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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600: <i>Research, Development, Test & Evaluation, Air Force I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0605230F / <i>Ground Based Strategic Deterrent</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	1,416.291	1,397.485	2,553.541	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,367.317
641025: <i>GROUND BASED STRATEGIC DETERRENT (GBSD)</i>	1,416.291	1,397.485	2,553.541	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5,367.317
Quantity of RDT&E Articles	-	-	4	-	-	-	-	-	-	-	-	-

Program MDAP/MAIS Code: 493

Note

In FY 2023, Program 0605230F, Ground Based Strategic Deterrent, Project 641025, Ground Based Strategic Deterrent, efforts were transferred to Program 0605238F, Ground Based Strategic Deterrent EMD, Project 655238, Ground Based Strategic Deterrent, in order to account for program transition to System Design and Development (Budget Activity 5).

A. Mission Description and Budget Item Justification

The Ground Based Strategic Deterrent (GBSD) program will design, develop, produce and deploy a replacement for the current Minuteman III (MM III) Intercontinental Ballistic Missile (ICBM) weapon system in order to maintain a safe, secure, reliable, and effective nuclear deterrent. The GBSD program will deliver a fully integrated weapon system beginning in Fiscal Year 2029 to lower lifecycle costs and to close key capability gaps and vulnerabilities identified in the GBSD Capabilities Based Assessment, GBSD Capabilities Development Document, and the GBSD Analysis of Alternatives. GBSD will also mitigate ground-based deterrent degradation due to MM III component age-out and attrition.

The GBSD program will include prime contractor development of applicable support equipment, data, flight test hardware and infrastructure, and training systems while examining and mitigating risk during the MM III to GBSD transition. GBSD program office has partnered with MM III program office to facilitate communication and integration of the weapon system recapitalization during the MM III to GBSD transition. This program includes any needed nuclear surety and certification and system vulnerability assessments.

During the Engineering and Manufacturing Development phase, the GBSD program will execute 1) government system engineering, analytics, and test capability development; 2) air vehicle equipment development; 3) command & launch systems development; 4) launch systems development; 5) support systems development; and 6) weapon system integration.

Government systems engineering investments include development of model-based systems engineering (MBSE), integration, test software, product life-cycle management framework, and modernization of existing system engineering labs and infrastructure. Air vehicle equipment is an integrated missile stack which includes the propulsion, post-boost, guidance, and re-entry systems sub-components. Command & launch encompasses all command and control components and interfaces, associated ground hardware, ground control equipment and associated software directly related to the survivability, monitoring, and launch of the replacement flight

UNCLASSIFIED

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<p>system. Launch systems include launch centers, launch facilities, and structures and associated ground mechanical systems. Support systems include operator and maintainer training systems hardware and software, security system architecture, transport support equipment, program office and weapon system facilities, and peculiar/common support equipment. Weapon system integration risk reduction includes non-proprietary open systems architecture with well-defined interfaces and a modular design at the weapon system level to allow future modification and technology insertion. As GBSD progresses toward Critical Design Review (CDR), the GBSD weapon system design will dictate the parameters for the MILCON real property requirements and their integration with the weapon system component requirements as these are inextricably linked.</p> <p>Funding allowed the program to execute the Engineering & Manufacturing Development (EMD) Contract to advance GBSD major activities to include systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design. The program is modifying, modernizing, and expanding the analytic environment and labs to support EMD activities to enable full execution of the program's capability to own the technical baseline throughout the program life cycle. This involves establishing a digital engineering system including a supporting environment / infrastructure to perform digital activities, collaborate with, and communicate across stakeholders. Based on success during the Technology Maturation & Risk Reduction contract, this program is continuing to examine and mature air vehicle equipment, command and launch, cybersecurity, operator and maintenance training systems hardware and software, security system architecture, transport sub-systems, Peculiar/Common Support Equipment and associated ground technologies. The program is also maturing and refining weapon system and non-operational software, software integration and development, modular system architecture requirements, and product life-cycle management. This requires execution and improvement of the unified certification strategy which meets nuclear surety, cyber security, and nuclear safety requirements. The program is expanding and maturing the analytical, information technology, test, and data management capabilities to ensure access to weapon system design information is properly controlled and securely transmitted between government and contractors. The program continues to develop Vandenberg AFB test capabilities and ensure Western Range Test capabilities for the Flight Test Program. Additionally, the GBSD program is funding all required developmental and operational test and evaluation activities to meet initial and full operational capability milestones including, but not limited to, developing, improving and modernizing test capabilities essential to reaching those milestones when existing test capabilities are inadequate or non-existent. The program is also continuing to integrate requirement for a dual-capable, air based, survivable launch capability. Finally, the program is establishing a government-owned and government-operated DevSecOps/software stack.</p> <p>This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such programs funds would be in addition to the civilian pay expenses budgeted in program elements 0605833F or 0605831F. In FY 2021 \$27.063M was expended for civilian pay expenses in this program element, and in FY 2022 \$37.5M is forecasted for civilian pay expenses in this program element.</p> <p>This effort is in Budget Activity 4, Advanced Component Development and Prototypes (ACD&P), because efforts are necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment.</p>		

UNCLASSIFIED

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B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	1,447.113	2,553.541	0.000	0.000	0.000
Current President's Budget	1,397.485	2,553.541	0.000	0.000	0.000
Total Adjustments	-49.628	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-49.628	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

Fiscal Year 2021 funding reflects a Small Business Innovation Research (SBIR) adjustment of \$49.628 million.

The Fiscal Year 2022 President's Budget submittal did not reflect Fiscal Year 2023 through Fiscal Year 2026 funding. Therefore, an explanation of the change between the two budget positions for Fiscal Year 2023 cannot be made in a relevant manner.

C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
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Title: Engineering & Manufacturing Development (EMD)	1,397.485	2,553.541	0.000
Description: The objectives of EMD for GBSD are: 1) advance GBSD major activities, systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design, 2) prototype and test mature technologies related to the major activities and demonstrate performance of sub-system and system capabilities through prototyping and testing and 3) engage in rapid prototyping events to mature future design increments.			
FY 2022 Plans:			
<ul style="list-style-type: none"> • Execute the EMD Contract to advance GBSD major activities to include systems engineering activities, information technology, data management, analytical capabilities and deliver a flexible, integrated weapon system critical design. • Modify, modernize, and expand the analytic environment and labs to support EMD activities to enable full execution of the program's capability to own the technical baseline throughout the program life cycle. This involves establishing a digital engineering system including a supporting environment/infrastructure to perform digital activities, collaborate with, and communicate across stakeholders. • Continue to examine and mature air vehicle equipment, command and launch, cybersecurity, operator and maintenance training systems hardware and software, security system architecture, transport sub-systems, and associated ground technologies. Define requirements and modular architectures through trade studies, prototyping, demonstration, and analysis. 			

UNCLASSIFIED

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Continue to mature and refine weapon system and non-operational software, software integration and development, modular system architecture requirements, and product life-cycle management. • Continue to mature the assessment of the current MM III launch systems to determine, through onsite assessments and analysis, the extent of degradation and evaluate for future upgrade, replacement, preparation, and modernization of operational and test facilities. • Execute all government critical path activities to include but not limited to Preliminary Draft Environmental Impact Statement (PDEIS), Coordinating Draft Environmental Impact Studies (EIS), Environmental Baseline Surveys, and Section 106 Programmatic Agreement. • Continue to mature the weapon system by conducting trade studies, system engineering, test activities, and system modeling and simulation. • Continue to further develop analytical, information technology, and data management capabilities. • Implement information systems and information technology design to support EMD execution. • Continue to assess fielding requirements for air vehicle equipment, command & launch, and launch systems and appropriate timelines to transition from MM III to GBSD solution. • Conduct planning for the use of MBSE tools during Operations and Sustainment phase in order to transform ICBM sustainment and supply chain management. • Continue to execute and improve the unified certification strategy which meets nuclear surety, cyber security, and nuclear safety requirements. • Expand and mature the analytical, information technology, test, and data management capabilities to ensure access to weapon system design information is properly controlled and securely transmitted between government and contractors. • Continue to refine Security Classification Guide, update impacts, and implement updates and changes through all Government and contractor programmatic activities. • Continue to increase FFRDC/UARC support to maintain the ability to own the technical baseline in EMD. • Continue to mature support systems to include CSE/PSE and all transportation equipment. • Plan and execute critical software risk reduction activities. • Expand the Information Systems/Information Technology/Information Assurance infrastructure networks and personnel required to support Top Secret, Special Access Programs, and collateral activities and expand capability at mission partner operating locations and network access points. • Develop, improve & modernize government test capabilities required for successful Developmental Test (DT) and Operational Test (OT) including but not limited to, Vandenberg AFB Test capabilities, Western Range Test capabilities, Broad Ocean Area Terminal Area Scoring Test Capability, and various Noise, Vibration and Harshness and Nuclear Hardness and Survivability test sites/beds as required. Modernization and improvement of LF-04 at Vandenberg AFB begins in FY22. • Continue integrating requirement for dual-capable, air-based, survivable launch capability. 				

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Air Force	Date: April 2022
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C. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<ul style="list-style-type: none"> • Develop a common cryptographic device and supporting equipment for use in multiple subsystems and/or networks throughout the GBSD weapon system. • Integrate the Mk-21A Reentry Vehicle (Program 0101328F), ICBM Fuze Modernization (Program 0604933F), and GBSD test programs. • Expand government-owned and government-operated DevSecOps/software stack. • Execute all government critical path activities. • Conduct studies and initiatives to build schedule margin, reduce risk in the Minuteman III-to-GBSD transition, and reduce life cycle costs as the program progresses through the EMD phase to the Production phase. • Modify and expand GBSD workspace at all operating locations to accommodate a growing workforce and provide the tools for the workforce to own the technical baseline. <p>FY 2023 Plans: N/A</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding decreased due to transition of Engineering and Manufacturing Development efforts to Program 0605238F, Ground Based Strategic Deterrent EMD, Project 655238, Ground Based Strategic Deterrent, in Fiscal Year 2023.</p>			
Accomplishments/Planned Programs Subtotals	1,397.485	2,553.541	0.000

D. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• RDTE 05 PE 0605238F: <i>Ground Based Strategic Deterrent EMD</i>	0.000	0.000	3,614.290	-	3,614.290	3,614.629	3,255.759	3,190.113	2,628.739	3,648.270	19,951.800
• RDTE 04 PE 0603851F: <i>Intercontinental Ballistic Missile - Dem/Val</i>	34.755	49.621	46.432	-	46.432	16.717	28.424	7.821	7.995	Continuing	Continuing
• MPAF 01 Line Item MGBSD0: <i>Ground Based Strategic Deterrent</i>	0.000	10.895	0.000	-	0.000	610.586	502.720	5,689.931	6,410.554	48,355.610	61,580.296
• MILCON PE 0101233F: <i>GBSD SQUADRONS</i>	89.200	168.099	434.000	-	434.000	218.152	301.547	694.984	709.093	6,078.493	8,693.568
• O&M PE 0101233F: <i>GBSD SQUADRONS</i>	3.404	20.001	40.915	-	40.915	51.351	90.363	42.767	64.843	0.000	313.644

UNCLASSIFIED

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPAF 03 WSC 834130: <i>AF Physical Security System</i>	0.000	0.000	2.839	-	2.839	0.000	0.000	0.000	0.000	0.000	2.839

Remarks

E. Acquisition Strategy

The objective of the GBSD program strategy is to deliver a full, integrated weapon system capability that meets Air Force Global Strike Command's Capability Development Document requirements beginning in Fiscal Year 2029. For the Engineering and Manufacturing Development (EMD) phase of this strategy, the Program Office awarded an EMD contract in the 4th quarter of Fiscal Year 2020. The objectives of EMD for GBSD are as follows: 1) to deliver low-risk, technologically mature, integrated weapon system baseline design; 2) develop flexible system architecture with options for future on-ramps and off-ramps to mitigate program risks; 3) embrace MBSE/digital engineering to streamline system development activities and time-lines; 4) align contract incentives to mitigate schedule and performance risk; 5) utilize MBSE processes and tools to create schedule margin and pull surety, safety, cyber, and test activities to the left for time certain delivery; 6) ensure government owns key interfaces and data rights; and 7) pursue "smart commonality" with Navy, Space, and Missile Defense Agency. The EMD phase will include an EMD Baseline Review, Critical Design Review, First Flight Test, Full Functional System Test, System Qualification/System Verification Review, Nuclear Certification, Developmental Test, Operational Test, and will culminate with early production and weapon system deployment. The program will also assess the cost and schedule risks associated with every requirement. The EMD contract includes 5 options for early production and deployment. The period of performance, to include the production and deployment options, is 4th quarter of Fiscal Year 2020 to the second quarter of Fiscal Year 2028. These efforts will ultimately extend the capabilities of the ground-based leg of the nuclear triad through 2075.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0605230F / Ground Based Strategic Deterrent	Project (Number/Name) 641025 / GROUND BASED STRATEGIC DETERRENT (GBSD)
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Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
TMRR Contractor #1	C/CPFF	Boeing Def, Space, & Sec : Huntsville, AL	261.115	-		-		-		-		-	0.000	261.115	261.115
TMRR Contractor #2	C/CPFF	Northrop Grumman Sys Corp : El Segundo, CA	366.542	-		-		-		-		-	0.000	366.542	370.790
EMD Contract	C/CPFF	Northrop Grumman Sys Corp : El Segundo, CA	121.454	1,079.575	Oct 2020	2,138.292	Oct 2021	-		-		-	0.000	3,339.321	13,293.563
Security Classification Guide Compliance	C/FFP	Lockheed Martin Corp : King of Prussia, PA	1.506	-		-		-		-		-	0.000	1.506	1.506
Subtotal			750.617	1,079.575		2,138.292		-		-		-	0.000	3,968.484	N/A

Remarks
 EMD Contract initiated in the fourth quarter FY20 under Program 0605230F, Ground Based Strategic Deterrent; beginning in FY23, funding shifted to Program 0605238F, Ground Based Strategic Deterrent EMD. Target Value of Contract is \$13,293.563 million across both programs.
 GBSD TMRR Contractor #1 and #2 contracts were modified to include costs for Security Classification Guide Compliance.
 GBSD Security Classification Guide Compliance includes compliance costs for the TMRR unsuccessful offeror.

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Integration Support Contract	C/FFP	BAE : Hill AFB, UT	235.363	75.000	Oct 2020	74.400	Oct 2021	-		-		-	0.000	384.763	519.735
Naval Surface Warfare Center Crane Support	MIPR	Naval Surface Warfare Center Crane : Crane, IN	23.541	4.098	Nov 2020	5.600	Nov 2021	-		-		-	0.000	33.239	-
Aerospace FFRDC Support	MIPR	Aerospace Corporation : El Segundo, CA	50.238	17.802	Nov 2020	21.416	Nov 2021	-		-		-	0.000	89.456	-
MITRE FFRDC Support	MIPR	MITRE : Bedford, MA	28.227	14.020	Nov 2020	14.035	Nov 2021	-		-		-	0.000	56.282	-

UNCLASSIFIED

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Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0605230F / Ground Based Strategic Det errent	Project (Number/Name) 641025 / GROUND BASED STRATEGIC DETERRENT (GBSD)
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Carnegie Mellon Software Engineering Institute Support	MIPR	Carnegie Mellon : Pittsburgh, PA	5.380	3.270	Nov 2020	3.320	Nov 2021	-		-		-	0.000	11.970	-
Sandia FFRDC Reentry Systems Analysis Support	MIPR	Sandia National Laboratories : Various	26.536	3.828	Oct 2020	4.422	Oct 2021	-		-		-	0.000	34.786	-
MIT Lincoln Labs FFRDC Reentry Systems Analysis Support	MIPR	MIT Lincoln Labs : Lexington, MA	3.988	1.300	Oct 2020	1.600	Oct 2021	-		-		-	0.000	6.888	-
Operations Research Analyst Support	C/FFP	Tecolote Research : Hill AFB, UT	4.754	3.821	Oct 2020	5.290	Oct 2021	-		-		-	0.000	13.865	35.487
Nuclear Surety & Certification Support	MIPR	Various : Various	9.418	0.295	Nov 2020	5.270	Nov 2021	-		-		-	0.000	14.983	-
Common Cryptographic Equipment	MIPR	Sandia National Labs : Various	6.500	13.500	Nov 2020	17.120	Nov 2021	-		-		-	0.000	37.120	-
Mantech Support	RO	Man Tech International : Herndon, VA	10.362	8.287	Dec 2020	11.500	Dec 2021	-		-		-	0.000	30.149	-
GBSD Direct Cite Civilian Pay	Various	US Gov Civilians : Hill AFB, UT	21.234	27.063	Oct 2020	37.461	Oct 2021	-		-		-	0.000	85.758	-
NEPA Analysis Support	MIPR	Various : Various	10.760	10.379	Oct 2020	5.471	Nov 2021	-		-		-	0.000	26.610	-
Reentry Vehicle Sustainment Support	C/CPAF	Lockheed Martin Corp : Bethesda, MD	0.000	0.615	Jan 2021	2.500	Dec 2021	-		-		-	0.000	3.115	-
Sandia Integration Support	MIPR	Sandia National Labs : Various	0.000	0.300	Jan 2021	1.800	Nov 2021	-		-		-	0.000	2.100	-
GBSD Facility Execution Support	MIPR	Various : Various	0.319	2.621	Jan 2021	4.651	Nov 2021	-		-		-	0.000	7.591	-
GBSD Enterprise Support	C/Various	Various : Various	6.853	0.478	Oct 2020	0.650	Dec 2021	-		-		-	0.000	7.981	-
Subtotal			443.473	186.677		216.506		-		-		-	0.000	846.656	N/A

Remarks
Integration Support Contract and Operations Research Analyst Support contracts initiated under Program 0605230F, Ground Based Strategic Deterrent; beginning in FY23, funding shifted to Program 0605238F, Ground Based Strategic Deterrent EMD. Target Value of Contract reflects value across both programs.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

GBSD is spearheading the Owning The Technical Baseline (OTTB) approach for system acquisition. This approach utilizes additional support efforts that would typically be performed by a Prime Contractor thus increasing costs within Cost Category Items.

In order to improve transparency, cost category items were changed as follows:

- GBSD Electronic Parts Strategy and Commonality renamed to Naval Surface Warfare Center Crane Support.
- GBSD System Engineering and Acquisition Support renamed to Aerospace FFRDC Support.
- GBSD Acquisition Support and System Engineering renamed to MITRE FFRDC Support.
- GBSD Software Engineering Institute renamed to Carnegie Mellon Software Engineering Institute Support.
- GBSD Reentry Systems (RS) FFRDC Support and Analysis renamed Sandia FFRDC Reentry Systems Analysis Support.
- GBSD RS FFRDC Analysis and Acquisition Intelligence Support renamed MIT Lincoln Labs FFRDC Reentry Systems Analysis Support.
- GBSD Surety and Certification Engineering Services renamed Nuclear Surety & Certification Support.
- GBSD Administrative Support moved to Management Services Category.
- GBSD Technical Design Agent for NC2 Codes/Crypto renamed to Common Cryptographic Equipment.
- GBSD Civilian Manpower renamed Civilian Direct Cite Authority Manpower.
- RV LM OEM Support renamed to Reentry Vehicle Sustainment Support.

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			

Johns Hopkins - Applied Physics Lab Support	MIPR	Johns Hopkins University-Applied Physics Lab : Laurel, MD	35.222	16.008	Oct 2020	18.060	Oct 2021	-		-		-	0.000	69.290	-
Arnold Engineering Development Complex - Integrated Test Team	PO	Arnold Engineering Development Complex : Arnold AFB, TN	14.965	9.032	Oct 2020	13.653	Oct 2021	-		-		-	0.000	37.650	-
Air Force Operational Test and Evaluation Center - Integrated Test Team	PO	Air Force Operational Test and Evaluation Center : Hill AFB, UT	4.112	2.290	Oct 2020	3.700	Oct 2021	-		-		-	0.000	10.102	-
Missile & Intelligence Center - Integrated Threat	MIPR	DIA-Missile and Space Intelligence	15.061	4.225	Nov 2020	5.000	Nov 2021	-		-		-	0.000	24.286	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0605230F / <i>Ground Based Strategic Deterrent</i>	Project (Number/Name) 641025 / <i>GROUND BASED STRATEGIC DETERRENT (GBSD)</i>
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Analysis and Simulation Environment		Center : Redstone Arsenal, AL													
National Air and Space Intelligence Center - Integrated Threat Analysis and Simulation Environment	MIPR	National Air and Space Intelligence Center : Fairborn, OH	1.137	0.000	Dec 2020	1.000	Nov 2021	-		-		-	0.000	2.137	-
Nuclear Dust and Debris Environments Study	MIPR	Air Force Research Lab : Wright Patterson AFB, OH	2.684	0.749	Nov 2020	-		-		-		-	0.000	3.433	-
30th Space Wing Base Support	Various	Various : Various	0.550	0.180	Dec 2020	-		-		-		-	0.000	0.730	-
309th SMXG Software Engineering Support	PO	309th / 517th SWEG : Hill AFB, UT	17.260	15.700	Oct 2020	20.204	Oct 2021	-		-		-	0.000	53.164	-
309th SMXG Nuclear Safety Cross Check Analysis	PO	309th / 516th SWES : Hill AFB, UT	3.973	8.400	Oct 2020	16.211	Oct 2021	-		-		-	0.000	28.584	-
Guidance Instrument Life Testing	MIPR	Aerospace Corporation : El Segundo, CA	7.200	0.000		0.320	Nov 2021	-		-		-	0.000	7.520	-
Silo Fly-out Modeling and Simulation	MIPR	Various : Various	6.091	2.455	Nov 2020	3.321	Nov 2021	-		-		-	0.000	11.867	-
Rapid Assessment Technology	MIPR	Various : Various	4.940	8.470	Mar 2021	4.500	Mar 2022	-		-		-	0.000	17.910	-
Sandia Flight Test Vehicle Development	MIPR	Sandia National Labs : Various	7.700	13.000	Dec 2020	15.500	Dec 2021	-		-		-	0.000	36.200	-
Lawrence Livermore Joint Environmental Test Unit	MIPR	Lawrence Livermore Labs : Livermore, CA	3.500	0.595	Dec 2020	0.500	Dec 2021	-		-		-	0.000	4.595	-
Naval Surface Warfare Center Corona Support	MIPR	Naval Surface Warfare Center : Corona, CA	0.600	1.149	Dec 2020	1.201	Dec 2021	-		-		-	0.000	2.950	-
Guidance Alt PIGA	MIPR	NAVY SSP : Washington Navy Yard, DC	0.000	1.641	Feb 2021	2.200	Nov 2021	-		-		-	0.000	3.841	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0605230F / Ground Based Strategic Det errent	Project (Number/Name) 641025 / GROUND BASED STRATEGIC DETERRENT (GBSD)
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Combined Test Facility	MIPR	Various : Various	0.000	0.000		5.800	May 2022	-		-		-	0.000	5.800	-
RAND Study Support	MIPR	RAND Corp : Santa Monica, CA	0.000	0.700	Jan 2021	-		-		-		-	0.000	0.700	-
Broad Ocean Area Terminal Area Scoring Test Capability	MIPR	Navy Strat Sys Program : Various	0.000	-		4.256	Apr 2022	-		-		-	0.000	4.256	-
GBSD Enterprise Test and Assessments	C/Various	Various : Various	7.303	0.279	Nov 2020	0.302	Nov 2021	-		-		-	0.000	7.884	-
Subtotal			132.298	84.873		115.728		-		-		-	0.000	332.899	N/A

Remarks

In order to improve transparency, cost category items were renamed as follows:

- GBSD Cybersecurity, Test, and Evaluation Framework, Codes/Crypto renamed to Johns Hopkins - Applied Physics Lab Support.
- GBSD Integrated Test Team renamed to Arnold Engineering Development Complex - Integrated Test Team.
- GBSD Independent Operational Test Agency renamed to Air Force Operational Test and Evaluation Center - Integrated Test Team.
- GBSD Integrated Threat Analysis and Simulation Environment (ITASE) 1 renamed to Missile & Intelligence Center - Integrated Threat Analysis and Simulation Environment.
- GBSD ITASE 2 renamed to National Air and Space Intelligence Center - Integrated Threat Analysis and Simulation Environment.
- GBSD Launch Systems LF-26 (TMRR) renamed to 30th Space Wing Base Support.
- GBSD Software Support renamed to 309th SMXG Software Engineering Support.
- GBSD NSCCA Support renamed to 309th SMXG Nuclear Safety Cross Check Analysis.
- GBSD Instrument Testing renamed to Guidance Instrument Life Testing.
- GBSD / Mission Defense Agency Silo Fly-out Modelling / Simulation Development renamed to Silo Fly-out Modeling and Simulation.
- GBSD Rapid Assessment Technology / LS Support renamed to Rapid Assessment Technology.
- GBSD Joint Test Assembly Encryption renamed to Sandia Flight Test Vehicle Development.
- GBSD Joint Environment Test Unit / Joint Test Assembly National Nuclear Security Agency Cost Share renamed to Lawrence Livermore Joint Environmental Test Unit.
- NSWC Corona Support renamed to Naval Surface Warfare Center Corona Support.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force **Date:** April 2022

Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0605230F / Ground Based Strategic Det errent	Project (Number/Name) 641025 / GROUND BASED STRATEGIC DETERRENT (GBSD)
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GBSD Administrative Support	C/FFP	Delta Solutions, Inc : Colorado Springs, CO	3.413	0.645	Nov 2020	0.873	Jan 2022	-		-		-	0.000	4.931	-
GBSD Enterprise Process Improvement Support	C/FFP	Booz Allen Hamilton : McLean, VA	2.031	3.501	Nov 2020	11.000	Nov 2021	-		-		-	0.000	16.532	-
Mission Defense Operations	MIPR	Various : Various	0.000	0.242	Aug 2021	3.200	Oct 2021	-		-		-	0.000	3.442	-
Hardware, Software, IT Resources	Various	Various : Various	33.824	6.029	Oct 2020	7.528	Oct 2021	-		-		-	0.000	47.381	-
GBSD DevSecOps, Software Factory, Cloud, & Infrastructure	Various	Various : Various	25.482	28.501	Nov 2020	43.864	Nov 2021	-		-		-	0.000	97.847	-
Enterprise PMA	Various	Various : Various	25.153	7.442	Oct 2020	16.550	Oct 2021	-		-		-	0.000	49.145	-
Subtotal			89.903	46.360		83.015		-		-		-	0.000	219.278	N/A

Remarks
 GBSD Integration Support Contract has been incorporated into the Integration Support Contract in the Support Category.
 GBSD Electronic Parts Strategy and Commonality has been incorporated into Naval Surface Warfare Center Crane Support in the Support Category.
 GBSD System Engineering and Acquisition Support has been incorporated into the Aerospace FFRDC Support in the Support Category.
 GBSD IS/IT Support renamed to Hardware, Software, IT Resources.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,416.291	1,397.485	2,553.541	-	-	-	0.000	5,367.317	N/A

Remarks
 Starting in FY23, GBSD program funding will be reflected in Program Element 0605238F, project 655238.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0605230F / <i>Ground Based Strategic Deterrent</i>	Project (Number/Name) 641025 / <i>GROUND BASED STRATEGIC DETERRENT (GBSD)</i>

FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4

Ground Based Strategic Deterrent (GBSD)	
EMD Phase	

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force		Date: April 2022
Appropriation/Budget Activity 3600 / 4	R-1 Program Element (Number/Name) PE 0605230F / <i>Ground Based Strategic Deterrent</i>	Project (Number/Name) 641025 / <i>GROUND BASED STRATEGIC DETERRENT (GBSD)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Ground Based Strategic Deterrent (GBSD)</i>				
EMD Phase	1	2021	4	2022

Note

In FY 2023, Program 0605230F, Ground Based Strategic Deterrent, Project 641025, Ground Based Strategic Deterrent, efforts were transferred to Program 0605238F, Ground Based Strategic Deterrent EMD, Project 655238, Ground Based Strategic Deterrent, in order to account for program transition to System Design and Development (Budget Activity 5).