JOINT REQUIREMENTS OVERSIGHT COUNCIL

THE JOINT STAFF
WASHINGTON, D.C. 20318-8000

JROCM 173-07
16 July 2007

MEMORANDUM FOR DISTRIBUTION

Subject: Net-Enabled Command Capability Increment One Capability Development Document

1. The Joint Requirements Oversight Council (JROC) approves the Net-Enabled Command Capability (NECC) Increment One Capability Development Document and Extensions, and validates the enclosed key performance parameters and key system attributes. The JROC will maintain approval authority for all key performance parameter changes, delegates capability development document approval authority oversight for changes to key system attributes to the Joint Capabilities Board, and delegates capability development document approval authority for all other non-key performance parameter/non-key system attribute changes to USJFCOM via the Joint Combat Capability Developer organization as outlined in the capability development document. Capability developers will use the NECC Capability Development Document and Extensions as the initial statement of validated capability needs for all phases of development. This program is assigned the Joint Potential Designator of "JROC Interest."

2. USJFCOM, working in concert with the Services and appropriate agencies, will determine program funding requirements for POM 2010 and beyond.

3. Should the Defense Information Systems Agency encounter costs exceeding ten percent of the approved acquisition program baseline or 25 percent of the original program baseline (Program Acquisition Unit Cost/Acquisition Procurement Unit Cost), they shall return to the JROC prior to reprogramming or budgeting additional funding into the program.

4. The JROC recognizes the importance of the NECC program and requests USJFCOM return to the JROC to provide annual program updates.

E. P. GIAMBASTIANI
Admiral, US Navy
Vice Chairman
of the Joint Chiefs of Staff

Enclosure

(INTENTIONALLY BLANK)

Net-Enabled Command Capability (NECC)

Capability Development Document (CDD)

Linked Extension H – C2 Shortfalls, NECC Attributes, FoS Synchronization, JCA Linkage, GEOINT

Increment: I

7 June 2007

This document has been approved by J8 for release to
Australia, Canada, and Great Britain

Revision History

Version 0.5 (Revised Draft): 01 September 2005: Staffed to Joint Staff J-2, 3, 6, 7, 8, Office of the Secretary of Defense, and C2 Functional Capabilities Board; U.S. Army; U.S. Navy; U.S. Marine Corps, U.S. Air Force, and U.S. Coast Guard; USJFCOM (including SJFHQ, JDPO, JSIC), USCENTCOM, USEUCOM, USNORTHCOM, USPACOM, USSOCOM, USSOUTHCOM, USSTRATCOM, and USTRANSCOM; DISA, NGA and JTAMDO.

Version 0.8 (Action Officer Adjudication): 09 February 2006: Reviewed and adjudicated by Joint Staff J-2, 3, 6, 7, 8, Office of the Secretary of Defense, and C2 Functional Capabilities Board; U.S. Army; U.S. Navy; U.S. Marine Corps, U.S. Air Force, and U.S. Coast Guard; USJFCOM (including SJFHQ, JDPO, JSIC), USCENTCOM, USEUCOM, USNORTHCOM, USPACOM, USSOCOM, USSOUTHCOM, USSTRATCOM, and USTRANSCOM; DISA, NGA and JTAMDO.

Version 0.8A: (Name Change): 10 May 2006: Document updated in accordance with Assistant Secretary of Defense Memorandum of 07 March 2006, approving Milestone A and changing the name of the program from Joint Command and Control (JC2) to Net-Enabled Command Capability (NECC).

Version 0.8B: (KMDS O-6 level review and adjudication): 14 July 2006: Reviewed and adjudicated 13-15 June 2006 by Joint Staff J-2, 3, 6, 7, 8, Office of the Secretary of Defense (DOT&E, NII, P&R) and C2 Functional Capabilities Board; U.S. Army; U.S. Navy; U.S. Marine Corps, U.S. Air Force, and U.S. Coast Guard; USJFCOM (including J-2, 3/4, 6, 8 & 9 (Concepts and JDPO) SJFHQ, JSIC), USCENTCOM, USEUCOM, USNORTHCOM, USPACOM, USSOCOM, USSOUTHCOM, USSTRATCOM, and USTRANSCOM; DISA, NGA and JTAMDO.

Version 0.8C: (KMDS O-6 level review and adjudication): 23 October 2006: NECC CDD split into a base document and extensions.

Version 0.9: (KMDS FO/GO level review and adjudication): 14 February 2007: Reviewed and adjudicated by Joint Staff J-2, J-4, 6, 7, 8, Office of the Assistant Secretary of Defense (NII); Joint Training Functional Capabilities Board; Office of the Under Secretary of Defense (AT&L), Office of the Secretary of Defense (DOT&E, I, PA&E); National Security Agency; U.S. Army; U.S. Navy; U.S. Marine Corps, and U.S. Air Force; USJFCOM, USCENTCOM, USEUCOM, USNORTHCOM, USSOCOM, USSOUTHCOM, USSTRATCOM, and USTRANSCOM; DISA (JPMO, JITC), NGA and JTAMDO.

Version 1.0: JROC Approved, 7 June 2007

Summary of Interim Changes

Change No.	Date of Change	Date Entered	Description of change/applicable page(s)

OPR for this CDD is USJFCOM. Address changes, questions, etc. to USJFCOM J88 Points of Contact listed on Page vi.

Table Of Contents

List of Tables

Foreign Releaseability

This document is authorized for release (either hardcopy or electronically) to Australia, Canada, and Great Britain governments and their respective contractors and representatives working as mutual defense cooperative capability partners in support of NECC.

AUS, CAN, GBR government agencies and their defense support contractors may disseminate "For Official Use Only" information to their employees and subcontractors who have a need for the information. Removal of the "For Official Use Only" marking can only be accomplished by the USJFCOM J88. All "For Official Use Only" information shall be stored in locked receptacles such as file cabinets, desks, or bookcases. When such internal security control is not exercised, locked buildings or rooms will provide adequate after-hours protection. During working hours, the information shall be placed in an out-of-sight location if the work area is accessible to persons who do not have a need for the information. Transmission of "For Official Use Only" information may only be accomplished on a government-to-government basis.

Further requests for this document should be submitted to:

Joint Combat Capability Developer (J88)
U.S. Joint Forces Command
1562 Mitscher Avenue, Suite 200
Norfolk, Virginia 23551-2488

Points of Contact

John Wellman, NECC JCCD Lead, J88 USJFCOM, (757) 836-0126, john.wellman@jfcom.mil

John Costello, NECC Washington Liaison Office Lead, J882DC USJFCOM, (703) 614-5016, john.costello@jfcom.mil

John Nankervis, NECC Capability Development & DOTMLPF Lead, J882B USJFCOM, (757) 836-6310, john.nankervis@jfcom.mil

1 Capability Discussion

See NECC CDD Core for discussion.

1.1 What NECC Is

See NECC CDD Core for discussion.

1.2 NECC Intent and Focus

See NECC CDD Core for discussion.

1.3 GCCS capability Transformation to NECC capability

See NECC CDD Core for discussion.

1.4 NECC Mission Capability Packages and Current Systems Shortfalls

See NECC CDD Core for discussion. NECC requirements are described in the following subsection in the context of NECC MCPs and current systems capability shortfalls are provided in the final subsection. (see Extension D: MCP List and Description.)

1.4.1 Force Projection[1]

NECC will provide the tools to conduct distributive collaborative planning from the Joint Staff level down to the Joint Task Force functional component level to support strategic guidance, concept and plan development, and plan dissemination. Within the concept and plan development, priority will be placed on providing tools that allow for rapid force identification and generation, force employment planning and execution, Global Force Management planning and execution,, sourcing, and mobilization/demobilization; logistics and force sustainment planning and management, and total force/asset visibility; strategic and theater deployment and redeployment transportation planning, management, and asset tracking; and personnel management planning to include medical planning and strategic and theater evacuation planning, and intelligence campaign planning. These tasks will be accomplished using networked and dynamic sources of information populated throughout the GES Additionally, tools will be developed to collaborate at the application level, ensuring that critical databases are linked and updated automatically across the suite of planning applications.

1.4.2 Force Readiness

NECC will enable accurate readiness assessment of United States (US) forces by providing near real time (NRT) access to quality information. Programs of Record (PoR) and initiatives are

[1].On December 13, 2005, the Secretary of Defense signed the Adaptive Planning (AP) Roadmap directing the implementation of a new overarching planning process to "succeed the Department's current planning and execution system." Since then, AP has developed into a comprehensive planning and execution system (Adaptive Planning and Execution (APEX)). APEX is the overarching process under which deployment planning and execution falls.

working to enhance readiness-reporting capabilities, which will be capitalized on within the NECC framework.

1.4.3 Intelligence

NECC will provide access to national imagery and intelligence databases, and the ability to forward local intelligence/analysis to national databases via GES' consumer- Task, Post, Process and Use (TPPU) concept. NECC will enable Joint Intelligence Preparation of the Battlefield (JIPB), targeting, and Intelligence, Surveillance and Reconnaissance (ISR) management through shared battlespace awareness.

1.4.4 Situational Awareness (SA)

NECC will provide fused Battlespace Awareness (BA) tailored to provide current and projected disposition of BLUE/RED/GRAY forces through NRT/real time (RT) sensor data and Service/Agency/joint-provided data sources.

1.4.5 Force Employment - Air/Space Operations

NECC will support C2 capabilities from planning to execution, including C2 activities associated with management of air/space assets, through better collaboration based on shared battlespace awareness and rapid formation of Communities of Interest (COI).

1.4.6 Force Employment - Land Operations

NECC will support C2 capabilities from planning to execution, including C2/management of land operations assets, through better collaboration based on shared BA.

1.4.7 Force Employment - Maritime/Littoral Operations

NECC will support C2 capabilities from planning to execution with joint maritime/littoral associated C2 activities by enabling faster, better decisions through shared BA composed of quality information.

1.4.8 Force Protection

NECC will provide warning and planning required to support execution, monitoring and assessment of joint and multinational operations to minimize vulnerability of joint, multinational and US organizations, personnel, resources, facilities, and critical infrastructure from enemy/terrorist threats, and integrate air and missile defense, Homeland Security/Homeland Defense (HS/HD), consequence management, and related operations. NECC will provide Detect, Assess, Warn, Defend, Recover capability and information to achieve NRT BA, leveraging GES' network of dynamic sources of information.

1.4.9 Current Systems Shortfalls

Per the JC2 AoA and the Joint Staff FNA, current systems, defined as DOD C2 systems of record (SORs) e.g., GCCS-Joint (GCCS-J) and GCCS Family of Services (GCCS FoS) (Service Variants), prototypes, Advanced Concept Technology Demonstrations (ACTDs), and other developmental efforts, etc., do not:

- Adequately support network nodes disadvantaged in bandwidth capability or nodes disconnected from the GIG due to service interruptions or tactical considerations.
- Allow timely decision making in a dynamic environment or provide the JPEC the capability to collaboratively analyze information and quickly develop appropriate planning and execution documents.
- Allow planners the ability to construct sufficient embedded options for plans(branches and sequels for a given course of action) to include rapid and regular update of plans and associated options.
- Provide for the development and maintenance of net-centric "living plans" which are updated routinely and reflect the latest intelligence assessments, guidance, and/or strategic environment identified by "automatic triggers".
- Allow Red and Blue force situational awareness to be integrated into a user definable display.
- Provide adequate capability to collaboratively conduct force readiness assessments to effectively support timely development of Operational Plans (OPLANs) and Operational Orders (OPORDs), or provide NRT readiness-reporting and joint total force/asset visibility, or provide the capability to conduct timely total force, TPFDD, historical, and trend analyses within planning and execution decision cycles.
- Fully provide the capability to access national imagery/intelligence databases and quickly integrate theater-produced intelligence, locally collected joint force and Service/functional component level imagery, and other relevant intelligence into local records, or provide the capability to forward local intelligence and analysis into national databases.
- Fully possess the capability to provide adequate SA to execute C2 of the force. Current systems do not provide shared SA, and have a limited ability to provide SA based on decision-quality, actionable information supporting effects-based planning and enabling rapid, decisive operations, and does not include the capability to store, maintain or analyze previous Red Force Threat critical or significant activity/event archives for historical precedence, and does not include the capability to model and manage ISR sensor coverage and exploitation capacity end-to-end for operational planning to support ISR sensor strategy and optimization with operations. In addition, current systems do not provide single source 3-D visualization of Geographic Information System data.
- Fully provide the capability to conduct air and space planning to support the Joint Force Air Component Commander/Joint Forces Space Operations Authority (JFACC/JFSOA), and does not provide the ability for C2 of space forces, and does not integrate Advance Planning Document (APD) development with other key processes to minimize planning cycles.
- Provide the capability to integrate maneuver and fire support planning with air/space operations planning cycles, or allow early visibility to apportionment and distribution to enable early fire support planning below corps level, or provide the capability for JFCs to

conduct joint fires planning enabling air/space, land, maritime, amphibious, and special operations forces (SOF) to move, maneuver, and control territory, populations, and lines of communication (LOCs).

- Fully provide the capability to integrate maritime and littoral support planning with air/space operations planning cycles, or allow seamless transition support during amphibious operations, or fully provide the capability for JFCs to conduct joint mine/undersea planning enabling air/space, land, maritime, amphibious, and SOF to move, maneuver, and control territory, populations, and LOCs.
- Provide integrated force protection C2 capabilities to NMCS and JFCs in conjunction with multinational and non-DOD partners, or provide integrated distributive collaborative capabilities supporting vertical/horizontal C2 information exchange and coordination between the NMCS, COCOMs, JTF, JTF components, Intelligence Community (IC), HS/HD components, DOD Agencies, non-DOD Agencies, Private-Industry, NGOs and multinational components (from here-on referred to as 'NECC community'), and does not permit commanders to exchange information across multiple security domains.
- Fully support access to data elements from the Services' Authoritative Data Sources (ADS) nor have they implemented the DOD common data strategy (DODD 8320.2) for sharing data across the DOD Enterprise.

1.5 Cross-Functional Capabilities and Current Systems Shortfalls

See NECC CDD Core for discussion.

1.5.1 Collaboration

See NECC CDD Core for discussion.

1.5.2 Security Cross-Domain Services

See NECC CDD Core for discussion.

1.5.3 Training

See NECC CDD Core for discussion.

1.5.4 Office Automation

See NECC CDD Core for discussion.

1.5.5 Messaging

See NECC CDD Core for discussion.

1.5.6 Information Assurance

See NECC CDD Core for discussion.

1.5.7 Discovery/Mediation/Storage

See NECC CDD Core for discussion.

1.5.8 Language Translation (LT)

See NECC CDD Core for discussion.

1.5.9 Mission Rehearsal and After Action Review

See NECC CDD Core for discussion.

1.5.10 Effects Assessment Data Management

See NECC CDD Core for discussion.

2 Analysis Summary

See NECC CDD Core for discussion and the JC2 AoA for analysis.

3 Concept of Operations Summary

See NECC CDD Core for discussion.

3.1 NECC Standards and Testing Support Concept

See NECC CDD Core for discussion.

3.2 NECC Business Architecture

The Business Enterprise Architecture (BEA) is the single DOD end-to-end architecture providing the overall framework for managing elements and DOD enterprise services procured from industry and delivered to the warfighter. NECC, as an integral part of the DOD enterprise, focuses on the business of warfighting, thereby providing the architecture for information interoperability among warfighting and supporting business domains. NECC single architecture is an enterprise structure with managed elements and enterprise services. Enterprise interactions take place in a loosely coupled environment with coarse-grained interactions. NECC will combine DISR open systems design approaches with standards-based or COTS systems, enabling inclusion of new and emerging technologies while maintaining interoperability with existing C2 and other GIG capabilities. NECC will establish strategies for handling incompatibilities of commercial products using conflicting standards NECC will leverage established COI data dictionaries/lexicons, and taxonomies to shape the systemic interoperable delivery of NECC capabilities to the warfighter. Identification of pertinent COIs may be augmented by establishment of COIs tailored to fill any NECC data sharing requirements not covered by existing COIs. Enterprise security policy and management will be implemented and administered on global, enclave and local levels. Besides achieving NECC interoperability, the BEA single architecture will reduce support needs such as logistics footprint, system administration, training, and maintenance (See Extension A: Integrated Architecture Products).

3.3 NECC Net-Centric Infrastructure Outline

NECC will be developed in the context of DOD Net-Centric information sharing and interoperability. NECC Net-Centric implementation will include the following: Identification of DOD NECC processes in support of Combatant Commander planning and execution; Creation of a NECC Net-Centric Architecture; Development of a NECC Knowledge Management Plan to include a Net-Centric Publish and Subscribe methodology, Data Share Space identification, and Data Strategy (which will include a vocabulary guide that lays out an Information Exchange Standards Specification, logical data models, data dictionaries, domain values, taxonomies, COI and cross COI core schemas); Identification of NECC Authoritative Data Sources, Data Stewards, and Data Steward Service Level Agreements (SLAs) to address Authoritative Data Source accuracy, format, timeliness, etc.

4 Threat Summary

See NECC CDD Extension E, Threat Summary and Assessment.

4.1 General Threats to NECC

See NECC CDD Extension E, Threat Summary and Assessment.

4.2 Information Operations (IO) Threat

See NECC CDD Extension E, Threat Summary and Assessment.

4.3 Coalition-Related Threat

See NECC CDD Extension E, Threat Summary and Assessment.

4.4 Computer Network Attack (CNA)/Computer Network Exploitation (CNE)

See NECC CDD Extension E, Threat Summary and Assessment.

5 Program Summary

See NECC CDD Core for discussion.

5.1 Overall Program Strategy to Reach Full Capability

See NECC CDD Core for discussion.

5.1.1 NECC Increments by Fiscal Year (FY)

See NECC CDD Core for discussion.

5.1.2 Evolutionary Acquisition Framework

See NECC CDD Core for discussion.

5.1.3 Fielding Strategy

See NECC CDD Core for discussion.

5.1.4 Operational Requirements Sponsor / Warfighter Lead

See NECC CDD Core for discussion.

5.2 Relationship Between CDD Increment and other Increments

See NECC CDD Core for discussion.

5.3 Considerations Driving Incremental Delivery Plan

See NECC CDD Core for discussion.

5.3.1 Network Centric Enterprise Services

See NECC CDD Core for discussion.

5.3.2 Hardware Components

To the maximum extent possible, NECC will utilize existing hardware suites. NECC will be designed using an evolutionary acquisition strategy, rapid prototyping, extensive user involvement, and integration of COTS and Government off-the-shelf (GOTS) components. NECC related hardware will be upgraded to support integration of evolutionary/life-cycle replacement to support NECC-Incremented capabilities in garrison/mobile environments. Integration and fielding of NECC hardware upgrades will be accomplished with minimal disruption to NECC sites' operational and support missions. NECC architectures will be open systems compliant, based on approved net-centric standards, and will not be reliant on a specific vendor's hardware suite.

5.3.3 Software Components

To support evolutionary growth, NECC will be designed to ease platform portability, promote smooth integration of new applications, and facilitate supportability. Service/Agency-provided software applications will be considered as candidate solutions to meet NECC MCP requirements. NECC software (e.g. COTS, GOTS, new development) must comply with and/or support regulated, industry, or DOD standards for open systems. NECC will comply with DISR emerging and mandated standards and the Net-Ready Key Performance Parameter (NR-KPP) and applicable DOD IA/security requirements to ensure interoperability and compatibility with required GIG C2 systems and communications networks. To ensure interoperability with existing Services' systems and communications architectures, NECC software must be compatible with transitioning Service variants and designed to adapt to bandwidth-constrained environments.

5.3.4 Architecture

See NECC CDD Core for discussion.

5.3.5 Transition Plan

See NECC CDD Core for discussion.

6 Capabilities Required For The Current Increment

See NECC CDD Core for discussion.

Extension D contains a discussion of MCP and cross-function capabilities with their associated threshold and objective values.

6.1 Key Performance Parameters (KPPs)

See NECC CDD Core for discussion.

6.2 NECC Attributes

See NECC CDD Core for discussion. NECC attributes supporting the Joint C2 Functional Concept and supported by NECC KPPs are provided in Table 6-1.

Table 6-1. NECC Functional Concept Attributes

NECC ATTRIBUTES	THRESHOLD	OBJECTIVE
Superior Decision-Making. Leadership & supporting capability to generate alternative actions, identify selection criteria, & assess alternatives to decisively control operational situations. Includes the use of automation in exchange, fusion, & understanding of information relevant to rapid, collaborative, knowledge-based decision-making.		
** Capability to generate, assess and select alternative COAs.	Develop three feasible COAs for three simultaneous different contingency plans.	Threshold = Objective.
	Each COA must: identify required force capabilities, capabilities are sourced, force/capabilities phased within transportation and logistics constraints, estimate logistics and sustainment requirements (all classes), estimate personnel and medical requirements, identify strategic and theater distribution network requirements, and provide feasibility assessment of transportation and warfighting.	Threshold = Objective.

** Decision support staffs linked horizontally and vertically.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at 1st COCOM and (as applicable), associated SJFHQ and JTF.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at all COCOMs and (as applicable), associated SJFHQs and JTFs.
Flexible Synchronization. Discretion to execute a range of control mechanisms, including self-synchronization, to achieve commander's intent		
** Capability to promote local intelligence and analysis from national databases.	Display COP information received in ≤15 seconds using standard message formats.	Display COP information received in ≤1.0 second using standard & non-standard message formats.
** Collaborative environment.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at 1st COCOM and (as applicable), associated SJFHQ and JTF.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at all COCOMs and (as applicable), associated SJFHQs and JTFs.
Shared Understanding. Common appreciation of the situation supported by common information to enable rapid, collaborative, joint engagement, maneuver, & support		
** Access to common information and a shared sense of the contextual relevance of that information.	Display COP information received in ≤15 seconds using standard message formats.	Display COP information received in ≤1.0 seconds using standard & non-standard message formats.
** Collaborative environment, essential to unity of effort in a joint operational environment.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at 1st COCOM and (as applicable), associated SJFHQ and JTF.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at all COCOMs and (as applicable), associated SJFHQs and JTFs.
Dispersed Command & Control / Disconnected Operations: Discretion to disperse JF C2 elements anywhere without loss of effectiveness to meet mission needs.	Support continuous operations at network nodes disadvantaged in bandwidth capability or nodes disconnected from the GIG due to service interruptions or tactical considerations.	Provide organizations the capability to conduct major combat and autonomous operations with limited or interrupted connectivity.
** Architecture based on dispersed C2 nodes with focus on force protection.	Web based architecture established and installed at 1st COCOM and (as applicable), associated SJFHQ and JTF.	Web based architecture established and installed at all COCOMs and (as applicable), associated SJFHQs and JTFs.
** Common, accurate situational awareness.	Display COP information received in ≤15 seconds using standard message formats.	Display COP information received in ≤1.0 seconds using standard & non-standard message formats.

** Collaborative environment.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at 1st COCOM and (as applicable), associated SJFHQ and JTF.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at all COCOMs and (as applicable), associated SJFHQs and JTFs.
Simultaneous C2 Processes. Capability for parallel C2 processes for monitoring & understanding the operational environment & synchronizing actions of assigned forces.		
** Synchronized parallel C2 processes through shared spaces.		
	100% of forces with connectivity have ability to provide information	Threshold = Objective.
	100% of forces with connectivity have ability to find, retrieve, and understand information	Threshold = Objective.
	100% of forces with connectivity have ability to participate in collaborative environment	Threshold = Objective.
Shared Quality Information: High quality information (information that is relevant, accurate, current, complete, etc.) shared among C2 elements via a robust network enabling shared understanding.		
** Seamless information exchange.	C/S/A databases and information sources published to the GIG and accessible via services.	C/S/A databases and information sources published to the GIG and accessible via services.
	80% of data sources interoperable. Data Interoperability.	100% of data sources interoperable.
	80% Data Standardization compliance with DISR and C2 COI developed data models, vocabularies and schema.	100% Data Standardization compliance with DISR and C2 COI developed data models, vocabularies and schema.
	Metadata Catalogues available on the GIG in compliance with DOD Metadata Registry architecture	Threshold = Objective.
Robust Networking: Interconnections among force elements that are dependable in the face of degradation/attack.		
** Capability to network.	≥95% parse rate success for all forces with connectivity based on relevance to mission, geographic area and situation.	≥99% parse rate success for all forces with connectivity based on relevance to mission, geographic area and situation.

** Capability to execute the collaborative C2 process.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at 1st COCOM and (as applicable), associated SJFHQ and JTF.	Collaborative environment established (shared space with tools: chat, whiteboard, etc) at all COCOMs and (as applicable), associated SJFHQs and JTFs.

6.3 Information Exchange Requirements (IERs)

IERs used for NECC CDD development were drawn from the JC2 ORD Operational View (OV)-3 (Operational Information Exchange Matrix). The OV-3 is not assessed as part of the NR-KPP review; however, the OV-3 is normally used to develop other architecture documents and can be included with the NR-KPP documentation to assist in development and conduct of the testing (CJCSI 6212.01D).

6.4 Service Annexes

Services' Annexes, Extensions, K, L, M, and N are centered on their own unique capabilities of C2 as well as the migration and implementation of NECC to Service-support joint headquarters and Service commands using NECC. Service-unique is defined as those C2 capabilities required by a Service not addressed in the NECC CDD or shared among the other Services. Service Annexes are intended to address C2 at the Service Component and Functional level. Service Annexes address desired capabilities. They do not address specific solutions, nor do they discuss specific system interfaces and interoperability needs. Those details will be addressed in follow-on Capabilities Production Documents (CPDs) IAW CJCSI 3170.01E.

7 Family of System and System of System Synchronization

Related CDDs, CPDs, ICDs, JCDs, and ORDs are provided in Table 7-1.

The Defense Planning Guide (DPG) directed Regional CCDRs (RCCs) to establish SJFHQs by FY05 IAW standards established by USJFCOM. As the materiel enabler for the SJFHQs, and with the intent of standardizing the processes, procedures and supporting C2 capabilities for the JFC, Deployable Joint Command and Control (DJC2) will provide RCCs with an integrated, rapidly deployable C2 capability for the JTF headquarters. DJC2 Increment I will be based upon GCCS-J and other present day C2 tools that enable a collaborative environment, and will migrate to NECC in subsequent increments.

Table 7-1. NECC Contributions and Related Efforts

GCCS MNS Capabilities	NECC CDD Contributions	Related ICDs, CDDs, CPDs & ORDs
Maintenance of a Common Perception of the Crisis	Access to common information & shared sense of contextual relevance. Promote local intelligence & analysis into national database. Situational awareness supporting generation, assessment, & selection alternate actions to decisively control air/space operations, land operations, & force protection activities.	GCCS-A ORD, TRADOC, 21 Nov 00 GCCS-M ORD, OPNAV, 12 Feb 99 DJC2 CPD, 03 Nov 04 GES ICD, 22 Mar 04 CCIC2S ORD, 20 Jan 04 *Intel Community Multi-Intelligence Acquisition Program (IC MAP) ORD (S/NF) (Draft), 8 Oct 02* Joint Targeting Toolbox (JTT) ORD (Draft), 19 Apr 02

	Use of Net Enabled Capability (NECC) is crucial to the delivery of effects based approach to operations. Continuously updates Operational Net Assessment (ONA) support tools providing visibility of effects-to-task linkages based on a "system-of-systems" analysis of a potential adversary's political, military, economic, social, infrastructure, & information (PMESII) war-making capabilities.	Software for Targeting Requirements information Operations and Kinetic Effects (STRIKE) ICD V2, 1 March 2006 (Draft) Air & Space Operations Center Weapon System ORD, AFC2ISRC, USAF, 16 Oct 03 GIG MA ICD, 14 Aug 04 GIG IA ICD, 06 Mar 06 NCOE JCD, 15 Dec 06 NCES CDD, 22 May 06 JDS MA ICD, 8 May 03 Joint Rapid Distributed Database Development Capability (JRD3C) ICD, (FOUO), 9 May 05 Multi-Platform Common Data Link (MP-CDL), Nov 03 (Draft) Persistent Unmanned Multi-role Aircraft (PUMA), 4 Aug 03 (Draft) Tactical Data Link (TDL) Transformation CDD, 22 Jan 04 Theater Battle Management Core Systems II (TBMCS) ORD, 12 Jul 2001 GFM OS CDD, 12 July 2006 (Draft) Adaptive Planning ICD, 15 January 2006 (Draft)
Access to Planning Support Information via Theater Infosphere	Collaborative planning & execution environment. Reduce C2 process time to plan & conduct rapid/decisive JF operations. Parallel C2 processes for monitoring, managing, & understanding events. Seamless exchange w/IC, HS/HD, DOD and non-DOD agencies & multi-national components. JF functional/Service component decision support staffs linked horizontally & vertically. Use of NECC is crucial to delivering EBO. Continuously updates ONA support tools providing visibility of effects-to-task linkages based on a "system-of-systems" analysis of a potential adversary's PMESII war-making capabilities.	GCCS-A ORD, TRADOC, 21 Nov 00 GCCS-M ORD, OPNAV, 12 Feb 99 DJC2 CPD, 03 Nov 04 GES ICD, 22 Mar 04 CCIC2S ORD, 20 Jan 04 *IC MAP ORD (S/NF) (Draft), 8 Oct 02* JTT ORD (Draft), 19 Apr 02 Software for Targeting Requirements information Operations and Kinetic Effects (STRIKE) ICD V2, 1 March 2006 (Draft) Air & Space Operations Center Weapon System ORD, AFC2ISRC, USAF, 16 Oct 03 GIG MA ICD, 14 Aug 04 GIG IA ICD, 06 Mar 06 NCOE JCD, 15 Dec 06 NCES CDD, 22 May 06 JDS MA ICD, 8 May 03 JRD3C ICD, (FOUO), 9 May 05 3-D Expeditionary Long Range Radar (3-D ELRR), 27 Jun 03 (Draft) MP-CDL, Nov 03 (Draft) MQ-9 Hunter-Killer, 30 Sep 03 (Draft) PUMA, 4 Aug 03 (Draft) TDL Transformation CDD, 22 Jan 04 TBMCS ORD, 12 Jul 2001 GFM OS CDD, 12 July 2006 (Draft) Adaptive Planning ICD, 15 January 2006 (Draft)
Collaborative Access to a Common Operational Picture	Accurate, complete, & relevant operational information. Accurate, complete, timely and fused tactical data. Shift from hierarchical to networked environment.	GCCS-A ORD, TRADOC, 21 Nov 00 GCCS-M ORD, OPNAV, 12 Feb 99 DJC2 CPD, 03 Nov 04 GES ICD, 22 Mar 04 CCIC2S ORD, 20 Jan 04

	Successful air/space operations, land operations, & force protection activities are achieved through remote, common, accurate situational understanding. Use of NECC is crucial to delivering EBO. Continuously updates ONA support tools providing visibility of effects-to-task linkages based on a "system-of-systems" analysis of a potential adversary's PMESII war-making capabilities.	*IC MAP ORD (S/NF) (Draft), 8 Oct 02* JRD3C ICD, (FOUO), 9 May 05 JTT ORD (Draft), 19 Apr 02 Software for Targeting Requirements information Operations and Kinetic Effects (STRIKE) ICD V2, 1 March 2006 (Draft) Air & Space Operations Center Weapon System ORD, AFC2ISRC, USAF, 16 Oct 03 GIG MA ICD, 14 Aug 04 GIG IA ICD, 06 Mar 06 NCOE JCD, 15 Dec 06 NCES CDD, 22 May 06 3-D ELRR, 27 Jun 03 (Draft) MP-CDL, Nov 03 (Draft) MQ-9 Hunter-Killer, 30 Sep 03 (Draft) PUMA, 4 Aug 03 (Draft) TDL Transformation CDD, 22 Jan 04 TBMCS ORD, 12 Jul 2001 GFM OS CDD, 12 July 2006 (Draft) Adaptive Planning ICD, 15 January 2006 (Draft)
Visibility of Plan Execution Status	Horizontally/vertically linked decision support staffs. Generate, assess, & select alternative actions to decisively control operational situations. Tailorable battlespace visualizations. Self-synchronization to achieve JF commander's intent.	GCCS-A ORD, TRADOC, 21 Nov 00 GCCS-M ORD, OPNAV, 12 Feb 99 DJC2 CPD, 03 Nov 04 GES ICD, 22 Mar 04 CCIC2S ORD, 20 Jan 04 *IC MAP ORD (S/NF) (Draft), 8 Oct 02* JRD3C ICD, (FOUO), 9 May 05 JTT ORD (Draft), 19 Apr 02 Software for Targeting Requirements information Operations and Kinetic Effects (STRIKE) ICD V2, 1 March 2006 (Draft) Air & Space Operations Center Weapon System ORD, AFC2ISRC, USAF, 16 Oct 03 GIG MA ICD, 14 Aug 04 GIG IA ICD, 06 Mar 06 NCOE JCD, 15 Dec 06 NCES CDD, 22 May 06 JDS MA ICD, 8 May 03 3-D ELRR, 27 Jun 03 (Draft) MP-CDL, Nov 03 (Draft) MQ-9 Hunter-Killer, 30 Sep 03 (Draft) PUMA, 4 Aug 03 (Draft) TDL Transformation CDD, 22 Jan 04 TBMCS ORD, 12 Jul 2001 GFM OS CDD, 12 July 2006 (Draft) Adaptive Planning ICD, 15 January 2006 (Draft)
Adaptive Control of Communications & Information Centers for Surge, Degraded Users, &	Architecture capable of adapting at the pace of change in real world situations. Flexibility to disperse C2 nodes and forces throughout the battlespace based on force capabilities & protection. Effective virtual support enabling dispersing JF C2 & capabilities.	GCCS-A ORD, TRADOC, 21 Nov 00 GCCS-M ORD, OPNAV, 12 Feb 99 DJC2 CPD, 03 Nov 04 GES ICD, 22 Mar 04 CCIC2S ORD, 20 Jan 04 *IC MAP ORD (S/NF) (Draft), 8 Oct 02* JTT ORD (Draft), 19 Apr 02

Incremental Deployment	Use of NECC is crucial to delivering EBO. Continuously updates ONA support tools providing visibility of effects-to-task linkages based on a "system-of-systems" analysis of a potential adversary's PMESII war-making capabilities.	Software for Targeting Requirements information Operations and Kinetic Effects (STRIKE) ICD V2, 1 March 2006 (Draft) Air & Space Operations Center Weapon System ORD, AFC2ISRC, USAF, 16 Oct 03 GIG MA ICD, 14 Aug 04 GIG IA ICD, 06 Mar 06 NCOE JCD, 15 Dec 06 NCES CDD, 22 May 06 JDS MA ICD, 8 May 03 JRD3C ICD, (FOUO), 9 May 05 MP-CDL, Nov 03 (Draft) PUMA, 4 Aug 03 (Draft) TDL Transformation, 22 Jan 04 TBMCS ORD, 12 Jul 2001 GFM OS CDD, 12 July 2006 (Draft) Adaptive Planning ICD, 15 January 2006 (Draft)

NECC will be an overarching set of capabilities with links to all Tier I and II JCAs. Table 7-2 below focuses strictly on the Tier I and Tier II JCAs most applicable to the NECC capabilities that will be delivered during Increment I, while providing a cross reference pedigree to the GCCS MNS capabilities and relevant MCPs.

Table 7-2 NECC Increment I Associated Joint Capability Areas (JCA)

GCCS MNS Capabilities	MCPs	NECC Increment I Related Tier I JCAs	NECC Increment I Related Tier II JCAs
Maintenance of a Common Perception of the Crisis	Force Projection Force Readiness Situational Awareness	Joint Global Deterrence Joint Net-Centric Operations Joint Logistics Joint Battlespace Awareness Joint Command and Control	Global Strike ■ Nuclear, Kinetic ■ Non-Kinetic Information Assurance Applications Joint Deployment/Rapid Distribution Planning & Direction ■ Identify Info and Collection Requirements ■ Conduct Collection Management ■ Build Collection Plan ■ Develop ISR Architecture Analysis & Production ■ Current Intelligence Develop & Maintain Shared SA and Understanding ■ Access / Share Info on Adversary / Neutral / Noncombatants ■ Access/Share Blue

			Force SA ■ Access/integrate Geospatial Info ■ Display tailored, relevant SA information UDOP Operational Planning ■ Develop / Analyze / Select COAs ■ Assess Plan Effectiveness; Prepare for Execution Monitor Execution, Assess Effects and Adapt Operations ■ Assess Compliance with Commander's Intent ■ Assess Achievement of Planned Effects ■ ID / Assess Implications of Unplanned Effects ■ Adapt Operations to Changing Situations ■ Determine Achievement of Desired Objective, End State or Phase Points Develop Skills ■ Train Exercise ■ Validation ■ Mission Rehearsal Exercise ■ Interagency, Intergovernmental & Multinational Exercises
		Joint Force Generation	
		Joint Force Projection	No Tier II JCAs exist for Joint Force Projection at this time.
Access to Planning Support Information via Theater Infosphere	Force Projection Force Readiness Situational Awareness	Joint Net-Centric Operations Joint Command and Control	Information Assurance Applications Communicate Commander's Intent and Guidance ■ Incorporate Strategic Mission & Guidance Into Commander's Intent Operational Planning ■ Develop Joint / Coalition Campaign Plan ■ Develop Plans Across Full ROMO Synchronize Execution Across All Domains ■ Synchronize Operations with Mission Partners and Other

			Agencies Leverage Mission Partners ■ Communicate Mission Objectives, Rationale, Intentions and Support / Action ■ Coordinate with Mission Partners to Gain Actionable Commitment
		Joint Force Management	Global Force Management Planning & Direction
		Joint IA / IGO / MN / NGO Coordination	US Government and Interagency Coordination Intergovernmental Organization Coordination Multinational Coordination Non-Governmental Organization Coordination
	Force Protection	Joint Protection	Protect Against Conventional Weapons ■ Integrated Air and Missile Defense (IAMD)
Collaborative Access to a Common Operational Picture	Force Projection Situational Awareness	Joint Global Deterrence	Global Strike ■ Nuclear, Kinetic ■ Non-Kinetic
		Joint Net-Centric Operations	Information Assurance Applications
		Joint Logistics	Logistics Information Fusion
		Joint Battlespace Awareness	Observation & Collection (All Domains) ■ Radio Frequency ■ Materials (Chem-Bio) ■ Geophysical ■ Electro-Optical IR ■ Nuclear/Radiological ■ Radar ■ Human Processing & Exploitation ■ MASINT ■ HUMINT ■ GEINT (IMINT) ■ SIGINT ■ TECHINT ■ OSINT Dissemination & Integration ■ Develop Databases & Applications ■ Enable Smart Pull/Push for

			Intelligence Products ■ Enable Real-Time Intel for Warfighter Develop & Maintain Shared SA & Understanding ■ Access / Share Info on Adversary / Neutral / Noncombatants ■ Access / Share Blue Force SA ■ Access / Integrate Geospatial Info ■ Reachback for SME Communicate Commander's Intent and Guidance ■ Conduct Mission Analysis Establish / Adapt Command Structures and Enable Global & Regional Collaboration ■ Establish / Identify Collaboration Mechanisms
Visibility of Plan Execution Status	Force Projection Situational Awareness	Joint Net-Centric Operations Joint Logistics Joint Battlespace Awareness Joint Command and Control	Information Assurance Applications Logistics Information Fusion Analysis & Production ■ Current Intelligence Develop & Maintain Shared SA and Understanding ■ Display tailored, relevant SA information UDOP Operational Planning ■ Develop / Analyze / Select COAs ■ Assess Plan Effectiveness; Prepare for Execution Synchronize Execution Across All Domains ■ Enable Self-Synchronization of Subordinate Forces ■ Synchronize Operations with Mission Partners and Other Agencies ■ Synchronize Execution Between / Across Phases Monitor Execution, Assess Effects and Adapt Operations ■ Assess Compliance with Commander's Intent

	Force Protection	Joint Protection	■ Assess Achievement of Planned Effects ■ ID / Assess Implications of Unplanned Effects ■ Adapt Operations to Changing Situations ■ Determine Achievement of Desired Objective, End State or Phase Points Protect Against Conventional Weapons ■ Integrated Air and Missile Defense (IAMD)
Adaptive Control of Communications& Information Centers for Surge, Degraded Users, & Incremental Deployment	Force Projection Situational Awareness	Joint Logistics Joint Net-Centric Operations Joint Battlespace Awareness Joint Command and Control	Logistics Information Fusion Information Assurance Applications Develop & Maintain Shared SA & Understanding ■ Reachback for SME Communicate Commander's Intent and Guidance ■ Develop / Promulgate Initial Commander's Intent / Guidance; Update as Required ■ Direct Action Through Mission-Type Orders Monitor Execution, Assess Effects and Adapt Operations ■ Adapt Operations to Changing Situations

8 Information Technology and National Security Systems (IT and NSS) Supportability

See NECC CDD Core for discussion.

8.1 NSS Supportability

See NECC CDD Core for discussion.

8.2 Information Technology Systems Supportability

See NECC CDD Core for discussion.

8.2.1 Hardware Components

For the initial increment and follow-on increments, NECC will be implemented by utilizing a spiral development approach to exploit a best-of-the-best acquisition strategy with rapid prototyping, extensive user involvement, and full integration of COTS and GOTS components. (See paragraph 5.3.2)

8.2.2 Software Components

NECC software must be backward compatible/interoperable with COE 4.X-compliant Service variants, such as the GCCS FoS, until their migration and phase out . For the initial increment, NECC will also be interoperable with NCES 1.X developed CES.

8.2.3 Secure Single Client Operating Environment

NECC software must ease the burden on system administrators and developers by: creating a single client operating environment; implementation of a standard desktop office automation suite to include spreadsheets, word processing, and presentation graphics; providing platform independent and portable server applications; operating Defense Message System (DMS) compliant e-mail/messaging package across platforms; and developing a way to route and prioritize NECC data and information transmission over the Non-Secure Internet Protocol Network (NIPRNet), Secret Internet Protocol Router Network (SIPRNet) and Joint Worldwide Intelligence Communications System (JWICS) and other networks as appropriate.

9 Intelligence Supportability

See NECC CDD Core for discussion.

9.1 C4I Standardization, Interoperability, Commonality, and Integration

See NECC CDD Core for discussion.

9.2 Joint and Multinational Interoperability

See NECC CDD Core for discussion.

9.3 Data Requirements

See NECC CDD Core for discussion.

9.4 Joint Technical Architecture

See NECC CDD Core for discussion.

9.5 Information Assurance

See NECC CDD Core for discussion.

9.6 Geospatial Intelligence (GEOINT) and Services

NECC will use/process imagery and geospatial intelligence from National Geospatial-Intelligence Agency (NGA) and other IC sources complying with applicable navigation/positioning format standards [e.g. International Organization for Standardization (ISO) 8211, Universal Transverse Mercator (UTM), Military Grid Reference (MGR), National Grid (NG) and World Geodetic Systems-1984 (WGS 84)].

NECC will take advantage of advancements in imagery sources, commercial services, and advanced geospatial processing software, allowing relevant IC members to build geospatial databases with global coverage using the best available data. NECC shall import, display, and use simulation system terrain databases when participating in a simulated environment.

The GEOINT central theme is based on: foundation data, mission specific data, and multi-source intelligence. The GEOINT analytical environment provides IC analysts and national, civil, theater, and tactical decision-makers with precise location information in four dimensions (latitude, longitude, height above ellipsoid/depth, and time), upon which all-source intelligence and other operational information of national security interest can be overlaid. These intelligence products factor prominently in national decision-makers' planning, decision, and execution cycles and are integrated into the guidance components of precision weapons systems and munitions. Reference: Joint Publication 2-03, *Geospatial Intelligence (GEOINT) Support to Joint Operations.*

To support Joint ISR and mission execution, the National Geospatial-Intelligence Agency's (NGA) system for geospatial intelligence (GEOINT) will capitalize on all forms of traditional or non-traditional data, including that derived from National Technical Means, airborne, commercial and other sources. Each form requires that NGA's GEOINT be provided with timeliness and accuracy specifications sufficient to support the decision, planning, operational, and execution cycles relative to the projected threat/crises environments. The projected threat environments include every circumstance from strategic and conventional deterrence and warfare; peacekeeping; counter-terrorism and counter-proliferation planning and operations; to natural disaster relief, to cite a few.

9.6.1 Geospatial Intelligence Unique Knowledge

Geospatial Intelligence provides unique knowledge not available by other means. GEOINT provides unprecedented precision, location in four dimensions; an integrated digital environment; and a geo-referenced visual representation of the mission space. It provides the foundation for the COP, situational awareness, information and decision superiority; as well as indications and warning analyses pursuant to diplomatic and military interests, such as weapons systems proliferation by hostile nations and/or non-state entities. Geospatial Intelligence gives warfighting commanders and their staffs a critical understanding of an adversary's strategic infrastructure and vulnerabilities, permitting precision strikes against joint force and Service/functional component targets in all weather.

9.6.2 Geospatial Intelligence Attributes

- Characterizes the location of an activity above, on, and under the surface of the earth.

- Includes the source of the data and provides related accuracy, currency and potential utility of that information for further analysis (Geospatial Assurance).
- Ensures, through the development of standards, that information content is consistent, easily accessible, viewable using common tools, and can be further updated by customers and collaborators located at disparate sites.
- The importance of establishing and maintaining evolving data, database standards, and models cannot be overstated.

9.6.3 Geospatial Intelligence Crucial Applications

- Adaptive Planning and execution
- Target acquisition and weapons delivery platforms
- Ensuring the precise and accurate placement of weapons on target

10 Electromagnetic Environment Effects (E3) and Spectrum Supportability

See NECC CDD Core for discussion.

11 Assets Required to Achieve Initial Operational Capability (IOC)

See NECC CDD Core for discussion.

11.1 Open Systems

See NECC CDD Core for discussion.

11.2 Interoperability Certification

See NECC CDD Core for discussion.

11.3 Shared Data Sources

See NECC CDD Core for discussion.

11.4 Geospatial Intelligence

GEOINT should provide knowledge unavailable by other means with: system required precision commensurate with our warfighting capabilities, location in four dimensions; an integrated digital environment; and a geo-referenced visual presentation of the mission space. This is essential because GEOINT will provide: the foundation for the COP, situational awareness, information and decision superiority, indications and warning analysis pursuant to diplomatic and military interests, modeling and simulations support during operations, decision making, running estimates, and training exercises. Reference: Joint Publication 2-03, *Geospatial Intelligence (GEOINT) Support to Joint Operations.*

12 Schedule and IOC/Full Operational Capabilities (FOC) Definitions

See NECC CDD Core for discussion. Extension F: GCCS FoS to NECC Transition displays related programs' synchronized schedules.

12.1 Evolutionary Acquisition

See NECC CDD Core for discussion.

12.2 Initial Operational Capability (IOC)

See NECC CDD Core for discussion.

12.3 Full Operational Capability (FOC)

See NECC CDD Core for discussion.

12.4 Ready for Training (RFT)

See NECC CDD Core for discussion.

13 Other Doctrine, Organizational, Training, Materiel, Leadership and Education, Personnel, and Facilities (DOTMLPF) Considerations

See Extension G.

14 Other Attributes

Associated attributes are detailed in the following subsections.

14.1 Drivers

See NECC CDD Core for discussion.

14.2 Human Systems Integration (HSI)

See NECC CDD Core for discussion.

14.3 Embedded Training Support

See NECC CDD Core for discussion.

14.4 Electronic Attack

NECC has no Electronic Attack requirements.

14.5 Information Protection

See NECC CDD Core for discussion.

14.6 Wartime Reserve Mode (WARM)

NECC has no WARM requirements.

14.7 Nuclear, Biological, and Chemical Contamination

See NECC CDD Core for discussion.

14.8 Natural Environmental Factors

NECC's electronic equipment will be operated in a sheltered environment – from tents to existing structures. Although a hardened shelter is not mandatory, the capability will require an ECU system for conditioning the airflow for personnel and equipment in the shelter. The system will have sufficient capacity to provide shelter over pressurization of 0.025 psi and a humidity level of 40 percent to 85 percent non-condensing. In transit, shipping cases, containers, and/or combat shelters will protect equipment. Terrain will not directly affect NECC, however, line-of-sight communications systems may be affected and will require some measures to mitigate terrain effects. NECC must be capable of operating at ambient pressure altitudes up to 10,000 feet above mean sea level. Deployable and shipboard NECC equipment will be resistant to shock and vibration in accordance with MIL-STD-167 and resistant to adverse environmental conditions in accordance with the pertinent sections of MIL-STD-810. It will also be validated before release.

Protection will be provided against the following conditions:

14.8.1 Climate

NECC associated systems will be capable of employment worldwide and will be exposed to all weather conditions, including: hot and dry deserts, hot and humid tropics, and cold polar environments. Adverse weather can affect operational performance by contributing to hardware degradation or failure. Weather factors affecting hardware, especially electronic components, include space weather (i.e. geomagnetic storms, coronal mass ejections, and ionosphere scintillation), blowing sand and dust, ice, snow, heavy rainfall, lightning, extreme temperatures, and humidity. NECC will be transported in all types of weather conditions using trucks, ships, and aircraft.

14.8.2 Sand & Dust

The equipment shall be storable/transportable in the wind and blowing sand/dust typical of a desert area. Equipment containers shall protect from the following conditions: particle concentration of 2.2 g/m^3 +/-0.5g/m^3; particle size range from 150-850 μm; and air velocity of 18-29 m/s. Protection from blowing dust shall meet the following tolerances: particle concentration of 10g/m +/-7g/m^3; particle sizes up to 150 μm; and air velocity of 1.5 to 8.9 m/s.

14.8.3 Rain/Water/Salt Atmosphere, Spray, and Humidity

The equipment shall be transportable in a salt atmosphere, spray, and fog without operational degradation. Equipment containers must be watertight, preventing water intrusion under conditions of heavy rain, salt-water spray, decontamination solutions and procedures, and transitory immersion (< 5 min) in fresh or salt water. During storage or transport, transit cases

shall protect NECC equipment up to a 5 percent salt atmosphere. During normal operations, NECC electronic equipment will be protected from salt/seawater spray by a shelter designed to protect from heavy rainfall ($\geq$ 3.9 in/hr).

14.8.4 Temperature

For NECC devices operated in facilities protected from environmental hazards (e.g. hardened facilities), the following conditions apply:

- Storage and transit: -50 degrees F to +160 degrees F (-45.6 C to 71.1 C)
- Operating: +32 degrees F to 104 degrees F (0 C to 40 C)

For NECC devices operated in all other facilities, the following conditions apply:

- Storage and transit: -50 degrees F to +160 degrees F (-45.6 C to 71.1 C)
- Operating: -40 degrees F to + 120 degrees F (-40 C to 48.9 C)

14.9 Hazards of Electromagnetic Radiation to Ordnance

NECC will pose no Hazards of Electromagnetic Radiation to Ordnance (HERO) safety issues.

14.10 Expected Mission Capability

Operations in environmental extremes may increase the time needed to execute NECC automated and non-automated processes. NECC will meet threshold levels of performance under all environmental conditions.

14.11 Physical and Operational Security Needs

See NECC CDD Core for discussion.

15 Program Affordability

See NECC CDD Core for discussion.

(INTENTIONALLY BLANK)