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Exhibit R-2, RDT&E Budget Item Justification: PB 2014 Air Force **DATE:** April 2013

APPROPRIATION/BUDGET ACTIVITY 3600: <i>Research, Development, Test & Evaluation, Air Force</i> BA 7: <i>Operational Systems Development</i>	R-1 ITEM NOMENCLATURE PE 0305913F: <i>NUDET Detection System (SPACE)</i>
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COST (\$ in Millions)	All Prior Years	FY 2012	FY 2013 [#]	FY 2014 Base	FY 2014 OCO ^{##}	FY 2014 Total	FY 2015	FY 2016	FY 2017	FY 2018	Cost To Complete	Total Cost
Total Program Element	-	81.989	64.965	50.547	-	50.547	20.724	6.519	4.272	13.872	Continuing	Continuing
672808: <i>Nuc Detonation Det Sys (sensors)</i>	-	81.989	64.965	50.547	-	50.547	20.724	6.519	4.272	13.872	Continuing	Continuing
Quantity of RDT&E Articles		0	0	0		0	0	0	0	0		

[#] FY 2013 Program is from the FY 2013 President's Budget, submitted February 2012

^{##} The FY 2014 OCO Request will be submitted at a later date

A. Mission Description and Budget Item Justification

The United States Nuclear Detonation (NUDET) Detection System (USNDS) provides a near real-time worldwide, highly survivable capability to detect, locate, and report any nuclear detonations in the earth's atmosphere or in near space. USNDS supports NUDET detection requirements across five mission areas: Integrated Tactical Warning and Attack Assessment (ITW/AA), Nuclear Force Management (NFM), Space Control (SC), Treaty Monitoring (TM) and a classified mission.

The USNDS program is jointly sponsored and funded by the Department of Defense (DoD), through the US Air Force, and the Department of Energy (DOE), through the National Nuclear Security Administration (NNSA) and its Nuclear Detonation Detection (NA-22) office, respectively. NNSA/NA-22 supplies, at no cost to DoD, USNDS NUDET space sensors as Government Furnished Equipment (GFE) to the Air Force's USNDS Program Office, which is responsible for all acquisition and systems engineering, integration and test (SEIT) activities on space vehicles (SVs), to include Global Positioning System (GPS) and additional hosts, and their supporting ground control segments.

DoD funds their contribution to the NDS program in Program Element (PE) 0305913F with RDT&E,AF, OPAF and Operation & Maintenance (O&M) dollars. NDS payload integration onto GPS satellites is funded in the GPS Space & Control PE 0305165F for GPS IIF and in the GPS III Space Segment PE 0305265F for GPS III.

USNDS consists of both space and ground segments. The space segment sensors, funded by DOE, consists of three nuclear detection sensor payloads: the Radiation Detection Capability (RADEC) payload for Defense Support Program (DSP) satellites, the Global Burst Detection (GBD) payload for Medium Earth Orbit (MEO) platforms (GPS satellites), and the Space Atmospheric Burst Reporting System (SABRS) payload for Geosynchronous Earth Orbit (GEO) platforms (classified GEO hosts). The RADEC sensor includes neutron gamma, optical and X-ray sensors. The GBD payload consists of optical, x-ray, and Electromagnetic Pulse (EMP) sensors. The SABRS payload consists of neutron, gamma ray and space environmental sensors. Together, these sensors comprise the global NUDET detection capability for USNDS. Space sensors communicate NUDET indications to the ground control segment which includes the Integrated Correlation and Display System (ICADS), Ground NDS Terminals (GNTs), and Universal Ground NDS Terminals (UGNTs), when fielded. These ground systems, funded by the Air Force, perform data analysis and provide a decision support tool to the Air Force controllers concerning probability of NUDET occurrence. ICADS resides on two fixed ground terminals as well as GNT, which provides ground receiving analysis and reporting capabilities to national authorities, commands, and forward users. The ground control segment is being modernized and continuously improved through an incremental evolution acquisition approach.

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The upgrade to the GNT is the Universal Ground Nuclear Detonation (NUDET) Detection System (NDS) Terminal (UGNT) which is funded with RDT&E, AF in this PE. The UGNT provides NUDET Detection Reports to end users, supports Integrated Tactical Warning and Attack Assessment (ITW/AA) missions, and provides survivable and endurable USNDS communications via Milstar/Advanced Extremely High Frequency (AEHF) circuits. The UGNT program modifies the baseline of the GNT program and deploys as an integral part of the Space Based Infrared System (SBIRS) Survivable / Endurable Evolution (S2E2) Mobile Ground System (SMGS) units. The UGNT, when integrated with the SMGS, will perform NUDET event processing with fused NDS data from GPS and DSP. SMGS capability refers to the result of the S2E2 upgrade program for the MGS mission processing capability, including the integration of UGNT. The intended end state of UGNT integration is delivery of enhanced missile warning and NUDET detection capabilities that meet survivable/endurable ITW/AA requirements directed by the President, SECDEF, Joint Staff, and USSTRATCOM delivering long-term, cost effective, multi-role, multi-mission space effects to the war fighter across the range of military operations.

This NDS PE 0305913F includes systems engineering, research, development, manufacture, integration, on-orbit and field testing and end-to-end verification of USNDS space sensors, ground analysis and reporting systems in support of the 5 (five) USNDS mission areas.

This program is in Budget Activity 7 - Operational System Development because it supports operational systems.

B. Program Change Summary (\$ in Millions)	FY 2012	FY 2013	FY 2014 Base	FY 2014 OCO	FY 2014 Total
Previous President's Budget	81.989	64.965	50.852	-	50.852
Current President's Budget	81.989	64.965	50.547	-	50.547
Total Adjustments	0.000	0.000	-0.305	-	-0.305
• Congressional General Reductions	-	0.000			
• Congressional Directed Reductions	-	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	-	0.000			
• Congressional Directed Transfers	-	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	0.000	0.000	-0.305	-	-0.305

Change Summary Explanation

FY14: -\$0.305M due to higher Air Force priorities

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2012	FY 2013	FY 2014
Title: ICADS	28.862	26.779	17.995
Description: Satellite ground data processing system that reports endo-atmospheric, transition and near-space nuclear detonations (NUDETs) as detected by the NDS sensors aboard the GPS and DSP satellites and SABRS equipped satellites.			

UNCLASSIFIED

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2012	FY 2013	FY 2014
<p><i>FY 2012 Accomplishments:</i> Received NDS Operational Acceptance on GPS IIF SV01 and GPS IIF SV02, received ICADS Build 6 Authority to Operate (ATO).</p> <p><i>FY 2013 Plans:</i> Operational delivery of ICADS Build 6, continue ICADS hardware and software development.</p> <p><i>FY 2014 Plans:</i> Complete ICADS hardware and software development (GPS III SVs 01-08 build and UGNT Build), deliver additional GBD for GPS III SVs, support GPS IIF checkout of NDS sensors during launch and on-orbit activities. Begin software development for changes to GBD sensors and SVs beginning with SV09.</p>				
<p><i>Title:</i> UGNT</p> <p><i>Description:</i> Delivers enhanced missile warning and NUDET detection capabilities that meet survivable/endurable tactical warning and attack assessment requirements directed by the President, SECDEF, Joint Staff and USSTRATCOM delivering long-term, cost effective, multi-role, multi-mission space effects to the war fighter across the range of military operations.</p> <p><i>FY 2012 Accomplishments:</i> Completed UGNT Preliminary Design Review (PDR).</p> <p><i>FY 2013 Plans:</i> Continue UGNT hardware and software development, deliver Testbed, complete Critical Design Review (CDR).</p> <p><i>FY 2014 Plans:</i> Continue UGNT hardware and software development, conduct Test Readiness Review, deliver Maintenance/Training system.</p>		26.384	25.365	19.797
<p><i>Title:</i> SABRS Integration on Alt Host II</p> <p><i>Description:</i> Integrated NUDET detection sensors providing a capability to replace aging DSP NDS capability. NDS RDT&E funding integrates the NDS sensors onto the host satellite. Second SABRS sensor package integration onto Alternate Host II was terminated in the FY13 PB.</p> <p><i>FY 2012 Accomplishments:</i> Supported SABRS on GEO platform launch activities. Identified costs and required actions for termination of SABRS on Alt Host II.</p>		12.800	0.000	0.000
<p><i>Title:</i> Systems Engineering/On-Orbit Support & Testing</p> <p><i>Description:</i> Support costs including funding for DOE sensor support, testing and system engineering.</p>		13.943	12.821	12.755

UNCLASSIFIED

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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2012	FY 2013	FY 2014
<p><i>FY 2012 Accomplishments:</i> Provided SE&I, technical support and program technical support for the five NDS mission areas, completed checkout of NDS sensors on GPS IIF SV02 during launch and on-orbit activities. Delivered GBD to GPS III SV01.</p> <p><i>FY 2013 Plans:</i> Provide SE&I, technical support and program technical support for the five NDS mission areas, support GPS IIF SV03 and GPS IIF SV04 checkout of NDS sensors during launch and on-orbit activities, deliver remaining Global Burst Detectors (GBD) for GPS IIF, deliver GBD for GPS III SV02.</p> <p><i>FY 2014 Plans:</i> Provide SE&I, technical support and program technical support for the five NDS mission areas. Deliver GBDs for GPS III SV03. Support GPS IIF checkout of NDS sensors during launch and on-orbit activities.</p>			
Accomplishments/Planned Programs Subtotals	81.989	64.965	50.547

D. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u> <u>Base</u>	<u>FY 2014</u> <u>OCO</u>	<u>FY 2014</u> <u>Total</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF: BA03: Line Item # 836750: <i>Nudet Detection Sys</i> <i>Space</i>	4.863	5.564	4.415		4.415	4.697	5.157	4.490	6.495	Continuing	Continuing

Remarks

E. Acquisition Strategy
 The USNDS Acquisition Strategy is to develop, integrate, field and sustain USNDS satellite sensors and USNDS ground data processing and distribution hardware and software as well as mission operational and technical program support to sustain the USNDS capability on GPS and DSP; funding is sent by Military Interdepartmental Purchase Request (MIPR) from DoD and Department of Energy (DOE) to Sandia, Lawrence Livermore, and Los Alamos National Laboratories and other agencies on existing DOE contracts.

F. Performance Metrics
 Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2014 Air Force **DATE:** April 2013

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Product Development (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
ICADS and GNT/UGNT	MIPR	Sandia National Laboratory:Albuquerque, NM	-	55.246	Nov 2011	52.144	Jan 2013	37.792	Jan 2014	-		37.792	Continuing	Continuing	
SABRS	MIPR	Various:Classified,	-	12.800	Nov 2011	0.000		0.000		-		0.000	0.000	12.800	
Completed NDS Development Efforts	Various	Various:Various	-	0.000		0.000		0.000		-		0.000	0.000	0.000	
SE&I	C/CPAF	SAIC:San Diego, CA	-	2.699	Nov 2011	2.640	Dec 2012	2.731	Dec 2013	-		2.731	Continuing	Continuing	
Subtotal			0.000	70.745		54.784		40.523		0.000		40.523			

Support (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Subtotal			0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000	0.000

Test and Evaluation (\$ in Millions)				FY 2012		FY 2013		FY 2014 Base		FY 2014 OCO		FY 2014 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	All Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Testing	PO	17th Test Squadron:Schriever AFB, CO	-	0.259	Nov 2011	0.261	Feb 2013	0.265	Dec 2013	-		0.265	Continuing	Continuing	
On-orbit Sensor Testing	MIPR	Various:Albuquerque, NM	-	2.589	Nov 2011	2.177	Mar 2013	2.264	Mar 2014	-		2.264	Continuing	Continuing	
Subtotal			0.000	2.848		2.438		2.529		0.000		2.529			

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Exhibit R-4, RDT&E Schedule Profile: PB 2014 Air Force

DATE: April 2013

APPROPRIATION/BUDGET ACTIVITY

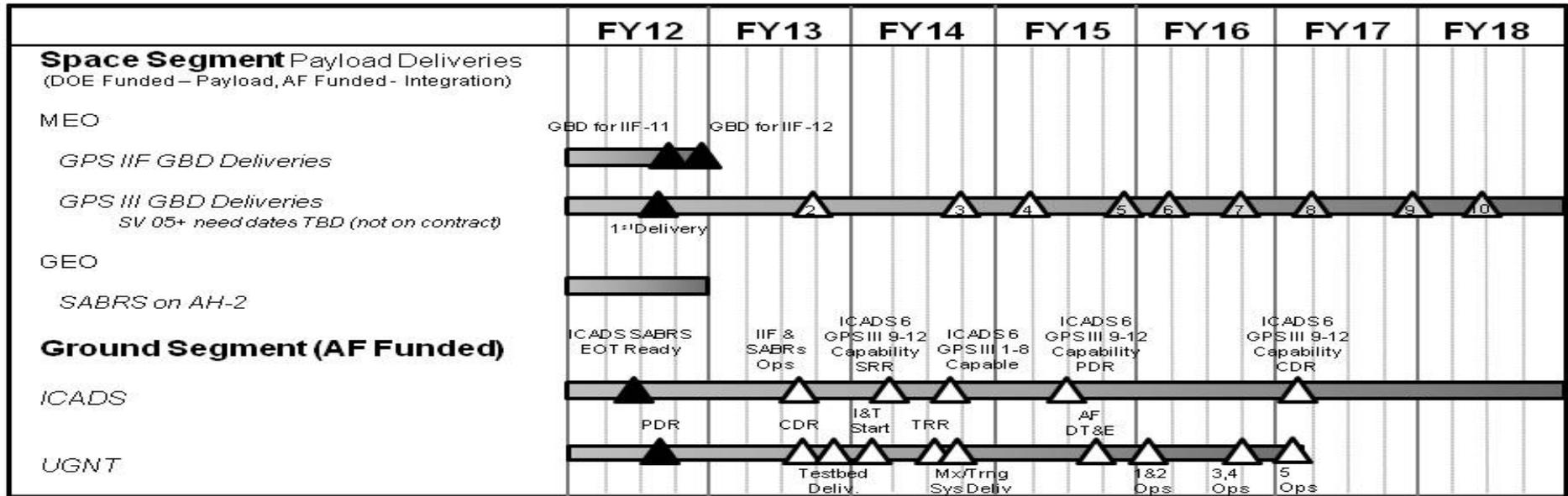
3600: *Research, Development, Test & Evaluation, Air Force*
 BA 7: *Operational Systems Development*

R-1 ITEM NOMENCLATURE

PE 0305913F: *NUDET Detection System (SPACE)*

PROJECT

672808: *Nuc Detonation Det Sys (sensors)*



AF – Air Force AH-2 – Alternate Host 2 CDR – Critical Design Review DOE – Department of Energy EOT – Early On-Orbit Test GBD – Global Burst Detector GEO – Geosynchronous Earth Orbit I&T – Integration and Test DT&E – Developmental Test & Evaluation	ICADS – Integrated Correlation and Display System MEO – Medium Earth Orbit PDR – Preliminary Design Review SABRS – Space Atmospheric Burst Reporting System SRR – System Readiness Review TRR – Test Readiness Review UGNT – Universal Ground NDS Terminal
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Exhibit R-4A, RDT&E Schedule Details: PB 2014 Air Force		DATE: April 2013
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Deliver final Global Burst Detectors (GBD) for GPS IIF	4	2012	1	2013
ICADS Build 6 Operational	3	2013	3	2013
UGNT Critical Design Review (CDR)	3	2013	3	2013
Deliver GBD for GPS III SV02	3	2013	3	2013
UGNT Testbed Delivery	4	2013	4	2013
ICADS Build 6 GPS III SV01-08 capable	3	2014	3	2014
UGNT Maintenance/Training System Delivery	3	2014	3	2014