Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force											Date: February 2019	
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303140F / *Information Systems Security Program*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	41.067	33.979	27.726	0.000	27.726	11.156	13.618	13.429	61.685	Continuing	Continuing
675100: *Cryptographic Modernization*	-	39.045	32.526	27.726	0.000	27.726	11.156	13.618	13.429	61.685	Continuing	Continuing
675231: *AF Key Management Enterprise (AF KME)*	-	2.022	1.453	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Information Systems Security Program (ISSP) - Includes resources, manpower authorizations, necessary facilities and equipment required to perform INFOSEC research and development, to provide INFOSEC services, to procure INFOSEC products required to secure telecommunications and information systems when such products are separately procurable from host systems, and to provide INFOSEC maintenance and support. Also includes costs associated with the protection afforded to telecommunications and information systems which process sensitive data and efforts to ensure confidentiality, integrity, and availability of the information and the system.

The ISSP Element provides cradle-to-grave research, development, acquisitions, supply, sustainment, depot maintenance, and demilitarization of the Air Force (AF) cryptographic and key distribution /management systems (known as the Key Management Enterprise (KME)). ISSP delivers on rising national, DoD, and AF priorities to address cyber security threats and increasing war-fighter dependence on cyberspace. The AF and the DoD require the capability to secure, collect, process, store, and disseminate an uninterrupted flow of information, while denying an adversary the ability to intercept, collect, destroy, interpret, or manipulate our information flows. Secure communication allows the DoD to achieve and maintain decision superiority, the key to successful application of the military instrument of national power in modern, high-tempo, full-spectrum operations. AF Communications Security (COMSEC) equipment protects information such as war-fighter positions, mission planning, target strikes, commanders orders, intelligence, force strength, and force readiness and ensures adversaries cannot interpret, manipulate, or destroy information. When an adversary is capable of interpretation, manipulation, or destruction of the information used by the war-fighter, DoD military forces will suffer significant and/or devastating mission degradation that can result in loss of life and resources and/or exceptionally grave damage to national security.

The overall focus of the Research, Development, Test, and Evaluation (RDT&E) efforts within this program is to transform electronic key delivery and cryptographic devices to meet the next generation war-fighting requirements. These efforts are driven by the National Security Agency's (NSA) mandates to address decertifications, new requirements, and end of life issues. NSA's first tenet calls for an AF KME that permits a totally "man-out-of-the-loop" electronic crypto key distribution system from the generation of the key in the key processor all the way into the using End Crypto Unit (ECU). This eliminates the current key vulnerability of compromise /interruption by individuals transporting or loading the key. NSA's second tenet requires an inventory of cryptographic devices that are more robust, modular, scalable, capable, net-centric, and durable. This enables more effective and efficient performance including reduced inventory, expanded data rates, simplified upgrades, lower life cycle costs, and ensured global information grid-compatibility.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force	Date: February 2019
Appropriation/Budget Activity 3600: *Research, Development, Test & Evaluation, Air Force* / BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ISSP weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is $14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	42.973	34.612	29.788	0.000	29.788
Current President's Budget	41.067	33.979	27.726	0.000	27.726
Total Adjustments	-1.906	-0.633	-2.062	0.000	-2.062
• Congressional General Reductions	-0.396	-0.633			
• 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	-1.510	0.000			
• Other Adjustments	0.000	0.000	-2.062	0.000	-2.062

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303140F / *Information Systems Security Program*	Project (Number/Name) 675100 / *Cryptographic Modernization*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675100: *Cryptographic Modernization*	-	39.045	32.526	27.726	0.000	27.726	11.156	13.618	13.429	61.685	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AF Cryptographic Modernization Effort modernizes cryptographic devices protecting critical national security information across cyber domain operations. In September 2000, the Defense Review Board (DRB) tasked National Security Agency (NSA) to evaluate the security posture of the cryptographic inventory. Systems with aging algorithms, those approaching non-sustainability, and those generally incompatible with modern key management systems were also identified and have been replaced or are in the process of being replaced. Priority systems that required immediate replacement were also identified. In addition, NSA documented the need to modernize the cryptographic inventory with capabilities designed to enable network-centric operations. Replacements/Modernization of the near term vulnerable systems must occur within the timeframe specified by device and algorithm in Chairman Joint Chiefs of Staff Notice (CJCSN) 6510. The DoD Cryptographic Modernization Program was established to develop a modern cryptographic base that provides this assured security robustness, interoperability, advanced algorithms, releasability, programmability, and compatibility with the future Key Management Infrastructure (KMI-See PE 0303140F, Project 67523, AF KMI for a full description). This AF effort supports an integrated effort across the cyber domain to transform to next-generation cryptographic capabilities. It provides U.S. forces and multinational and interagency partners the security needed to protect the flow and exchange of operational decision making information in accordance with national and international policy/standards, the validated operational requirements of the warfighters, and the intelligence communities.

The AF Cryptographic Modernization Effort is a collection of projects accomplished in three phases: replacement, modernization, and transformation. The replacement phase of the program focused on updating and/or replacing out-of-date algorithms along with unsustainable cryptographic products. The modernization phase provides crypto devices with common solutions that are more robust, modular, scalable, and provide the durability to existing cryptographic end items, as well as updating mid-term aging/unsupportable crypto equipment. Manpower and logistics requirements will be reduced and manpower efficiencies gained, while incremental capability enhancements and footprint reduction are provided. The third phase of the Cryptographic Modernization Program, transformation, provides common joint solutions which enable secure, transparent, network-centric capabilities across the cyber domain. Activities also include studies and analysis to support both current program planning/execution and future program planning.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ISSP weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Technology Development (TD)	1.684	1.215	14.154

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Technical Development (TD) conducts concept development and early systems engineering activities to analyze evolving threats and Communications Security (COMSEC) capability gaps across AF and DoD mission areas. Develops, plans and executes foundational technology demonstration efforts to inform COMSEC requirements, concept characterization and technical description (CCTD), and support cost estimates prior to Materiel Development Decision (MDD) for future cryptographic initiatives. Mitigates risk for thousands of AF and DoD users affected by algorithm security issues and ensures required security upgrades can be integrated into the AF and DoD enterprise. Works closely with NSA and other services to develop standards that increase security of communication and information products and facilitate efficient crypto and COMSEC enterprise management. Includes but is not limited to: Common Cryptologic Management Information Base (CC MIB), Advanced Cryptographic Capabilities Increment One (ACC Inc. 1), Cryptographic Modernization 2 (CM2), Trusted Systems Network (TSN)/Supply Chain Risk Management (SCRM), Space Aligned Ground Equipment (SAGE), and MILSATCOM Crypto Mod (MCM). Space Aligned Ground Equipment (SAGE) addresses capability gaps by developing Ground Operating Equipment (GOE) to support modular cryptography, operating at higher data rates, incorporating enhanced system protective capabilities, and including tenants of the Warrior Construct. MILSATCOM Crypto Modernization (MCM) Initiative is comprised of the Protected Tactical SATCOM (PTS) and Evolved Strategic Satellite (ESS). The PTS Crypto Program will provide the cryptographic capabilities for Telemetry, Tracking, & Commanding (TT&C) links for the Protected Tactical SATCOM. This satellite system will provide worldwide, beyond line of sight, Anti-Jam (AJ), low probability of intercept communications to tactical warfighters in both benign and contested environments via space-based fully processed SATCOM payloads. The centerpiece of the PTS system will be a new, more resilient Protected Tactical Waveform (PTW), designed to mitigate the effects of advanced jamming in Anti-Access/Area Denial environments. The ESS Crypto Program will provide the cryptographic capabilities for the Mission Communications and TT&C links for the ESS system. This satellite system will be a follow-on program to the Advanced Extremely High Frequency (AEHF) satellite constellation providing survivable, global, secure, protected, and jam-resistant communications for high-priority military ground, sea and air assets. ESS satellites will be interoperable with existing AEHF satellites and AEHF-compatible sea, air and ground SATCOM terminals. ESS satellites will also extend the Enhanced Polar Satellite (EPS) systems missions as they operate in a highly elliptical orbit. ***FY 2019 Plans:*** - Continue to conduct research to support the replacement or upgrade of obsolete Air Force cryptographic devices in support of the Advanced Cryptographic Capabilities Increment One (ACC Inc. 1) initiative - Continue to identify AF materiel solutions requiring modification or acquisition under the joint Cryptographic Modernization 2 (CM2) Initial Capabilities Document (ICD) and provide information to AF Lead Command to support AF1067 modifications or JCIDS documentation for follow-on acquisition - Conduct Technology Maturation and Risk Reduction (TMRR) activities to support cryptographic equipment modifications and new cryptographic equipment developments within the scope of the CM2 program			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Continue development of the Common Cryptologic Management Information Base (CC MIB) standard that will enable accurate tracking and management of crypto assets across the AF in support of the CM2 developments - Continue to develop system security documentation (OPSEC Plans, Cybersecurity Plans, Security Classification Guidance (SCG), Integrated Threat Assessments (ITAs), Anti-Tamper Planning and Program Protection Planning - Continue to develop the necessary TSN processes to deliver a trusted system (integrating all source supply chain information, threat to risk methodologies, mapping of both SCRM Key Practices and Risk Management Framework (RMF) mitigations, risk strategies, and technical mitigations for both H/W and S/W) - Continue to provide both counterfeit detection (H/W analysis) and Malware Analysis (S/W analysis) - Continue to provide TSN contract language and clauses to effectively acquire trusted systems - Continue to refine analysis for the replacement or upgrade of space Ground Operating Equipment (GOE) devices in support of the Space Aligned Ground Equipment (SAGE) initiative and associated activities in preparation for Decision Point 2 (DP-2) to support a Materiel Development Decision - Continue to conduct analysis for the replacement or upgrade of legacy MILSATCOM crypto devices in support of the MILSATCOM Crypto Modernization (MCM) Initiative and associated activities in preparation for Decision Point 2 (DP-2) approval to support a Materiel Development Decision			
FY 2020 Plans: - Will conduct research to support the replacement or upgrade of obsolete Air Force cryptographic devices in support of the Advanced Cryptographic Capabilities Increment 1 (ACC Inc. 1) initiative - Will identify AF materiel solutions requiring modification or acquisition under the joint Cryptographic Modernization 2 (CM2) Initial Capabilities Document (ICD) and provide information to AF Lead Command to support AF1067 modifications or JCIDS documentation for follow-on acquisition - Will conduct Technology Maturation and Risk Reduction (TMRR) activities, execute AF 1067 cryptographic equipment modifications, and begin new cryptographic equipment developments within the scope of the CM2 program - Will continue development of the Common Cryptologic Management Information Base (CC MIB) standard that will enable accurate tracking and management of crypto assets across the AF in support of the CM2 developments - Will develop system security documentation (OPSEC Plans, Cybersecurity Plans, Security Classification Guidance (SCG), Integrated Threat Assessments (ITAs), Anti-Tamper Planning and Program Protection Planning - Will develop the necessary TSN processes to deliver a trusted system (integrating all source supply chain information, threat to risk methodologies, mapping of both SCRM Key Practices and Risk Management Framework (RMF) mitigations, risk strategies, and technical mitigations for both H/W and S/W) - Will provide both counterfeit detection (H/W analysis) and Malware Analysis (S/W analysis) - Will provide TSN contract language and clauses to effectively acquire trusted systems			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
-Will continue to refine analysis for the replacement or upgrade of space Ground Operating Equipment (GOE) devices in support of the Space Aligned Ground Equipment (SAGE) initiative and associated activities in preparation for Decision Point 2 (DP-2) to support a Materiel Development Decision Will conduct analysis for the replacement or upgrade of legacy MILSATCOM crypto devices in support of the MILSATCOM Crypto Modernization (MCM) Initiative and associated activities in preparation for Decision Point 2 (DP-2) approval to support a Materiel Development Decision ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increased due to Cryptographic Modernization 2 (CM2) requirements			
Title: Mini Crypto (MC) ***Description:*** Mini Crypto (MC) is developing a Tactical Key Management (TKM) miniaturized cryptographic solution to protect Secret and Below (SaB) Command and Control (C2) and mission data for Size, Weight, and Power (SWaP) constrained platforms which currently have no cryptographic capability and transmit in the clear. MC's Tactical Key Management (TKM) solution has a self-generating key which removes the requirement for pre-placed keys and has the ability to add or remove users as tactical situation dictates. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A	2.506	0.000	0.000
Title: Space Modular Common Crypto (SMCC) ***Description:*** Space Modular Common Crypto (SMCC) provides Information Assurance (IA) services for new satellite architectures via a family of common crypto solutions that integrate Tracking, Telemetry, & Commanding (TT&C), Mission Data (MD), and/or Transmission Security (TRANSEC) key stream functions for the Air Force and Intelligence Community space systems. ***FY 2019 Plans:*** - Conclude Technology Maturation and Risk Reduction (TMRR) activities - Continue SMCC AES-256 Crypto Engine (ACE) Common Solution (ACS) development contract activities - Continue SMCC Medium/Large [satellite] Common Solution (MLCS) development contract activities ***FY 2020 Plans:*** - Will ramp down SMCC ACS development contract activities	31.020	27.826	10.124

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Will ramp down SMCC MLCS development activities ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funded decreased due to ramp down in SMCC development contract activities			
Title: Algorithm Transition Compliance and Support ***Description:*** Supports Air Combat Command (AF lead for Cyber Superiority) in Algorithm Transition Compliance and provides Information Assurance (IA) support by conducting analysis on all utilized cryptographic algorithms and hundreds of cryptographic equipment types to support transition efforts. This includes the development and planning of technology demonstrations to ensure new algorithms can be integrated into the multitude of devices across the AF crypto enterprise, determining and monitoring mitigation strategies to address vulnerabilities, and tracking and reporting algorithm/device integration. Assesses current state of AF cryptography across the enterprise and develops the Cryptographic Roadmap. Develops and maintains a classified Crypto Modernization (CM) database system that tracks status of AF crypto device types that is accessible by the CM community via SIPRNET. Efforts support NC3, ISR, all AF platforms, and most ground networks. ***FY 2019 Plans:*** - Continue to analyze the AF crypto enterprise and provide situational awareness of significant risks related to aging inventory and cryptographic vulnerabilities - Continue to provide analysis of adequacy of COMSEC products in support of NSA requirements, sustainment issues, and the state of technology - Provide Crypto Mod analysis database to AF community to assist in annual assessments and long term efforts to develop enterprise capabilities based assessment (CBA) and to identify technical capability gaps - Conduct annual assessment of the state of the AF cryptographic enterprise and update the Cryptographic Roadmap ***FY 2020 Plans:*** - Will analyze the AF crypto enterprise and provide situational awareness of significant risks related to aging inventory and cryptographic vulnerabilities - Will continue to provide analysis of adequacy of COMSEC products in support of NSA requirements, sustainment issues, and the state of technology - Will provide Crypto-Mod analysis database to AF community to assist in annual assessments and long term efforts to develop enterprise capabilities based assessment (CBA) and to identify technical capability gaps - Will conduct annual assessment of the state of the AF cryptographic enterprise and update the Cryptographic Roadmap ***FY 2019 to FY 2020 Increase/Decrease Statement:***	1.835	3.385	3.448

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding increased due to Crypto Modernization 2 (CM2) support			
Title: Missile Electronic Encryption Device (MEED) Modification ***Description:*** The MEED Modification upgraded the legacy Missile Entry Control System (MECS) devices used to securely authenticate personnel attempting access to this Nation's ground-based Intercontinental Ballistic Missile (ICBM) facilities. This effort will bring the MEED equipment into compliance with current NSA information assurance (IA) security design guidance. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A	1.505	0.000	0.000
Title: Classified Data At Rest (CDAR) ***Description:*** CDAR plans to develop and procure an NSA approved modernized cryptographic solution(s) for use in ISR, C2, and EW platforms exposed to hostile/uncontrolled environments. The enterprise cryptographic solution will encrypt/decrypt Top Secret and Below (TSAB) data at rest residing in a variety of data storage environments. ***FY 2019 Plans:*** - Develop requirements documentation and acquisition strategy in preparation for Milestone B (MS B) - Coordinate security requirements with NSA and conduct market research in preparation for CDAR development request for proposal (RFP) ***FY 2020 Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** N/A	0.146	0.100	0.000
Title: VINSON/ANDVT Cryptographic Modernization (VACM) ***Description:*** VINSON (VHF (Very High Frequency)/UHF (Ultra High Frequency) Wideband Tactical Secure Voice System Cryptographic Equipment)/ANDVT (Advanced Narrowband Digital Voice Terminal) Cryptographic Modernization (VACM) will develop and acquire cryptographic capability to replace the legacy capability on VINSON/ANDVT secure voice communications on aircraft, ships, and ground fixed mobile platforms (Devices: KY-57/58, KY-99/100, KYV-5 and ARC-234 (with Embedded Crypto). The program will develop and acquire Remote Control Units (RCU) to augment and replace depleting legacy RCU	0.349	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
inventory. The RCU project is a permanent sustainment modification effort (AF 1067) (Devices: Z-ANP, Z-AHP, Z-AVH, Z-ANH, A-ANG) ***FY 2019 Plans:*** If funding became available, the RCU project plans to award a contract for Increment 1 RCU development. Increment 1 will develop new form, fit replacement KY-58M RCUs (Z-ANP/Z-AHP) that addresses legacy obsolescence issue while maintaining all legacy capabilities. ***FY 2020 Plans:*** If funding became available, the RCU project will continue Increment 1 development and testing of new RCU's and begin early acquisition RCU activity for Increment 2 development.			
Accomplishments/Planned Programs Subtotals	39.045	32.526	27.726

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 831010: *COMSEC Equipment*	60.509	54.675	49.979	-	49.979	48.752	49.573	50.454	51.359	Continuing	Continuing

Remarks

Remarks: Other Program Funding reflects Crypto Modernization (CM) portion of Information Systems Security Program (ISSP) OPAF total.

D. Acquisition Strategy

Implement AF portion of the DoD's Cryptographic Modernization (CM) Initiative through modernization/modification efforts, in varying stages of the acquisition cycle, with focus on minimizing life cycle costs. The CM portfolio of component acquisition projects is executing using a variety of approaches that vary from an evolutionary acquisition strategy using spiral development (for new component development) to incremental improvement leveraging leading-edge, certified non-developmental items (for modernization). Contract type is selected for each of the individual projects based upon its acquisition approach and its unique technology risks. A mixture of fixed-price and cost-reimbursement contracts have been selected which maximize the best value for the Government.

E. Performance Metrics

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tech Development	Various	MULTIPLE : MULTIPLE	-	0.269	Jan 2018	0.226	Jan 2019	14.152	Jan 2020	-		14.152	Continuing	Continuing	-
Mini Crypto	C/CPIF	VIASAT, INC : Carlsbad, CA	-	1.717	Apr 2018	-		-		-		-	Continuing	Continuing	-
Space Modular Common Crypto (SMCC)	C/CPIF	MULTIPLE : MULTIPLE	-	26.499	Dec 2017	23.664	Dec 2018	9.383	Dec 2019	-		9.383	Continuing	Continuing	-
		Subtotal	-	28.485		23.890		23.535		-		23.535	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mini Crypto	Various	MULTIPLE : MULTIPLE	-	0.441	Mar 2018	0.371	Mar 2019	-		-		-	Continuing	Continuing	-
Space Modular Common Crypto (SMCC)	Various	MULTIPLE : MULTIPLE	-	2.153	Dec 2017	1.811	Dec 2018	0.743	Dec 2019	-		0.743	Continuing	Continuing	-
		Subtotal	-	2.594		2.182		0.743		-		0.743	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA)	Various	Various : Various	-	7.966	Dec 2017	6.454	Dec 2018	3.448	Dec 2019	-		3.448	Continuing	Continuing	-
		Subtotal	-	7.966		6.454		3.448		-		3.448	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	39.045		32.526		27.726		-		27.726	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

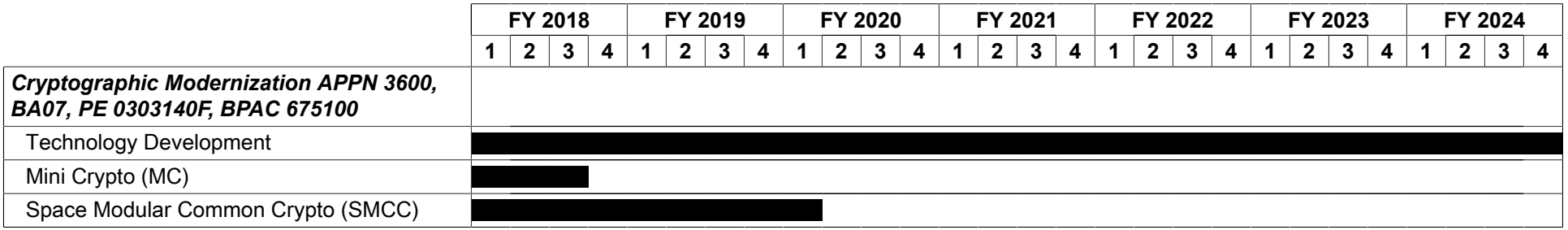

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675100 / *Cryptographic Modernization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Cryptographic Modernization APPN 3600, BA07, PE 0303140F, BPAC 675100				
Technology Development	1	2018	4	2024
Mini Crypto (MC)	1	2018	3	2018
Space Modular Common Crypto (SMCC)	1	2018	1	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303140F / *Information Systems Security Program*	Project (Number/Name) 675231 / *AF Key Management Enterprise (AF KME)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
675231: *AF Key Management Enterprise (AF KME)*	-	2.022	1.453	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air Force Key Management Enterprise (AF KME) Program consists of multiple developments supporting the AF requirements/portion of the DoD Key Management Infrastructure (KMI). The National Security Agency (NSA) acts as the Executive Agent for the DoD KMI Program. AF KMI, in concert with this overarching DoD KMI Program, will provide a secure and flexible capability for the electronic generation, distribution, accounting, and management of key material and other communications security (COMSEC) materials for all DoD Command, Control, Communications, Computers, and Intelligence (C4I) systems and for the Services' weapon systems. KMI represents a broad-scale replacement of the current Electronic Key Management System (EKMS). KMI will provide capabilities that will allow networked operation in consonance with the AF Information Network and other DoD, fellow Service, and AF enterprise objectives. It thereby will assure a viable support infrastructure for future weapons and C4I programs to incorporate key management into their system designs.

The DoD KMI will greatly improve protection of national security-related information by substantially enhancing confidentiality, integrity, and non-repudiation characteristics over the legacy EKMS. KMI will greatly accelerate the availability of crypto key materials through electronic transmission versus shipping of materials, will enhance mission responsiveness and flexibility, and will eventually take the man "out-of-the-loop" in the distribution of crypto key materials.

The AF KMI Program in concert with the DoD KMI Program is transitioning the Air Force from the legacy EKMS to modern DoD KMI and building the AF KME Tier 3 architecture. This Research and Development effort includes system engineering, development and testing to successfully implement the AF KMI Last Mile architecture as part of the AF Key Management Enterprise (KME). The AF KME Tier 3 is a holistic solution integrating the legacy and new and evolving cryptographic programs, materials, products, sources and consumers. The AF KME Tier 3 capabilities include as part of the AF KME distribution, management, and loading of cryptographic materials from the KMI (COMSEC account) to the end cryptographic unit (ECU). It builds the linkage interfaces that will allow KMI systems to communicate and integrate other related developments to meet operational needs. AF KME Tier 3 is currently in the Development Phase. Activities also include studies and analysis to support both current program planning and execution and future program planning.

In parallel with AF KMI, DoD and the Services are addressing the need for a new generation of future KMI-aware ECUs that will be capable of direct interaction with the DoD KMI Enterprise, under the Joint Crypto Modernization Initiative (PE0303140F, BPAC 675100, Cryptographic Modernization, supports this initiative). In some cases these new ECUs, although needing to be supported by KMI, will not be KMI network-connected. "Last mile" transport of black (aka benign, or encrypted) and red (unencrypted) keying material from a KMI client to a new generation ECU or current legacy ECU will need to be handled in the early years by one of two data transfer devices.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

This program element may include necessary civilian pay expenses required to manage, execute, and deliver ISSP weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, and 0605898F.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Air Force KME Tier 3 Space & Naval Warfare Systems Command (SPAWAR) Support (Tier 3) ***Description:*** Support includes architectural planning, systems engineering, testing and studies and analyses for migration to the Key Management Infrastructure (KMI) (includes acquisition planning, systems integration, engineering support and System Program Office (SPO) support). Transitioned existing key management capabilities to AF KME Tier 3. ***FY 2019 Plans:*** - Continue to provide annual resources to SPAWAR to plan and execute specific profile Air Force ECUs - Continue to develop and integrate/test MS App with existing Tier 3 Key Loaders ***FY 2020 Plans:*** - Will continue to provide annual resources to SPAWAR to plan and execute specific profile Air Force ECUs - Will continue to develop and integrate/test MS App with existing Tier 3 Key Loaders ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decreased due to ramping down of development and test efforts	1.905	1.453	0.000
Title: AF KME Tier 3 ***Description:*** Air Force KME Tier 3 early system engineering, risk reduction and engineering development to include: concept development for distribution, load and management elements of last mile; studies and analyses for technology possibilities and prototyping efforts for the last mile; and development of a certified KMI-aware, Product Delivery Enclave - enabled key load device. ***FY 2019 Plans:*** N/A ***FY 2020 Plans:*** N/A	0.117	0.000	0.000
Accomplishments/Planned Programs Subtotals	2.022	1.453	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• OPAF 03 831010: *COMSEC Equipment*	0.360	2.654	2.623	-	2.623	1.956	2.909	2.961	3.013	Continuing	Continuing

Remarks

Remarks: Other Program Funding reflects AF Key Management Infrastructure (KMI) portion of Information Systems Security Program (ISSP) OPAF total.

D. Acquisition Strategy

Implement AF portion of the DoD's Cryptographic Modernization (CM) Initiative through modernization/modification efforts, in varying stages of the acquisition cycle, with focus on minimizing life cycle costs. All major contracts within this project are open to full and open competition with technology knowledge, expertise, and prior experience on similar projects weighted heavily in the evaluation process.

E. Performance Metrics

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force			Date: February 2019
Appropriation/Budget Activity 3600 / 7	R-1 Program Element (Number/Name) PE 0303140F / *Information Systems Security Program*	Project (Number/Name) 675231 / *AF Key Management Enterprise (AF KME)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AF KMI Last Mile (Tier 3)	C/CPIF	L3 Comm : Camden, NJ	-	1.335	Mar 2018	1.258	Mar 2019	0.000		-		0.000	Continuing	Continuing	13.364
		Subtotal	-	1.335		1.258		0.000		-		0.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Technical Documentation	SS/T&M	MITRE : San Antonio, TX	-	-		-		-		-		-	Continuing	Continuing	-
Engineering & Technical Acquisition Support Service	C/CPFF	Abacus Technology Corp. : Chevy Chase, MD	-	0.071	Jan 2018	-		-		-		-	Continuing	Continuing	-
AF KMI Last Mile (Tier 3)	MIPR	U.S. Navy SPAWAR : San Diego, CA	-	0.357	May 2018	-		-		-		-	Continuing	Continuing	-
		Subtotal	-	0.428		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
KMI Last Mile (Tier 3)	PO	46 TS : Eglin AFB, FL	-	0.078	Mar 2018	-		-		-		-	Continuing	Continuing	-
NSA Test Support	MIPR	NSA : FT Meade, MD	-	-		-		-		-		-	Continuing	Continuing	-
KMI Last Mile TEST	MIPR	605 TES : Eglin AFB, FL	-	-		-		-		-		-	Continuing	Continuing	-
CERDEC/PD Net E	MIPR	US Army : Aberdeen Proving Ground, MD	-	-		-		-		-		-	Continuing	Continuing	-
Joint Interoperability Test Command	MIPR	JITC : Ft. Huachuca, AZ	-	-		-		-		-		-	Continuing	Continuing	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	-	0.078		-		-		-		-	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Administration (PMA)	Various	Various : Various	-	0.181	Dec 2017	0.195	Dec 2018	-		-		-	Continuing	Continuing	-
		Subtotal	-	0.181		0.195		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.022		1.453		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

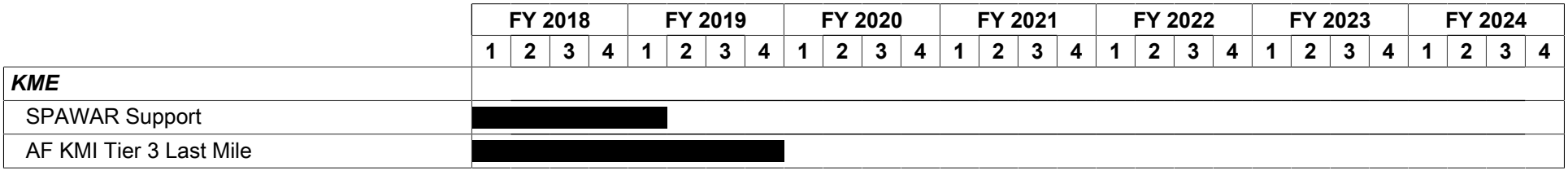

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
Appropriation/Budget Activity 3600 / 7	**R-1 Program Element (Number/Name)** PE 0303140F / *Information Systems Security Program*	**Project (Number/Name)** 675231 / *AF Key Management Enterprise (AF KME)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
KME				
SPAWAR Support	1	2018	1	2019
AF KMI Tier 3 Last Mile	1	2018	4	2019