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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)								DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations						
COST (In Thousands)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost	216910	308415								
1155 Discrimination	27880	0								
3153 Systems Architecture and Engineering	15569	4416								
3155 Systems Engineering and Integration	0	23574								
3161 Information Management and Technology	0	10579								
3352 Modeling and Simulation	37573	44451								
3353 JNTF	52510	46670								
3354 Targets	2159	50952								
3357 Facilities, Siting, and Environment	0	2975								
3359 Test, Evaluation, and Assessment	0	11375								
3360 Test Resources	65386	102746								
4000 Operational Support	15833	10677								

The BMD Program and resulting FY02 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY02, funding from this Program Element is moved to the Ballistic Missile Defense Organization Program Element 0603880C to facilitate BMD system capability evolution, allow timely responses and reactions to changes in the BMD program, and provide the programmatic agility to mitigate unforeseen consequences.

A. Mission Description and Budget Item Justification

The Ballistic Missile Defense (BMD) Technical Operations Programs are comprised of the centrally managed functional capabilities required to assure the execution of Theater Missile Defense (TMD), Family of Systems Engineering and Integration (FOS E&I), National Missile Defense (NMD), and Technology programs. Functional areas

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<p>include BMD systems architecting and engineering analysis, test resources and facilities, modeling and simulation, and phenomenology data collection and analysis. These highly specialized BMD-specific investments provide the threat representative data and derived requirements, modeling capabilities, test facilities, and facilities, siting and environmental programs necessary to meet the aggressive development, test, and deployment schedules of the TMD and NMD systems. These centrally managed programs are executed in a manner integrated with BMDO's mission areas.</p> <p>This project is assigned to the Budget Activity and Program Element codes as identified in this descriptive summary in accordance with existing Department of Defense policy. Further justification of the Budget Activity code assigned to each Program Element is contained within the Brief Description of Element section of each Program Element Summary.</p>		
B. Program Change Summary		
	<u>FY 2000</u>	<u>FY 2001</u>
Previous President's Budget (<u>FY 2001 PB</u>)	214445	270718
Congressional Adjustments		42500
Appropriated Value		313218
Adjustments to Appropriated Value		
a. Congressional General Reductions		-4125
b. SBIR / STTR		
c. Omnibus or Other Above Threshold Reductions		
d. Below Threshold Reprogramming		
e. Rescissions		-678
Adjustments to Budget Years Since <u>FY 2001 PB</u>	2465	37697
Current Budget Submit (<u>FY 2002 PB</u>)	216910	308415
<p>Change Summary Explanation: The BMD Program and resulting FY02 President's Budget request has been developed based on revised Secretary of Defense direction to develop capabilities to defend against the missile threat and sustain appropriate deterrence levels. Beginning in FY02, funding from this Program Element is moved to the Ballistic Missile Defense Organization Program Element 0603880C.</p>		
<p>C. Acquisition Strategy: See Individual R2 summaries.</p>		

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COST (<i>In Thousands</i>)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
1155 Discrimination	27880	0								

A. Mission Description and Budget Item Justification

To prepare for critical future defense needs, technical operations will support MDAP programs by conducting a balanced program of high leverage technologies that yield improved capabilities across a selected range of boost, midcourse, and terminal phase missile defense interceptors, advanced target sensors, and innovative science. The objectives of these investments are subsystems with improved performance or reduced costs for acquisition programs, and technical solution options to mitigate advanced and near-term National and Theater Ballistic Missile threats.

This program provides the U.S. with the data and predictive tools to generate high confidence target signatures for Ballistic Missile Defenses (BMD). This is a critical adjunct to the evaluation of BMD system performance across the full spectrum of threats and engagement scenarios. This program provides data collection sensors and instruments for use on live-fire missions and provides analysis of the resulting test data. This program provides predictive models of target signatures in both Radar and Electro-Optical regimes. This program evaluates and develops algorithms for the critical functions of discrimination, target handover, and aimpoint selection.

Data collection and exploitation of data is achieved by ground, air, and sea based assets for domestic and foreign tests. This includes collection by assets that are owned or operated by other agencies for use by BMDO.

Algorithms and Analysis work is divided into optical and radar regimes. Promising acquisition, discrimination, track, and aimpoint algorithms are coded and installed at the Lexington Discrimination System (LDS) for evaluation in a real-time operating mode using real and simulated data. Algorithms from acquisition programs are evaluated for effectiveness in a variety of targets and scenarios.

Models provide predictive signature codes ranging from high-fidelity single component models to integrated model architecture that combine several components into a composite modeling capability. Component models follow the subject discipline of hardbody targets, missile plumes, and backgrounds. Codes are validated and upgraded, as analysis of measured data becomes available and understood.

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FY 2000 Accomplishments:

- 6744 Algorithms and Analysis: Provide data analysis support for TMD systems in Dev/Val and EMD. Provide support for NMD radar/optical discrimination algorithms and architectures for advanced NMD threats and pen aids. Develop algorithms for real-time sensor resource allocation to support threat-adaptive algorithm architectures.
- 4853 Models: Continue development and validation of high fidelity signature and environment codes.
- 13260 IR Data Collection Upgrade: Conduct Preliminary Design Review (PDR) and Critical Design Review (CDR).
- 233 Cobra Ball Upgrade: Initiate sensor subsystem design trade studies.
- 1175 Government Project Personnel Support: Civilian Salaries for BMDO Executing Agent (EA)
- 1615 International: Continue MESAR efforts and support of the Scientific Cooperative Research Exchange (SCORE) exchange with the UK.

Total 27880

FY 2001 Planned Program:

- 0 Related activities transferred to projects 3352, 3359 and 3360 for FY01.

Total 0

B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>To Compl</u>	<u>Total Cost</u>
3352 Modeling and Simulation, PE 0603874C		4722								
3359 Test, Simulation & Assessment, PE 0603874C		7714								
3360 Test Resources, PE 0603874C		13825								

C. Acquisition Strategy: This project funds its efforts through executing agents in the Air Force, Army, Navy and BMDO via existing contracts.

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BUDGET ACTIVITY **4 - Demonstration and Validation** PE NUMBER AND TITLE **0603874C BMD Technical Operations** PROJECT **1155**

D. Schedule Profile	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
ODA Model and simulation support	1Q-4Q							
Support BMDO test flight programs	1Q-4Q							
IR Sensor SRR	1Q							
IR Sensor PDR	2Q							
IR Sensor CDR	4Q							

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 1155
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. IR Sensor Upgrade	C, CPMF	Aeromet, OK	12884									
b. Cobra Ball Upgrade	C, TBD	Raytheon, TX	427									
			2000									
Subtotal Product Development:			15311									

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. OSC SW Maintenance	CPFF	TBE, Huntsville AL	947									
b. BES Development	Allot	SMDC, H'sville AL	961									
c. Bkgnds SW Dev	Allot	AFRL, MA	2106									
d. SSGM Software Dev	Allot	NRL, Wash DC	800									
e. SSGM SW Dev	CPFF	PRA, Calif Other, VA	2600									
f. Cont. Eng Supprt	C, CPMF	Other, VA	1791									
Subtotal Support Costs:			9205									

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Mission Planning supt.	Various	Other	781									
b. MESAR Trials	MIPR	PEO-TAD, Wash	225									
Subtotal Test and Evaluation:			1006									

Remark:

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 1155
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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Plumes Analysis	Allotment	AFRL, CA	2105									
b. Radar Analy / Supprt	MIPR	MIT/LL Lex, MA	8641									
c. Optical analy (ODA)	CPFF	NRC, H'sville AL	5253									
d. Prog Man Pers	Allotment	SMDC, H'sville AL	745									
e. Other Intl prgms	Various	Other	623									
Subtotal Management Services:			17367									

Remark:

Project Total Cost:			42889									
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Remark:

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3153
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COST (<i>In Thousands</i>)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3153 Systems Architecture and Engineering	15569	4416								

A. Mission Description and Budget Item Justification

Beginning in FY 01, Project 3153 funds activities associated with the BMDO Chief Architect (BMDO/CA). Tasks within this project had funded the Chief Architect / Engineering Office (then BMDO/DE) activities prior to FY 01. These tasks will no longer be active in this project. This project resources architectural development to design an integrated Global Air and Missile Defense capability that meets current evolving threats. The Chief Architect establishes and maintains the Ballistic Missile Defense (BMD) Baseline Architecture. The BMD Baseline Architecture is the overarching and unifying BMD structure expressed in terms of components, connections, constraints, and their interrelationships. The architecture functions include assessing the evolving technical, military, and geopolitical environments, developing and evaluating architecture alternatives to provide suitable BMD capabilities, integrating the selected architecture alternative, and tracking architecture implementation. The BMD Baseline Architecture expressed as a series of time-phased spiral development epochs pacing the threat, serves as the technical basis for systems engineering and acquisition planning. The Chief Architect provides analytical support to the Director, BMDO, and staff through a common analysis framework. The Chief Architect conducts special studies related to alternative and extended missile defense architectures and quick reaction studies in response to immediate senior decision-maker requests.

FY 2000 Accomplishments:

- 9394 System Engineering and Architecture Analysis: Supported analyses for Current Systems/Architectures, development of advanced/future systems/architecture requirements, and develop and maintain engineering threat documentation. Conducted functional and physical analysis and related allocation in support of current and advanced/future systems/architectures. Performed risk analysis and mitigation/control activities, trade-off analysis, and conduct program reviews in support of architecture analysis and control function. Supported BMDO corporate technical decision processes.
- 3800 Missile Defense Interoperability: Formulate policy and implement DoD and BMD interoperability requirements in support of the services and coalition partners. Conduct BMC3 activities, to address NATO, US/GE, and US/UK customer interoperability scenarios and issues. NATO analysis will include joint experiment planning and upgrade of Extended Air Defense Test Bed. US and United Kingdom interoperability efforts concentrate on multi-sensor tracking and fusion. An interoperability study will be conducted during FY00. BMC3 interoperability activities address DoD's mandated implementation of the Joint Technical Architecture. BMC3 Support includes technical analysis of allies capabilities and interfaces to TAMD, tracking and maintaining an allies capability inventory, support of BICAR and DISA, quick reaction suspense/document reviews, analysis of CINC interoperability shortfalls, and interoperability analysis of Service Systems/JPN/JDN/JCTN. Data Standardization support includes development of TMD/NMD information exchange requirements, support of common data definitions required for NMD/TMD, analysis of standardization of interfaces to external systems, support to NMD data process and Missile Defense Data groups, review of Service BMC3 documents, MD Data Element Crosswalk input development, Metadata analysis, and technical review of data packages from JTAMDO and NMD. BMC3 interoperability efforts also develop joint TMD Technical Architectures. Technical Architectures and related analysis will be developed for 2003 and 2010 timeframes.

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3153
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- 850 Test and Evaluation: This task conducts T&E activities required to support BMDO architecture and system engineering functions by ensuring T&E is used to reduce acquisition risk and provide early and continuing estimates of system performance. It ensures test planning, testing and analysis of test results are integral parts of the systems engineering process to meet objectives. This includes reviewing SEMP's and other Systems Engineering (SE) documentation, to verify T&E programs and documentation (TEMP's) are traceable and support the SE requirements verification process. These T&E activities will also include assessing testability of current and future BMD architectures and MD Lethality Program test and experiment support.
- 1525 System Planning: Activities develop missile defense system concept alternatives, linked to the evolution of the currently defined BMD system, for inclusion in the BMD Master Planning process. Specific task activities include assistance in defense threat characterizations (post-2010), identification and description of future missile defense deficiencies, the conduct of competitive studies to define alternative defense concepts, system needs definition for advanced technology programs, leadership of Joint Technology Board process, and technical assistance in developing Pre Milestone I OSD required documentation.

Total 15569

FY 2001 Planned Program:

- 3235 Conduct the Ballistic Missile Defense System Architecture Study (BMDSAS) to develop, analyze, and assess the baseline and preferred architectures for Ballistic Missile Defense (BMD). Integrate the architectures from the National Missile Defense (NMD) and Theater Air and Missile Defense (TAMD) Family of Systems into a single evolutionary defense architecture covering 2000 to 2030. Conduct quantitative and qualitative analyses to provide insights into the various systems, potential alternatives, and integrated performance against current and potential threats. Support BMDO corporate technical decision processes. Develop, implement, and maintain the architecture configuration management process; produce and maintain the Architecture Description Document (ADD).
- 1181 Conduct special studies related to alternative and extended missile defense architectures, quick reaction studies in response to immediate senior decision-maker questions and requests, and unplanned Congressional tasking.

Total 4416

B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
3153, Sys Arch & Engineering, PE0603873C		4615								
3153, Sys Arch & Engineering, PE0603877C										

C. Acquisition Strategy: Systems analysis work in this project is contracted. Expertise of Government, Federally Funded Research & Development Center (FFRDC), and Scientific, Engineering and Technical Assistance (SETA) personnel are leveraged in the execution of project activities, using existing contracts to the maximum extent possible. Additional contractor services will be procured if needed to meet emerging program requirements.

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit) DATE **June 2001**

BUDGET ACTIVITY: **4 - Demonstration and Validation** PE NUMBER AND TITLE: **0603874C BMD Technical Operations** PROJECT: **3153**

D. Schedule Profile	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Initiate BMDSAS Iteration 8		1Q						
Final Architecture Description Document (ADD) version 1.0 to Director		1Q						
Initiate BMDSAS Iteration 9		2Q						
Initiate BMDSAS Iteration 10		3Q						
Final ADD Version 2.0 to Director		3Q						

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BMDO RDT&E COST ANALYSIS (R-3)										DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3153		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Product Development:												
Remark:												
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Support Costs:												
Remark:												
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Test and Evaluation:												
Remark:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. SETA Analysis Support	CPAF	SPARTA, CA		4260								
b. SETA Analysis Support	CPAF	CSC, VA		156								
Subtotal Management Services:				4416								
Remark:												
Project Total Cost:				4416								

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BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3155	
COST (In Thousands)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3155 Systems Engineering and Integration	0	23574								
A. <u>Mission Description and Budget Item Justification</u>										
<p>This project is part of a Program Element (PE) currently in a transition phase after BMDO's reorganization. BMDO has realigned its Systems Engineering functional tasks, which had previously been accomplished as a part of a number of projects under this PE and consolidated them under this project (3155). Beginning in FY02, the Systems Engineering efforts will reside in the new BMD Architecture and Engineering PE (0603877C).</p> <p>The Systems Engineer is responsible for producing the BMD Functional Baseline (Systems Architecture Allocated Functional Requirements Document (SAAFRD)), which ensures the technical viability, integrity, and interoperability of the BMD program, to include TAMD, NMD and cruise missile options. Working in conjunction with the Chief Architect, Systems Engineering provides the core engineering capability to assess operational requirements and translates them into system requirements that are allocated to: legacy systems, modifications of legacy systems, and/or new system concepts necessary to meet user needs. This includes the development and allocation of systems requirements necessary to ensure that the Major Defense Acquisition Program (MDAP) systems are fully interoperable and provide maximum flexibility to the warfighter. Battle Management Command, Control, Communication (BM/C3) Systems Engineering provides the warfighter with timely, early warning information through development of a theater missile defense architecture that fosters interoperability and system integration. These activities also develop data standards, conduct studies and analyses, and formulate and implement policy and procedures to ensure that DoD and BMD interoperability requirements support the Services, allied and coalition partners. Working closely with the intelligence community, Systems Engineering establishes and maintains the design-to-threat requirements, funded via PE 0603876C, to ensure consistent threat parameters across the MDAPs.</p> <p>To ensure the technical viability of BMDO programs, Systems Engineering conducts continuous assessments of systems development to assess progress, determine capability, and identify and mitigate risks, including risks incurred due to the evolving threat environment. Mitigation activities include the generation of technology requirements and identification of opportunities for technology insertion. Systems Engineering maintains an ongoing Corporate Lethality Program to characterize the effectiveness of the BMD architecture, understand post-intercept effects, establish methodologies to allow warhead typing based on impact response, and provide a common end-to-end lethality assessment capability across the MDAPs. Working in conjunction with the test and evaluation community, Systems Engineering develops test requirements and conducts post test analyses to ensure the MDAP systems meet requirements and satisfy warfighter needs. Finally, Systems Engineering executes the BMDO Configuration Control Process and maintains configuration control of TMD and NMD architecture baselines.</p> <p>Systems Engineering is executed in a collaborative environment. BMDO maintains a close working relationship with the MDAP Program Managers, PEOs and the PEO Systems Engineers, and the BM/C3 Community. Additionally, BMDO continues to work with the Military Services, U.S. Space Command, U.S. Joint Organization to ensure full integration of other systems, sensors, and command and control centers that contribute to BMD.</p>										
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FY 2000 Accomplishments:		
<ul style="list-style-type: none"> • 		
Total	0	
FY 2001 Planned Program:		
<ul style="list-style-type: none"> • 12612 General Engineering - Initiate development of the BMD Functional Baseline (SAAFRD). Conduct system engineering assessments of BMD programs to identify performance/cost/schedule issues within these programs and assess potential solutions. Develop and implement the BMD Corporate risk management process. Develop and track Technical Performance Measures for the BMD System Architecture. Baseline the items for Configuration Control of the BMD Systems Architecture. Assemble and prioritize technology needs (including manufacturing technologies) for input to the BMDO S&T program. Lead migration of BMD systems and architectures toward Open Systems implementations. Perform cost benefit analysis of alternatives for BMDO MDAP high cost items and cost drivers. Perform independent technical and engineering assessments of BMD system architectures including trade-off studies using Federally Funded Research and Development Centers (FFRDC)/National Laboratories/University Affiliated Research Centers (UARC) resources. • 4211 BM/C3 – Initiate development of a TBMD BMC3 System Requirements Document (SRD) to support the overarching Systems Architecture Allocated Functional Requirements Document (SAAFRD) document; develop a Family of Systems (FoS) Integrated System Specification (ISS) to baseline current TBMD performance capabilities; develop an FoS System Performance Specification (SPS) focused on meeting near-term BMC3 interoperability requirements. Develop TBMD Link-16 and Global Command and Control System (GCCS) interoperability enhancements (e.g. Coalition/Ally tactical TBM message exchanges, Joint Range Extension, and integration of joint service force planners such as the Joint Defensive Planner). Develop and maintain a list of BM/C4I risks; monitor and assess BM/C4I CARDS; develop TMD Interface Exchange Requirements (IER); develop a TMD/NMD Interoperability Program Plan and Interoperability Roadmap; and define interoperability test and tool requirements. Conduct interoperability studies and experiments; Missile Defense Interoperability Plan; BMDO annual interoperability and capability report, allied/coalition BM/C3 Analysis (NATO, UK, Israel, etc); Interoperability Analysis of Service’s Joint Planning Network, Joint Data Network and Joint Composite Tracking Network. Provide support to the Ballistic Missile Defense System Architecture Study (BMDSAS) with regard to C4ISR, and DUSD C3I efforts; support Joint Mission Area Analysis (JMAA) and development of Ballistic Missile Information Architecture. Support JTA Compliance and Missile Defense (MD) Annex development, Migration Plans and waivers as required; Data Element Dictionary (DED) for MD; development of BMDO Technical Architecture, and BMDO C4ISR Support Plans. • 6751 Corporate Lethality Program (CLP) – Target Response; conducts high speed testing to improve understanding of the dynamics of structural response via hydrocode benchmarking. Agent/Debris Source Term Characterization; obtains salvage fuzing/radiation effects data by performing hydrocode runs of engagement conditions to predict particulars of primary high explosive initiation. Atmospheric Transport and Dispersion; conducts empirical studies of droplet stability and fluid break-up by developing codes with best drop deformation algorithms in open literature. Intercept Effects and Consequences, Sensitivity Analysis; generates hydrocode predictions of bulk chemical source terms for hazard propagation modeling; develops correlation between inputs and outputs, performs uncertainty and sensitivity studies. Data Collection/Analyses; correlates agent/simulant phenomenology by establishing a database for thickened VX for those characteristics relevant to lethality. 		
Total	23574	
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B. <u>Other Program Funding Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To Compl	Total Cost
3155, Systems Engineering and Integration, PE 0603873C	60700	49289								
3155, Systems Engineering and Integration, PE 0603872C	47144									
3155, Systems Engineering and Integration, PE 0603876C		9692								
3155, Systems Engineering and Integration, PE 0208864C		3938								

C. Acquisition Strategy: The 3155 Project acquisition strategy leverages existing system acquisition programs (which are subject to milestone decisions and testing) and accomplishes supporting tasks to satisfy Systems Engineering performance requirements. A portion of this project entails systems engineering of separately funded and managed service programs so that all systems will interoperate when fielded.

D. <u>Schedule Profile</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Identify BMC4I Risks		1Q						
Develop./Maintain Risk Mitigation Plans		1Q						
Develop/Maintain Software Engineering		1Q 4Q						
Revise SDIO Dir. 3405		2Q						
Coordinate BMDO Software Policy		3Q						
Develop/Revise MD Interop. Plan		1Q						
Develop/Revise Security Architecture		1Q						
Publish BMC4I Analysis Results		4Q						
Publish NATO BMC4 Analysis Final Report		4Q						
Publish US/GE Analysis Final Report		4Q						
Develop MD Technology Roadmap		1Q						
Standards Compliance Lessons Learned Data Base		3Q						
Publish JTA Annual Report		4Q						
Develop Processes JTA MD Subdomain		4Q						
Investigate Joint Tactical Radio System (JTRS)		2Q						
Maintain Control Over Sys. Interf.		Quarterly						

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BMC4I Standards Compliance		Quarterly						
Enforce BMDO JTA		Quarterly						
Direct Processes BMC4I Sensor System Engineering		Quarterly						
Final development/fielding of JDP V.2x into GCCS V4.0		3Q						
Final development/fielding of JDP V.2x into TBMCS V2.0		3Q						
TAMD-I ACTD		3Q						
TBMD Enhancements		1Q						
Develop TBMD BMC3 Systems Requirements Document (SRD)		3Q						
Integrated System Specification (ISS) Draft/Final		Quarterly						
System Performance Specification Draft/Final		Quarterly						
Joint Range Extension (JRE) Prototype Gateway Development	3Q							
Operational DEMO @ Roving Sands	3Q							
Develop JRE Intrem Capability		1Q						
Assemble tech viable analysis team to audit technical health of each BMD program		1Q						
Complete initial BMD level TPM's		1Q						
Develop Security Architecture		1Q						
Collect TPM Data to validate selected measures, establish control thresholds		2Q						
Start operational vs system requirements synergies vs disconnect analysis		2Q						
Stand-up CCB and BMD Configuration Management process – Run DTT through the process		2Q						
Develop M&S and Test Tool Strategy		3Q						
Complete initial technical viability assessments for BMD program		3Q						
Establish Configuration Control or BMD Baselines to be Managed, Complete Analysis of 1 st Iteration of System Architecture Baseline		4Q						
Assess TPM Utility, Relate Requirements to M&S and T&E Activities		4Q						
Operational/System requirements integration		4Q						
JRE Application Protocol		4Q						

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit) DATE **June 2001**

BUDGET ACTIVITY **4 - Demonstration and Validation** **PE NUMBER AND TITLE** **0603874C BMD Technical Operations** **PROJECT** **3155**

Complete expansion of SE World Class Engineering Process briefing into a training manual for new BMDO and contractor engineers		4Q							
Obtain Approval for Initial NMD/TBMD SAAFRS		4Q							
Complete initial integration of operational vs systems requirements		4Q							
JRE Protocol Gateway Development		Quarterly							

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3155
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
Subtotal Product Development:												

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. System Engineering	Various	POET, Multiple		4543								
b. System Engineering & Integration (SE&I)	CPFF	TRW		4829								
c. System Engineering	CPAF	Sparta, Arlington, VA		2584								
d. System Engineering	CPFF	CSC, Arlington, VA		1915								
e. System Engineering	CPFF	VRI, Arlington, VA		302								
f. ABL PB	Allotment	Services, Various		1056								
g. TMDSE	Allotment	Services, Various		60								
h. BMD Functional Baseline & SAAFRS	Allotment	Services, Various		362								
i. TPM Development & Tracking	Allotment	Services, Various		121								
j. BMD Risk Management	Allotment	Services, Various		60								
k. Test Requirements	Allotment	Services, Various		121								
l. Configuration Baseline Tracking & Analysis	Allotment	Services, Various		302								
m. MDAP Baseline / TIM / ISS	Allotment	Services, Various		453								
n. JREAP & Interim Capability	Allotment	Services, Various		453								
o. JDP	Allotment	Services, Various		62								
p. BMC4I Standards Compliance	Allotment	Services, Various		201								
q. System Engineering	MIPR	DOE		1335								
r. System Engineering	Allotment	SMDC		1150								

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3155
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s. System Engineering	MIPR	BATTELLE		1530								
t. System Engineering	MIPR	NSWCDD		888								
u. System Engineering	MIPR	UK		471								
v. System Engineering	MIPR	AFRL/AERO		776								
Subtotal Product Development:				23574								

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Test and Evaluation:												

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												

Remark:

Project Total Cost:				23574								
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Remark:

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE June 2001			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3161		
COST (In Thousands)		FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3161	Information Management and Technology	0	10579								
A. <u>Mission Description and Budget Item Justification</u>											
<p>This project provides the Support Technology funding for the Ballistic Missile Defense Organization (BMDO) Data Centers Program. The primary responsibility for this project is for the BMDO Data Centers Information System Program Manager to provide management, oversight, technical assistance, and expertise for the BMDO Data Centers Program. The purpose of the BMDO Data Centers Program is to archive, manage, develop data products, distribute and provide remote access to all relevant BMD data. Operation and management of the Data Center activities is accomplished at several sites, each site specializing in a particular discipline. Taskings include providing assessments of technical/programmatic issues and data center performance, coordinating NMD, TMD, and Support Technology customer program/data management requirements and cooperative partnership requirements.</p> <p>FY 2000 Accomplishments:</p> <ul style="list-style-type: none"> • 0 <p>Total 0</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 731 This task provides the Support Technology funding for the BMDO Data Centers Program and Virtual Data Center (VDC) operation and Maintenance (O&M). The primary responsibility under this task is for the BMDO Data Centers Information System Program Manager to provide management, oversight, technical assistance, and expertise for the BMDO Data Centers Program. The purpose of the BMDO Data Centers Program is to archive, manage, develop data products, distribute and provide remote access to all relevant BMD data. • 2592 Provides the U.S. Army with Project Funding to support the Missile Defense Data Center (MDDC), SMDC. The MDDC, as a primary BMDO Data Center will acquire, process, manage, and archive Ballistic Missile Defense (BMD) mission oriented technology. This includes the collection, organization, archiving, protection, processing, analyzing and dissemination of strategic and tactical missile systems (NMD and TMD) data products. • 2155 Provides the U.S. Air Force with Project Funding to support the Advanced Missile Signature Center (AMSC) at AEDC, Arnold AFB, TN, as a primary BMDO Data Center that can process, manage, and archive BMD mission oriented data. AMSC also provides technical support, data cataloging, test/experiment planning, and data product distribution for BMDO-sponsored NMD FoS, CMD and BPI programs. • 1653 Provides the Joint National Test Facility funds for the BMD Simulation Support Center (BMD SSC), as a primary BMDO Data Center that can process, manage and archive M&S, C2SIM and CINC Assessments, BM/C3I, and JEA data; provide technical and data catalog support; and conduct test/experiment planning and data product distribution for BMDO-sponsored programs. • 3448 Provides funding for the design, development, engineering, implementation, and operation of the BMDO Wide Area Network (WAN). <p>Total 10579</p>											
Project 3161				Page 19 of 57 Pages				Exhibit R-2A (PE 0603874C)			

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3161
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B. <u>Other Program Funding Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To Compl	Total Cost
3353, BMDO Data Centers Program, PE 0603874C	7099	0								
3352, SSC Support, PE 0603874C	567	821								
3352, SSC Support, PE 0603878C	0	0								
3161, Information Management and Technology, PE 0603877C	0	0								

C. Acquisition Strategy:

The work in this project is sourced through full and open competition. Primary Data Center Program support is performed at SMDC, AEDC, and JNTF. The SMDC contractor operates under a Cost Plus Award Fee (CPAF) first awarded in February of 1999. The AEDC contractor operates under a CPAF first awarded in October of 1995.

D. <u>Schedule Profile</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Develop Standard Data Centers Program Cost Business Model		1Q						
Update Data Centers Plan		1Q						
Transition/Realign Data Centers Program with Corporate Information Management Program		3Q						

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BMDO RDT&E COST ANALYSIS (R-3)										DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3161		
4												
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Product Development:												
Remark:												
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Data Centers	MIPR	BMDO		731	TBD							
b. Data Centers	Allotment	MDDC, Huntsville		2592	TBD							
c. Data Centers	Allotment	AMSC, Arnold AFB		2155	TBD							
d. Data Centers	Allotment	JNTF, Colorado Springs, CO		1653	TBD							
e. Wide Area Network	MIPR	BMDO		3448	TBD							
Subtotal Support Costs:				10579								
Remark:												
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Test and Evaluation:												
Remark:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												
Remark:												
Project Total Cost:				10579								
Remark:												
Project 3161												

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3352	
COST (<i>In Thousands</i>)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3352 Modeling and Simulation	37573	44451								
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>This project is responsible for the implementation of a comprehensive program that establishes and maintains an affordable and validated set of Core Models and Simulations (M&S). These mission focused Core Models and Simulations are required for pre- and post-test evaluation activities that support the Corporate Test Program and MDAP testing events. This project provides for the program management, planning, coordination, and technical oversight of system level M&S.</p> <p>This mission common task provides computing and networking infrastructure support for the ARC/SC. Specific efforts supported include the concept exploration, development, and test of Theater Air Missile Defense (TAMD) and National Missile Defense (NMD) U.S. Army elements. This task supports the operations and maintenance of computing resources for multiple testbeds within the ARC and supercomputers and local and wide area networking capabilities within both the ARC and SC.</p> <p>Signature Model and Synthetic Scene Generation and Simulation activities provide high confidence signature prediction capability for active and passive EO and RF sensors used in BMD elements and systems. Both empirical and physics-based models and computer codes are developed, verified & validated, maintained, and distributed to provide high-confidence results. These predictions support test planning, test target design, sensor design/development/test, data and systems analysis, operational test and evaluation, and algorithm development.</p> <p>M&S activities also funded by this project include: development, enhancement, and maintenance of the theater test beds and tools for the conduct of wargames that provide the analysis, integration, demonstration, and performance verification for TMD systems. It ensures joint usage of simulation tool resources and supports allied and friendly international participation and cooperation in wargaming exercises. This project focuses M&S support in three major areas: assessments, development/modification, and program management for BMDO and Service M&S programs.</p> <p>The Ballistic Missile Defense Simulation Support Center (BMDSSC) archives and maintains M&S tools which are joint, global and possess multi-level fidelity. The BMD SSC seamlessly links existing and planned simulations of C4I networks, platforms and weapon systems. This activity also includes the operation and maintenance of centralized M&S catalogs of databases that identify current and developing BMDO simulation tools. BMD SSC has been designated as the BMDO Node for models, simulations, and data on the Defense Modeling and Simulation (DMSO) Resource Repository (MSRR).</p> <p>Wargame 2000 is being developed as a BMD simulation to run wargames and exercises at the JNTF for the next 10 years. The requirements are to: design the simulation using an object oriented paradigm, enable "plug and play" of TMD and NMD models, facilitate integrating (BMDO's JNTF) internal and external elements into a flexible real-time simulation suite, incorporate realistic C2 displays, enhance wargaming productivity and responsiveness, and provide for multi-level security.</p>										
Project 3352			Page 22 of 57 Pages				Exhibit R-2A (PE 0603874C)			

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE June 2001
BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3352
<p>This task includes the "Wide Bandwidth Information Infrastructure Project" (WBII), which is to create a network for geographically distributed ground test facilities for both THAAD and NTW missile defense programs. Specifically, linking the Aegis Weapons System Combat Systems Engineering Development Sites (CSEDS) in Moorestown, NJ, and the Standard Missile-III Systems Integration Laboratory (SIL) in Tucson, AZ using networking and Virtual Private Network (VPN) technology. Both Hardware-in-the-Loop (HWIL) applications will involve information security and interoperability issues. The focus on networking technologies is to meet scaleable national security classification networking architecture requirements to distribute imagery data for seeker and sensor algorithm developers for the Ballistic Missile Defense Organization (BMDO) Project Hercules.</p> <p>In FY00 only, this project also provided acquisition and support services for the design, development, modernization, and control of BMDO Mission Oriented Information Technical Modernization (ITR). The objective for this program is to provide responsive ITR support and services via a flexible, responsive architecture to satisfy validated current and projected user ITR requirements. Specific tasks include processing of Mission Oriented ITR-related service requests, conducting the Mission Oriented ITR Working Group and supporting BMDO Chief Information Officer (CIO) initiatives such as the drafting and implementation of the mission oriented portions of the BMDO Strategic Information Management Plan and BMDO Five Year Information Resources Management Plan (FYIRMP). This project is also responsible for the identification and support of High Performance Computing requirements.</p> <p>Lethality Model activities provide modeling and simulation support for the BMDO Corporate Lethality Program and the lethality community. The Lethality program answers are the primary evaluation tools to determine the success or failure of a threat target intercept. This task supports the maintenance and enhancement of lethality models through the development of standard lethality threat-representative targets, the pre-flight prediction of tests and experiments to obtain lethality data and the incorporation of that data into the interceptor/target lethality models' design.</p> <p>This mission common task includes the government salaries and related support costs (e.g. rent, travel, supplies, etc.) for the Service Executing Agent (EA) government technical personnel, other than the PEO, directly supporting and assigned to the Testbed Product Office and the ARC/SC.</p> <p>This project is conducted in accordance with DoD 5000.59, DoD Modeling and Simulation (M&S) Management.</p> <p>FY 2000 Accomplishments:</p> <ul style="list-style-type: none"> • 13453 The ARC/SC is a Major DoD computational, testbed, communication, and engineering support center. The ARC/SC successfully supported BMDO, USASMDC, NMD JPO, PEO AMD and the HPCMO in National Missile Defense (NMD), Theatre Missile Defense (TMD), Technology and other DoD programs and projects milestones. The ARC/SC successfully completed the design, development and installation of the second Integrated System Test Capability (ISTC2) in support of the National Missile Defense program. The Atmospheric Interceptor Technology (AIT) testbed has been designed, and a super computer purchased/ installed and the AIT is expected to be operational by the end of FY2000. In addition, the ARC/SC personnel continue to provide "hands-on" support to 108 BMDO and USASMDC programs and projects for complex problem resolutions. ARC/SC modeling and simulation resources continue to be used to isolate and correct missile, sensor, battle management, and radar software prior to critical milestones and flight tests. 		
Project 3352	Page 23 of 57 Pages	Exhibit R-2A (PE 0603874C)

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
		June 2001
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603874C BMD Technical Operations	3352
<ul style="list-style-type: none"> • 4471 Provided BMDO M&S support in three major areas: assessments, development/modification, and program management for BMDO and Service M&S programs. This area also included funding for Service M&S activities. Top priorities included: the BMDO M & S Acquisition Strategy and Investment Plan; Wargame 2000; BMD SSC; Modeling and Simulation Working Group (MSWG) management; execution of MSWG action plans; and model assessments/evaluations. Continued to incorporate new web technology into the BMD SSC, as well as continue the population and refinement of M&S catalogs/repositories. Continued to refine and update on-line query capabilities of both unclassified and classified information. Assisted and improved DoD support to the DMSO MSRR. • 7510 Provided JNTF Project funding to support continued development of Wargame 2000. The Wargame 2000 program continued to design and develop a "world-class" simulation tool for use in support of wargames and exercises testing operational concepts involving National Missile Defense and Theater Air and Missile Defense. Funding involved development to support a NMD Command and Control Simulation event, two Wargame 2000 Theater Air and Missile Defense (TAMD) demonstration exercises and a NMD Follow-on capability (FOC). Also, provided a version of Wargame 2000 for the FY '00 Multi National Conference. • 7313 Designed and developed a distributed HWIL Testbed linking the Ground Based Radar Simulation (GBRSIM) at the Advanced Research Center (ARC) with the AMCOM THAAD infrared HWIL facilities in Huntsville, AL. In parallel effort, connected AMCOM AIT (optical) and SMDC ARC (radar) HWIL connectivity for real-time information fusion analysis and algorithm development and design a Next Generation Internet/Virtual Private Network (NGI/VPN)-based geographically distributed network for the Navy Theater Wide (NTW) program. This NGI/VPN capability linked the Raytheon Standard Missile Block III infrared HWIL/SIL facility in Tucson, AZ, with the Moorestown, NJ AEGIS Combat System Engineering Development Site (CSEDS). The NGI/VPN technology supported high bandwidth communications over NGI networks, such as Internet 2, while providing the quality of service and security features that allow use of public networks for sensitive applications. • 1861 Continued to support BMDO's Mission Oriented ITR. Priorities included: continued modernization of BMDO's computer capabilities based on supporting BMD program priorities; continued upgrading of supercomputers to support modeling and simulations and computationally intensive analyses; implementation of new technology to support multimedia applications; replacement of obsolete computational resources; continue to expand Mission Oriented ITR data collections to include all Mission Oriented programs; and supported the drafting and execution of BMDO Strategic Information Management Plan and FYIRMP. • 2965 Provided funding for Army salaries in support of the ARC/SC and the SMDC Battlelab. 		
Total		37573

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)		DATE
BUDGET ACTIVITY 4 - Demonstration and Validation		June 2001
PE NUMBER AND TITLE 0603874C BMD Technical Operations		PROJECT 3352
FY 2001 Planned Program:		
•	16899 Modernize/upgrade and expand high performance computing resources, provide high level technical support and operational capability for multiple NMD, TMD and Technology testbeds. These testbeds facilitate research, development and testing for the BMDO Missile Defense programs. Major areas of support include upgrades, enhancements, maintenance, and facility modification. FY2001 requirements have been developed and complied in the ARC/SC Long Range Plan (LRP). The LRP quantifies the infrastructure upgrades for the computational, networking and communications resources.	
•	4722 Signature Models provide high confidence signature prediction capability for active and passive EO and RE sensors used in BMD elements and systems. Signature Models data will be used to support test planning, test target design, sensor design/development/test, data and systems analysis, operational test and evaluation, and algorithm development. The codes are used to generate databases to support HWIL and engagement-level simulations and to calibrate and improve the realism of force-on-force simulations. They are also used to gauge system and sub-system performance in aspects of the engagement envelope that cannot or will not be fight-tested.	
•	3679 Provide BMDO M&S support in three primary areas: assessments, development/modification, and program management for BMDO and Service M&S programs. This area also includes funding for Service M&S activities. Top priorities include: the BMDO M&S Investment Plan; BMD SSC; MSWG management; execution of MSWG action plans; and model assessments/evaluations. Continue the population and refinement of M&S catalogs/repositories. Continue to refine and update on-line query capabilities of both unclassified and classified information. Assist and improve DoD support to the DMSO MSRR.	
•	7183 Provide JNTF Project funding to support continued development of Wargame 2000. The Wargame 2000 program will continue to design and develop a "world-class" simulation tool for use in support of wargames and exercises testing operational concepts involving National Missile Defense and Theater Air and Missile Defense. The Executing Agent will maintain NMD capabilities and will continue to incorporate changes reflecting the evolving NMD/TMD architectures. Wargame 2000 will support NMD and JTBMD events in FY'01.	
•	1092 Provide Lethality funding to support primary evaluation tools that determine the success or failure of a threat target intercept. Current models include Parametric Exo/Endoatmospheric Lethality Simulation (PEELS) and Post Engagement Ground Effects Model input for campaign level models. During FY01, the management of these models will be streamlined. Resources support BMDO Corporate Lethality Program (CLP), MSWG, CTWG, and TEWG subcommittees as well as other Defense committees and boards pertaining to lethality.	
•	9315 Designed and developed a distributed HWIL Testbed linking the Ground Based Radar Simulation (GBRSIM) at the Advanced Research Center (ARC) with the AMCOM THAAD infrared HWIL facilities in Huntsville, AL. In parallel effort, connected AMCOM AIT (optical) and SMDC ARC (radar) HWIL connectivity for real-time information fusion analysis and algorithm development and design a Next Generation Internet/Virtual Private Network (NGI/VPN)-based geographically distributed network for the Navy Theater Wide (NTW) program. This NGI/VPN capability linked the Raytheon Standard Missile Block III infrared HWIL/SIL facility in Tucson, AZ, with the Moorestown, NJ AEGIS Combat System Engineering Development Site (CSEDS). The NGI/VPN technology supported high bandwidth communications over NGI networks, such as Internet 2, while providing the quality of service and security features that allow use of public networks for sensitive applications.	
•	1561 Provide funding for Army salaries in support of the ARC/SC.	
Total	44451	
Project 3352		
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Exhibit R-2A (PE 0603874C)		

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3352
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B. <u>Other Program Funding Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
3352, Modeling and Sim, PE 0603873C		25133								
3155, Sys Eng & Integration, PE 0603872C	11488									

C. Acquisition Strategy:
 The work in this project is sourced through full and open competition. Majority of M&S support is performed at the JNTF, ARC/SC, BMD SSC and other test bed facilities. The ARC/SC contractor operates under a Cost Plus Fixed Fee (CPFF) contract first awarded in June of 1989.

D. <u>Schedule Profile</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
BMDSSC Version Release (Unclassified)	1Q-4Q	1Q-4Q						
Wargame 2000 Integration with BMC3	1Q							
M-O FYIRMP	4Q	4Q						
BMD SSC Version Release (Classified)	1Q,3Q	1Q,3Q						
C2SIM with Wargame 2000	1Q							
C2SIM '00 w/ Wargame 2000		1Q						
Wargame 2000 TAMD IOC	3Q							
Wargame 2000 TAMD FOC (Block 33)		3Q						
M & S Acquisition Strategy	1Q							
M & S Investment Plan	2Q	2Q						
PEGEM Version 3.6		1Q						

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3352
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. ARC Infrastructure	SS/CPFF	Colsa Corporation (HSV)	14016	16899								
b. Simulation Center Infrastructure	C/CPFF	Madison Research (HSV)	8437									
c. WG2K Software Dvlpmt, Rqmt Analysis, System Engineering and design test	C/CPAF	TRW (JNTF)	22451	7183								
d. Services M&S	Allotment	Multiple	861	0								
e. BMDO Data Centers	Allotment	Multiple	12317	0								
f. Mission Oriented ITR	Allotment	Multiple	2907	0								
g. Bandwidth Infrastructure	Allotment	Multiple	7660	9315								
h. Signature Models	Allotment	Multiple	0	4722								
i. Lethality Models	Allotment	Multiple	0	1092								
j. SSC Support	Allotment	Multiple	0	821								
Subtotal Product Development:			68649	40032								

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Support Costs:												

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. T&E Technical Support	BMDO HQ Contract	Vanguard	1353	777								
b. T&E Technical Support	BMDO HQ Contract	TRSR	997	1302								

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3352
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c. T&E Technical Support	BMDO HQ Contract	SPARTA	2152	733								
d. T&E Technical Support	BMDO HQ Contract	MITRE	2295	0								
e. T&E Technical Support	BMDO HQ Contract	TRW	2895	0								
f. T&E Technical Support	BMDO HQ Contract	EER	0	46							46	
Subtotal Test and Evaluation:			9692	2858							12550	

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001</u> Cost	<u>FY 2001</u> Award Date	<u>FY 2002</u> Cost	<u>FY 2002</u> Award Date	<u>FY 2003</u> Cost	<u>FY 2003</u> Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Army Salaries	Allotment	Huntsville	5484	1561								
Subtotal Management Services			5484	1561								

Remark:

Project Total Cost:			83825	44451								
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Remark:

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE June 2001			
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3353		
COST (In Thousands)		FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3353 JNTF		52510	46670								
A. <u>Mission Description and Budget Item Justification</u>											
<p>The Joint National Test Facility (JNTF) is BMDO's premiere modeling, simulation and test capability for evaluating the interoperability of Theater Missile Defense (TMD) and National Missile Defense (NMD) functions. It is staffed by the military services with a focus on Family of System Interoperability for TMD and NMD in both Joint and Combined environments. In evaluating systems interoperability, the JNTF measures the integrated effects of systems and architectures, using both actual and simulated systems, and the capability to demonstrate effective information exchange within a prescribed scenario. In addition to conducting tests on systems of systems, JNTF also provides one-on-one support to TMD service developers for technical insertion and upgrade programs. JNTF also actively participates in CINC-sponsored TMD Exercises and Experiments supporting simulation and connectivity requirements, as well as collecting field interoperability data / information to assist in validating models and simulations. Both TMD and NMD Battle Management capabilities are exercised and evaluated at the JNTF. The JNTF provides inter-service computational capabilities and wide area network communication networks with Service facilities.</p> <p>FY 2000 Accomplishments:</p> <ul style="list-style-type: none"> • 24030 The JNTF conducted a TMD interoperability test and subsequent analysis in the third quarter. This test gave clear indications of interoperability problems that needed to be addressed by the various systems involved. Preparations were made and dry runs conducted for an expanded test that is to occur in the second quarter of FY01. The JNTF supported 30 CINC exercises with missile defense inputs through the Missile Defense and Space Tool. Conducted two Joint Theater and Air Missile Defense (JTAMD) wargames for the warfighter community. Conducted Passive Defense Early Warning Analysis for the JTAMD Organization Technical Director in support of their Joint Mission Area Assessment. Employed the JNTF's capability to compare and contrast various approaches to fusing data for NMD and TAMD functions which contributed to the Joint Composite Tracking Network algorithm benchmarking effort. Began conducting a verification and validation of the Theater Missile Defense System Exerciser (TMDSE) TADIL J Communication Emulation Segment. The JNTF provided high-end computational resources for the entire DoD community. This capability allowed the acceleration of the Wargame 2000 development. Provided a missile defense data repository to archive, manage, develop, distribute, and provide remote access to all relevant BMD test, experiment, M&S, and wargame data. Managed the BMDO Data Centers program. • 2023 Began the transition of Wide Area Network architectural changes to adopt Asynchronous Transport Mode as the technology of choice for remote connectivity. Upgraded information technology assets used to support the program management functions and to evolve to a more web-centric operation. Investments in data backup and restoral of key program management and mission data were completed. • 26457 Provide operations support of network, computer hardware, software, and communication procurement, installation, and maintenance, leased communication lines, systems engineering, security (both personnel and equipment), facility maintenance, government civilian pay, advisory and assistance service to the government, and contractor management services essential to missile defense acquisition. (Note: This area also supports \$28M of mission work from other BMDO PMAs and other DoD Agencies.) <p>Total 52510</p>											
Project 3353		Page 29 of 57 Pages					Exhibit R-2A (PE 0603874C)				

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3353
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FY 2001 Planned Program:

- 15239 Bridge the gap between warfighters and the Missile Defense acquisition community by creating key information related to Air and Missile Defense CONOPS, and the development, acquisition, and deployment of systems and architectures. Conduct two major TMD Hardware-in-the-Loop interoperability tests with analysis reports, and accomplish all preparations for a third test that will be conducted in 1QFY02. Continue to update the Theater Missile Defense System Exerciser (TMDSE) that provides a test platform for BMDO-sponsored Hardware in the Loop Tests (HWILT). Provide analysis expertise to address BMD issues across the entire development and operational spectrum. Provide command and control simulations for TMD and NMD for joint CONOPS development, and provide missile defense system simulations to CINC exercises. In addition to large C2 simulations, conduct one large C2 Simulation Workshop and 2-3 smaller simulations to support BMC3 procedure development. Incorporate new WEB technologies into the BMD Simulation Support Center, and update the TMD, NMD, and building block M&S catalogs/repositories.
- 1576 Continue to modernize and upgrade the Wide Area Network architecture to reduce costs for remote connectivity and prepare for growth in bandwidth requirements. Upgrade 15% of desktop productivity tools and roll out Microsoft Office 2000. Implement facility modernization to support the technology base.
- 29855 Provide operations support of network, computer hardware, software, and communication procurement, installation, and maintenance, leased communication lines, systems engineering, security (both personnel and equipment), facility maintenance, government civilian pay, advisory and assistance service to the government, and contractor management services essential to missile defense acquisition. (Note: This area also supports \$23M of mission work from other BMDO PMAs.)

Total 46670

B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY2007</u>	To Compl	Total Cost
2259 Israeli Cooperative Projs, 0603875C	188	0								
2404 BMC3, 0603871C	4024	0								
2407 Systems Engineering, 0603871C	4325	0								
3153 TAMD Integration, 063873C		59								
3155 Sys Eng & Integration, 0603873C	1025	99								
3161 Data Centers & Management, 0603874C	0	1653								
3261 TMD BM/C3I, 0603873C	437	0								
3270 Threat And CM Program, 0603876C	2075	2526								
3352 Modeling & Simulation, PE 0603874C	8077	8004								
3359 Test, Eval & Assessment, 0603873C	2493	5874								
MIPRs from other DoD Agencies	4793	0								

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3353
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C. Acquisition Strategy:

The tasks in this project are met through full and open competition. The CRDC contract, currently performed by TRW and its sub-contractors, will be re-competed in FY01 through full and open competition. Formal source selection procedures are envisioned with an estimated award date of 15 October 2001. Contracted Advisory & Assistance Services are provided by Vanguard Research as Cost Plus Award Fee. This contract is being re-competed as a technical and administrative assistance contract for the JNTF Government staff in FY00. Formal source selection procedures are envisioned with an estimated award date of 15 October 2001.

D. <u>Schedule Profile</u>	<u>FY2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
TAMD/CINC Exercises	1-4Q	1-4Q						
TAMD Wargame	4Q	2&4Q						
C2 Simulation (NMD)		1Q						
Interoperability Tests	2Q	2&4Q						
Wargame 2000 Block 31	3Q							
Wargame 2000 Block 32		1Q						
Wargame 2000 Block 33		2Q						

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3353
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. N/A												
Subtotal Product Development:												

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost FY99-01	Target Value of Contract
a.												

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. TRW	C/CPAF	JNTF	89948	36686	TBD							
b. Vanguard Research	C/CPAF	JNTF	7877	3900	TBD							
c. JNTF	Government	JNTF	7935	3924	N/A							
d. USN NRL	Government	JNTF	1675	800	N/A							
e. LLNL	FFRDC	LLNL, Livermore, CA	600	300	N/A							
f. MITRE	FFRDC	JNTF	1686	1060	N/A							
Subtotal Test and Evaluation:			109721	46670								

Remark:

The JNTF provides missile defense-related analysis, system level engineering, integration, and test and evaluation; supports the development of joint and combined missile defense doctrine, requirements, and CONOPS; and supports warfighting CINCs by conducting joint and combined simulations and wargames and participating in exercises. It accomplishes this mission by hosting BMDO projects, and non-BMDO customers who have synergy with missile defense, with space occupancy (facility O&M, security, utilities, transportation and handling, etc.), computers (O&M, networking, supplies and materials, customer service, licensing, installation, etc.), communications, modernization of computer equipment and software, facility modifications and enhancements, and product engineering support.

The JNTF focus is on interoperability testing. This involves conducting C2 simulations to develop and test CONOPS for missile defense, and conducting tests with all TMD missile defense systems connected to test their ability to work together in a theater defensive posture.

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3353
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On 1 Feb 99 JNTF consolidated the Lockheed Martin O&M contract and the TRW R&D contract into a TRW Consolidated R&D Contract.

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. N/A												
Subtotal Management Services:												

Remark:

Project Total Cost:			109721	46670								
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Remark:

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3354	
COST (<i>In Thousands</i>)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3354 Targets	2159	50952								
A. <u>Mission Description and Budget Item Justification</u>										
<p>The PAC-3, Navy Area, THAAD, Navy Theater Wide, and Airborne Laser (ABL) programs require target system support to accomplish their planned test and evaluation programs. The PAC-3 program uses HERA and Storm targets launched from Ft. Wingate into White Sands Missile Range (WSMR) and from Wake Island to Kwajalein Missile Range (KMR). The Navy Area program will use HERA targets from Ft. Wingate into WSMR, Short-Range Air Launched Targets (SRALT) at PMRF for the Linebacker test series, and Navy Theater Wide is using the Minute Man I, M-56 second stage booster for Aegis Leap Intercept testing launched from Pacific Missile Range Facility (PMRF - Barking Sands, Kauai) into open ocean impact areas. Lance missiles have been used for testing with the PAC-3 and the Navy Area programs. U.S. Army Space and Missile Defense Command (USASMDC) and U.S. Air Force Space and Missile Command (USAFSMC) are developing short and long range air launched target (LRALT) capabilities. LRALT will augment the existing target inventory; provide the capability to launch targets at various azimuths and ranges into TMD test ranges; and allow multiple simultaneous engagements.</p> <p>In FY00, this project maintained the Strategic Target System (STARS) motors, components and launch equipment and mission planning support for possible future use as a Theater Missile Defense (TMD) long range target or National Missile Defense (NMD) target. FY01 funding for STARS is in the NMD Technology Program Element (0603871C).</p> <p>In FY01, this project will support the Consolidated Targets Program (CTP), the mission of which is to provide threat-credible ballistic missile targets and target system support to weapon system development and acquisition programs in accomplishment of BMDO's reliance obligations to the Department of Defense (DOD). The major functions of the CTP include: design, development and presentation of Theatre Missile Defense (TMD) targets; management of the Target Certification Process; Verification, Validation and Certification (VV&C) of target assets; modification and reuse of strategic missile hardware; air launched and liquid fueled target development; matching ballistic re-entry vehicle development; proof of concept/risk reduction demonstration flights; the acquisition and management of actual threat targets (Foreign Material Acquisition), and program management. Each target developed for BMD testing will be certified as providing the correct threat representative characteristics to test a system.</p>										
FY 2000 Accomplishments:										
	2159	Provided for maintenance, storage, aging and surveillance, refurbishment and mission planning of STARS assets in anticipation of future launch requirements.								
Total	2159									
Project 3354			Page 34 of 57 Pages				Exhibit R-2A (PE 0603874C)			

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3354
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- FY 2001 Planned Program:**
- 12155 Provide for the purchase, acquisition, refurbishment, storage, aging and surveillance, maintenance, and testing of boosters, RVs, and missile related components used to build target systems. This includes SR-19 boosters, Pershing II RVs, M-57 boosters, and the Lance Missile assets. Provide requirements analysis, mission planning, target VV&C, contract coordination, program management, cost reduction analysis, database development, range integration, and pre/post mission analysis services for all TMD customers.
 - 1600 Provide target infrastructure and target-related support systems required to ensure WSMR, PMRF, and Wake Island can operationally support interceptor flights, air launch programs, and limited mission planning for various TMD programs.
 - 31327 Includes Support design, development, and demonstration of the Long-Range Air Launched Target (LRALT) including a threat representative RV and MBRV-2 Risk Resolution Flight from Wake Island.
 - 794 Provide maintenance, refurbishment, and launch services for acquired Foreign Material Acquisition (FMA) targets. FMA assets provide actual threat targets for testing against TMD systems.
 - 2482 Provide target-related engineering and technical assistance in support of a liquid fueled surrogate target design. The design will address performance expectations, divergences from baseline signatures, trajectory kinematics accuracy, test range compatibility, and Laser Attack Vulnerability Assessment. Initiates Phase 1 of Liquid Surrogate target Development Program.
 - 2594 Provide government project personnel support.
- Total 50952

B. Other Program Funding Summary	<u>FY2000</u>	<u>FY2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>To Compl</u>	<u>Total Cost</u>
2257 PATRIOT, PE 0604865C	220674	79851								
2260 THAAD, PE 0604861C	81614	543498								
2260 THAAD, PE 0603861C	506221	0								
1266 NAVY THEATER WIDE, PE 0603868C	368769	456372								
2263 NAVY AREA, 0604867C	303479	271052								
2400 NMD, PE 0603871C	944922	1853877								
3354 TARGETS, PE 0603872C	43711									
3354 TARGETS, PE 0603878C										
3354 TARGETS, PE 0603873C	5886									
3354 TARGETS, PE 0603173C	8917	9433								
3360 TEST RESOURCES, PE 0603874C	66758	102746								
3360 TEST RESOURCES, PE 0603878C										
3360 TEST RESOURCES, PE 0603872C	14954									
3360 TEST RESOURCES, PE 0603871C	474	474								

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3354
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C. Acquisition Strategy:

- The Hera and Storm target systems are being developed by the executing agent: U.S. Army Space and Missile Defense Command (USASMDC), Theater Targets Program Office (SMDC-TJ-TT) in Huntsville, AL. The Hera and Storm target systems are being procured under the Consolidated Theater Target Services (CTTS) contract. Coleman aerospace corporation, Orbital Sciences Corporation, and Lockheed Martin Missile Systems compete for TMD target services. This contract provides increased flexibility to meet MDAP schedules and requirements.
- The development and demonstration of the long range air launched ballistic target system (LRALT) is being managed by the USASMDC/TT&E office with the Air Force Space and Missile Command as the contracting agency.
- With the advent of LRALT STARS is no longer a required TMD target. STARS will continue to be supported in the NMD Technology Program Element (0603871C).
- A liquid fueled target development program was initiated in FY00 to design a liquid-fueled booster for TMD target use. FY01 initiates a design phase with development starting in FY02.

D. Schedule Profile

	<u>FY2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Navy Area		1-4Q						
Navy Theater		1-4Q						
PAC-3	2Q-4Q	1-4Q						
Others (Technology Programs)		2Q						

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3354
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Target Validation	Allot	USASMDC Huntsville, AL	56511	28482	N/A							
b. Liquid Fueled Targets	CPFF	USASMDC Huntsville, AL	0	2482								
c. LRALT	CPFF	USAFSMC Los Angeles, CA	0	16600								
d. FMA	CPFF	USASMDC Huntsville, AL	0	794								
Subtotal Product Development:			56511	48358								

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Support Costs:												

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Test and Evaluation:												

Remark:

BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3354
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IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Maintenance of System	Allot	USASMDC, Huntsville, AL	5467	2594	N/A							
Subtotal Management Services:			5467	2594								

Remark:

Project Total Cost:			61978	50952								
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Remark:

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations				PROJECT 3357		
COST (In Thousands)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3357 Facilities, Siting, and Environment	0	2975								
A. <u>Mission Description and Budget Item Justification</u>										
<p>In FY01, this project provides environmental program guidance, environmental impact analyses and documentation, real property facility siting, acquisition, and facility operational support for the Ballistic Missile Defense Organization (BMDO) Theater Missile Defense (TMD) and National Missile Defense (NMD) systems. This project plans, programs, budgets, and oversees facility acquisition through the Military Construction (MILCON) and RDT&E construction programs. This project provides guidance and supports BMDO TMD, NMD, and Advanced Technology Environmental Safety and Health (ESH) Programs, including the Environmental Assessment and Environmental Impact Statement process, environmental compliance, pollution prevention, and other environmental efforts.</p>										
FY 2000 Accomplishments:										
<ul style="list-style-type: none"> • • 										
Total	0									
FY 2001 Planned Program:										
<ul style="list-style-type: none"> • 1335 Ensure ESH compliance of BMDO weapon systems throughout the acquisition life cycle. ESH efforts are accomplished in five (5) areas to integrate ESH issues into the systems engineering and other program planning processes. These areas are 1) the National Environmental Policy Act (NEPA), 2) environmental compliance, 3) safety and occupational health, 4) hazardous materials, and 5) pollution prevention. Work continues on new BMDO requirements as well as on NMD, Space Based Laser (SBL), Navy Area, Navy Theater Wide, MEADS, THAAD, PAC-3, and technology programs to meet their requirements. • 1640 Ensure the FY00-03 MILCON, Minor MILCON, and RDT&E design and construction activities are executed in time to support BMD programs' facility requirements and ensure compliance with all applicable laws and regulations. Emphasis will be on completing the design for the National Missile Defense (NMD) facility requirements in support of the Deployment Readiness Review, TMD systems, and the SBL Test Facility. Provide for TMD and NMD test and evaluation facilities improvements to support increasingly complex test scenarios. 										
Total		2975								
<p>Project 3357 Page 39 of 57 Pages Exhibit R-2A (PE 0603874C)</p>										

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE		
BUDGET ACTIVITY								PROJECT		
4 - Demonstration and Validation								3357		
PE NUMBER AND TITLE										
0603874C BMD Technical Operations										
B. <u>Other Program Funding Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	To <u>Compl</u>	Total <u>Cost</u>
2257 PATRIOT, PE 0604865C	220674	79851								
2260 THAAD, PE 0604861C	81614	542498								
2260 THAAD, PE 0603861C	506221	0								
1266 NAVY THEATER WIDE, PE 0603868C	368769	456372								
2263 NAVY AREA, 0604867C	303479	271052								
3354 TARGETS, PE 0603874C	2159	50952								
3354 TARGETS, PE 0603878C										
3354 TARGETS, PE 0603873C	5886									
3354 TARGETS, PE 0603173C	8917	9433								
3354 TARGETS, PE 0603872C	43711									
3360 TEST RESOURCES, PE 0603871C	474	474								
3360 TEST RESOURCES, PE 0603872C	14954									
3360 TEST RESOURCES, PE 0603874C	66758	102746								
3360 TEST RESOURCES, PE 0603878C										
3357 Facilities, Siting, & Environmental, PE 0603878C										
3357 MILCON Planning & Design 0603878C										
3360 MILCON Planning & Design 0603874C	124									
3357 Minor MILCON 0603878C										
3360 Minor MILCON 0603874C	1248									
2400 NMD MILCON Planning & Design 0603871C	15000	14500								
2400 NMD Minor MILCON 0603871C		2000								
2400 NMD Major MILCON 0603871C		85095								
2400 NMD, PE 0603871C 0603871C	944922	1853877								

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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3357
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C. Acquisition Strategy:

BMDO tasks the Services through Program Management Agreements to perform the required tasks in support of the BMD program and performs quarterly reviews to verify and validate completed tasks.

To provide technical assistance concerning facilities construction, siting, and environmental activities, BMDO implements a process which:

- Maintains perspective of national technical test capabilities relative to all BMD developmental programs,
- Responds to MDAP program requirements,
- Makes maximum use of existing test resources where possible,
- Requires full coordination prior to development of new resources,
- Consolidates management of existing resources where possible and practical.

This process is executed through a variety of acquisition methods. Executing Agent Project Managers for the elements and tasks under this project include the three military services and the BMDO. Service Project Manager organizations specifically include the:

- U.S. Army Space and Missile Defense Command (USASMDC)
- U.S. Air Force Materiel Command
- Navy Program Executive Officer (Theater Surface Combatants)
- U.S. Army Corps of Engineers (USACE)
- U.S. Navy, Naval Facilities Engineering Command (NAVFAC)
- U.S. Army Program Executive Officer-Missile Defense.
-

D. <u>Schedule Profile</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Environmental Support for BMDO Programs		1-4Q						
Facility Acquisition Support for BMDO Programs		1-4Q						

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BMDO RDT&E COST ANALYSIS (R-3)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3357
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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Army TMD Facility/ Environmental Programs Development	Allot	Army PEO, Huntsville		100	10/01/00							
b. Navy TMD Facility/ Environmental Programs Development	Allot	Navy PEO TSC, Arlington VA		50	10/01/00							
c. Air Force TMD Facility/Environmental Programs Development	Allot	AF SMC, Los Angeles CA		77	10/01/00							
d. Army SMDC Fac/Envir Prog Development	Allot	Army SMDC, Huntsville, AL		20	10/01/00							
Subtotal Product Development:				247								

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Facility Acquisition Life-Cycle Management	MIPR	U.S. Army Corps of Engineers, Huntsville AL		84	10/01/00							
b. System Engineering and Technical Support (BMDO)	CPFF	SciComm, Inc. – Bethesda, MD		2622	10/01/00							
c. Army PAX Support	MIPR	U.S. Army Corps of Engineering, Washington DC		22	10/01/00							
Subtotal Support Costs:				2728								

Remark:

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III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Test and Evaluation:												

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a.												
Subtotal Management Services:												

Remark:

Project Total Cost:				2975								
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Remark:

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BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3359	
COST (In Thousands)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3359 Test, Evaluation, and Assessment	0	11375								
<p>A. <u>Mission Description and Budget Item Justification</u></p> <p>Fiscal year 2001 Test, Evaluation and Assessment activities consist of selected activities previously performed under Project 1155, Discrimination.</p> <p>To prepare for critical future defense needs, technical operations will support BMDO programs by conducting several cross cutting programs that will yield improved capabilities across a selected range of boost, midcourse and terminal phase missile defense interceptors, advanced target sensors and innovative science. The ultimate objective is improved performance, reduced costs for acquisition programs and technical solutions options to mitigate evolving threats associated with National and Theatre Ballistic Missile Defense.</p> <p>This program provides the critical BMD signature data collection, analysis and reporting provided to the BMD community necessary for weapon system and interceptor development. Analysis efforts consist of Radar Cross Section analysis and Infrared signature analysis using data collection by assets owned or operated by BMDO or operated by other agencies for use by BMDO.</p> <p>This program also supports BMDO efforts to engage Allied countries in conducting collaborative efforts associated with ballistic missile signature and phenomenology research. Exchanges are conducted to assist Allies in facilitating surveillance, acquisition, track, discrimination and kill assessment through data collection, analysis and reporting.</p> <p>FY 2000 Accomplishments:</p> <ul style="list-style-type: none"> • <p>Total 0</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 7021 Optical/RCS data collection analysis and reporting • 1533 International • 1489 Advanced Multi-sensor Fusion Test Bed support • 693 Corporate data collection, analysis and reporting • 639 Test Planning and Management Support <p>Total 11375</p>										
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B. <u>Other Program Funding Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>To Compl</u>	<u>Total Cost</u>
3359 System Test and Eval, PE 0603872C	19915									
3359 System Test and Eval, PE 0603878C										
3359 System Test and Eval, PE 0603873C	22252	64827								

C. **Acquisition Strategy:** This program provides critical optical/IR and RCS signature data and algorithm development for the BMDO MDAPs and is inserted in the systems engineering process for weapon system improvement. International collaborative efforts promote shared ballistic missile defense research and technologies which will contribute to a stronger ballistic missile defense capability by Allied countries

D. <u>Schedule Profile</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Live BM flight events (MDAP DT/OT, CMP, SIT, Real World)		1Q/4Q						

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BMDO RDT&E COST ANALYSIS (R-3)										DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation					PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3359		
I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>FY 2002 Cost</u>	<u>FY 2002 Award Date</u>	<u>FY 2003 Cost</u>	<u>FY 2003 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
Subtotal Product Development:												
Remark:												
II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>FY 2002 Cost</u>	<u>FY 2002 Award Date</u>	<u>FY 2003 Cost</u>	<u>FY 2003 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contt
Subtotal Support Costs:												
Remark:												
III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>FY 2002 Cost</u>	<u>FY 2002 Award Date</u>	<u>FY 2003 Cost</u>	<u>FY 2003 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. Mission Planning supt.	MIPR	Various		261	1Q01							
b. Collection, analysis and reporting	Allotment	Various		7714								
c. International	Multiple	Various		1533								
d. Testbed Support	Allotment	PMRF		1489								
Subtotal Test and Evaluation:				10997								
Remark:												
IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	<u>FY 2001 Cost</u>	<u>FY 2001 Award Date</u>	<u>FY 2002 Cost</u>	<u>FY 2002 Award Date</u>	<u>FY 2003 Cost</u>	<u>FY 2003 Award Date</u>	Cost To Complete	Total Cost	Target Value of Contract
a. SMDC	Allotment	SMDC, Huntsville, AL		378	1Q01							
Subtotal Management Services:				378								
Remark:												
Project Total Cost:				11375								
Remark:												

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BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3359	
COST (<i>In Thousands</i>)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
3360 Test Resources	65386	102746								
A. <u>Mission Description and Budget Item Justification</u>										
<p>This project provides for BMDO planning, oversight and coordination of integrated test and evaluation facilities. The project includes inter-element as well as inter-service test and evaluation efforts, and provides for common ground test facilities, ranges and instrumentation. Project 3360 funds those test resources mutually supporting BMDO's National Missile Defense (NMD), Theater Missile Defense (TMD) and Technology programs. Individual BMDO programs pay only the direct costs associated with their specific testing efforts at these mission critical facilities.</p> <p>The ground test facilities include:</p> <ul style="list-style-type: none"> Kinetic Kill Vehicle Hardware in the Loop Simulator (KHILS) at Eglin AFB in Fort Walton Beach, FL AEDC Hypervelocity Wind Tunnel Number 9 (Tunnel 9) at White Oak, MD Infrared and Blackbody Standards at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD. Hypervelocity Ballistic Range G Light Gas Gun Von Karman Facilities (VKF) at the Arnold Engineering and Development Center (AEDC) in Tullahoma, TN 7V and 10V Space Chambers at AEDC, Tullahoma, TN National Hover Test Facility (NHTF) at Edwards AFB, CA Army Missile Optical Range (AMOR) at Redstone Arsenal, AL Aero-Optic Evaluation Center (AOEC) at Calspan-University of Buffalo Research Center (CUBRC), NY Holloman High Speed Test Track (HHSTT) at Holloman AFB, NM <p>The test range facilities include national ranges such as:</p> <ul style="list-style-type: none"> White Sands Missile Range (WSMR) in Las Cruces, NM including Ft. Wingate Launch Complex near Gallup, NM Kwajalein Missile Range (KMR) in the Marshall Islands Pacific Missile Range Facility (PMRF) and Kauai Test Facility (KTF) at Kauai, HI Wake Island Launch Complex <p>The range instrumentation special test equipment, data collection assets, and range instrumentation include:</p> <ul style="list-style-type: none"> IR data collection sensors and platforms Mobile Range Safety System and Kwajalein Range Safety Control Center Upgrades NP-3 Aircraft upgrade for remote area safety support. Sea-Lite Beam Director (SLBD), based at White Sands Missile Range, Las Cruces, NM Miscellaneous improvements to BMDO infrastructure and support systems 										
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 3360
<p>These ground test, range and instrumentation assets provide valuable risk reduction and test implementation capability in support of TMD and NMD test and evaluation. The ground test facilities provide a cost-effective method of testing and evaluating applicable component, sub-system and system level technologies. The common range facilities provide a cost-effective method of flight testing missile and target components applicable to the BMD program and TMD Family of Systems (FoS), BMC³ and interoperability testing. Range instrumentation provides a cost-effective capability to collect missile characteristics, phenomenology data, and target/interceptor diagnostics on flight tests. These facilities and capabilities support systems design, verification and validation of weapon system and target realism, and the evaluation of test results.</p> <p>FY 2000 Accomplishments:</p> <ul style="list-style-type: none"> • 12278 Provided ground test facility infrastructure and upgrades for BMDO testing including: wind tunnel testing at Tunnel 9 and AOEC; sensor testing at AEDC 7V/10V; lethality testing at AEDC Range G/VKF; primary IR standards, black body and optical materials, calibrations at the NIST; Integrated kill vehicle testing at NHTF; capability for sled track maintenance and upkeep at HHSTT; upgrades at KHILS to support TMD, AIT and NMD interceptor kill vehicle testing; Lidar test activities at AMOR; and IR testing at the POST facility. • 3238 Provided test range planning and range instrumentation support, maintenance and upgrades. Included all efforts associated with integrating the Ballistic Target Program with National Range activities, MDAP customers, BMDO, and National Laboratories. Included all efforts associated with direct target launch mission support, efforts associated with target launch logistics support, development and coordination of all required Universal Documentation System inputs, and efforts associated with target launch site development at the various National Ranges. • 17883 Continued support of Navy Area and Theater-Wide Programs TBMD risk reduction at-sea testing and infrastructure improvements at PMRF. Provided support to SLBD, an infrared optical data collection, data recording/reduction, and data analysis and reporting system. Provided maintenance of the physical plant, the technical systems and the compliance posture of the Kauai Test Facility. Supported risk reduction activities for Navy Area and Navy Theater Wide testing, by implementing additional upgrades and improvements to the radar instrumentation, range data display system, telemetry instrumentation, a scenario planning tool, and advanced electro-optical sensor technology at PMRF. • 1777 Provided for White Sands Missile Range (WSMR) general support to BMDO and for the maintenance and care of launch facilities which support BMD testing. Contracted with land owners for the use of their land. Provided White Sands technical support to BMDO to conduct studies and respond to taskings as requested. • 14849 Provided O&M core funding to keep the IR data collection platforms, including AST and HALO/IRIS, intact and the system operational in order to support customer-funded TMD and NMD live fire tests at ballistic missile test ranges worldwide. Performed collection and analysis of requirements for external (non-range) sensor platforms to support MDAP test and evaluation data collection needs. • 7794 Provided range services, upgrades, and repairs in support of BMD testing at Kwajalein Missile Range. Provided caretaker activities to maintain Meck Island facilities and a composite mobile range safety system, configured on a mobile sea platform/ship, to manage overall flight safety (USS Worthy/Kwajalein Mobile Range Safety System). Provided the KMR Wake Island maintenance, development and integration of core technical support capabilities. Continued a multiyear effort to upgrade the Range Safety Control Center for Multiple Simultaneous Engagements and to replace the underground communications cable on the islands of Kwajalein, Roi Namur and Meck. Provided for upgrade to KMR communications link to CONUS using a DS-3 level communications capacity. 		
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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
4 - Demonstration and Validation	0603874C BMD Technical Operations	3360
<ul style="list-style-type: none"> • 2423 Integrated ESH considerations into BMDO weapon systems acquisition life cycle; to reduce overall risk and costs, while enhancing the human environment and systems' performance. ESH analyses were accomplished in five (5) areas to integrate ESH issues into the systems engineering and other program planning processes. These areas were: 1) the National Environmental Policy Act (NEPA), 2) environmental compliance, 3) safety and occupational health, 4) hazardous materials management, and 5) pollution prevention. Work continued on environmental analyses for National Missile Defense (NMD), Medium Extended Air Defense System (MEADS), and Advanced Interceptor Technology (AIT). Work also continued on new BMDO requirements as well as on Space Based Laser (SBL), Navy Area, Navy Theater Wide, THAAD and PAC-3 systems. • 1650 Ensured the FY99-01 MILCON, Minor MILCON, and RDT&E design and construction activities were executed in time to support BMD programs' facility requirements and ensured compliance with all applicable laws and regulations. The design emphasis was on completing design for the National Missile Defense (NMD) facility requirements in preparation for the Deployment Readiness Review and design for TMD systems. Provided for TMD and NMD test and evaluation facilities improvements to support increasingly complex test scenarios. • 1838 Provided technical support for BMDO T&E activities including: development of a T&E Program Plan; test resource planning; analysis, planning and resource support for test ranges, facilities and targets; Test & Evaluation Working Group (TEWG) support; and special studies and analyses as tasked. • 1656 Provided for government personnel and project support. <p>Total 65386</p> <p>FY 2001 Planned Program:</p> <ul style="list-style-type: none"> • 17502 Provide ground test facility infrastructure and upgrades for BMDO testing including: wind tunnel testing at Tunnel 9 and AOEC; sensor testing at AEDC 7V/10V; lethality testing at AEDC Range G/VKF; primary IR standards, black body and optical materials, calibrations at the NIST; Integrated kill vehicle testing at NHTF; capability for sled track maintenance and upkeep at HHSTT; upgrades at KHILS to support TMD, AIT and NMD interceptor kill vehicle testing; Lidar test activities at AMOR; and IR testing at the POST facility. • 2681 Provides test range planning and range instrumentation support, maintenance and upgrades. Includes all efforts associated with integrating the Ballistic Target Program with National Range activities, MDAP customers, BMDO, and National Laboratories. Includes all efforts associated with direct target launch mission support, efforts associated with target launch logistics support, development and coordination of all required Universal Documentation System inputs, and efforts associated with target launch site development at the various National Ranges. • 25023 Support continuing Navy Area and Theater-Wide Programs TBMD risk reduction at sea-testing and infrastructure improvements at PMRF. Support to SLBD, an infrared optical data telescope, which collects calibrated radiometric and metric images of missile flights over WSMR. Maintenance of the physical plant, the technical systems and the compliance posture of KTF. Congressional plus-ups totalling \$20.5M were received for, PMRF Upgrades, Electro-Optical Sensors, the Range Data Fusion Upgrade Project, and installation of a software based program (ESPRIT) at PMRF which facilitates the planning and scripting of test events. • 2085 Provides for White Sands Missile Range (WSMR) general support to BMDO and provides for the maintenance and care of launch facilities which support BMD testing. Contracts with land owners for the use of their land. Provides White Sands technical support to BMDO to conduct studies as needed, to respond to tasking as requested, and to provide manpower support to BMDO in the Washington, D.C. area. • 16137 Provide O&M core funding to keep the AST data collection platform intact and operational in order to support customer-funded TMD and NMD live fire tests at ballistic missile test ranges worldwide. Perform collection and analysis of requirements for external (non-range) sensor platforms to support MDAP test and evaluation data collection needs. 		
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- 6157 Provide for the caretaker activities to maintain Wake Island facilities for BMD target launch operations. Provides lease of Defense Information Systems Agency provided relay satellite bandwidth and the receiver earth station at Hickam AFB, Hawaii. Provides for the payment of shipments to and from Wake Island via air and sea. Provides fuel purchases. Provides environmental compliance for Wake Island.
 - 6256 Provide range services, upgrades, and repairs in support of BMD testing at Kwajalein Missile Range. Provides caretaker activities to maintain Meck Island facilities and a composite mobile range safety system, configured on a mobile sea platform/ship, to manage overall flight safety. Provides the KMR Wake Island maintenance, development and integration of core technical support capabilities. Provides for upgrade to KMR communications link to CONUS using a DS-3 level communications capacity.
 - 3306 Provide technical support for BMDO T&E activities including: development of a T&E Program Plan; test resource planning; analysis, planning and resource support for test ranges, facilities and targets; Test & Evaluation Working Group (TEWG) support; and special studies and analyses as tasked.
 - 4866 Provide core funding to perform all activities required to maintain a mission-ready optical data collection test asset (HALO/IRIS) to support TMD/NMD data collection missions required/requested by BMDO, MDAPs, and other Programs/Projects.
 - 16804 Improve target and background data collection capabilities of airborne sensors in support of NMD and TMD sensor development. Provide for Optical Data/Sensor Fusion efforts.
 - 1929 Provide for government personnel and project support.
- Total 102746

B. Other Program Funding Summary	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>To Compl</u>	<u>Total Cost</u>
2257 PATRIOT, PE 0604865C	220674	79851								
2260 THAAD, PE 0604861C	81614	542498								
2260 THAAD, PE 0603861C	506221									
1266 NAVY THEATER WIDE, PE 0603868C	368769	456372								
2263 NAVY AREA, 0604867C	303479	271052								
3354 TARGETS, PE 0603874C	2159	50952								
3354 TARGETS, PE 0603878C										
3354 TARGETS, PE 0603873C	5886									
3354 TARGETS, PE 0603173C	8917	9433								
3354 TARGETS, PE 0603872C	43711									
3360 TEST RESOURCES, PE 0603871C	474	474								
3360 TEST RESOURCES, PE 0603878C										
3360 TEST RESOURCES, PE 0603872C	14954									
3357 MILCON Planning & Design		0								
3360 MILCON Planning & Design	124									
3357 Minor MILCON		0								
3360 Minor MILCON	1248									

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2400 NMD MILCON Planning & Design	15000	14500							
2400 NMD Minor MILCON		2000							
2400 NMD Major MILCON		85095							
2400 NMD, PE 0603871C	944922	1853877							

C. Acquisition Strategy:

BMDO tasks the Services through Program Management Agreements to perform the required tasks in support of the BMD program, provides monthly reports, and performs quarterly reviews to verify and validate completed tasks.

In providing range and test facilities support to the MDAP Program managers, BMDO implements a process which:

- Maintains perspective of national technical test capabilities relative to all BMD developmental programs,
- Responds to MDAP program requirements,
- Makes maximum use of existing test resources where possible,
- Requires full coordination prior to development of new resources,
- Consolidates management of existing resources where possible and practical.

This process is executed through a variety of acquisition methods. Executing Agent Project Managers for the elements and tasks under this project include the three military services and the BMDO. Service Project Manager organizations specifically include the:

- U.S. Army Space and Missile Defense Command (USASMDC)
- U.S. Air Force Materiel Command
- U.S. Navy Office of Naval Research
- Navy Program Executive Officer (Theater Surface Combatants)
- U.S. Air Force Research Laboratory
- U.S. Army Corps of Engineers (USACE)
- U.S. Navy, Naval Facilities Engineering Command (NAVFAC)
- U.S. Army Program Executive Officer-Missile Defense.

D. <u>Schedule Profile</u>	<u>FY2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
KHILS – DITP (Quantum Well, Integration Tests)	1-4Q	1-4Q						
KHILS – DTRA (Nuclear Requirements)	1-4Q	1-4Q						
KHILS – BPI (System Studies)	1-4Q	1-4Q						
7V/10V – GBI: Raytheon	1-4Q	1-4Q						

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Tunnel 9 – THAAD Support	1-4Q	1-4Q							
Tunnel 9 – Arrow Support	1-4Q	1-4Q							
Tunnel 9 – NMD	1-4Q	1-4Q							
Range G – NMD	1-2Q	1-2Q							
Range G – Navy Theater TBMD	1-4Q	1-4Q							
Range G – THAAD	3-4Q	3-4Q							
RCSS Operational Capability									
NIST – 7V/10V, EKV SM-3, SBIRS (Blackbody Calibration)	1-4Q	1-4Q							
NIST – SM-2, THAAD, EKV, NraD (Emissivity)	1-4Q	1-4Q							
KMR TCMP Launch	2Q	2Q							
WSMR Navy SM2-Blk IV Testing	1Q	1Q							
Airborne Data Collection	1-4Q	1-4Q							
Airborne Data Collection Upgrades	1-4Q	1-4Q							
NHTF – NTW TBMD	1-4Q	1-4Q							
HHSTT – Navy Lower Tier	1-2Q	1-2Q							
HHSTT – NTW TBMD	3-4Q	3-4Q							
POST – NMD	1-4Q	1-4Q							
AOEC – Navy Lower Tier	1-2Q	1-2Q							
AOEC – AIT Technology	1-4Q	1-4Q							
Environmental Support for BMDO Programs	1-4Q								
FacilityAcquisition Support for BMDO Programs	1-4Q								

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I. Product Development	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Army TMD Facility/ Environmental Programs Development	Allot	US Army PEO, Huntsville	138		N/A							
b. Navy TMD Facility/ Environmental Programs Development	Allot	US Navy PEO TSC, Arlington VA	330		N/A							
c. Air Force TMD Facility/Environmental Programs Development	Allot	USAF SMC, Los Angeles CA	364		N/A							
d. Army SMDC Fac/Envir Prog Development	Allot	USASMDC, Huntsville, AL	422		N/A							
e. PMRF Upgrades	Allot	US Navy, PMRF	30000	15391								
f. Optical Sensor Upgrade	Allot	US Navy, PMRF	10000	4965								
g. Data Collection Upgrades	Allot	USASMDC	0	16558								
h. Data Collection Upgrades	Allot	USAF	0	246								
Subtotal Product Development:			41254	37160								

Remark:

II. Support Costs	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Facility Acquisition Life-Cycle Management and Support	MIPR	Various	228	0	N/A							
b. System Engineering and Technical Support (BMDO)	CPFF	SciComm, Inc. Bethesda, MD	2601	0	8/1/00							
c. Army PAX Support	MIPR	U.S. Army Corps of Engineering, Washington, DC	30	0	N/A							

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d. T&E Technical Support	CPFF	SRS Technologies Arlington, VA	1189	0	N/A							
e. T&E Technical Support	CPAF	Vanguard Research Fairfax, VA	1917	2377	6/00							
f. Subtotal Support Costs			5965	2377								

Remark:

III. Test and Evaluation	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. HALO & AST Support	Allot	USASMDC Huntsville, AL	16230	21350	N/A							
b. Wake Island Support	Allot	USASMDC Wake Island	11609	6157	N/A							
c. KTF	Allot	US Navy, Kauai Test Facility	3526	3674	N/A							
d. Army PAX Support	MIPR	U.S. Army Corps of Engineering, Washington, DC	30	0	N/A							
e. Sea Light Beam Dir	MIPR	SPAWAR	874	993	N/A							
f. Kwaj. Missile Range Spt	CPAF	USASMDC	9290	6256	N/A							
g. White Sands Missile Range Spt	Allot	WSMR White Sands, NM	1920	2085	N/A							
h. Target Launch Support	Allot	USASMDC	1997	2681	N/A							
Subtotal Test and Evaluation:			45476	43196								

Remark:

IV. Management Services	Contract Method & Type	Performing Activity & Location	Total PYs Cost	FY 2001 Cost	FY 2001 Award Date	FY 2002 Cost	FY 2002 Award Date	FY 2003 Cost	FY 2003 Award Date	Cost To Complete	Total Cost	Target Value of Contract
a. Core Infrastructure Planning Support	Allot	USASMDC, Huntsville, AL	30943	2482	10/1/00							
b. Core Infrastructure Planning Support	Allot	USAF	17141	14623	10/1/00							

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c. Core Infrastructure Planning Support	Allot	JNTF	294	0	10/1/00						
d. Core infrastructure Planning Support	Allot	USN	1351	0	10/1/00						
e. Core Infrastructure Planning Support	MIPR	Various	4542	979	TBD						
f. Gov Project Personnel Support	Allot	USASMDC, Huntsville, AL	1656	1929	10/01/00						
Subtotal Management Services:			55927	20013							

Remark:

Project Total Cost:			148622	102746							
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Remark:

UNCLASSIFIED

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)								DATE June 2001		
BUDGET ACTIVITY 4 - Demonstration and Validation				PE NUMBER AND TITLE 0603874C BMD Technical Operations					PROJECT 3360	
COST (In Thousands)	FY2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY2005 Estimate	FY2006 Estimate	FY2007 Estimate	Cost to Complete	Total Cost
4000 Operational Support	15833	10677								
<p>A. <u>Mission Description and Budget Item Justification:</u></p> <p>This project funds three basic areas: personnel and related facility support costs; statutory and fiscal requirements, and support service contracts. In FY-02, all projects in this Program Element has been transferred to Program Element 0603877C, BMD Architecture and Engineering and Program Element 0603878C, BMD Test and Evaluation.</p> <p>Personnel covers government civilians performing program-wide oversight functions such as financial management, contracting, security, information systems support, and legal services at the Ballistic Missile Defense Organization located within the Washington D.C. area, as well as BMDO's Executing Agents within the US Army Space & Missile Defense Command, US Army PEO Air and Missile Defense, US Navy PEO for Theater Surface Combatants, US Air Force and the Joint National Test Facility. Related facility costs include rents, utilities, supplies, ADP equipment, and all the associated operation and maintenance activities.</p> <p>Fiscal Requirements include reimbursable services acquired through the Defense Business Operating Fund (DBOF) such as accounting services provided by the Defense Finance and Accounting Services (DFAS); reserves for special termination costs on designated contracts; and provisions for terminating other programs as required. BMDO has additional requirements to provide for foreign currency fluctuations on its limited number of foreign contracts. Statutory requirements include funding for charges to canceled appropriations in accordance with Public Law 101-510.</p> <p>Finally, assistance required to support BMD program-wide management functions is also contained in this project. This assistance ranges from operational contracts to support functions such as ADP operations, Access control offices and graphics support, to efforts required to supplement BMDO and Executing Agent government personnel. Typical efforts include cost estimating, security management, information management, technology integration across BMDO projects and assessment of schedule, cost and performance, with attendant documentation of the many related programmatic issues. The requirements for this area are based on most economical and efficient utilization of contractors versus government personnel.</p> <p>FY 2000 Accomplishments:</p> <ul style="list-style-type: none"> • 15833 Provided management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies. • • • <p>Total 15833</p>										
Project 3360			Page 56 of 57 Pages				Exhibit R-2A (PE 0603874C)			

BMDO RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)	DATE June 2001
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BUDGET ACTIVITY 4 - Demonstration and Validation	PE NUMBER AND TITLE 0603874C BMD Technical Operations	PROJECT 4000
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FY 2001 Planned Program:

- 10677 Continue providing management and support for overhead/indirect fixed costs such as civilian payroll, travel, rents & utilities and supplies.
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-

Total 10677

Change Summary Explanation: Internal readjustment to management account.

B. <u>Other Program Funding Summary</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY2007</u>	<u>To Compl</u>	<u>Total Cost</u>

C. Acquisition Strategy:

D. <u>Schedule Profile</u>	<u>FY2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>