Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Missile Defense Agency										DATE: February 2012	
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*							
COST ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**Cost To Complete**	**Total Cost**
Total Program Element	105.580	96.232	51.313	-	51.313	45.355	32.423	34.195	35.087	Continuing	Continuing
MD12: *Space Tracking and Surveillance System (STSS)*	101.744	91.957	48.708	-	48.708	43.067	30.839	32.507	33.306	Continuing	Continuing
MD40: *Program-Wide Support*	3.836	4.275	2.605	-	2.605	2.288	1.584	1.688	1.781	Continuing	Continuing

Note

The Program Office for Space Tracking and Surveillance System (STSS) relocated to Colorado Springs in the MDA Missile Defense Integration and Operations Center (MDIOC) within the Missile Defense Space Experimentation Center (MDSEC) 25 May 2011. At that time, the MDSEC was renamed to the Missile Defense Space Development Center (MDSDC).

MDA will continue to assess the health/utility of the Near Field Infrared Experiment (NFIRE) satellite on an annual basis to determine whether to continue NFIRE operations and testing.

A. Mission Description and Budget Item Justification

Space Tracking and Surveillance System (STSS)

With the successful launch of two (STSS) demonstration satellites in 2009, the agency has on-orbit capability to validate remote sensor and fire control integration to inform the design and operation of the Precision Tracking Space System (PTSS), to characterize contribution of space data into the BMDS architecture, and to provide sensor measurements and background data supporting trade studies and analyses for PTSS and Standard Missile-3 (SM-3) IIB development. Lessons learned from the two STSS demonstration satellites are guiding decisions on the development of a fiscally sustainable, continuously available, operational PTSS constellation and ground communications/processing system.

Beginning FY 2013, funding in this element is provided for STSS on-orbit operations which includes contractor operation of the STSS Demonstration Satellites and software maintenance, Government costs, BMDS Level Testing, Data Collection and Analysis activities, and the NFIRE satellites tests and experiments. Funding availability for NFIRE will be determined as the health and utility of the satellite is assessed for FY 2013.

STSS is providing risk reduction for PTSS models, algorithms, sensors and spacecraft development by providing background and clutter scene characterization, complex target signatures, interface definition, communications architectures, and performance across acquisition, tracking, and discrimination. STSS is also providing definition to BMDS Concept of Operations, timelines and performance requirements for sensor cuing and weapons engagement such as Aegis Launch On/Engage On from remote space sensors.

STSS will emphasize continued research and development to address the more sophisticated threats we expect to encounter in the far term. The greatest protection against missile defense threats of all ranges remains a highly available early missile tracking capability from space. Space sensors provide the most cost effective and operationally suitable means of providing global persistent surveillance and engagement, directly addressing the number one missile defense priority need for

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Combatant Commanders. STSS is a capability development activity for the demonstration of technologies to support development and future capability delivery of the BMDS space layer, PTSS. For example, during Aegis Intercept Flight Test (FTM-15), STSS demonstrated the capability to receive an external cue and transmit that cue to the out-of-view STSS satellite, resulting in stereo midcourse tracking. This provided significant risk reduction for PTSS by closely emulating a communication, cuing, and track reporting chain for an operational engagement. In addition, the STSS Demonstration Satellites have demonstrated the ability of a space sensor to provide high precision, real time tracking of missiles and midcourse objects, thus enabling simultaneous regional, theater, and strategic missile defense systems to be cued to track well beyond their organic detection capability. Data from on-going Space Tracking and Surveillance System (STSS) testing has validated the ability to track cold, midcourse objects from space and close the fire control loop with BMDS interceptors. During several MDA Flight Tests, STSS has provided data in real-time that has met the Aegis Missile Defense Systems Quality of Service (QoS) data requirements for Remote Engagement Authorized (REA). In FY 2013, STSS will provide real-time data to Aegis during a live fire test that will culminate in an actual Standard Missile-3 (SM-3) launching against the target using STSS data to initiate the engagement. Finally, STSS provides a new infrared sensor phenomenology for the Ballistic Missile Defense System (BMDS) that will demonstrate the benefit of the Precision Tracking Space System (PTSS) when combined with radars that will provide robustness against current and advanced countermeasures.

MDA has developed, and is testing, two STSS Demonstration Satellites to demonstrate key functions of space sensors in support of PTSS risk reduction. STSS Element Level testing is funded as part of a capabilities development program and reflected in the Program Element submission. Element testing is based on an integrated, comprehensive, and phased test program. Element systems, subsystems, and components were tested early in development and this testing was necessary prior to conducting BMD level testing. Key data from the STSS Demonstration Satellites efforts continue to provide lessons learned as MDA pursues longer term space sensor needs with PTSS.
- Space sensors extend BMDS sensor coverage to a global level. The STSS has demonstrated the capability of satellites to track ballistic missiles and the ability to provide accurate tracking information to the BMDS battle manager to close the fire control loop with BMDS interceptors, thus extending the effective range of BMDS interceptors and other sensors.
- Space-based sensors are not limited by basing rights issues or deployment decisions, and will allow cost effective coverage of countries and large areas not accessible from ground based sensors.
- Space based visible and Infrared (IR) sensors will complement radars and contribute to a sensor architecture more robust to countermeasures
- Space-based sensors will enable near continuous threat observation and tracking from launch to intercept, covering threats by augmenting the coverage of the BMDS radars, and providing state vectors to Command and Control, Battle Management and Communications (C2BMC) to enable interceptor fire control via multiple BMDS assets (Aegis, Ground-based Midcourse Defense (GMD), Terminal High Altitude Area Defense (THAAD))

Goals for STSS
- Risk reduction for PTSS
- Risk reduction for SM-3 IIB interceptor sensor trades
- Demonstrate C2BMC interfaces, sensor registration, communication chains and latencies to support PTSS concept of operation development

Near Field Infrared Experiment (NFIRE)
The NFIRE technology project was designed to collect near field phenomenology data for use in plume to hard body handover algorithms for boost phase interceptor programs. MDA used this data to validate the models and simulations that are fundamental to developing the guidance and endgame homing algorithms. NFIRE

is now focused on PTSS and SM-3 IIB development support by collecting background, clutter, and target signatures for modeling and algorithm development and validation. A secondary objective of the experiment has been to collect hyper-temporal short wave infrared and visible data for assessing early launch detection and tracking capability. The experiment includes three plume signature mission types: targets of opportunity, dedicated fly-bys, and ground observations. The dedicated fly-by experiments have been accomplished. The NFIRE satellite also carries a Laser Communication Terminal, which has been and continues to be used to conduct communication experiments with the German Terra SAR-X satellite. These experiments test low earth orbit satellite-to-ground and satellite-to-satellite capabilities of the terminal for potential incorporation into the BMDS. Data products are utilized by multiple programs to improve missile engagement performance.

Goals for Near Field Infrared Experiment (NFIRE)
- Conduct multiple data collection missions from the Missile Defense Space Development Center (MDSDC) against ground, air, space and ballistic missile targets of opportunity
- Conduct low earth orbit satellite-to-satellite and satellite-to-ground laser communication experiments
- Provide data to validate models and simulations that are fundamental to developing the navigation, guidance and control, and endgame homing algorithms, as well as laser communication proof of concept

MD40 consists of Program-Wide Support (PWS) non-headquarters management costs in support of MDA functions and activities across the entire Ballistic Missile Defense System (BMDS).

B. Program Change Summary ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Previous President's Budget	112.678	96.353	53.577	-	53.577
Current President's Budget	105.580	96.232	51.313	-	51.313
Total Adjustments	-7.098	-0.121	-2.264	-	-2.264
• Congressional General Reductions	-0.767	-0.121			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.000	-			
• SBIR/STTR Transfer	-3.331	-			
• Other Adjustment	-	-	-2.264	-	-2.264

Change Summary Explanation

FY 2011 adjustments include Congressional reductions (Department of Defense ((DoD)) and Full year continuing Appropriation Act, Public Law 112-10) and reflects realignment to DoD priorities.

The FY 2012 decrease reflects a congressional reduction (Consolidated Appropriation Act of FY 2012 (Public Law 112-74)).

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The FY 2013 reduction reflects a realignment of DoD priorities.

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COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
MD12: *Space Tracking and Surveillance System (STSS)*	101.744	91.957	48.708	-	48.708	43.067	30.839	32.507	33.306	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

Note

The Program Office for Space Tracking and Surveillance System (STSS) relocated to Colorado Springs in the MDA Missile Defense Integration and Operations Center (MDIOC) within the Missile Defense Space Experimentation Center (MDSEC) 25 May 2011. At that time, the MDSEC was renamed to the Missile Defense Space Development Center (MDSDC).

MDA will continue to assess the health/utility of the Near Field Infrared Experiment (NFIRE) satellite on an annual basis to determine whether to continue NFIRE operations and testing.

A. Mission Description and Budget Item Justification

Space Tracking and Surveillance System (STSS)
The STSS Demonstration Satellites provide two on-orbit satellite assets with visible and infrared sensors in low earth orbit for testing with other Ballistic Missile Defense Systems (BMDS) elements. These two satellites provide valuable risk reduction for acquisition, tracking, and discrimination functionality to include stereo data fusion, cueing radars over the horizon and over-the-horizon fire control. The program is demonstrating the functions and interfaces required for space data delivery to the BMDS, validating the data quality necessary for interceptors to launch and/or engage on STSS sensor data. The two Demonstration Satellites are operated 24 hours a day, 7 days a week from the ground station processing center at the MDSDC with a government and contractor team. On-orbit, STSS Demonstration Satellites continue data collection and analyses in FY 2012 and beyond striving to view all available Targets of Opportunity (TOOs) to include participation with other BMDS target and flight tests that provide demonstration of the MDA Space Layer capabilities and allow collection of future system risk reduction information.

The satellites are demonstrating key functions of missile tracking with space sensors in support of Precision Tracking Space System (PTSS) risk reduction. On-orbit sensor operations are collecting invaluable background, scene and target signatures to support PTSS and Standard Missile-3 (SM-3) IIB sensor development trade studies. STSS activities support PTSS development by integration of space-based missile tracking (midcourse phases); sensor and weapons cueing (such as Aegis and Terminal High Altitude Area Defense (THAAD)) via Command and Control, Battle Management and Communications (C2BMC); features and discrimination; and hit/impact point assessments into C2BMC. STSS risk reduction for PTSS will enable early capability assessment of the Warfighter`s need for a highly available early missile tracking capability from space providing an operationally suitable means of global persistent surveillance and engagement. Capabilities being assessed for PTSS include detecting and acquiring ballistic missiles; tracking ballistic missiles and their deployed objects; emerging threat detection and tracking; performing autonomous acquisition-to-track handover within a satellite; performing tracking handover to a satellite from a ground cue; performing uplink and downlink of mission, health, and status data both directly and via crosslink between two satellites; reporting ballistic missile and intercept event to close the fire-control loop; filtering reports to C2BMC; providing near real-time object data to external users; and providing a System Performance Evaluation Tool model. As such, the demonstration of these

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activities will support future PTSS capability development and will enable meeting a Warfighter`s requirements to include tracking missile threats and objects of interest; provide post-launch sensor cueing; integrate, fuse and correlate sensor data; engage/re-engage ballistic missile threats; and provide system modeling tools.

MDA Element testing is based on an integrated, comprehensive, and phased test program. Element systems, subsystems, and components are tested early in development and are necessary prior to conducting Ballistic Missile Defense System (BMDS) level testing. The Space Tracking and Surveillance System (STSS) Element Level testing is funded as part of a capabilities development program and reflected in this Program Element (PE) submission. The STSS Demonstration Satellites demonstrate key functions of space sensors. MDA will continue planning for and conducting integrated BMDS intercept tests based on track data passed from the STSS Demonstration Satellites through Command and Control, Battle Management and Communications (C2BMC) to Aegis, Ground-based Midcourse Defense (GMD), or other interceptors.

Near Field Infrared Experiment (NFIRE)
The NFIRE satellite is operated from the Missile Defense Space Development Center (MDSDC) and continues to collect environmental background characterization (regional/seasonal atmospheric radiance variability, day-night, land-sea clutter, clouds, auroral measurements, etc) for the Precision Tracking Space System (PTSS) sensor and Standard Missile-3 (SM-3) IIB seeker development programs, hyper-temporal short wave infrared data to support research and development of early launch detection and tracking capabilities, and earth limb radiance measurements to support improvement of environmental models. The NFIRE satellite also carries a Laser Communication Terminal to conduct communication experiments with the German Terra SAR-X satellite. These communications experiments test low earth orbit satellite-to-ground and satellite-to-satellite laser communications capabilities for potential incorporation into the BMS. The laser communication experiments will be conducted on a non-interference basis with other MDA missions. MDA will continue to assess the health/utility of the NFIRE satellite on an annual basis to determine whether to continue NFIRE operations and testing.

Lessons learned and data gathered from the STSS program and the NFIRE program will continue to provide valuable information for PTSS modeling and simulation activities in assessing the capability of a low earth orbit constellation to complement sensor coverage and missile detection and tracking capabilities provided by Overhead Persistent Infrared (OPIR) sensors.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
Title: Demonstration Satellites	72.384	70.163	45.689
Articles:	0	0	0
Description: See Description Below			
FY 2011 Accomplishments: - Completed on-orbit calibration and system performance testing - Achieved a number of firsts in demonstrating capability of space-based sensors for the BMDS -- First ever birth-to-death tracking of a missile target from low earth orbit (Aegis Simulated Intercept Flight Test (FTM-16 E1)) -- First stereo collection on birth-to-death missile flight and providing the missile tracking data to the BMDS in near real-time (Sensors Flight Test (FTX-16 E1))			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
-- First on-orbit demonstration of receipt of an external cue and the use of the Space Tracking and Surveillance System (STSS) crosslink to transmit that cue to the out-of-view satellite, resulting in stereo midcourse tracking and first observation of missile intercept from low earth orbit (Aegis Intercept Flight Test (FTM-15)) -- First simulated remote Aegis engagement authorization based on STSS trajectory (Aegis Intercept Flight Test (FTM-15)) -- First stereo acquisition sensor-to-track sensor hand-off (Air-Launched Target Return to Flight (FTX-17)) - Conducted missile tracking experiments as identified in the test specific sections, BMDS Level Testing and Element Integration and Testing, that follow - FY 2011 testing of the STSS Demonstration Satellites continued the execution of the STSS-related Critical Engagement Conditions (CECs)/Empirical Measurement Events (EMEs) -- Collection of test data from CECs/EMEs used in updating and verification, validation, and accreditation of modeling and simulation representations for assessing system performance - The STSS program office relocated from the Space and Missile Systems Center (SMC) to the Missile Defense Space Development Center (MDSDC) in Colorado Springs, CO - Conducted independent government validation of STSS Demonstration Satellites data in the STSS Demo Analysis Center			
FY 2012 Plans: - Conduct missile tracking experiments as identified in the test specific sections, BMDS Level Testing and Element Integration and Testing, that follow - FY 2012 testing of the STSS Demonstration Satellites continues the execution of the STSS-related CECs/EMEs -- Collection of test data from CECs/EMEs used in updating and verification, validation, and accreditation of modeling and simulation representations for assessing system performance - Conduct independent government validation of STSS Demonstration Satellites data in the STSS Demo Analysis Center			
FY 2013 Plans: - Testing includes SM-3 intercept using STSS as a remote sensor. - Conduct missile tracking experiments as identified in the test specific sections, BMDS Level Testing and Element Integration and Testing - FY 2013 testing of the STSS Demonstration Satellites continues the execution of the STSS-related CECs/EMEs -- Collection of test data from CECs/EMEs used in updating and verification, validation, and accreditation of modeling and simulation representations for assessing system performance - Conduct independent government validation of Space Tracking and Surveillance System (STSS) Demonstration Satellites data at the Missile Defense System Development Center (MDSDC) - Perform satellite functionality testing and calibration as part of the satellite operations			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
- In FY 2013, testing begins to transition from dedicated, more costly, first-time efforts to missions collecting data to verify earlier results. These verifications further strengthen BMDS-related modeling and simulation as well as support development of future systems design and concept of operations.			
Title: BMDS Level Testing	18.838	14.645	3.019
Articles:	0	0	0
Description: See Description Below			
FY 2011 Accomplishments: Planned and executed STSS participation in BMDS flight tests. Collection from a variety of test targets and conditions enable a statistically relevant database to be constructed to support future space system design. - Tracked five BMDS targets -- Aegis Simulated Intercept Flight Test (JTFM-04 E1): Aegis 4.0.1 simulated intercept of a surrogate separating Medium-Range Ballistic Missile (MRBM) --- Collected data demonstrating stereo track sensor tracking --- Collected data demonstrating autonomous fully calibrated stereo acquisition sensor Object Sighting Messages --- Used data to analyze simulation of Aegis Launch-On STSS track --- Fused STSS Object Sighting Message data in the Enterprise Sensors Laboratory and passed data to X-Lab using post-test playback of recorded data -- Aegis Simulated Intercept Flight Test (FTM-16 E1): Aegis 4.0.1 simulated Standard Missile-3 (SM-3) Block IB intercept of a Short-Range Ballistic Missile (SRBM) target with Associated Objects --- Performed first demonstration of birth-to-death tracking of missile target from low earth orbit --- Collected data to analyze real-time sharing of track messages to the BMDS --- Simulated Aegis (Hardware-in-the-Loop) Engage-On STSS track --- Conducted post-test assessment to support STSS providing precision cue to the Terminal High Altitude Area Defense in post-test playback of recorded data -- Sensors Flight Test (FTX-16 E1): Aegis 3.6.1 simulated Launch on Remote engagement of a ballistic missile using STSS data in the Fire Control Solution in 20 post-test hardware-in-the-loop playbacks of recorded data --- Conducted first-ever stereo collection on birth-to-death missile flight --- Demonstrated ability to provide missile tracking data to the BMDS in near real-time -- Aegis Intercept Flight Test (FTM-15): Aegis 3.6.1 SM-3 Block IA engagement of an Intermediate-Range Ballistic Missile (IRBM) with Remote Engagements Authorized			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
--- Demonstrated first on-orbit receipt of external cue and ability to crosslink the cue to the out-of-view satellite resulting in stereo midcourse tracking and the first missile intercept observation from low earth orbit --- Collected data to analyze Space Tracking and Surveillance System (STSS) emerging threat detection and threat capability --- Fused STSS Object Sighting Message and other sensors data in the Enterprise Sensors Laboratory and pass to the X-Lab to provide a precision cue using post-test playback of recorded data as risk reduction for future Launch on Remote -- Air-Launched Target Return to Flight (FTX-17): Return to flight of the Short-Range Air Launch Target --- Conducted first-ever stereo automatic onboard acquisition sensor-to-track sensor handover --- Collected data to analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, Complex Scenes, Post Boost Detection, and Multiple Objects in a Scene --- STSS Object Sighting Messages fused in the Enterprise Sensors Laboratory and passed to the X-Lab to produce Ballistic Missile Defense System (BMDS) system tracks - Conducted planning for integrated BMDS intercept tests based on track data passed from the STSS Demonstration Satellites through Command and Control, Battle Management and Communications (C2BMC) to Aegis or other weapon systems - Planned and participated in available Targets of Opportunity (TOOs) - Planned and coordinated range activities to support the MDA Integrated Master Test Plan (IMTP) - Continued STSS Demo Analysis Center participation in BMDS testing and collection of scientific data for refinement of BMDS-relevant models			
FY 2012 Plans: - Demonstrate first simultaneous tracking of two targets with STSS during Terminal High Altitude Area Defense (THAAD) Intercept Flight Test (FTT-12): THAAD multiple engagement scenario with two near-simultaneous engagements -- Both STSS satellites accomplish acquisition sensor-to-track sensor handoff and tracked both the Medium and Short-Range Ballistic Missiles (SRBM) in stereo. Also, internally sent cues to both STSS satellites to acquire and track the Short-Range Ballistic Missile in midcourse. -- At the same time, in shadow mode, transmit data through the Enterprise Sensors Laboratory and X-Lab to the Space and Naval Warfare Systems Command (SPAWAR) lab (Aegis 3.6.1) and accomplished Aegis Remote Engagement Authorized (REA) using STSS data. - Plan and execute STSS participation in BMDS flight tests. Collection from a variety of test targets and conditions enable a statistically relevant database to be constructed to support future space system design. - Current STSS participation in the IMTP is planned to include the following BMDS flight tests with STSS striving to meet reasonable expectations to view these as well as seeking opportunities to participate in other IMTP events: -- Ground-based Midcourse Defense Controlled Test Vehicle (GM CVT-01): Ground-based Midcourse Defense Intercept Controlled Vehicle Flight Test --- Collect data to analyze STSS cold-body target tracking capability			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
-- Aegis Intercept Flight Test (FTM-16 E2a): Aegis 4.0.1 Standard Missile-3 (SM-3) Block IB intercept of a SRBM target with Associated Objects			
--- Demonstrate birth-to-death tracking of missile target from low earth orbit			
--- Collect data to analyze real-time sharing of track messages to the BMDS			
--- Simulate Aegis (Hardware-in-the-Loop) Launch-On STSS track			
-- Aegis Intercept Flight Test (FTM-18): Aegis 4.0.1 intercept of a Medium-Range Ballistic Missile (MRBM) target with a Standard Missile-3 (SM-3) Block IB			
--- Simulate Aegis Engage-On Space Tracking and Surveillance System (STSS) in shadow mode			
--- Fuse STSS Object Sighting Message and other sensors data in the Enterprise Sensors Laboratory and pass to the X-Lab to provide a simulated Aegis Engage-On fused track			
--- Collect data and analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, Complex Scenes, Post Boost Detection, Emerging Threat Detection, Emerging Threat Tracking, and Multiple Objects in a Scene			
-- Aegis Intercept Flight Test (FTM-19): Aegis 4.0.1 intercept of a Short-Range Ballistic Missile (SRBM) target with a SM-3 Block IB missile			
--- Simulate Aegis Engage-On STSS in shadow mode			
--- Fuse STSS Object Sighting Message and other sensors data in the Enterprise Sensors Laboratory and pass to the X-Lab to provide a simulated Aegis Engage-On fused track			
--- Collect data and analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, Complex Scenes, Post Boost Detection, Emerging Threat Detection, Emerging Threat Tracking, and Multiple Objects in a Scene			
-- Ground-based Midcourse Defense Intercept Flight Test (FTG-06b): Ground-based Midcourse Defense intercept of Intermediate-Range Ballistic Missile (IRBM) target based on results from FTG-06a (Ground-based Midcourse Defense intercept of IRBM with Associated Objects, Medium Closing Velocity using Exo-atmospheric Kill Vehicle (EKV) Capability Enhancement-II) Failure Investigation Team			
--- Demonstrate STSS ability to precision cue BMDS radars and receive system cues live during the event and post-test using playback of recorded data			
--- Collect data to analyze STSS cold-body target tracking capability			
--- STSS Object Sighting Messages will be fused in the Enterprise Sensors Laboratory and passed to the X-Lab to produce BMDS system tracks			
-- Aegis/Terminal High Altitude Area Defense (THAAD)/Patriot Multiple Engagement Flight Test (FTI-01): BMDS Developmental Flight Test against SRBM and MRBM targets			
--- Collect data and analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, Post Boost Detection, Emerging Threat Detection, Emerging Threat Tracking, and Multiple Objects in a Scene			
--- Fuse STSS Object Sighting Message and other sensors data in the Enterprise Sensors Laboratory and pass data to X-Lab using post-test playback of recorded data			

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
--- Simulate Aegis Launch-On STSS in shadow mode --- Demonstrate STSS ability to precision cue BMDS radars and receive system cues live during the event and post-test using playback of recorded data - Plan and participate in available Targets of Opportunity (TOOs) - Collect both STSS and Overhead Persistent Infrared (OPIR) data live during TOOs and MDA Flight Tests, then play back OPIR data through the Enterprise Sensors Laboratory and pass data to X-Lab. The X-Lab will then provide an OPIR system cue to the STSS track sensor, the STSS track sensor will then point to the target based solely on the OPIR cue. This will validate STSS Cueing Campaign and demonstrate the viability of the Precision Tracking Space System (PTSS) Concept of Operations. - Conduct planning for integrated BMDS intercept test based on track data passed from the STSS Demonstration Satellites through Command and Control, Battle Management and Communications (C2BMC) to Aegis or other weapon systems - Continue Space Tracking and Surveillance System (STSS) Demo Analysis Center participation in BMDS testing and collection of scientific data for refinement of BMDS-relevant models, demonstration and trade space determination for Precision Tracking Space System (PTSS), and development support for the Standard Missile-3 (SM-3) Block IIB interceptor ***FY 2013 Plans:*** - Testing includes SM-3 intercept using Space Tracking and Surveillance System (STSS) as a remote sensor. -- STSS will provide to an Aegis 3.6.x or 4.0.1 ship the Quality of Service data track that will initiate a Remote Engagement Authorized (REA) launch of a SM-3 Block IB against an actual Medium Range Ballistic Missile (MRBM) target - Plan and execute STSS participation in BMDS flight tests. Collection from a variety of test targets and conditions enable a statistically relevant database to be constructed to support future space system design. - Current STSS participation in the Integrated Master Test Plan (IMTP) is planned to include the following BMDS flight tests with STSS striving to meet reasonable expectations to view these as well as seeking opportunities to participate in other IMTP events: -- Aegis Simulated Intercept Flight Test (FTM-21 E1): Aegis 4.0.1 (two ships) SM-3 Block IB simulated engagement using digital engagement coordination of three Short-Range Ballistic Missiles (SRBMs) --- Collect data and analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, Complex Scenes, Post Boost Detection, Emerging Threat Detection, Emerging Threat Tracking, and Multiple Objects in a Scene --- Simulate Aegis (Hardware-in-the-Loop) Engage-On STSS track --- Conduct post-test assessment to support STSS providing precision cue through post-test playback of recorded data --- Demonstrate STSS precision cue of radar in post-test playback of recorded data -- Aegis Simulated Intercept Flight Test (FTM-21 E2): Aegis 4.0.1 (two ships) SM-3 Block IB simulated engagement using digital engagement coordination of three SRBMs --- Collect data and analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, Complex Scenes, Post Boost Detection, Emerging Threat Detection, Emerging Threat Tracking, and Multiple Objects in a Scene --- Simulate Aegis (Hardware-in-the-Loop) Engage-On STSS track			

Exhibit R-2A, RDT&E Project Justification: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
--- Conduct post-test assessment to support STSS providing precision cue through post-test playback of recorded data --- Demonstrate STSS precision cue of radar in post-test playback of recorded data -- Aegis Intercept Flight Test (FTM-21 E3): Aegis 4.0.1 SM-3 Block IB salvo engagement of SRBM --- Collect data and analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, Complex Scenes, Post Boost Detection, Emerging Threat Detection, Emerging Threat Tracking, and Multiple Objects in a Scene --- Simulate Aegis (Hardware-in-the-Loop) Engage-On STSS track --- Conduct post-test assessment to support STSS providing precision cue through post-test playback of recorded data --- Demonstrate STSS precision cue of radar in post-test playback of recorded data -- Aegis Intercept Flight Test (FTM-22 E2): Aegis 4.0.1 SM-3 Block IB engagement of a SRBM --- Collect data and analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, and Post Boost Detection -- Aegis/Terminal High Altitude Area Defense (THAAD)/Patriot Multiple Engagement Flight Test (FTO-1): BMDS Operational Flight Test against SRBM and MRBM targets --- Collect data and analyze STSS capability in the areas of Booster Acquisition, Plumes, Hard Body Detection, Post Boost Detection, Emerging Threat Detection, Emerging Threat Tracking, and Multiple Objects in a Scene --- Fuse Space Tracking and Surveillance System (STSS) Object Sighting Message and other sensors data in the Enterprise Sensors Laboratory and pass data to X-Lab using post-test playback of recorded data --- Simulate Aegis Launch-On STSS in shadow mode --- Demonstrate STSS ability to precision cue BMDS radars and receive system cues live during the event and post-test using playback of recorded data - Plan and participate in available Targets of Opportunity (TOOs) - Collect both STSS and Overhead Persistent Infrared (OPIR) data live during TOOs and MDA Flight Tests, then play back OPIR data through the Enterprise Sensors Laboratory and pass data to X-Lab. The X-Lab will then provide an OPIR system cue to the STSS Track sensor, the STSS Track sensor will then point to the target based solely on the OPIR cue. This will validate STSS Cueing Campaign and demonstrate the viability of the Precision Tracking Space System (PTSS) Concept of Operations. - Continue participation in BMDS testing and collection of scientific data for refinement of BMDS-relevant models, demonstration and trade space determination for PTSS, and development support for the Standard Missile-3 (SM-3) Block IIB interceptor - In FY 2013, testing begins to transition from dedicated, first time efforts to less costly missions collecting data to verify earlier results. These verifications further strengthen BMDS-related modeling and simulation, as well as support development of future systems design and concept of operations.			
Title: Near Field Infrared Experiment (NFIRE)	5.075	4.073	-
Articles:	0	0	0

Exhibit R-2A, RDT&E Project Justification: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603893C: *Space Tracking & Surveillance System*	**PROJECT** MD12: *Space Tracking and Surveillance System (STSS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
Description: See Description Below ***FY 2011 Accomplishments:*** - Continued On-Orbit Operations at the Missile Defense Space Development Center (MDSDC) to support data collection and analysis on targets of opportunity - Conducted cooperative tests with other BMDS elements to include planning, execution and analyses; perform data collection on other targets of opportunity -- Executed 116 Data Collection Events in support of missile defense requirements definition for future space-based systems --- Data Collection Events included: 51 Earth Limb Background, Clutter and Aurora characterization tests in support of the PTSS design, 19 maintenance and calibrations, 14 Intelligence Collections, 9 Flight Tests including BMDS Flight Tests in support of MDA and other users, 7 software improvements, 6 Targets of Opportunity, 6 Cueing Experiments with stars and ground sources, 3 Ground Static Rocket Motor Firings, and 1 Resident Space Object (RSO) data collection - Continued laser communication experiments to assess viability of the technology -- Performed 54 space-to-space links with the German Terra SAR-X satellite recording 4,405.89 seconds of total communications with 3,360 seconds of bi-directional communication having a maximum duration of 423 second. Each 6.1 seconds of data is equivalent to a DVD`s worth of data. - Continued to support, as requested by Air Force Space Command (AFSPC) and other agencies, Space Situational Awareness - Assessed satellite health/utility for potential, future utilization ***FY 2012 Plans:*** - Continue On-Orbit Operations at the Missile Defense Space Development Center (MDSDC) to support data collection and analysis on targets of opportunity - Conduct cooperative tests with other BMDS elements to include planning, execution and analyses; perform data collection on other targets of opportunity - Continue laser communication experiments to assess viability of the technology - Continue to support, as requested by Air Force Space Command (AFSPC) and other agencies, Space Situational Awareness - Assess satellite health/utility for potential, future utilization ***FY 2013 Plans:*** Funding for On-Orbit Operations and cooperative tests are planned to continue pending a positive assessment of the Near Field Infrared Experiment (NFIRE) satellite`s health and utility. Participation is planned for tests in the Integrated Master Test Plan to include SM-3 intercept using Space Tracking and Surveillance System (STSS) as a remote sensor.			
Title: Element Integration and Testing	5.447	3.076	-
Articles:	0	0	0

Exhibit R-2A, RDT&E Project Justification: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
Description: See Description Below ***FY 2011 Accomplishments:*** - Completed remaining 23 functionality tests for early on-orbit testing - Completed Space Vehicle 1`s track sensor line of sight calibration - Conducted planning and execution of 182 Data Collection Events in support of missile defense requirements definition for future space-based systems -- Data Collection Events included: 2 Static Motor Rocket Firings, 4 area of interest, 2 Sensor Registration Health & Status Monitoring star collects, 11 Battlespace Awareness Campaign collections, 38 Midcourse Tracking of Resident Space Objects, 74 Technical Intelligence Campaign collections, 18 Geo-Transfer Orbit Campaign collections, 8 collections of the Space Shuttle, and 25 Earth Limb Characterization collections in support of the Precision Tracking Space System design - Conducted periodic acquisition/calibration of Demonstration Satellites with ground laser source ***FY 2012 Plans:*** - Conduct planning and execution of Missile Surrogate Testing (Resident Space Objects) - Conduct periodic acquisition/calibration of Demonstration Satellites with ground laser source ***FY 2013 Plans:*** In FY 2013, funding and activity associated with performing satellite functionality testing and calibration is captured above under Demonstration Satellites and conducted as part of satellite operations.			
Accomplishments/Planned Programs Subtotals	101.744	91.957	48.708

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
• 0603175C: *Ballistic Missile Defense Technology*	92.617	74.920	79.975		79.975	81.388	115.427	133.742	136.654	Continuing	Continuing
• 0603884C: *Ballistic Missile Defense Sensors*	389.259	222.075	347.012		347.012	327.342	362.520	341.780	326.095	Continuing	Continuing
• 0603888C: *Ballistic Missile Defense Test & Targets*	999.068	85.569	0.000		0.000	0.000	0.000	0.000	0.000	0.000	1,084.637
• 0603892C: *AEGIS BMD*	1,530.767	988.928	992.407		992.407	960.870	950.097	1,030.201	958.680	Continuing	Continuing
• 0603895C: *Ballistic Missile Defense System Space Programs*	10.569	7.940	6.912		6.912	6.576	6.610	7.219	7.371	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2013 Missile Defense Agency			DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
• 0603896C: *Ballistic Missile Defense Command and Control, Battle Management & Communication*	454.440	363.640	366.552		366.552	376.116	383.055	358.431	364.725	Continuing	Continuing
• 0603902C: *Next Generation Aegis Missile (Standard Missile-3 Block IIB (SM-3 IIB))*	0.000	13.443	224.077		224.077	295.248	455.373	508.356	430.239	Continuing	Continuing
• 0603904C: *Missile Defense Integration & Operations Center (MDIOC)*	83.112	69.249	63.043		63.043	54.299	55.409	54.693	55.844	Continuing	Continuing
• 0603914C: *Ballistic Missile Defense Test*	0.000	487.699	454.400		454.400	420.357	446.542	373.395	421.632	Continuing	Continuing
• 0603915C: *Ballistic Missile Defense Targets*	0.000	454.357	435.747		435.747	475.175	505.591	406.931	485.950	0.000	2,763.751
• 0604883C: *Precision Tracking Space System*	36.693	80.723	297.375		297.375	267.505	285.529	326.073	354.190	Continuing	Continuing

D. Acquisition Strategy

The Space Tracking and Surveillance System (STSS) program follows the Missile Defense Agency`s capability-based acquisition strategy that emphasizes testing, incremental development, and evolutionary acquisition. The STSS Demonstration Satellites effort utilizes a single prime contractor, Northrop Grumman Aerospace Systems (NGAS), formerly known as Northrop Grumman Space Technology (NGST), with the subcontractor Raytheon providing the sensor payload. The contract for the STSS Demonstration Satellites effort was awarded in third quarter FY 2002. This contract implements MDA`s capability-based acquisition strategy by using existing satellite hardware as a low risk opportunity, building upon the lessons learned from previous development efforts, and establishing a series of planned enhancements to bring added capability to the BMDS.

The acquisition strategy shifted from the launch phase to the operations and testing of the STSS Demonstration satellites. Options for Operations and Testing were definitized April 2011.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration Satellites Capability Based R&D	SS/CPAF	NGAS:Redondo Beach, CA	444.353	56.595	Oct 2011	35.491	Oct 2012	-		35.491	Continuing	Continuing	Continuing
Demonstration Satellites Systems Engineering	FFRDC	Aerospace:Los Angeles AFB CA, Schriever AFB CO	43.614	3.374	Oct 2011	3.429	Oct 2012	-		3.429	Continuing	Continuing	Continuing
Demonstration Satellites STSS Support to Missile Defense Space Development Center (MDSDC)	C/CPAF	MDIOC:CO	4.990	3.683	Dec 2011	-		-		-	0.000	8.673	8.673
Near Field Infrared Experiment (NFIRE) Prime Contract	SS/CPAF	Orbital Sciences Corporation:AZ	8.391	2.977	Nov 2011	-		-		-	Continuing	Continuing	Continuing
Near Field Infrared Experiment (NFIRE) Mission Planning/Data Reduction	MIPR	MIT/LL:MA	3.294	1.096	Nov 2011	-		-		-	0.000	4.390	4.390
		Subtotal	504.642	67.725		38.920		-		38.920			

Remarks

Funding for Capability Based R&D efforts is placed on contract for Northrop Grumman Aerospace Systems (NGAS) to assist in conducting mission planning and operations of the Demonstration Satellites. BMD Systems Engineering provides System Description Documents and System Specifications for elements to design, build, integrate and test BMDS components. These products optimize performance at the system level and further ensure that the assessment of the designed BMD System is based on sufficient ground and flight testing. Compliance of the Space Tracking and Surveillance System (STSS) to BMD System level requirements is monitored in a series of requirements and design reviews both at the system and element levels. Systems Engineering support is provided by Aerospace directly to the Demonstration Satellites effort. STSS Support to Missile Defense Space Development Center (MDSDC) funds support cost associated with the satellite operations conducted at the MDSDC. This support is obtained through the Joint National Integration Center (JNIC) Research and Development Contract (JRDC). NFIRE funding will be forwarded to several contractors and government organizations to include, but not limited to Orbital Sciences Corporation (formerly General Dynamics) and the Air Force Research Laboratory. Funding covers support for operations, testing, and analysis activities. The Target Value of Contract above for the NFIRE Prime Contract reflects continuing pending negotiation to extend operations, testing, and support for the NFIRE satellite based on health and utility assessment of the satellite.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Demonstration Satellites Program Mission Support	Various	SMC:CA	18.832	1.425	Oct 2011	0.727	Oct 2012	-		0.727	Continuing	Continuing	Continuing
Demonstration Satellites Other Government Agency (OGA) Civilian	MIPR	SMC:CA	9.547	2.784	Oct 2011	2.400	Oct 2012	-		2.400	Continuing	Continuing	Continuing
Demonstration Satellites MDA Civilian	Allot	MDA:AL	5.044	1.672	Oct 2011	2.314	Oct 2012	-		2.314	Continuing	Continuing	Continuing
Demonstration Satellites Contract Support Services (CSS)	C/BPA	MDA:AL	11.184	0.630	Nov 2011	1.328	Oct 2012	-		1.328	Continuing	Continuing	Continuing
		Subtotal	44.607	6.511		6.769		-		6.769			

Remarks

Demonstration Satellites Support Costs include the following: Program Mission Support to include funding personnel travel, training, and supplies; OGA Civilian personnel for reimbursement of Air Force Personnel costs that directly support the Space Tracking and Surveillance System (STSS) program, for the Demonstration Satellites programs and functions at the Missile Defense Space Development Center (MDSDC); MDA Civilian Salaries to support program office management; and CSS Costs that provide for administrative, engineering, logistics and financial management/cost estimating support services. In FY2012, STSS will have completed transition to the MDSDC and will fund for IT Network Support, telephone operations and maintenance, hardware and software purchases and maintenance through the Missile Defense Integration and Operations Center (MDIOC) service contracts.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BMDS Level Testing STSS Demo Analysis Center (SDAC) - Government Verification & Validation (V&V)	MIPR	Various:Various	1.845	1.409	Jan 2012	-		-		-	0.000	3.254	3.254
BMDS Level Testing BMDS Integration-Test Engineering and Resources	SS/CPAF	NGAS:Redondo Beach, CA	9.603	7.914	Dec 2011	3.019	Oct 2012	-		3.019	Continuing	Continuing	Continuing
BMDS Level Testing Systems Engineering	FFRDC	Aerospace:Los Angeles AFB CA	16.142	5.322	Oct 2011	-		-		-	0.000	21.464	21.464

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Element Integration and Testing Ground Support for Acquisition Line-of-Sight Calibration	MIPR	AFRL:Kirtland AFB NM	1.283	0.680	Jan 2012	-		-		-	0.000	1.963	1.963
Element Integration and Testing STSS Capability Based R&D-Test Support	SS/CPAF	NGAS:Redondo Beach, CA	18.246	2.396	Oct 2011	-		-		-	Continuing	Continuing	Continuing
		Subtotal	47.119	17.721		3.019		-		3.019			

Remarks

BMDS Level Testing: As the Space Tracking and Surveillance System (STSS) moves into FY 2012, engineering costs associated with BMDS Level Test increases to complete necessary analyses of data collected in FY 2011; conduct mission planning, test execution, and data analysis of FY 2012 test events; and prepare and conduct pre-mission planning as necessary for upcoming FY 2013 test events. In FY 2013, testing begins to transition from dedicated, first-time efforts to missions collecting data to verify earlier results and further strengthen BMDS-related modeling and simulation as well as supporting development of future systems design and concept of operations. Funding for the STSS Demo Analysis Center maximizes return on investment to further the development of the future BMDS space layer. Costs covered include the purchase and maintenance of software tools for mission planning and simulation, data management and Overhead Persistent Infrared (OPIR) data analysis as well as test engineering and analysis support for BMDS testing and collection of scientific data for refinement of BMDS-relevant models. BMDS Integration-Test Engineering and Resources funding covers: test engineering to conduct pre-mission planning, execution, and post-mission analyses for testing events associated with STSS participation in BMDS flight tests. Funding for Systems Engineering is allocated to Aerospace to provide independent test engineering to: assist in requirements definition; mission planning and tasking capability for BMDS missile flight tests and targets of opportunity; analyze mission results and prepare detailed reports; analyze data for use in anchoring and validating the modeling and simulation tool System Performance Evaluation Tool (SPET) and other MDA models; aid in issue resolution; support interface with design engineers to understand and develop operating and test procedures; and support interface with other government agencies. Element Integration and Testing: Funding for Ground Support for Acquisition Line-of-Sight (LOS) Calibration goes to the Air Force Research Laboratory (AFRL) to provide laser ground source to perform line-of-sight calibration of acquisition sensors on board the two STSS Demonstration Satellites. The STSS Capability Based R&D-Test Support funding covers costs associated with the STSS Prime Contractor providing satellite functionality testing and calibration support. As the level of specific, dedicated test support transitions into data collection testing to further support and refine BMDS-related modeling and simulation, the satellite functionality testing and calibration will be included as part of the satellite operations captured above in the Capability Based R&D effort performed by the STSS Prime Contractor under Product Development.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2012 Cost	FY 2012 Award Date	FY 2013 Base Cost	FY 2013 Base Award Date	FY 2013 OCO Cost	FY 2013 OCO Award Date	FY 2013 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	-		-		-		-	0.000	0.000	0.000

Remarks

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

	Total Prior Years Cost	FY 2012		FY 2013 Base		FY 2013 OCO		FY 2013 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	596.368	91.957		48.708		-		48.708			

Remarks

NA

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603893C: *Space Tracking & Surveillance System*	**PROJECT** MD12: *Space Tracking and Surveillance System (STSS)*

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603893C: *Space Tracking & Surveillance System*	**PROJECT** MD12: *Space Tracking and Surveillance System (STSS)*

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603893C: *Space Tracking & Surveillance System*	**PROJECT** MD12: *Space Tracking and Surveillance System (STSS)*

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603893C: *Space Tracking & Surveillance System*	**PROJECT** MD12: *Space Tracking and Surveillance System (STSS)*

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603893C: *Space Tracking & Surveillance System*	**PROJECT** MD12: *Space Tracking and Surveillance System (STSS)*

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603893C: *Space Tracking & Surveillance System*	**PROJECT** MD12: *Space Tracking and Surveillance System (STSS)*

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603893C: *Space Tracking & Surveillance System*	**PROJECT** MD12: *Space Tracking and Surveillance System (STSS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Aegis Simulated Intercept Flight Test (JFTM-04 E1): Aegis 4.0.1 simulated intercept of a surrogate separating Medium-Range Ballistic Missile (MRBM)	1	2011	1	2011
Aegis Simulated Intercept Flight Test (FTM-16 E1): Aegis 4.0.1 simulated Standard Missile-3 (SM-3) Block IB intercept of a Short-Range Ballistic Missile (SRBM) target with Associated Objects	2	2011	2	2011
Sensors Flight Test (FTX-16 E1): Aegis 3.6.1 simulated Launch on Remote Engagement of a ballistic missile using Space Tracking and Surveillance System (STSS) data in the Fire Control Solution	2	2011	2	2011
Aegis Intercept Flight Test (FTM-15): Aegis 3.6.1 SM-3 Block IA engagement of an Intermediate-Range Ballistic Missile (IRBM) with Remote Engagements Authorized	3	2011	3	2011
Air-Launched Target Return to Flight (FTX-17): Return to flight of the Short-Range Air Launch Target	4	2011	4	2011
Terminal High Altitude Area Defense (THAAD) Intercept Flight Test (FTT-12): THAAD multiple engagement scenario with two near-simultaneous engagements	1	2012	1	2012
Ground-based Midcourse Defense Controlled Test Vehicle (GM CVT-01): Ground-based Midcourse Defense Intercept Controlled Vehicle Flight Test	3	2012	3	2012
Aegis Intercept Flight Test (FTM-16 E2a)	3	2012	3	2012
Aegis Intercept Flight Test (FTM-18): Aegis 4.0.1 Standard Missile-3 (SM-3) Block 1B engagement of a SRBM target, STSS Engage on Remote Shadow Mode	3	2012	3	2012
Aegis Intercept Flight Test (FTM-19): Aegis 4.0.1 intercept of a SRBM target with a SM-3 Block IB missile, STSS Launch on Remote Shadow Mode	4	2012	4	2012
Ground-based Midcourse Defense Intercept Flight Test (FTG-06b): Ground-based Midcourse Defense intercept of IRBM target based on results from FTG-06a	4	2012	4	2012
Aegis/Terminal High Altitude Area Defense (THAAD)/Patriot Multiple Engagement Flight Test (FTI-01): BMDS Developmental Flight Test against SRBM and MRBM targets	4	2012	4	2012

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

	Start		End	
Events	Quarter	Year	Quarter	Year
Aegis Simulated Intercept Flight Test (FTM-21 E1): Aegis 4.0.1 (two ships) Standard Missile-3 (SM-3) Block IB simulated engagement using digital engagement coordination of three SRBMs	3	2013	3	2013
Aegis Simulated Intercept Flight Test (FTM-21 E2): Aegis 4.0.1 (two ships) SM-3 Block IB simulated engagement using digital engagement coordination of three SRBMs	3	2013	3	2013
Aegis Intercept Flight Test (FTM-21 E3): Aegis 4.0.1 SM-3 Block IB salvo engagement of Short Range Ballistic Missile (SRBM)	3	2013	3	2013
Aegis Intercept Flight Test (FTM-22 E2): Aegis 4.0.1 Standard Missile-3 (SM-3) Block IB intercept of a SRBM	3	2013	3	2013
Aegis/Terminal High Altitude Area Defense (THAAD)/Patriot Multiple Engagement Flight Test (FTO-01): BMDS Operational Flight Test against Short-Range and Medium-Range Ballistic Missile (MRBM) targets	3	2013	3	2013
Aegis Simulated Intercept Flight Test (FTX-14): Aegis 4.0.1 SM-3 Block IB simulated engagement of a Wildcat Target	1	2014	1	2014
Arrow System Test (AST-15): First Arrow 3 engagement test	1	2014	1	2014
Aegis Flight Test (SCDPTV-01): SM-3 Block IIA 1st, 2nd, and 3rd stage performance test	1	2014	1	2014
Aegis Ashore Flight Test (AA CVT-01)	2	2014	2	2014
Aegis Intercept Flight Test (FTM-20 E1): Aegis 5.0 intercept of Medium-Range Ballistic Missile (MRBM) target with SM-3 Block IB missile	3	2014	3	2014
Ground-based Midcourse Defense Intercept Flight Test (FTG-08): Intercept of Intermediate-Range Ballistic Missile target with Associated Objects using 2-stage booster with first generation avionics	3	2014	3	2014
Aegis Ashore Intercept Flight Test (AA FTM-01)	4	2014	4	2014
Aegis Ashore Intercept Test Flight (AA FTM-02)	4	2014	4	2014
Aegis Flight Test, Standard Missile (FTM-24)	4	2014	4	2014
Terminal High Altitude Area Defense (THAAD) Intercept Flight Test (FTT-11a): THAAD exo-atmospheric engagement of a complex separating SRBM	4	2014	4	2014

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD12: *Space Tracking and Surveillance System (STSS)*

	Start		End	
Events	Quarter	Year	Quarter	Year
Space Tracking and Surveillance System (STSS) Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity (TOO)- 1Q2011	1	2011	1	2011
Space Tracking and Surveillance System (STSS) Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity (TOO)- 2Q2011	2	2011	2	2011
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 3Q2011	3	2011	3	2011
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 4Q2011	4	2011	4	2011
STSS Demonstration Satellites-BMDS Flight Tests/TOO - 1Q2012	1	2012	1	2012
STSS Demonstration Satellites-BMDS Flight Tests/TOO - 2Q2012	2	2012	2	2012
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 3Q2012	3	2012	3	2012
Space Tracking and Surveillance System (STSS) Demonstration Satellites-BMDS Flight Tests/Targets of Opportunity (TOO) - 4Q2012	4	2012	4	2012
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 1Q2013	1	2013	1	2013
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 2Q2013	2	2013	2	2013
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 3Q2013	3	2013	3	2013
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 4Q2013	4	2013	4	2013
Space Tracking and Surveillance System (STSS) Demonstration Satellites-BMDS Flight Tests/TOO- 1Q2014	1	2014	1	2014
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 2Q2014	2	2014	2	2014
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 3Q2014	3	2014	3	2014
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 4Q2014	4	2014	4	2014
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 1Q2015	1	2015	1	2015
Space Tracking and Surveillance System (STSS) Demonstration Satellites-BMDS Flight Tests/TOO- 2Q2015	2	2015	2	2015
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 3Q2015	3	2015	3	2015
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 4Q2015	4	2015	4	2015
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 1Q2016	1	2016	1	2016
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 2Q2016	2	2016	2	2016

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Missile Defense Agency		DATE: February 2012
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	Start		End	
Events	Quarter	Year	Quarter	Year
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 3Q2016	3	2016	3	2016
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 4Q2016	4	2016	4	2016
STSS Demonstration Satellites-BMDS Flight Tests/TOO - 1Q2017	1	2017	1	2017
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 2Q2017	2	2017	2	2017
Space Tracking and Surveillance System (STSS) Demonstration Satellites-BMDS Flight Tests/TOO- 3Q2017	3	2017	3	2017
STSS Demonstration Satellites-BMDS Flight Tests/TOO- 4Q2017	4	2017	4	2017
STSS Demonstration Satellites On-Orbit Operations - 1Q2011-4Q2011	1	2011	4	2011
STSS Demonstration Satellites On-Orbit Operations - 1Q2012-4Q2012	1	2012	4	2012
STSS Demonstration Satellites On-Orbit Operations - 1Q2013-4Q2013	1	2013	4	2013
STSS Demonstration Satellites On-Orbit Operations - 1Q2014-4Q2014	1	2014	4	2014
STSS Demonstration Satellites On-Orbit Operations - 1Q2015-4Q2015	1	2015	4	2015
STSS Demonstration Satellites On-Orbit Operations - 1Q2016-4Q2016	1	2016	4	2016
STSS Demonstration Satellites On-Orbit Operations - 1Q2017-4Q2017	1	2017	4	2017
Near Field Infrared Experiment (NFIRE) - TOO- 1Q2011	1	2011	1	2011
NFIRE - Targets of Opportunity - 2Q2011	2	2011	2	2011
Near Field Infrared Experiment (NFIRE) - TOO- 3Q2011	3	2011	3	2011
NFIRE - TOO- 4Q2011	4	2011	4	2011
NFIRE - TOO- 1Q2012	1	2012	1	2012
NFIRE - TOO-2Q2012	2	2012	2	2012
NFIRE - TOO- 3Q2012	3	2012	3	2012
NFIRE - TOO- 4Q2012	4	2012	4	2012
NFIRE On-Orbit Operations - 1Q2011-4Q2011	1	2011	4	2011
Near Field Infrared Experiment (NFIRE) On-Orbit Operations - 1Q2012-4Q2012	1	2012	4	2012
NFIRE Laser Communications Terminal (LCT) Experiments/Operations - 1Q2011	1	2011	1	2011
NFIRE LCT Experiments/Operations - 2Q2011	2	2011	2	2011

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Missile Defense Agency		DATE: February 2012
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	Start		End	
Events	Quarter	Year	Quarter	Year
NFIRE LCT Experiments/Operations - 3Q2011	3	2011	3	2011
NFIRE LCT Experiments/Operations - 4Q2011	4	2011	4	2011
NFIRE LCT Experiments/Operations - 1Q2012	1	2012	1	2012
NFIRE LCT Experiments/Operations - 2Q2012	2	2012	2	2012
NFIRE LCT Experiments/Operations - 3Q2012	3	2012	3	2012
NFIRE LCT Experiments/Operations - 4Q2012	4	2012	4	2012

Exhibit R-2A, RDT&E Project Justification: PB 2013 Missile Defense Agency			DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD40: *Program-Wide Support*	

COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
MD40: *Program-Wide Support*	3.836	4.275	2.605	-	2.605	2.288	1.584	1.688	1.781	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0		0	0	0	0	0		

Note

In FY 2012, Program Wide Support reflects a proportional increase as a result of adjustments made to the Space Tracking and Surveillance System (STSS).

In FY 2013, Program Wide Support reflects a proportional decrease as a result of decreases made to the Space Tracking and Surveillance System (STSS).

A. Mission Description and Budget Item Justification

Program-Wide Support (PWS) contains non-headquarters management costs in support of MDA functions and activities across the entire Ballistic Missile Defense System (BMDS). Includes Government Civilians, Advisory and Assistance Services, and Federally Funded Research and Development contracts (FFRDC) providing integrity and oversight of the BMDS as well as, supporting MDA in enabling the development and evaluation of technologies that will respond to the changing threat. In addition, includes Global Deployment personnel and support performing deployment site preparation and activation. Other costs included provide facility capabilities for MDA Executing Agent locations (with the exception of Federal Office Building 2 after FY 2011), such as physical and technical security, legal services, travel and agency training, office and equipment leases, rents and utilities, data and unified communications support, supplies and maintenance, logistics and central property management of equipment, and similar operating expenses. Also includes legal settlements, and foreign currency fluctuations on a limited number of foreign contracts. In keeping with congressional intent, PWS is allocated on a pro-rata basis and therefore, fluctuates by year based on the total MDA budget.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2011	FY 2012	FY 2013
Title: Civilian Salaries and Support	3.836	4.275	2.605
Articles:	0	0	0
Description: See Description Below			
FY 2011 Accomplishments: See paragraph A, Mission Description and Budget Item Justification			
FY 2012 Plans: See paragraph A, Mission Description and Budget Item Justification			
FY 2013 Plans: See paragraph A, Mission Description and budget item justification.			
Accomplishments/Planned Programs Subtotals	3.836	4.275	2.605

Exhibit R-2A, RDT&E Project Justification: PB 2013 Missile Defense Agency		DATE: February 2012
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603893C: *Space Tracking & Surveillance System*	PROJECT MD40: *Program-Wide Support*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A