Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Air Force										DATE: February 2012	
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)*							
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	71.347	81.989	64.965	-	64.965	50.852	44.914	49.238	51.681	Continuing	Continuing
672808: *Nuc Detonation Det Sys (sensors)*	71.347	81.989	64.965	-	64.965	50.852	44.914	49.238	51.681	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

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, who is responsible for all acquisition and systems engineering, integration and test (SEIT) activities on space vehicles, to include GPS and additional hosts, and their supporting ground control segments.

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

USNDS consists of nuclear detection space sensors and ground control segments. The space segment consists of three 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 (Defense Support Program (DSP) satellites and other GEO hosts). The RADEC sensor includes gamma, neutron, 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 in orbit on GEO and MEO platforms comprise the global NUDET detection capability for USNDS. Space Sensors communicate NUDET detection to the grounds control segment which includes the Integrated Correlation and Display System (ICADS), Ground NDS Terminals (GNTs), and Universal Ground NDS Terminals (UGNTs). These ground systems perform data analysis and provide a decision support tool to the Air Force controllers concerning probability of NUDET occurrence. ICADS consists of two fixed ground terminals and GNT provides ground receiving analysis and reporting capabilities to national authorities, commands, and forward users. UGNT will upgrade GNT with survivable and endurable capabilities. The ground control segment is being modernized and continuously improved through an incremental evolutional acquisition approach.

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

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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 with 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 NUDET Detection System (NDS) data from Global Positioning System (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 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 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total
Previous President's Budget	72.199	81.989	79.325	-	79.325
Current President's Budget	71.347	81.989	64.965	-	64.965
Total Adjustments	-0.852	-	-14.360	-	-14.360
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments	-0.852	-	-14.360	-	-14.360

Change Summary Explanation

FY11: -0.852 Congressional and General Reductions

FY13: Space and Atmospheric Burst Reporting System (SABRS) on Alt Host 2 is canceled (-14.360)

C. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: NDS	71.347	81.989	64.965
Description: Research and development, testing and fielding of ICADS, GNT, UGNT and the integration of SABRS payloads on GEO platform.			

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C. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
FY 2011 Accomplishments: ICADS, GNT, and UGNT development, USNDS sensor on-orbit qualification testing, 2nd operational sensor launched on SVN-63, further increasing USNDS probability analysis reporting, SABRS on GEO platform development and integration, SE&I and technical support. Began development of hardware and software for survivable UGNT . ***FY 2012 Plans:*** Continue ICADS and UGNT development, support GPS launches and NDS senor on-orbit testing, SABRS on GEO platform development and integration, launch and on-orbit testing, SE&I, technical support and program technical support. ***FY 2013 Plans:*** Operational delivery of ICADS Build 6 and continue ICADS and UGNT development, USNDS sensor on-orbit qualification testing, SE&I and technical support and program technical support.			
Accomplishments/Planned Programs Subtotals	71.347	81.989	64.965

D. 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
• Related Activities:: *N/A*	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• P-43: *OPAF, PE 0305913F, Nudet Detection System Space*	5.893	4.863	5.564	0.000	5.564	5.915	6.211	6.347	6.433	Continuing	Continuing

E. Acquisition Strategy

The USNDS Acquisition Strategy is to develop, 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; funding is sent by Military Interdepartmental Purchase Request (MIPR) from DoD and Department of Energy (DoE) to Sandia 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.

Exhibit R-4, RDT&E Schedule Profile: PB 2013 Air Force		DATE: February 2012
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)*

Exhibit R-4A, RDT&E Schedule Details: PB 2013 Air Force		DATE: February 2012
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ICADS Build 6 Authority to Operate (ATO) Activities	3	2011	3	2012
Deliver final two Global Burst Detectors (GBD) for GPS IIF	2	2012	1	2013
ICADS Build 6 Test (SABRS early on-orbit test ready)	3	2012	3	2012
UGNT Preliminary Design Review (PDR)	3	2012	3	2012
Deliver GBD for GPS III SV-1	3	2012	3	2012
UGNT Critical Design Review (CDR)	3	2013	3	2013
ICADS Build 6 GPS III SV1-8 capable	3	2014	3	2014