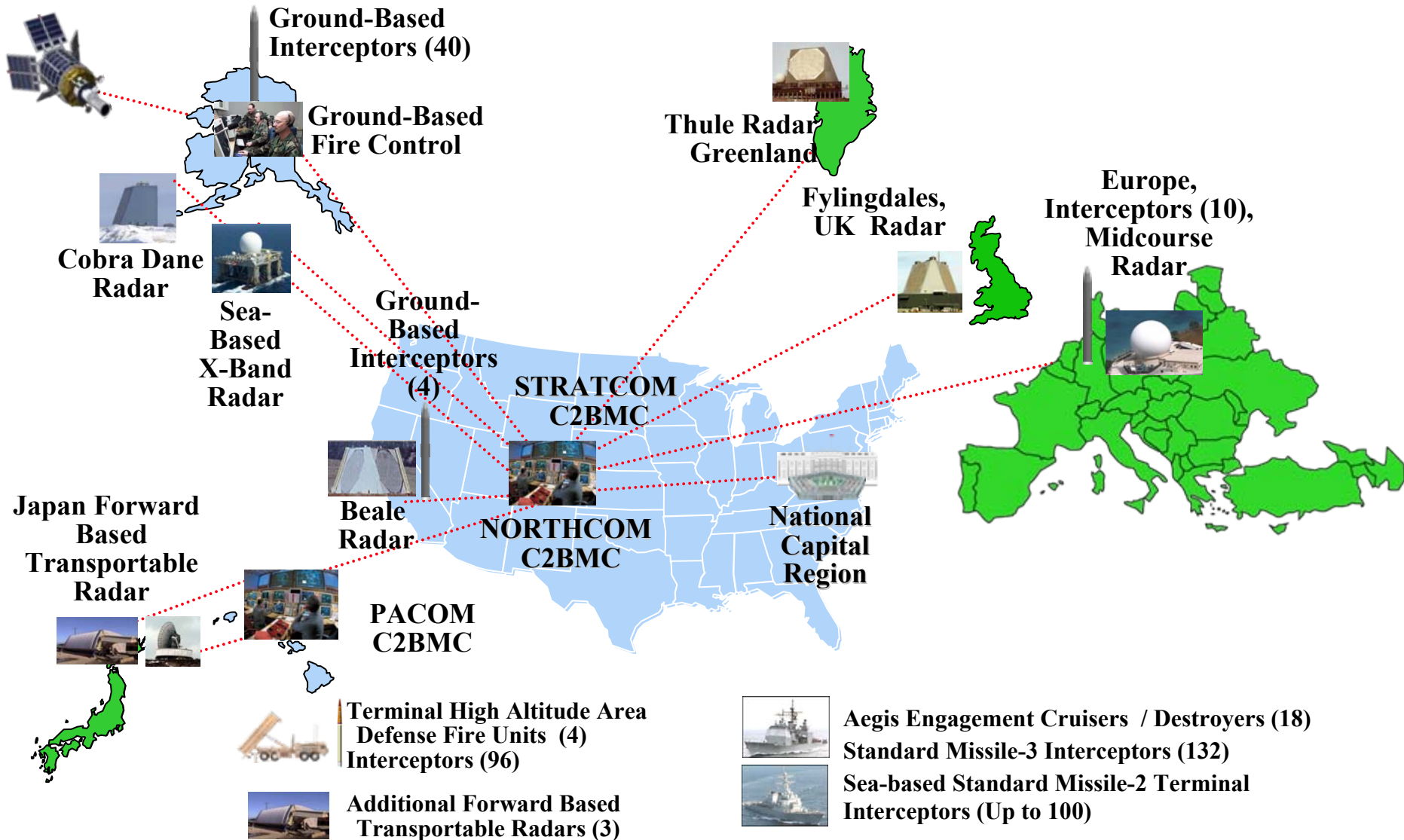


Ballistic Missile Coverage Against Long-Range Iranian Missiles





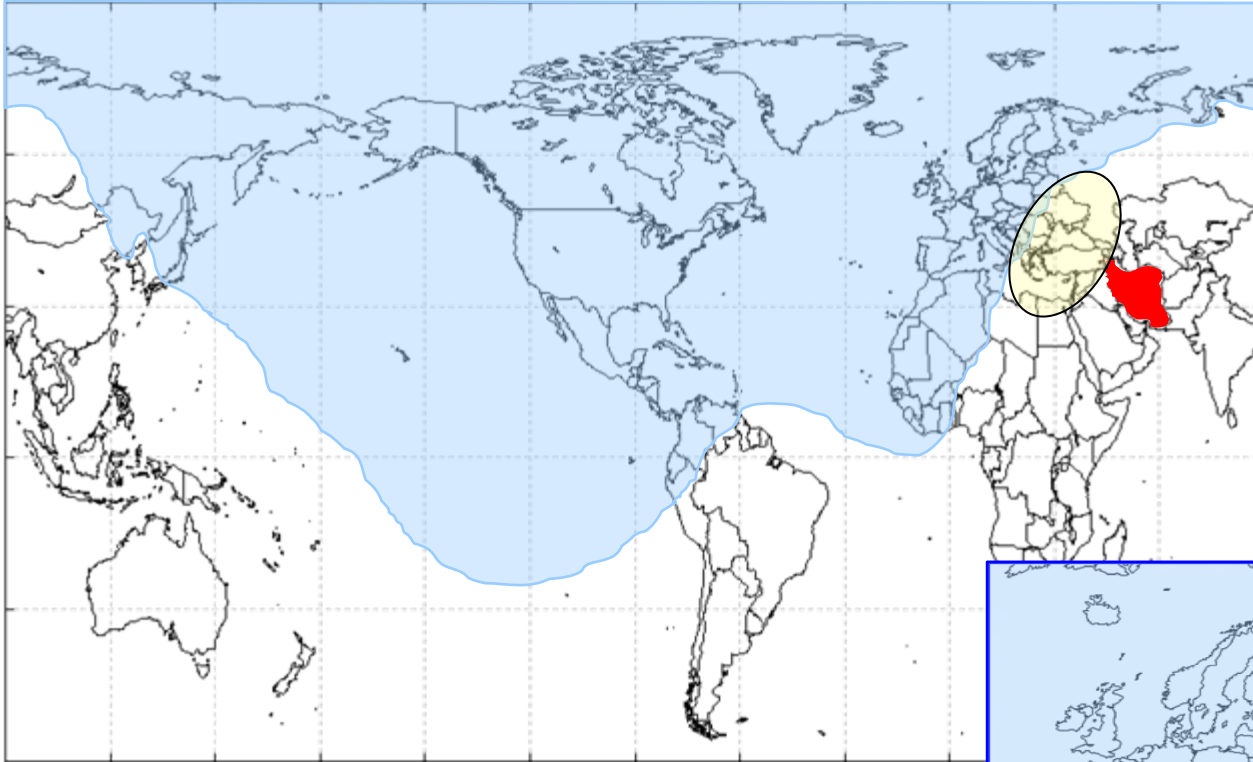
System Configuration 2013



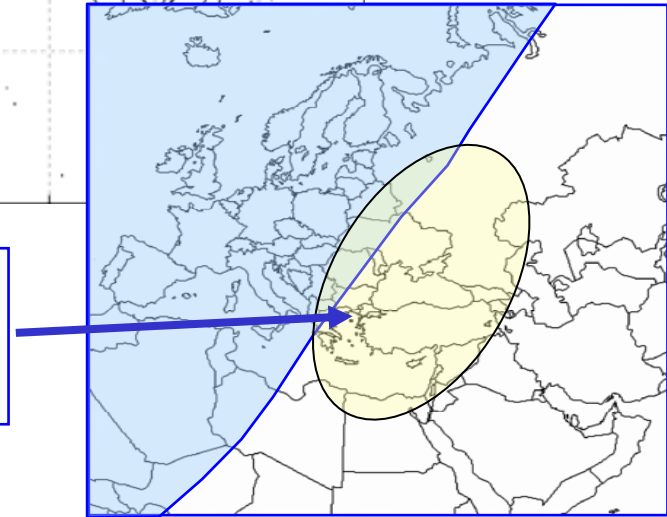


Capability Provided Versus Iranian Ballistic Missile

**BMD System With Interceptor Field (Poland) +
Midcourse Radar (Czech Republic) + Forward Based Radar**



**Can be covered by National or
NATO-deployed short- and
medium-range systems**





Rationale For Development Of Long-Range Defenses In Europe

- **Policy Rationale**

- Reaffirms indivisibility of U.S. and European security interests
- Strengthens deterrence and promotes regional stability by giving U.S. and European leaders more options
- Limits the ability of hostile governments to coerce European allies, indirectly holding the United States hostage
- Devalues utility of ballistic missiles

- **Technical Rationale**

- Currently no defenses in European theater to engage intermediate-to long-range ballistic missiles launched from Iran
- Mobile sea-based and transportable ground-based missile defenses available today to engage slower, more numerous shorter-range ballistic missiles
- Lead times for long-range missile defense development are significant
- Most cost-effective, timely solution is land-based long-range interceptors with associated radars



Proposed Missile Defense Elements In Europe

- (U) European interceptor site
 - Up to 10 silo-based long-range interceptors located in Eastern Europe (2011-2013)
- (U) European midcourse radar
 - Re-location of a narrow-beam, midcourse tracking radar currently used in our Pacific test range to central Europe (2011)
- (U) Forward-based radar
 - Field an acquisition radar focused on the Iranian threat from a forward position to provide detection, cueing, and tracking information
- (U) Why Poland and Czech Republic?
 - Azimuthal coverage
 - Range from Iran





European Site Initiative And NATO

- **Sites complement envisioned NATO system**
 - **Current NATO Feasibility Study addresses short to intermediate-range missile threats (up to 3,000 km)**
 - **European deployments address intermediate to intercontinental-range threats from the Middle East**
- **European interceptor and radar sites would provide opportunity for significant cost savings to the Alliance**
 - **U.S. provides interceptor and radar site at no cost to NATO**
 - **U.S. site would cover most of Europe**
 - **Exploring current / planned Allied Active Layered Tactical Ballistic Missile Defense system to extend coverage**
- **Significant opportunities for future synergies between U.S. and NATO systems**
 - **Shared situational awareness / information sharing**



Summary

- **The BMD system we are fielding to address a real and growing threat works and is having a positive impact**
- **We will continue to build on the current system to close performance gaps and improve its capabilities over time**
- **European missile defense deployments are essential to defend the United States, allies and friends against the growing threat from Iran**
- **We look forward to working with our European partners to promote the continued improvement of our ballistic missile defense capabilities**



BACKUP



Defended Area Against Iranian Missiles

- Europe Interceptor Site + ALTBMD Or (Aegis Weapon System + THAAD) -

Sensor: Forward Based Radar at Caspian Sea Region

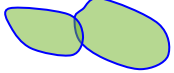
Missile Class

IRBM
&
Shorter
Range



Architecture

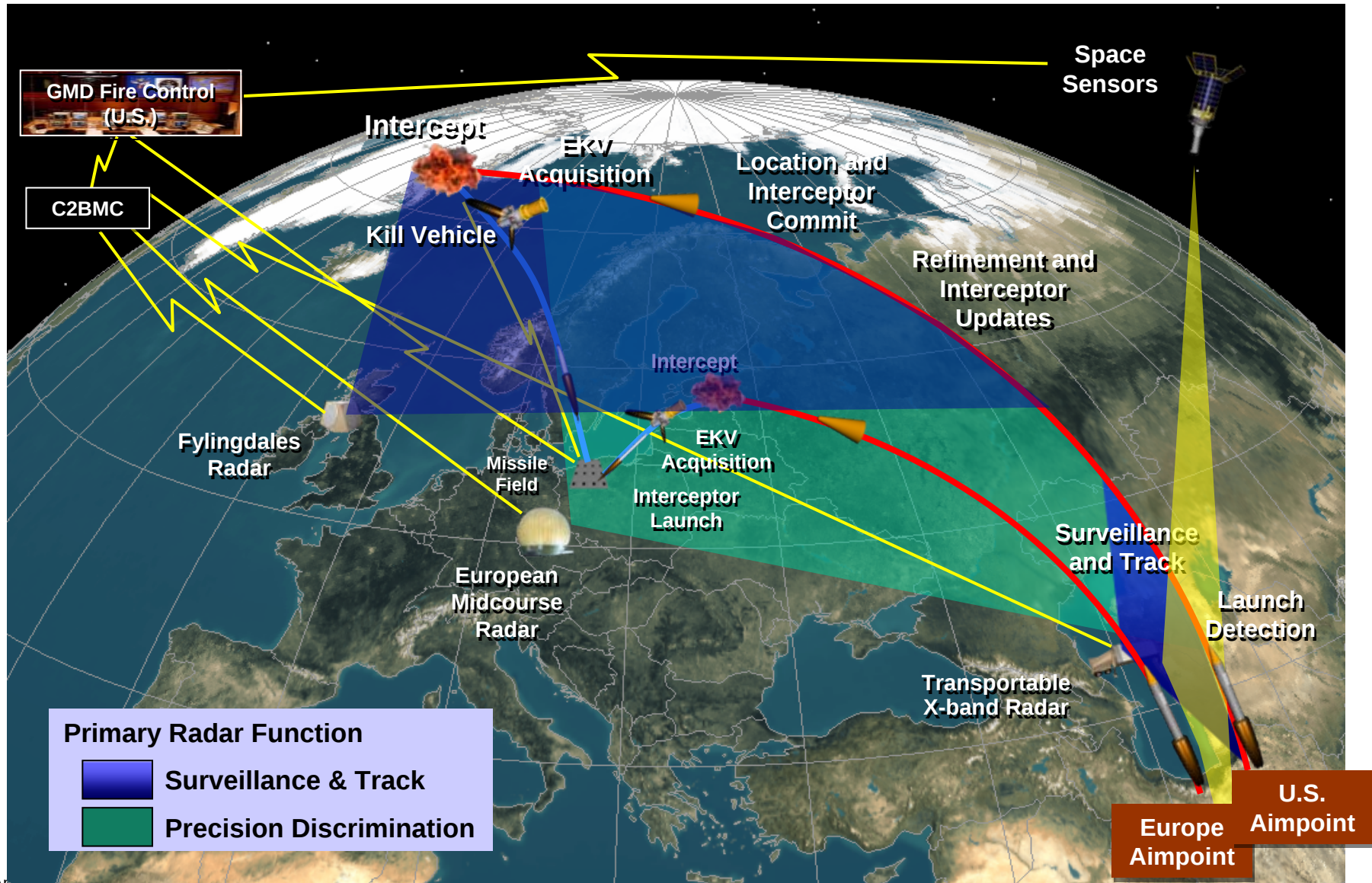
— European
Interceptor
Defended Area
(Poland Site)


Aegis
Defended
Area


THAAD
Defended
Area



European Components “How It Works”





NATO

19 April NAC-R, NRC-R Meetings

- “... The unanimous view this morning was, and I’ve used that principle before myself, that also in the case of missile defence the principle of indivisibility of security should apply and in that context there is a shared desire... should be complimentary to any NATO missile defence system. Including potentially, I say potentially, a system on Active Layered Theatre Missile Defence. . .
- ... Another important element I should mention is that there is absolutely a shared threat perception between the Allies. Allies all agree that there is a threat from ballistic missiles. Full stop. . . .
- ... This one is at a higher level (NRC-R) because all Allies and the Russian Federation were represented at a high level from their capitals. Let me say in this framework that it was a good meeting; it was a useful meeting. . . I cannot say and I cannot conclude that we agree on everything.”

NATO Secretary General
Jaap de Hoop Sheffer
19 April 2007



NATO

19 April NAC-R, NRC-R Meetings

- **“... The Allies are convinced, were convinced and are convinced, that there are no implications of the United States system for the strategic balance and ten interceptors can also not pose a threat to Russia.**
- **... So in all a very valuable day. The Allies are united on the issue, on the threat, and on the way ahead.**
- **... that system (NATO MD system) could and in my opinion should be complimentary so that you have the total cover be it for the long-range and be it for the short and medium-range. . . ”**

**NATO Secretary General
Jaap de Hoop Sheffer
19 April 2007**

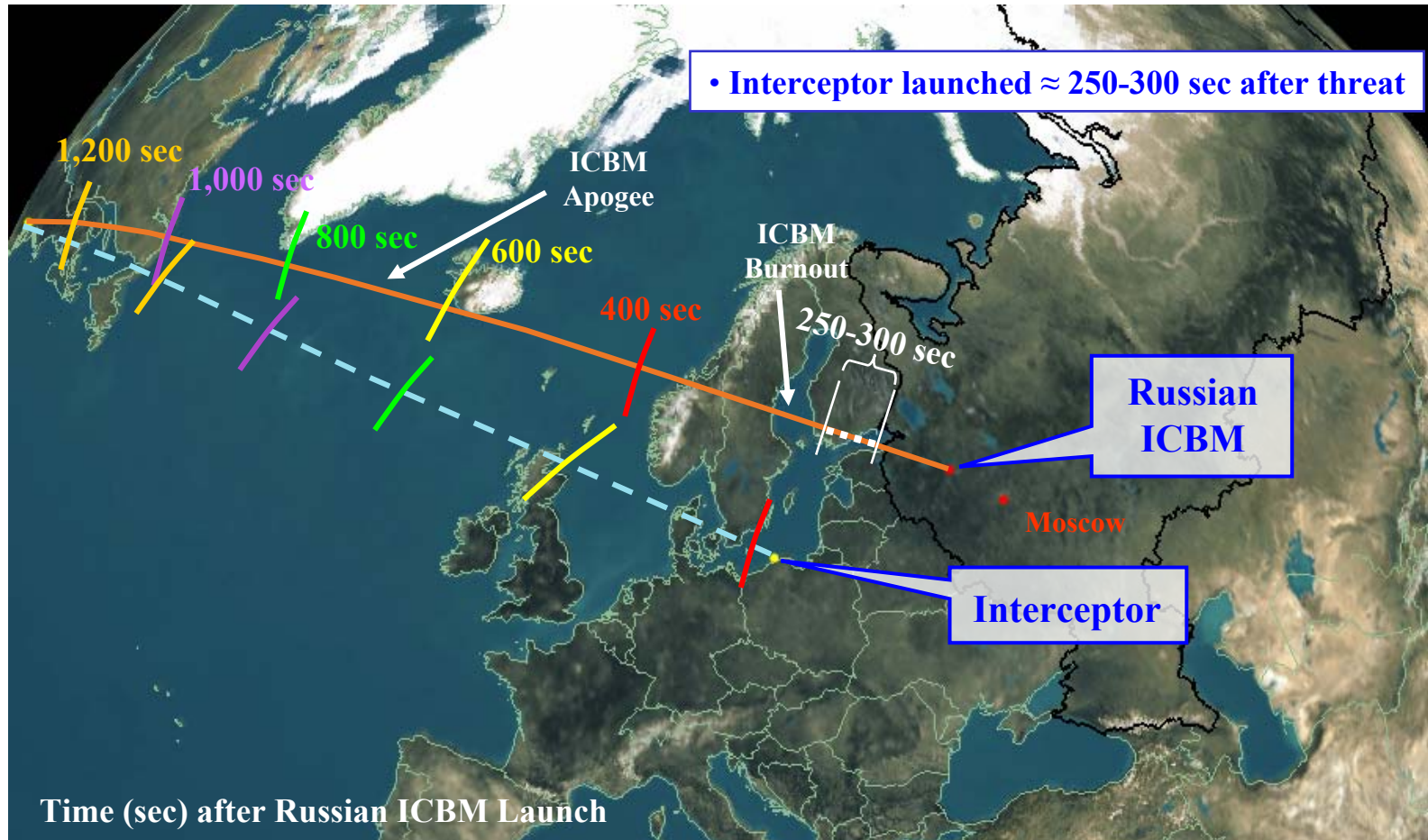


U.S. System Cannot Counter Russian Offensive Missiles

- U.S. missile defense system deployments are directed against rogue nation threats, not advanced Russian missiles
- A European interceptor site (up to 10 interceptors) would be no match for Russia's strategic offensive missile force – would be easily overwhelmed
- European interceptor site has no capability to defend U.S. from Russian launches
 - Not geographically situated in European for this purpose
 - Too close Russian launch site to be able to engage intercontinental missiles headed for U.S.
 - Would result in “tail chase” for interceptors launched from a European site
- No plan to expand the number of interceptors in Europe – not in our five year budget
- Standing invitation to the Russians to visit U.S. missile defense sites for transparency purposes



Interceptors Cannot Catch Russian Missiles



U.S. European Interceptor Site Cannot Affect Russian Strategic Capability



Background

- **Concern about potential adverse consequences from “intercept debris”**
- **Two misconceptions about “debris” are frequently encountered**
 - **Debris would “fall out of the sky” upon Nation under intercept point**
 - **Dispersed intercept debris would be worse than warhead detonating on target**
- **U.S. Perspective – consequences of not intercepting are far more severe than any potential secondary adverse effects from intercept debris**



Debris Facts

- **Booster**
 - **Booster debris is dependent on launch azimuths and engagement geometries**
 - **In addition to booster stages, separation debris fragments of varying sizes**
- **Interceptor**
 - **Debris generated is dependent upon the target, intercept point, angle and velocity**
 - **Debris path is dependent upon intercept altitude, intercept velocity, intercept angle, and flight path angle**
- **Reentry Vehicle**
 - **Dependent on Size and Mass**
- **Adversary boosters will also drop stages near intended target**



Intercept Debris

- Intercept debris is minor compared to intact WMD warhead hitting a major population center
- An intercepted warhead produces very little debris
 - Closing speed between the interceptor and warhead is more than 7 km per second
 - Intercept occurs in space at an altitude of more than 200 km, well outside the earth's atmosphere
 - Resulting kinetic energy vaporizes much of the reentry vehicle, warhead and kill vehicle and disperses debris
- U.S. flight test have shown that very little debris reaches the earth – pieces no more than 8 inches long
- Probability of any casualty on the ground is very low
 - 3 in a 1,000 to 1 in 2.5M depending upon population density

Aegis FTM-10

22 JUN 06

Terminal High Altitude Area Defense

THAAD FTT-07

None Shall Pass

5 April 2007

THAAD

Pacific Missile Range Facility (PMRF)
Kauai, Hawaii

FTT-07

**Pacific Missile Range Facility - PMRF
Kauai, Hawaii**

FTM-11

FTM-11

Stellar Hunters



26 April 2007