(U) Utility of STSS & KEI to European Ballistic Missile Defense

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(U) Introduction & Methodology

• (U) Description of space-based sensors & Kinetic Energy Interceptor’s utility for:
  – (U) The US Ballistic Missile Defense System (BMDS)
  – (U) NATO’s Active Layered Theater Ballistic Missile Defense (ALTBMD) System

• (U) Discussion of Kinetic Energy Interceptor’s (KEI) ability to extend reach & battlespace for BMDS and ALTBMD

• (U) Description of the Space Tracking & Surveillance System (STSS)
  – (U) Additional target viewing capable from space-based sensor

• (U) Increased mission utility of STSS & KEI against notional threat scenario

• (U) Conclusions
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**(U) KEI Weapon System Description**

**Flexible Basing Options**

- Common Booster / AUR
  - Solid Propellant Boosters
  - Fast Acceleration
  - Cold-Launched From Canister
  - Critical to sea-mobile migration
  - MDA Core Standard and HABNS II Compliant
- Total System Mobility
  - Sized to enable world-wide deployment within hours on standard USAF aircraft
- Multi-Mission Capability with Payload Flexibility
  - Single & Multiple Kill Vehicle
  - Other Mission Payloads
  - Multiple KV load-outs enable extended battlespace, flexible responsiveness to target sets
- High Acceleration High Maneuver Booster
  - Fast acceleration crucial for early engagements
  - Enables very large Launch Area Denied

**Interceptor & All-Up Round (AUR)**

- ONIR Direct Downlink (DDL)
  - Provides early tracking to enable Boost Phase & Midcourse engagements
  - Leverages national overhead assets
- Link to CONUS KEI (CKEI)
  - Fast Multi-Sensor Data Fusing
  - Faster more accurate track identification & fire control solution
  - Relays fused track data from C2BMC
- Near Continuous In-Flight Communications
  - Provides track updates to interceptor in-flight
  - Required for "shout back" capability to relay target status up to point of impact
  - Enhances capability of subsequent shooters/layers to engage successfully

**Fire Control and Communications**

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**(U) Potential KEI European Deployment Area**

- **(U) KEI primarily designed for strategic defense of CONUS**
- **(U) European basing could also provide additional utility for European theater defense (ALTBMD)**
  - **(U) KEI high performance 40" interceptor provides flexible basing options to defend Europe**
- **(U) 40" class, mobile interceptor:**
  - (U) Deployed anywhere in the white shaded deployment area to defend Europe
- **(U) 21" class, sea-mobile interceptor:**
  - (U) Required to be in the green shaded Deployment Area to defend Europe
(U) STSS Description

- (U) Space Tracking & Surveillance System (STSS)
  - (U) Provides space-based birth-to-death tracking of ballistic missiles
    - (U) Compliments Missile Warning sensors that provide boost-phase tracking
    - (U) Tracks threats from boost, through burnout & midcourse, to reentry
  - (U) Tied in with the BMDS through C2BMC to provide real-time tracking data to interceptors
  - (U) Direct Downlink (DDL)
    - (U) Connect directly with sensors and interceptors in theater
  - (U) Two STSS Demonstration satellites to launch in 2009
    - (U) Supporting the Ballistic Missile Testbed
  - (U) Operational constellation in architecture development phase
    - (U) Constellation design, sensor & communications architecture definition

(U) BMDS Future Architecture  OV-1

From MDA Gen. Obering Presentation, 11-18-2006
(U) Space Sensor Provides Over-the-Horizon Tracking of Theater Ballistic Missiles

- Space layer of BMD systems can provide view of target prior to terrestrial sensors
  - Curvature of Earth limits radar systems
- Space & ground sensors working in concert
  - A cue from space sensors allows for:
    - Use of full radar capability
    - Reduces uses of radar resources

(U) STSS & KEI Enhanced Capabilities for Theater Ballistic Missiles Defense

- STSS enables full Range capability of EMR & interceptors
- KEI allows early engagement of threats & maximizes Shoot-Look-Shoot
(U) Conclusions

- (U) STSS’s addition to the "Space Layer" of BMDS & ALTBMD crucial to tracking hostile Theater Ballistic Missiles
  - (U) Cueing of ground & ship based radars
  - (U) Providing intercept quality tracking to enable engagement of threats at full kinematic capability of the interceptors

- (U) Fusing of track data from all sensors (space & ground) enables full capabilities of interceptors

- (U) KEI enables full utilization of tracking provided, engaging threats during both mid-course and boost phases
  - (U) STSS enables full utilization of KEI’s capability through DDL of tracking data throughout interceptor fly-out

- (U) A Euro KEI integrated with the US BMDS system and taking advantage of the full spectrum of Alliance sensors bears consideration
  - (U) KEI must be compatible with ALTBMD to provide full coverage

- (U) Innovative sensors & shooters needed to meet evolving threat scenarios