

# (U) Statement of Work for the 100G Ethernet Encryptor

9 December 2015

Rev 1.5

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## 1.0 (U) SCOPE

### 1.1 (U) Objective

~~(U//FOUO)~~ This Statement of Work, hereafter referred to as the "SOW", defines the Government's minimum essential requirements and the tasks to be performed to design, develop, fabricate, test and document the 100G Ethernet Encryptor (100G EE). The 100G EE Project shall develop a Type-1 100G EE that supports the encryption/decryption of classified information up to the TOP SECRET/SCI level. The SOW addresses applicable documents, development program implementation requirements and deliverables. It also includes the associated program management, engineering, logistic support planning and an option for procurement of production units under an Indefinite Delivery Indefinite Quantity (IDIQ) Contractor Line Item Number (CLIN).

~~(U//FOUO)~~ It is envisioned that the

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(U) An incremental approach to supporting ESS 1.0 and future encryption algorithms (e.g. Suite A) shall be implemented in the design of the equipment, through firmware and software upgrades only. Use of international standards and commercial off-the-shelf technology shall be applied to the greatest extent possible to maximize compatibility with commercial equipment and to minimize procurement cost and schedule.

### 1.2 (U) Background

(U) In-Line Network Encryptors (INEs) for networks have historically used Asynchronous Transfer Mode (ATM), Internet Protocol (IP), and Synchronous Optical Network (SONET) protocols. INEs have been fielded at OC-768 (40 Gbps) speeds for SONET. The 100G EE will satisfy the need for a Network Encryptor operating at Ethernet layer at speeds up to and including 100Gbps.

(U) The 100G EE will be optimized for general frame based link protection providing selectable traffic flow security for GbE networks. The 100G EE will be used to encrypt and decrypt U.S Government classified information transmitted over commercial 100 Gigabit Ethernet interfaces in terrestrial optical networks. This high assurance Ethernet encryption device must be compatible with the 100G Ethernet Encryptor Functional Specification, hereafter referred to as the "100G EE SPEC", attached to the contract. The 100G EE SPEC defines Increment 1 requirements that are a subset of ESS 1.0. Where there is a conflict the 100G EE SPEC will take precedence over ESS 1.0.

### 1.3 (U) Government Risk Reduction

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## 2.0 (U) APPLICABLE DOCUMENTS

(U) The following documents form a part of this SOW. Unless otherwise indicated, the version in effect on the date of contract award shall apply. In the event of conflict between the documents referenced herein and the contents of this SOW, the contents of this SOW shall be considered a superseding requirement.

### 2.1 (U) Government Documents

Identification	Date	Title
100G EE SPEC	5 DEC 2014	Functional Specification for the 100G EE Equipment Development Version 1.2.1
IASRD	14 MAR 2014	IASRD 13-16, National Security Agency Information Assurance Security Requirements Directive (IASRD) Tailored for the 100G EE
TSRD	15 Nov 2013	TSRD 13-16 Version C, National Security Agency Telecommunications Security Requirements Document (TSRD) Tailored for the 100G EE
Ethernet Security Specification (ESS) v1.0	09 Sep 2013	Ethernet Security Specification v1.0
NISPOM	28 Feb 2006	National Industrial Security Operations Manual (NISPOM), DOD 5220.22-M
NSM	1 Nov 2012	NRO Security Manual
NSA/CSS Policy Manual No. 3-16	05 Aug 2005	Control of Communications Security (COMSEC) Material

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## 2.2 (U) Commercial or Non-Government Standards

Identification	Date	Title
ANSI/EIA-748-B	Jun 2007	Industry Guidelines for Earned Value Management Systems
GR-63-CORE	Apr 2012	NEBS <sup>TM</sup> Requirements: Physical Protection, Telcordia Technologies, GR-63-CORE, Issue Number 4
GR-1089-CORE	May 2011	Electromagnetic Compatibility (EMC) and Electrical Safety – Generic Criteria for Network Telecommunications Equipment, Telcordia Technologies, GR-1089-CORE, Issue Number 6

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### 3.0 (U) REQUIREMENTS

#### 3.1 (U) General

(U//~~FOUO~~) This SOW describes the requirements for the design, development, fabrication, testing and documentation of the 100G EE in accordance with (IAW) the 100G EE SPEC, the National Security Agency (NSA) Information Assurance Security Requirements Directive as Tailored for the 100G EE (hereinafter referred to as the "IASRD"), the NSA Telecommunications Security Requirements Document (hereinafter referred to as the "TSRD"), and other applicable documents listed in Section 2.0 and the requirements of this SOW.

(U//~~FOUO~~) The Government intends to achieve compliance with ESS 1.0

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(U//~~FOUO~~) The Contractor shall provide all the data items in the Contact Data Requirements List (CDRL) as specified by this SOW.

##### 3.1.1 (U) Project Management and Schedule

(U) The Contractor shall provide the necessary program management to successfully conduct all tasks under this contract. The Contractor shall provide a Program Management Plan (PMP) IAW CDRL A003. The PMP shall include a narrative that discusses the associated risks with each phase of the program. The Contractor shall recommend alternative approaches to high-risk design areas throughout the preliminary and critical design phases of this development effort. The Government will evaluate all recommendations to determine if implementation is in the best interest of the Government.

(U) The Contractor shall create and provide a Contract Work Breakdown Structure (CWBS) and dictionary that defines all CWBS elements (CDRL A008).

(U) The Contractor shall develop, maintain, and provide an Integrated Master Schedule (IMS) for all contract CLINs, IAW CDRL A010. The Contractor shall define the schedule to be followed during the contract such that the initial design, development, fabrication, testing and documentation are completed and all deliverables are submitted IAW the period of performance in Section F of the contract. Major milestones and all reviews shall be identified in the IMS.

(U) The Contractor shall provide quarterly Contract Funds Status Reports (CFSR) (CDRL A012).

##### 3.1.2 (U) Program Reviews

###### 3.1.2.1 (U) Major Program Reviews

(U) The Contractor shall schedule and conduct the major program reviews identified below with Government participation. The Contractor shall prepare and forward agendas and briefing charts in advance of each major program review (a through f below), IAW CDRL A006. The Contractor shall keep minutes of each review, to include action item lists and action closure, and shall submit them to the Government, IAW CDRL A002. The Contractor shall accommodate up to 20 Government representatives at each of these reviews, and shall ensure that the conference

can be conducted at the SECRET level. The Contractor shall deliver the final as-briefed (with corrections) Design Review package, IAW CDRL A006. The Major Program Reviews shall be:

- a. Post Award Conference (PAC), 30 days after date of initial award determination.
- b. System Requirements Review (SRR) at the conclusion of the System Requirements Definition Phase,
- c. Preliminary Design Review (PDR) at the conclusion of the Preliminary Design Phase,
- d. Critical Design Review (CDR) at the conclusion of the Detailed Design Phase.
- e. Test Readiness Review (TRR) after completion of dry run testing and prior to formal (i.e. Government witnessed) System Test.
- f. End Product Acceptance Review (EPAR) after completion of all prior phases and unit testing.

### **3.1.2.2 (U) Program Management Reviews**

(U) The Program Management Reviews (PMRs) shall encompass all aspects of the program (i.e., cost, schedule, technical performance, etc.). Typically, PMRs will be held at the Contractor's facility; however, two (2) per year will be conducted in the Baltimore/Washington, D.C. area. The Contractor shall plan for the first PMR to occur one (1) month after contract award at the Contractor's facility. Following the first PMR, the Contractor shall plan on one PMR approximately every 30 days for the period of performance of the contract. Prior to each PMR, the Contractor shall prepare and forward the agenda and briefing charts, IAW CDRL A001. Also, the Contractor shall keep minutes of each review, to include action item lists and action closure, and submit them to the Government, IAW CDRL A002. The Contractor shall provide interim updates to the Government via a short duration weekly status call.

### **3.1.2.3 (U) Technical Exchange Meetings**

(U) The Contractor shall host Technical Exchange Meetings (TEMs) as necessary or as directed by the Government to resolve complex technical issues facing the program. The Contractor shall also include travel, preparation and follow-up engineering time, for up to four (4) offsite TEMs. Travel expenses can be budgeted on transportation costs coast-to-coast, per-diem costs and salaries for up to three engineers per meeting. Trades in the total number of meetings, number of attendees and location shall be adjudicated with the Government based on technical requirements to achieve the objectives of the contract. The Contractor shall keep minutes of each meeting, to include action item lists and action closure, and shall submit them to the Government, IAW CDRL A002.

### **3.1.3 (U) Technical Data**

(U) The Contractor shall prepare and maintain a Data Accession List IAW CDRL A013.

### **3.1.4 (U) COMSEC Account & Key Storage**

(U) The Contractor shall obtain an NSA COMSEC account and maintain it in accordance with the NSA/CSS Policy Manual No. 3-16. The Contractor shall maintain this account for the duration of the contract. This COMSEC account is for the secure communication equipment, cryptographic keying material for this equipment, for the 100G EE cryptovariables, the 100G EE

boards and the 100G EE themselves. The Contractor shall enter these devices into COMSEC accountability.

### **3.2 (U) Personnel and Facilities**

(U) The Contractor shall provide personnel, equipment and facilities to perform the work required by this SOW. The Contractor shall provide cleared personnel and facilities for performing security relevant tasks. Technical lead personnel and personnel performing security related tasks or requiring access to classified design documentation shall have at least SECRET clearances. Security related tasks include systems design, hardware design, software design, and system test of security functions within the system's INFOSEC boundary, program management, and security critical aspects of production.

### **3.3 (U) Technical Tasks**

#### **3.3.1 (U) 100G EE Design & Development**

~~(U//FOUO)~~ The Contractor shall design, develop and fabricate 100G EE unit(s) to be compliant with the Government provided requirements documents IAW the design and development methodology of Section 3.4. The Contractor shall test the 100G EE units to ensure that they meet said requirements IAW Section 3.5. The Contractor shall continue to support the 100G EE development through successful completion of the Government's certification process.

#### **3.3.2 (U) System and System Security Engineering**

(U) The Contractor shall provide System and System Security Engineering support to execute the 100G EE requirements development, functional allocation and verification, system design integration. The Contractor shall develop and document configuration/initialization, management and operational concepts for the unit (CDRL B002). The Contractor shall ensure the 100G EE units are functional, cryptographically interoperable and operate in a secure manner when integrated into 100 GbE based networks with commercial networking equipment using standards based networking protocols.

##### **3.3.2.1 Ethernet Control Processing**

- (U) The Contractor shall perform engineering analysis to determine which control protocols will be discarded, peered or encrypted/decrypted in support of each Ethernet Data Encryption (EDE) device type required by increment 1. The control processing may differ based on EDE device type. The analysis should also study the need to bypass protocol control information.
- (U) The Contractor shall perform engineering analysis to determine the proper amount of memory needed to support flow control and typical network operations given the maximum distances supported on the interfaces

##### **3.3.2.2 Secure Management Information Base (MIB) Development.**

~~(U//FOUO)~~ As previously stated, ESS 1.0 describes the use of public standards for an EDE. The public standards (IEEE 802.1ae and 802.1X) define a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. The standards further describe "Security Considerations" for some of the management objects defined in the MIB.

(U//~~FOUO~~) The Contractor shall provide System Security Engineering support when developing the MIBs required in the 100G EE Spec. The Contractor shall perform an analysis to determine additional access restrictions to secure MIB objects and apply the results of this analysis to the delivered MIB.

### **3.3.2.3 System Requirements Management**

(U//~~FOUO~~) The Contractor shall develop the Software/Hardware Requirements Specification (SHRS) (CDRL C005). The Contractor shall work with the Government to ensure that the SHRS is consistent and complete relative to the Contractor developed CONOPs (CDRL B002) and the 100G EE SPEC.

(U//~~FOUO~~) The Contractor shall update and maintain configuration of the SHRS for the duration of the contract. The coordination of the design with the SHRS shall include monitoring, review, coordination and allocation of 100G EE requirements into lower-level specifications and internal interface documents. In addition, the SHRS shall be used to ensure sufficient test coverage for all testing in general, and for functional and security testing in particular.

### **3.3.3 (U) 100G EE EDM**

(U) The Government plans to use 100G EE Engineering Development Model (EDM) units as an early form, fit and function integration device for system end-to-end tests. As such, the Contractor shall fabricate, assemble and test the quantity of non-NSA certified 100G EE EDM units as required in Section 4.2 of this SOW. To the maximum extent practicable, the 100G EE EDM(s) shall use identical parts as those in the production 100G EE units. The 100G EE EDM(s) shall complete the functional tests per Section 3.5 below and be fully operational.

### **3.3.4 (U) 100G EE Increment 2 Requirements Analysis**

(U) ESS 1.0 describes the use of public standards for Ethernet Data Encryption (EDE) protecting a National Security System (NSS). ESS 1.0 provides the requirements and recommended functionality for an NSS EDE device supporting a variety of network architectures. The ultimate goal of the 100G EE program is to produce a unit that is fully compliant with ESS 1.0. This goal must be balanced with the need to develop the unit under a tightly controlled schedule; therefore, some of the mandatory requirements in ESS 1.0 will not be required in the initial increment.

(U//~~FOUO~~) The Contractor shall work with the Government to conduct an Increment 2 requirements analysis for an ESS 1.0 compliant 100G EDE. The Increment 2 analysis shall start upon completion of the Increment 1 SRR. Increment 2 shall include support for both a key agreement protocol and pre-shared keys. The Contractor shall identify requirements, architecture and certification details for upgrade with firmware and software only upgrades.

(U//~~FOUO~~) The Contractor shall work closely with the Government to conduct trades including key management trade on EAP-TLS, EAP-Internet Key Exchange or KMI aware, PDE enable device. For the purposes of this effort, EAP-TLS implemented per RFC-5216 may be considered “optional” as opposed to “mandatory” for ESS 1.0.

(U) The Contractor shall perform engineering analysis to propose a method to support up to 4 priority queues and estimate the additional cost/schedule needed to support priority based flow control over a simple single queue scenario.

(U) The Contractor shall determine which control protocols will be discarded, peered or encrypted/decrypted in support of each EDE device type specified in ESS 1.0. The Government is aware that the IEEE Ethernet specifications are still maturing with respect to layer 2 control protocols to realize the prescribe EDE device types in real networks. The contractor shall analyze the relevant draft IEEE specifications, identify issues, present options and attempt to integrate the draft IEEE specification with ESS 1.0.

(U) The Contractor shall document the Increment 2 architecture, CONOPs and trade results IAW CDRL B001. The report shall contain a Rough Order of Magnitude (ROM) cost and schedule estimate to productize and obtain NSA certification of the Increment 2 architecture. The contractor shall document Increment 2 system-level requirements IAW CDRL C005 and conduct an Increment 2 SRR.

### **3.3.5 (U) Engineering Analysis and Support Task (CLIN0002)**

(U) The Contractor shall perform engineering analysis and support tasks as required by the program office, under separate task orders within CLIN0002. For example, the program office expects that from time to time, 100G EE users may come forward with requests for additional analysis or ad hoc support tasks. The Contractor will use this task as the means to accomplish this scope.

(U) The Contractor shall provide the appropriate labor skill set mix to accomplish the tasks. The Contractor shall deliver the results of the analysis to the Government with a Technical Report IAW CDRL B003. The initial pool of hours shall include a mixed skill set of 4,000 hours.

(U) The Contractor shall work with Government to demonstrate that the 100G EE devices can communicate with each other in Government lab environment. The Contractor shall review Government produced test plan/procedures. The testing shall ensure that the 100G EE devices are interoperable with commercial networking products. The testing will be conducted using EDM units at multiple sites within the Washington DC metro area. The Contractor shall provide on-site integration and testing support for two trips to Washington DC metro area and remote teleconference support for the duration of the testing.

### **3.3.6 (U) Indefinite Delivery Indefinite Quantity (IDIQ) – OPTION (CLIN 0003)**

(U) The Contractor shall deliver additional 100G EE productions units as required under an Indefinite Delivery Indefinite Quantity (IDIQ) CLIN. The Contractor shall fabricate, test and deliver the quantity of production 100G EE units as specified in Section 4.2.3. The 100G EE(s) shall use approved design, parts, processes, tests and facilities from the development. The 100G EE(s) shall be fully functional, Type 1 devices and shipped according to the Security Procedures and Controls specified for this program.

(U) In order to minimize the schedule risk associated with the procurement of long lead items the Contractor may order and procure the long lead material necessary for the execution of this

option as soon as the option is approved. The material shall be sufficient for the fabrication of the minimum quantities of production units identified in 4.2.3.

### **3.4 (U) Design & Development Methodology**

(U) The Contractor shall follow a structured design, development and test methodology to insure that the system requirements are fully implemented, documented, and tested and can be independently analyzed and verified by the Government in support of system certification. The methodology provided below provides a guideline to the developer for a typical high assurance development effort. The methodology chosen by the Contractor shall include the following milestones: System Requirements Review, Preliminary Design Review, Critical Design Review and Test Readiness Review. These milestones shall be considered complete when: the review has been held; all documentation required up to that point has been delivered and accepted; all major issues (identified as such by the Government at the review) have been resolved to the Government's satisfaction.

#### **3.4.1 (U) System Design**

(U) Development begins with a system design phase and shall culminate in a System Requirements Review (SRR). During this phase, the Contractor shall analyze system requirements, shall decide upon initial system architecture, shall make a preliminary allocation of requirements to hardware or software, and shall plan system level testing.

(U) The contractor shall perform an analysis of the Telcordia GR-63-CORE (Environmental) and GR-1089 (EMC) requirement documents. The contractor shall investigate construction requirements and material selection and determine an appropriate subset to meet the requirements in the 100G EE SPEC. The contractor shall document the analysis (B003) and incorporate the findings into baseline SHRS.

(U) During the system design phase, the Contractor shall prepare and maintain a system level requirement specification (Software / Hardware Requirements Specification (SHRS)) from which the requirement baseline and all system level testing requirements are derived. The SHRS shall be derived from the Government-provided requirements: 100G EE SPEC, TSRD, and IASRD. The Contractor shall begin and baseline the SHRS during this phase. The Contractor shall prepare and deliver the SHRS IAW the CDRL C005.

(U) The Contractor shall track the allocation of these requirements to the elements that satisfy the requirements in the design. In addition to any other data stored which the Contractor may find useful, the Contractor shall record the requirement statement, a Contractor-assigned requirement number, the part of the implementation that satisfies the requirement, how the requirement is tested, and at what level of system integration the requirement is tested. The Contractor shall use this database to guide their test planning and test execution to ensure that the delivered system completely satisfies all system requirements. The Contractor shall report on the status of the requirements baseline at every major program review.

#### **3.4.2 (U) Preliminary Design**

(U) The Preliminary Design phase follows the System Design phase, culminating in a Preliminary Design Review (PDR). During this phase the Contractor shall complete the top-level hardware and software design. The Contractor shall further develop the system design, define

subsystems, decompose requirements and allocate them to subsystems, and begin planning system integration.

### **3.4.3 (U) Detailed Design**

(U) The Detailed Design phase follows the Preliminary Design phase, culminating in a Critical Design Review (CDR). During this phase the Contractor shall completely develop the design of all subsystems to the point that they are ready to be implemented in the form of code, circuits, or hardware, including worst case analyses, timing analyses, thermal analyses, writing Preliminary Design Language, and other techniques.

## **3.5 (U) Integration & Test**

(U) The System Integration phase follows the Detailed Design phase, culminating in a Test Readiness Review (TRR). During this phase the Contractor shall implement the designs integrate them into the 100G EE unit and test the resulting unit.

### **3.5.1 (U) Test Readiness Review**

(U) After completion of dry run testing and prior to formal (i.e. Government witnessed) System Test, the Contractor shall host a Test Readiness Review (TRR) with the participation of the Government Program Office to assess readiness for system level testing. The TRR marks the completion of system integration and the beginning of system testing.

### **3.5.2 (U) Design Verification**

(U/~~FOUO~~) Design verification ensures that the fully integrated 100G EE unit satisfies all system level requirements levied by this SOW and related documents. The Contractor shall produce a Design Verification (DV) Plan IAW CDRL B004. The Contractor shall develop procedures and perform all necessary testing, inspection and analysis IAW the DV procedure. The Contractor shall record the results of each test, track all test failures, and submit test results IAW the CDRL B005. The Contractor shall make corrections and retests until all system requirements have been satisfied. The Government or a designated Government representative may witness formal Design Verification Testing.

### **3.5.4 (U) Acceptance Test**

(U/~~FOUO~~) Acceptance testing ensures that the 100G EE units will meet the performance specifications and demonstrate error-free workmanship in manufacturing. The Contractor shall produce an Acceptance Test Plan IAW CDRL B007. The Contractor shall develop procedures and perform all necessary testing, inspection and analysis IAW the Acceptance Test procedure. The Contractor shall record the results of the test and track all test failures. The Government or a designated Government representative may witness formal acceptance testing.

### **3.5.5 (U) End Product Acceptance Review**

(U) The End Product Acceptance Review (EPAR) reviews the results of all system level testing leading up to Government authorization to proceed with production build and test. The Contractor shall host an EPAR to include a summary of all Design Verification testing, including design verification, security verification, qualification testing, and other tests. The EPAR shall include the status of problems encountered during integration and test, discrepancy reports,

deviations, waivers, and their corrective actions. The EPAR shall look forward, reviewing plans for fabrication, maintenance and training. The Contractor shall keep minutes of each review, to include action item lists and action closure, and shall submit them to the Government, IAW CDRL A002.

### **3.6 (U) Quality Assurance**

(U) The Contractor shall establish a Quality Assurance (QA) Program. As a minimum, the Contractor shall establish a system for early detection and correction of errors, assure quality of system deliverables, assure quality of engineering data, and assure quality of purchased products. The Contractor's documented QA program shall be made available to the Government for review upon request.

(U) The Contractor shall establish and maintain a system of quality assurance records. These records shall comprise those reports and internal records developed/required by the contract in the normal performance of the quality control procedures to include: Contractor Acceptance Tests; System Level Tests (Design Verification, Design Verification, and SV); Engineering Drawing Audits and Inspections; and Technical Publications Validation/Verification and Inspection. These QA records shall be made available for review by the Government.

### **3.7 (U) Configuration Management**

(U) The Contractor shall establish and maintain a Configuration Management Program, which shall include the establishment of a Configuration Control Board (CCB) to ensure all design and test related documentation and artifacts are maintained by a controlled process to ensure the as-built design and product are accurately captured. The Contractor shall ensure that all design changes are evaluated on a basis of performance, risk and affordability.

### **3.8 (U) Software / Firmware Delivery**

#### **3.8.1 (U) Software Delivery**

(U) The Contractor shall deliver all executable code IAW CDRL B008 and B009. In the event that contract funding or mixed funding is used in the development and the Government has Unlimited or Government Purpose Rights, the Contractor shall also deliver source code IAW CDRL B008 and B009.

#### **3.8.2 (U) Hardware Description Language Delivery**

(U) In the event that contract funding or mixed funding is used in the development and the Government has Unlimited or Government Purpose Rights, the Contractor shall submit HDL Files IAW CDRL B010 and B011. The HDL files used to document the hardware designs in the fabrication of the electronic device shall be partitioned into two basic types: HDL design files and auxiliary files.

### **3.9 (U) NSA CERTIFICATION**

(U) The Contractor shall architect, design, document, develop and test a Type 1 100G EE that is compliant with the TSRD and IASRD identified in Section 2.0. The Contractor shall plan, perform, and report all testing required by the TSRD, to include TEMPEST and Security Verification testing.

(U) The Contractor shall prepare, submit and work with the Government to obtain approval of the NSA certification related CDRLs contained in the TSRD. All certification CDRLs (CDRL

C001 – C021) submittals shall be in accordance with the format specified in the TSRD and associated Data Item Descriptions (DID). The Contractor shall deliver the CDRLs no later than the time specified in the TSRD.

(U) The Contractor shall maintain all NSA certification documentation current and provide updates as required throughout this contract to ensure a complete and accurate certification package is presented to NSA certification.

(U) As part of this development effort, the Contractor shall afford the Government the opportunity to witness any and all development activities and NSA required testing. Advanced notice of design reviews shall be provided to the Government such that reasonable lead-time exists for Government travel arrangements if travel is required.

### **3.10 (U) Integrated Logistics Support**

#### **3.10.1 (U) Preliminary Maintenance and Provisioning Concept**

(U) The Contractor shall develop and document a preliminary maintenance and provisioning concept for the 100G EE program CDRL D001. This concept should address requirements for future maintenance, test and support equipment in sufficient detail to maintain an end-state inventory of up to one hundred 100G EE units. The maintenance concept shall accommodate a two tier maintenance support structure as stated below.

(U) Echelon 1 (E1) Support: The Government will provide a depot facility for E1 software and firmware upgrades and limited repairs (i.e. tamper recovery) for rapid turnaround support.

(U) Echelon 2 (E2) Support: In-depth troubleshooting and repairs will be handled in E2 maintenance activities as contract maintenance tasks.

#### **3.10.2 (U) Operator Training**

(U) The Contractor shall develop an Operator's Training Plan IAW CDRL D002 and submit it to the Government for approval. The Contractor shall develop, document and conduct an initial training course (CDRL D003) IAW the approved Training Plan for up to 25 Government representatives. Training shall cover how to install, configure and operate the 100G EE unit. The initial training course shall be offered at the Contractor's facility. The Contractor shall prepare and submit the training material for review and approval by the Government.

#### **3.10.3 (U) Operator Manual**

(U) The Contractor shall prepare and deliver an Operator Manual IAW CDRL D004. This manual shall describe how to install, configure and operate the 100G EE equipment.

### **3.11 (U) Security**

(U) The Contractor shall prepare and submit a Program Protection Plan (PPP) (CDRL A004) to the Cognizant Program Security Officer (PSO). The PPP shall detail how security will be administered under this contract. The PPP shall identify a company Program Security Officer (Contractor PSO) by name to be final adjudicator on all security issues within the company and serve as the interface to the Government PSO that has been or will be trained to meet all Government security requirements. The PPP shall specifically address the protection construct for the 100G EE development including classified and unclassified facilities, personnel, and interfaces with sub-Contractors and information systems and identify security personnel and

their roles and responsibilities. The Contractor shall adhere to the approved PPP contents for the duration of the program.

(U) The Contractor shall prepare and submit a System Security Plan (SSP) (CDRL A005) identifying all security policies, mechanisms and procedures for protection of all data systems used for the design and management of this program. The Contractor shall submit proof of certification and accreditation of all classified Information Systems for this program. The Contractor shall maintain these certifications and accreditations for the duration of the program.

(U) The prime Contractor and all sub-Contractors shall have approved facilities and equipment for handling and storing classified data at the SECRET level for initial design work. The prime and all sub-Contractors shall maintain the necessary facility clearances for the duration of the program.

(U) The Contractor shall appropriately mark any work product in accordance with the classification levels from the Government's DD-254. Any Contractor generated work product that is classified is handled according to directives from the Defense Security Service (DSS) and the NISPOM or more current document.

(U) The Contractor shall report all incidences promptly in accordance with the NISPOM, or more current document, to both their DSS representatives and the Government Program Office.

#### 4.0 (U) DELIVERABLES

##### 4.1 (U) Contractual Data Requirements List

(U) The Contractor shall deliver the documents identified in the list provided in the Table below. Unless a document format is otherwise noted, the Contractor shall use best commercial practices in preparing the documents. Deliverables shall be provided in Government-approved Contractor format: softcopy submission compatible with Microsoft Office environment on disk or CDR media, with a transmittal letter to the Contracting Officer and include the appropriate security classification markings. All magnetic media shall be virus tested by the Contractor using commercially available software for virus detection and eradication prior to delivery consistent with Government standards-

##### 4.1.1 (U) Administrative and Program Management

CDRL	TITLE
A001	Program Management Review Package
A002	Minutes w/ Action Items & Action Closure; Trip Reports
A003	Program Management Plan
A004	Program Protection Plan
A005	System Security Plan
A006	Design Review Package (and Agendas)
A007	--Reserved--
A008	Contractor Work Breakdown Schedule
A009	--Reserved--
A010	Integrated Master Schedule (IMS)
A011	--Reserved--
A012	Contract Funds Status Reports (CFSR)
A013	Data Accession List

Table is UNCLASSIFIED

#### 4.1.2 (U) 100G EE Technical, Non-Certification CDRLs

CDRL	TITLE
B001	100G EE Increment 2 Requirements Analysis
B002	Concept of Operations Document
B003	Technical Report(s)
B004	Design Verification Plan
B005	Design Verification Report
B006	Reserved
B007	Acceptance Test Plan
B008	Software Deliverables (e.g. source code, executables, and electronic media)
B009	Software Version Description (SVD)
B010	HDL Version Description (HVD)
B011	HDL Files

Table is UNCLASSIFIED

#### 4.1.3 (U) 100G EE NSA Certification CDRLs

Table is UNCLASSIFIED

CDRL	TITLE
C001	Security Evaluation Document (SED)
C002	Security Verification (SV) Plan & Procedures
C003	Security Verification (SV) Report
C004	Technical Report – Study/ Services; Software Development Process Description Document” (SDPDD)
C005	Software/Hardware Requirement Specification (SHRS)
C006	Technical Report – Study/ Services; Software /Hardware Design Description (SHDD)
C007	Technical Report – Study/ Services; Software and Programmable Logic Evaluation Report (SPLER)
C008	Technical Report – Study/ Services; Sub Title: Key and Certificate Management Architecture (KCMA)

CDRL	TITLE
C009	Technical Report – Study/ Services; Sub Title: Key and Certificate Management Plan (KCMP)
C010	Key Specification
C011	Physical Configuration Audit Plan (PCAP)
C012	Physical Configuration Audit Report (PCAR)
C013	--Reserved--
C014	TEMPEST Test Plan
C015	TEMPEST Test Report
C016	In-Process Accounting Procedures
C017	Security Production Assurance (SPA) Description
C018	Product Drawings/ Models and Associated Lists
C019	--Reserved--
C020	Information Security (INFOSEC) Anonymity Plan
C021	Engineering Change Proposal (ECP)

Table is UNCLASSIFIED

#### 4.1.4 (U) Sustainment Documentation

CDRL	TITLE
D001	Maintenance and Provisioning Concept
D002	Training Plan
D003	Training Course Materials
D004	Operator's Manual

Table is UNCLASSIFIED

#### 4.2 (U) Hardware Deliverables

##### 4.2.1 (U) Engineering Development Models (EDMs)

(U) The Contractor shall deliver eight (8) 100G EE EDMs with SR10 pluggable optics, power cables and other ancillaries required for operation. The units shall be covered by a minimum of a one year Contractor repair warranty.

#### 4.2.2 (U) 100G EE Manager Software

(U) The Contractor shall develop 100G EE Manager software that performs remote management of 100G EE units in the enterprise and displays the information in a consolidated interface. Development of the 100G EE Manager software should not impact the delivery schedule for 100G EE Increment 1 hardware. The Contractor is encouraged to leverage existing management software that may provide similar functionality. The Contractor shall provide software updates, including patch updates during warranty period.

#### 4.2.3 (U) Certified Production Units

(U) The Contractor shall deliver additional 100G EE productions units as required under an Indefinite Delivery Indefinite Quantity (IDIQ) CLIN. The IDIQ contract option is identified under Federal Acquisition regulation (FAR) 16.504 for the period of performance specified in the contract.

(U) The delivery orders issued under the contract will be Firm Fixed Price for the purchase of 100G Ethernet Encryptor Units.

(U) The minimum quantity of 100G EE to be ordered during the period of program shall be 10.

(U) The maximum quantity of 100G EE to be ordered during the period of program shall be 250. However, there may be a potential for the Government to exceed the original unit maximum.

(U) The Contractor shall comply with FAR regulations related to Authorization of Fixed Price Task or Delivery Orders (MAR 2009).

(a) The following CLINs or SubCLINs in this contract are for fixed-price delivery orders:

<u>CLIN</u>	<u>SubCLIN</u>	<u>Contract Type</u>
005	001 (Long-Reach configuration)	FFP
005	002 (Short-Reach configuration)	FFP

(b) When requested, the Contractor shall submit a delivery order, as specified by the Contracting Officer, for the performance of delivery order to be placed under the CLIN(s) identified in the table above. Each delivery order shall contain details of the delivery order, the CLIN under which the work will be performed, and the total price or cost for the work to be performed in the detail specified by the Contracting Officer. Delivery orders in response to said proposals will be serially numbered, dated, and signed by the Contracting Officer before transmittal to the Contractor. In no event shall the cumulative firm fixed price of all orders authorized exceed the firm fixed price set forth in Section B for the designated CLIN(s).

(c) Each delivery order will specify: (1) the CLIN under which the delivery order has been placed; (2) the delivery order price (3) Delivery Date (4) Hardware Configuration (e.g. Pluggable Optics). Within ten calendar days after receipt of each delivery order, the Contractor shall submit a written notice to the Contracting Officer indicating acceptance or non-acceptance of the delivery order. Each delivery order accepted by the Contractor shall be deemed to be incorporated into this contract by reference. Failure of the Contractor to provide written

acceptance to the Contracting Officer shall be considered non-acceptance of that delivery order. The Contractor understands that acceptance of a delivery order obligates the Contractor to complete all the effort required by that delivery order for the firm fixed price set forth therein.

(d) In the event the sum of the firm fixed prices of all delivery orders authorized hereunder is less than the total price of the designated CLIN(s), the price of said CLIN(s) shall be modified to equal the total price of all task/delivery orders authorized.

(e) No delivery order shall be issued under this provision until sufficient funds are allotted to cover the work. Incremental funding of delivery orders shall be governed by the provisions of the *Limitation of Government's Obligation* clause.

**(U) APPENDIX A – Acronyms**

(U) NOTE – All Acronyms are UNCLASSIFIED

100G EE	100 Gigabits per second Ethernet Encryptor
ANSI	American National Standards Institute
ASIC	Application Specific Integrated Circuit
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CFSR	Contract Funds Status Report
CONOP	Concept of Operations
COTR	Contracting Officer's Technical Representative
CPR	Contract Performance Report
DID	Data Item Description
DSS	Defense Security Service
DV	Design Verification
ECP	Engineering Change Proposal
EDE	Ethernet Data Encryptor
EDM	Engineering Development Model
EIA	Electronic Industry Association
EKMS	Electronic Key Management System
EPAR	End Product Acceptance Review
ESS	Ethernet Security Specification
FPGA	Field Programmable Gate Array
FSDA	Fail-Safe Design Analysis
GFE	Government Furnished Equipment
GFI	Government Furnished Information
HDL	Hardware Description Language
IASRD	Information Assurance Security Requirements Directive
IAW	In Accordance With
IDIQ	Indefinite Delivery Indefinite Quantity
INFOSEC	Information Security
KMP	Key Management Plan
NISPOM	National Industrial Security Program Operating Manual
NSA	National Security Agency
PCA	Physical Configuration Audit
PDR	Preliminary Design Review
PSO	Program Security Officer
QA	Quality Assurance

SED	Security Evaluation Document
SOW	Statement of Work
SRR	System Requirements Review
SV	Security Verification
SVD	Software Verification Description
SVT	Security Verification Test
TRR	Test Readiness Review
TSRD	Telecommunications Security Requirements Document