

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 The Joint Staff **Date:** March 2019

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604826J <i>I Joint C5 Capability Development, Integration, and Interoperability Assessments</i>
---	---

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	45.330	23.638	22.435	20.062	-	20.062	20.274	20.066	21.316	21.087	Continuing	Continuing
001: <i>C5 Assessments and Analyses</i>	23.082	12.898	11.648	9.275	-	9.275	9.487	9.279	10.529	10.300	Continuing	Continuing
002: <i>C5 Capability Development</i>	13.673	6.590	5.787	5.787	-	5.787	5.787	5.787	5.787	5.787	Continuing	Continuing
003: <i>Joint Fires C2 Interoperability</i>	8.575	4.150	5.000	5.000	-	5.000	5.000	5.000	5.000	5.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

Lead command, control, communications, computers, and cyber (C5) assessments, analyses, capability development, and joint fires command and control (C2) interoperability efforts required to achieve an effective, integrated, and interoperable joint force. Efforts include C5 requirements determination, C5 architectures development and integration, C5 data standardization, joint fires C2 interoperability, and C5 integration and interoperability assessments.

B. Program Change Summary (\$ in Millions)

	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020 Base</u>	<u>FY 2020 OCO</u>	<u>FY 2020 Total</u>
Previous President's Budget	23.638	22.435	20.062	-	20.062
Current President's Budget	23.638	22.435	20.062	-	20.062
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	0.000	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• N/A	-	-	0.000	-	0.000

Change Summary Explanation

The FY 2020 requested amount reflects the mandated 25% Major Headquarters Activities (MHA) reductions prescribed by the 2016 NDAA.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>				Project (Number/Name) 001 / <i>C5 Assessments and Analyses</i>			
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
001: <i>C5 Assessments and Analyses</i>	23.082	12.898	11.648	9.275	-	9.275	9.487	9.279	10.529	10.300	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Conduct analysis and assessment activities to inform and enhance joint warfighter capabilities in support of national security requirements. Provide timely, facts-based findings and recommendations to DoD decision-making processes that validate operational requirements and apply funding to field effective, interoperable capabilities. Conduct interoperability assessments and analyses that evaluate capability and interoperability of fielded and emerging command, control, communications, computers, and cyber (C5), and systems in response to operational issues and shortfalls. Conduct integration assessment efforts focused on emerging capabilities in wireless devices and security, operational and tactical command and control, networking, satellite communications, advanced secure digital datalinks, and allied/coalition data exchanges.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020
Title: C5 Assessments and Analyses	12.898	11.648	9.275
<p>Description: Support the Chairman's statutory requirement to advise the Secretary of Defense "on development of joint command, control, communications and cyber capability, including integration and interoperability of such capability through requirements, integrated architectures, data standards and assessments." Also supports the Chairman's focus area of improving joint warfighting capability and the SECDEF's line of effort to strengthen alliances and attract new partners. Interoperability is assessed and integrated solutions are developed to improve C5 system performance by providing recommendations based on operational architectures and evolving standards and data products. Combatant Commands, Services, Agencies and Allies/Coalition partners are provided a laboratory, exercise and assessment venue for the warfighter and capability developer to identify and solve interoperability, integration, and cyber issues.</p> <p>FY 2019 Plans: Conduct analysis, assessment, and integration activities to inform and enhance Joint warfighter capabilities in support of national security requirements. Provide timely, facts-based findings and recommendations for action through formal DoD decision-making processes used to validate operational requirements and apply funding to field integrated, interoperable capabilities. Conduct interoperability assessments, analyses, and integration that evaluate and enhance capability and interoperability of fielded and emerging command, control, communications, computers, and cyber (C5), and systems in response to operational needs and issues. Conduct integration and integration assessment efforts focused on emerging capabilities in wireless devices and security, tactical command and control and networking, satellite communications, advanced secure digital datalinks, and coalition data</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 001 / <i>C5 Assessments and Analyses</i>

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020
<p>exchanges. Employ a deployable capability supporting the collection and analysis of decision quality data for command and control operations from the operational to lowest tactical echelons of command. Joint analysis supports capability development, acquisition, and systems employment decisions based on quantifiable performance in both actual and replicated operational environments. Projects include:</p> <p>Coalition Interoperability and Assurance Validation (CIAV) – CIAV assessments of US and coalition systems support in-theater operations by ensuring C5 system adequacy before their operational employment in the Afghan and Iraq areas of operations. CIAV is also increasing efforts in the Pacific. CIAV assessments validate complete and timely exchange of critical information and improve interoperability, enabling coalition forces to fight more effectively and efficiently.</p> <p>Classified reconfigurable operational wireless network – the integration, employment, and assessment of a single, rapidly deployed and configurable wireless network that carries multiple classifications. Network is suitable for tactical field settings, temporary installations, and fixed headquarters thereby addressing tactical, operational, and strategic requirements. Employs National Security Agency approved communications security and provides secure communications faster with less hardware and overhead.</p> <p>Joint fires support joint mission thread interoperability assessment – assess joint and coalition fire support command and control systems digital (machine-to-machine) interoperability and provide findings and observations.</p> <p>Advanced tactical cellular (4G/LTE) integration – multiple efforts to increase the availability of 4G/LTE to tactical forces. Addresses communications security, smart-phone battlefield apps, and 4G/LTE survivability in contested and austere environments.</p> <p>Bold Quest (BQ) 2019 coalition interoperability demonstrations – support the design, plan, and execution of the BQ events which address close air support, counter UAS, IFF testing, and cyber effects on operations for U.S. forces and coalition partners. Support includes accredited exercise networks, associated C2 systems, and data collection and analysis capabilities.</p> <p>Joint expeditionary integration capabilities – integrate, refine, and accelerate the migration of Special Operating Forces (SOF) battle-proven capabilities to general purpose forces in accordance with governing instructions. Rapid migration of SOF “best practices” provides greater capability to general purpose forces and enhances interoperability with SOF and coalition partners. The capabilities include integrated secure radio networks, tactical data links, tactical cellular, enroute satellite communications, enhanced situational awareness, fratricide prevention, and a more efficient kill-chain.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 001 / <i>C5 Assessments and Analyses</i>

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020
<p>Battlefield intelligence trusted network environment – the integration and assessment of an enterprise environment featuring a single, aggregated intelligence sharing capability for multiple partner nations that does not compromise respective national networks or domains.</p> <p>Joint Planning Services (JPS) – operational assessment of the JPS pilot will determine if the combatant commanders and Service operational planning requirements would be met by JPS. JPS is intended to enable planners to develop and maintain complex strategic/contingency plans in a dispersed, collaborative, cross-functional joint, interagency, intergovernmental, multinational environment. JPS should also provide rapid access to authoritative, geospatially-enabled planning data and tools and efficient and expeditious information dissemination.</p> <p>Mode 5 analysis – Plan and execute analysis events at various live venues (such as RED FLAG or BOLD QUEST) in support of certification of Service Mode 5 IFF capabilities.</p> <p>USCENTCOM counter-UAS (C-UAS) support – Conduct analysis activities both at CONUS C-UAS events and in active operational theaters to evaluate effectiveness of rapidly fielded C-UAS systems. Results will inform follow-on fielding and rapid procurement decisions.</p> <p>FY 2020 Plans: Conduct quantifiable analysis, assessment, and integration activities in both actual and replicated operational environments to inform and enhance C5I Joint warfighter capabilities in support of capability development, acquisition, and systems employment decisions. Conduct interoperability assessments, analyses, and integration through rapidly reconfigurable C5 laboratories replicating joint and coalition system of systems operational environments that can respond to emerging warfighter needs and issues. Employ a deployable assessment capability supporting the collection and analysis of decision quality data for command and control operations from the operational to lowest tactical echelons of command, in field conditions, in real time to provide immediate feedback on the data being collected. Projects include:</p> <p>Cyber Guard (CG)/Cyber Flag (CF) - Provide assessment and technical support to cyber exercises to include C2 information systems, while conducting assessments of cyber effects on systems integrated into the DoD Information Network.</p> <p>Trusted Network Environment - Support cross domain security solution that provides cross domain collaborative services (e-mail with attachments, chat, VoIP, and file share) between US SIPRNET, coalition bi-lateral and multilateral networks that does not compromise respective national networks or domains.</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 001 / <i>C5 Assessments and Analyses</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
Counter-UAS (CUAS) – Data collection and analysis during RTD&E test events as well as in support of urgent operational needs in active operational theaters. Analysis covers all aspects of CUAS defense, including lethal engagements.			
Small Unit Situational Awareness – Support DARPA Squad-X and related efforts to enhance Joint/Coalition small unit situational awareness and lethality with quantitative/qualitative field assessments. Efforts include assessments of GPS-denied navigation aids, unmanned systems performance, command of kinetic/non-kinetic engagements, and employment of expert systems/artificial intelligence systems at small unit level.			
Bold Quest (BQ) 2020 Coalition Interoperability Demonstrations – Support the design, plan, and execution of the BQ events which address close air support, Mission Partner Environment (MPE) / Federated Mission Networking (FMN) development/assessments, counter UAS, IFF testing, and cyber effects on operations for U.S. forces and coalition partners. Support includes accredited exercise networks, associated C2 systems, and data collection and analysis capabilities.			
Joint Tactical Integration - Integrate, refine, and accelerate the migration of Special Operating Forces (SOF) battle-proven capabilities to rapidly improve the Joint warfighting capabilities and lethality of general purpose forces in accordance with governing instructions. Capabilities include integrated secure radio networks, tactical data links, tactical cellular, enroute satellite communications, enhanced situational awareness, fratricide prevention, and a more efficient kill-chain.			
Coalition Interoperability and Assurance Validation (CIAV) - Assess US and coalition systems support in-theater operations by ensuring C5 capabilities adequacy before current operational employment in the Afghan and Iraq areas of operations. Conduct CIAV projects in the INDOPACOM AOR. CIAV assessments improve interoperability and joint warfighting capabilities.			
<i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> \$276K in FY 2019 resources were transferred to support the Small Business Innovation Research program. The FY 2020 requested amount reflects the mandated 25% Major Headquarters Activities (MHA) reductions prescribed by the 2016 NDAA.			
Accomplishments/Planned Programs Subtotals	12.898	11.648	9.275

C. Other Program Funding Summary (\$ in Millions) N/A
Remarks
D. Acquisition Strategy Biannual review of C4/Cyber resources includes an examination of the current and future Budget/Spend Plan, Lines of Effort, Acquisition Strategy and current Execution.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 001 / <i>C5 Assessments and Analyses</i>

The award of a Multi Award Contract (MAC) seeks efficiencies in the performance of requirements for C4/Cyber and Information services, and promotes contractor teaming to provide critical technical and management support. The MAC approach also seeks to reduce the costs of current contract support through the elimination of multiple fees for service contracts, and through the competitive award of contract services.

E. Performance Metrics

1. Conduct a minimum of 15 interoperability assessments designed to identify joint and coalition interoperability issues and recommend solutions to program managers, Combatant Commands, Services, and agencies.
2. Conduct a minimum of one broad-spectrum Counter-UAS (C-UAS) analysis event; providing data collection, analysis, and recommendations that directly address identified C-UAS capability gaps and interoperability shortfalls for partners including: Joint, Services, intergovernmental, and coalition stakeholders.
3. Provide C2 systems and persistent command, control, communications, and computers (C4) environment supporting at least two Combatant Command exercises to satisfy Combatant Command training objectives, including the cyber threat to mission systems.
4. Support up to four Squad-X experiment events, providing objective analysis on performance and interoperability that directly informs the acquisition of improved C2 capabilities for U.S. small units.
5. Support a minimum of 30 coalition interoperability assurance and validation events and provide a minimum of 100 observations/findings to resolve end-to-end mission based interoperability issues, validate tactics, techniques, and procedures, and support NATO future mission networking (FMN) and U.S. mission partner environment (MPE) plans.
6. Provide analyses for at least six field assessments/demonstrations in the areas of joint fires, C2, coalition intelligence, surveillance, and reconnaissance (CISR), digitally aided close air support (DACAS), FMN and MPE. Analyses results will inform continued development of evaluated capabilities, including acquisition/fielding decisions and tactics, techniques and procedures.
7. Provide C2 Systems and persistent C4 environment supporting at least four individual or team training events per year to meet cyber training and certification objectives.
8. Provide C2 Systems and Persistent C4 Environment to support at least four cyber assessments promoting cyber capability development.
9. Integrate at least two new capabilities per year supporting Combatant Command, Service, agency, and commercial solutions for classified and mobile computing program requirements.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 001 / <i>C5 Assessments and Analyses</i>

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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

Joint C5I																												
C5 Assessments and Analyses																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 001 / <i>C5 Assessments and Analyses</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Joint C5I				
C5 Assessments and Analyses	1	2020	4	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604826J / Joint C5 Capability Development, Integration, and Interoperability Assessments					Project (Number/Name) 002 / C5 Capability Development		
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
002: C5 Capability Development	13.673	6.590	5.787	5.787	-	5.787	5.787	5.787	5.787	5.787	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

C5 capability development functions as the DoD requirements lead for the joint command and control family of programs, Joint cyber, and requirements lead for mission partner environment (MPE). The program also develops joint C4 architectures, joint common systems functions, joint mission threads, leads analysis and reviews architectures and standards in joint capability development systems. C5 development enables warfighter access to authoritative data sources and improves data interoperability by establishing common C2 data and service standards.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020
Title: C5 Capability Development	6.590	5.787	5.787
<p>Description: Lead C2 capability development and integration in order to achieve an interdependent joint force. Supports Chairman's focus to improve joint warfighter capability and enhance global integration. This will be accomplished through four focus areas: capability development, C4 architectures, data and services, and interoperability and integration.</p> <p>FY 2019 Plans: Capability Development – analyze and coordinate the Department's FY 2021-2025 C2 integrated priority lists and capability gap assessment for JROC approval. Develop and coordinate annual Joint C2 FY 2020 and FY 2021 operational priorities for JROC approval. Facilitate Nuclear C3 requirements through the JROC process for C4/Cyber-aligned capabilities. Enhance C2 requirements creation, validation, and management through the Net-enabled Requirements Identification Database (NRID) and Decision Support Tool (DST) suite, and development and management of aligned JCIDS capability development documents. Provide requirements management and operational focus to test and field the Global Command and Control System-Joint (GCCS-J) version 6.0 and begin development of its follow-on GCCS-J Enterprise (GCCS-JE) cloud-accessible solution utilizing Agile/DevOps acquisition methodologies. Ensure warfighter demands for a functional denied-disconnected, intermittent, low-bandwidth capability at the Combined/Joint Task Force-level are adequately understood and addressed by the capability developer. Ensure capability needs are addressed for 1) Command and Control of the Information Environment (C2IE) transition and enhancement, 2) Joint Force Capability Catalog/Global Laydown Server (JFCC/GLS)/ORION development and sustainment, and 3) Joint Planning Services (JPS) materiel development and transition.</p> <p>C4 Architectures - provide architecture and joint mission thread development and analysis efforts as required to support the Chairman's directed focus areas and Chief Information Officer (CIO) lines of operations. Provide architectures and analytical</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019		
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 002 / <i>C5 Capability Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
<p>support as required to the Chairman's Joint Military Net Assessment. Conduct analysis and validate architectures and engineering designs for continued implementation of the Joint Information Environment (JIE). Update the warfighter mission area (WMA) architecture development standards to improve WMA architecture portal usability. Continue to improve the quality of and expand the amount of the C4/Cyber portfolio architecture information available on the WMA architecture portal. Conduct analyses and develop architectures and metrics for JCIDS capability requirement documents.</p> <p>Data and Services – develop, promote, and integrate warfighter data and services requirements, standards, technical specifications, and policy to improve warfighter interoperability and information sharing with joint, mission partners, and other U.S. government departments and agencies. Perform and lead proof of concept activities of the North Atlantic Treaty Organization (NATO) core data framework and the National Information Exchange Model (NIEM) with selected communities of interest, such as robotics and autonomous systems, to achieve coalition interoperability and demonstrate operational effectiveness for the Mission Partner Environment and for the Federated Mission Networking domain. Continue to align and standardize emerging tactical data link, symbology (including cyber symbology) and messaging standards with enterprise information sharing. Support and guide the maturation of and implementation of NIEM in the interagency, joint and coalition domains as the common enterprise level interoperability information exchange standard for new and updated IT services.</p> <p>Integration and interoperability – lead mission partner environment (MPE) implementation and support cyber priorities across DoD by performing analysis, conducting assessments and supporting materiel developers. Review and monitor the continued development of the MPE information system to ensure it meets the operational requirements of the Combatant Commands and Services and complements the greater MPE initiative. Continue to shape NATO future mission networking implementation to ensure it remains aligned with MPE, including related capability development. Support development and maturation of DOD enterprise cyber-range environment command and control information system to support US and coalition cyber force readiness, cyber defense of coalition networks, integration, interoperability, and defensibility of mission partner environment federated networks. Coordinate and lead non-overseas contingency operations-funded coalition interoperability events across the geographic Combatant Commands.</p> <p>FY 2020 Plans: Capability Development – Analyze and coordinate the Department’s FY 2022-2026 C2 integrated priority lists and capability gap assessment for JROC approval. Develop and coordinate annual Joint C2 FY 2021 and FY 2022 operational priorities for JROC approval. Enhance C2 requirements validation and management through the Net-enabled Requirements Identification Database (NRID) and Decision Support Tool (DST) suite, and development and management of aligned JCIDS capability development documents. Provide requirements management and operational focus to develop and field the Global Command and Control System-Joint Enterprise (GCCS-JE) cloud-accessible solution utilizing Agile/DevOps acquisition methodologies. Additionally,</p>				

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 002 / <i>C5 Capability Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>participate in quarterly Program Increment planning session for Agile/DevOps development of GCCS-JE. Ensure warfighter demands for a functional denied-disconnected, intermittent, low-bandwidth capability at the Combined/Joint Task Force-level are adequately understood and addressed by the capability developer. Ensure joint capability needs are addressed for:</p> <p>(1) Nuclear C3 requirements for C4/Cyber-aligned capabilities</p> <p>(2) Command and Control of the Information Environment(C2IE)</p> <p>(3) Joint Force Capability Catalog/Global Laydown Server (JFCC/GLS)/ORION</p> <p>(4) Joint Planning Services (JPS) modernization and sustainment</p> <p>(5) Multi-domain Battle C2 initial prototype capability development. Integrate missile warning enhancements identified in VCJCS Competitive Area Study into GCCS-J. Collaborate with J2 and OSD(I) to identify/prioritize Intelligence Support to C2 requirements for materiel solution development.</p> <p>C4 Architectures - Provide architecture and joint mission thread development and analysis products as required to support the Chairman's directed focus areas and Chief Information Officer (CIO) lines of operations (e.g. operational context for Artificial Intelligence). Provide architecture and analysis as required in support of Chairman's Priorities (e.g. Joint Military Net Assessment, Coalition Interoperability). Conduct analysis and validate architectures and engineering designs for continued implementation of the Joint Information Environment (JIE). Update the Joint Common Service/System Function List and Warfighter Mission Area (WMA) architecture development standards to improve WMA architecture integration and interoperability. Continue to improve the quality of and expand the amount of the FCB portfolio architectures available on the WMA architecture portal. Conduct analyses and develop architectures and metrics for JCIDS capability requirement documents.</p> <p>Data and Services – Develop, promote, and integrate warfighter data and services requirements, standards, technical specifications, and policy to improve warfighter interoperability and information sharing with joint, mission partners, and other U.S. government departments and agencies. Perform and lead proof of concept activities of the North Atlantic Treaty Organization (NATO) core data framework and the National Information Exchange Model (NIEM) with selected communities of interest, such as robotics and autonomous systems, to achieve coalition interoperability and demonstrate operational effectiveness for the Mission Partner Environment and for the Federated Mission Networking domain including one complex demonstration with NATO and one Service partners. Continue to lead, align and standardize emerging tactical data link, symbology (including cyber symbology) and messaging standards with enterprise information sharing. Support and guide the maturation of and implementation of NIEM</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 002 / <i>C5 Capability Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020
<p>in the interagency, joint and coalition domains as the common enterprise level interoperability information exchange standard for new and updated IT services. Support standardization of common warfighter Identity Access Management, robust cyber security, standardized interfaces and common data tagging to promote warfighter interoperability. Support joint command and control governance and requirements documents development (Information Support Plan (ISP))to ensure data and service equities are properly represented on behalf of the warfighter.</p> <p>Interoperability and Integration - Lead mission partner environment (MPE) implementation and support coalition cyber priorities across DoD by performing analysis, conducting assessments and supporting materiel developers. Review and monitor the continued development of the MPE information system to ensure it meets the operational requirements of the Combatant Commands and Services and complements the greater MPE initiative. Continue to shape North Atlantic Treaty Organization (NATO) federated mission networking (FMN) implementation to ensure it remains aligned with MPE, including related capability development. Participate in the Combined Communications-Electronics Board to ensure interoperability among the Five Eyes nations (Canada, New Zealand, Australia, UK and US). Coordinate and lead Coalition Interoperability Assurance and Validation (CIAV) interoperability mission-based assessments across the geographic Combatant Commands. Lead the NATO-sponsored Coalition Warrior Interoperability Exploration, Experimentation, Examination, Exercise's FMN Focus Area to ensure standardized, effective development of Joining, Membership, and Exit Instructions.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> \$137K in FY 2019 resources were transferred to support the Small Business Innovation Research program. The FY 2020 requested amount reflects the mandated 25% Major Headquarters Activities (MHA) reductions prescribed by the 2016 NDAA.</p>			
Accomplishments/Planned Programs Subtotals	6.590	5.787	5.787

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

N/A

Remarks

D. Acquisition Strategy

Biannual review of C4/Cyber resources includes an examination of the current and future Budget/Spend Plan, Lines of Effort, and Acquisition Strategy.

The award of a Multi Award Contract (MAC) seeks efficiencies in the performance of requirements for C4/Cyber and Information services, and promotes contractor teaming to provide critical technical and management support. The MAC approach also seeks to reduce the costs of current contract support through the elimination of multiple fees for service contracts, and through the competitive award of contract services.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 002 / <i>C5 Capability Development</i>

E. Performance Metrics

1. Secure DoD approval for following JCIDS documents to meet warfighter capability gaps: Information Systems-Initial Capability Document (IS-ICD) for Cyber C2, and Capability Definition Package (CDP)/Capability Package (CP) for Joint Cyber C2 in coordination with USAF and USCYBERCOM; CPs for Intelligence Support to C2/targeting in coordination with J2; IS-ICD for Fires in coordination with U.S. Army; CPs for Global-Theater Security Cooperation Management Information System (G-TSCMIS) in coordination with DSCA; CP for C2IE in coordination with JS J39; CP for Missile Warning in coordination with USSTRATCOM; and Joint Planning and Execution Services Phase II functional requirements specifications in coordination with J3.
2. Secure JROC approval of the FY 2020 and FY 2021 joint C2 operational priorities defining C2 capability needs/gaps providing senior level oversight and direction to joint C2 capability development.
3. Ensure Joint C2 requirements development supports the DoD-directed better buying power by continuing the rapid development and fielding of virtualized C2 system capabilities to Combatant Commands and Services. Advocate and participate in quarterly GCCS-JE Program Increment planning sessions to prioritize Agile backlog of capabilities for development IAW warfighter demand signal.
4. Revise the warfare mission area architecture development standards, Joint Common Service/System Function List and JMT governance to align with new JCIDS Manual Requirements, new JCAs and changes to cyberspace operations functionality.
5. Review, analyze and validate warfighter capability requirements in 35 JCIDS, joint information environment and mission partner environment architectures.
6. Conduct three National Information Exchange Model Military Operations Domain Configuration Control Board sessions to improve and increase information sharing via promulgation of one domain content update.
7. Include mission partnering concepts in four Combatant Command and Service exercises.
8. Establish at least two new or enhanced information/sharing and collaboration areas.
9. Establish and refine processes and procedures to ensure FMN implementation is included in two NATO exercises.

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 002 / <i>C5 Capability Development</i>

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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

C5 Capability Development																												
C5 Capability Development																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 002 / <i>C5 Capability Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
C5 Capability Development				
C5 Capability Development	1	2020	4	2020

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff										Date: March 2019		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604826J / Joint C5 Capability Development, Integration, and Interoperability Assessments				Project (Number/Name) 003 / Joint Fires C2 Interoperability			
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
003: Joint Fires C2 Interoperability	8.575	4.150	5.000	5.000	-	5.000	5.000	5.000	5.000	5.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Lead interoperability efforts across DoD and partner nations at the operational and tactical level for mission partner operations, fire support, combat identification (CID), and friendly force tracking (FFT) capabilities. Conduct joint fire support, joint close air support and CID-FFT action plans to fulfill CJCS-directed, General Officer/Flag Officer (GOFO) level responsibilities. Conduct Joint Fire Support Executive Steering Committee (JFS ESC) standardization team accreditation visits to U.S. and partner nation schoolhouses to ensure memorandum of agreement signatories are accomplishing schoolhouse training in compliance with the memoranda.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2018	FY 2019	FY 2020
Title: Joint Fires C2 Interoperability	4.150	5.000	5.000
<p>Description: These efforts directly support Chairman, Joint Chiefs of Staff (CJCS) guidance to increase interoperability with allies and partners, to more effectively counter trans-regional threats. Supports Chairman's focus area of improving joint warfighting capability and the SECDEF's line of effort to stengthen alliances and attract new partners. Execute Joint Staff-sponsored Bold Quest systems-of-systems interoperability assessment, including integration of cyber capabilities with command and control of conventional and Special Operations Force missions from a multinational perspective at the tactical level. Lead the Joint Fire Support Executive Steering Committee (JFS ESC), composed of Flag/General Officer representatives and supporting staffs from the U.S. Services, Special Operations Command and 21 partner nations. Those nations include NATO nations, Australia, Republic of Korea and key Gulf State allies. Also lead the Combat Identification – Friendly Force Tracking Executive Steering Committee (CID-FFT ESC), focused on more effective and efficient combat operations and reduced potential for friendly fire incidents.</p> <p>FY 2019 Plans: Plan and execute Joint Staff-sponsored Bold Quest 2019 capability demonstration and assessment, focused on interoperability for joint and coalition fires. Bold Quest data and assessments inform US and Partner Nation investment in multiple capability areas: combat identification, friendly force tracking, digitally aided close air support and fires, integrated air and missile defense, coalition intelligence surveillance and reconnaissance, and cyber. These efforts directly support the National Military Strategy, the CJCS' global integration objectives and the Combatant Commanders conventional and SOF international engagement programs. Continue leading accreditation visits of current JFS ESC member programs and provided staff assistance for development of close air support-related training and certification programs.</p> <p>FY 2020 Plans:</p>			

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 003 / <i>Joint Fires C2 Interoperability</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020
<p>Plan and execute Joint Staff-sponsored Bold Quest 2020 capability demonstration and assessment, focused on interoperability for joint and coalition fires. Bold Quest data and assessments inform US and Partner Nation investment in multiple capability areas: combat identification, friendly force tracking, digitally aided close air support and fires, integrated air and missile defense (Mode 5 Identify Friend or Foe), coalition intelligence surveillance and reconnaissance, integrated interoperable simulations, and cyber. These efforts directly support the National Military Strategy, the CJCS' global integration objectives and the Combatant Commanders conventional and SOF international engagement programs. Continue leading accreditation visits of current JFS ESC member programs and provide staff assistance visits for development of close air support-related training and certification programs.</p> <p><i>FY 2019 to FY 2020 Increase/Decrease Statement:</i> \$119K in FY 2019 resources were transferred to support the Small Business Innovation Research program. The FY 2020 requested amount reflects the mandated 25% Major Headquarters Activities (MHA) reductions prescribed by the 2016 NDAA.</p>			
Accomplishments/Planned Programs Subtotals	4.150	5.000	5.000

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

N/A

Remarks

D. Acquisition Strategy

Biannual review of C4/Cyber resources includes an examination of the current and future Budget/Spend Plan, Lines of Effort and Acquisition Strategy.

The award of a Multi Award Contract (MAC) seeks efficiencies in the performance of requirements for C4/Cyber and Information services, and promotes contractor teaming to provide critical technical and management support. The MAC approach also seeks to reduce the costs of current contract support through the elimination of multiple fees for service contracts, and through the competitive award of contract services.

E. Performance Metrics

1. Lead development, demonstration and assessment of situational awareness and cooperative/non-cooperative identification capabilities that enable U.S. and NATO/Coalition warfighters to identify friendly, enemy, and neutral forces for "shoot/don't shoot" decisions.
2. Synchronize Service testing, acquisition and fielding of Mode 5 IFF capability, with focus on Full Operational Capability (FOC) in 2020. Monitor Service fielding progress of 169 platform types.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 003 / <i>Joint Fires C2 Interoperability</i>
<p>3. Due to resource re-phasing, lead the design, planning and execution of two risk reduction sized Bold Quest coalition capability demonstrations and assessments, in order to inform U.S. and partner nation investment in networked capabilities to improve the detection and engagement of targets via surface (ground and maritime) and air delivered fires and other non-kinetic means.</p> <p>4. Lead the digitally aided close air support (DACAS) coordinated implementation initiative among all US Services, USSOCOM, and 16 partner nations; develop and document engineering change proposals' technical solutions to operational interoperability issues in the CAS mission area; maintain the associated equipment and currency of assessment tools software and licensing agreements.</p> <p>5. Lead US and partner nations with international fire support interoperability capability development initiatives, to ensure on-going efforts optimize: unity-of-effort; resource/cost benefit; and enhanced fire support integration.</p> <p>6. Expand digital call-for-fire solution development to include enhanced multi-national interoperability with 11 partner nations.</p> <p>7. Lead, coordinate, organize, and execute an annual Joint Fire Support Symposium to exchange information, identify issues, examine capability shortfalls, assess emerging technologies, and recommend areas for DoD action/resolution.</p> <p>8. Conduct accreditation assessments for 18 of 33 current signatory programs (11 Joint Terminal Attack Controller, 2 Forward Air Controller (Airborne), and 5 Joint Fires Observer).</p> <p>9. Lead development and refinement of four U.S. and NATO joint fires-related doctrine and tactics, techniques, and procedures publications.</p> <p>10. Plan and conduct quarterly Joint Fire Support and Combat ID-Friendly Force Tracking Executive Steering Committees and working group meetings to address identified shortfalls in those mission areas.</p>		

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 003 / <i>Joint Fires C2 Interoperability</i>

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
<i>Joint Fires C2 Interoperability</i>																												
Joint Fires C2 Interoperability																												

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2020 The Joint Staff		Date: March 2019
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604826J / <i>Joint C5 Capability Development, Integration, and Interoperability Assessments</i>	Project (Number/Name) 003 / <i>Joint Fires C2 Interoperability</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Joint Fires C2 Interoperability</i>				
Joint Fires C2 Interoperability	1	2020	4	2020