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NATO Communications and Information Agency
Agence OTAN d'information et de communication

BOOK II

PART IV – STATEMENT OF WORK

(SOW)

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SOW ANNEX B: SITE INFORMATION DATA PACKAGE (SIDP) – UNITED KINGDOM (THE CONTENTS CAN BE FOUND IN THE BIDDERS LIBRARY, SECTION 11)

SOW ANNEX C: SYSTEM REQUIREMENT SPECIFICATIONS (SRS) CIVIL WORKS (CW) – UNITED KINGDOM – SEE ATTACHMENT

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SOW ANNEX F: SYSTEM REQUIREMENT SPECIFICATIONS (SRS) CIVIL WORKS (CW) - NETHERLANDS – SEE ATTACHMENT

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SOW ANNEX H: SITE INFORMATION DATA PACKAGE (SIDP) – GREECE (THE CONTENTS CAN BE FOUND IN THE BIDDERS LIBRARY, SECTION 11)

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SECTION 1 INTRODUCTION

1.1. Overview

- 1.1.1. This Statement of Work (SOW) describes the responsibilities and efforts to be performed by the Contractor in satisfying the requirements of the Ship Shore Ship Buffer Project in the United Kingdom (UK), Greece (GR) and The Netherlands (NL). The SOW is comprised of seventeen (17) Sections that describe the technical, civil works (CW) and the managerial requirements for the Contractor's performance during the Contract.
- 1.1.2. The scope of the IFB-CO-15577-SSSB project is to procure, design, deliver, install, test and support integration of communication equipment of the SSSB system in the United Kingdom, Greece and The Netherlands. The IFB-CO-15577-SSSB project is divided into two separate parts.
- 1.1.3. The scope comprises of Civil Works (CW) components that will need to be carried out by the Contractor to enable the implementation of the Communications and Information Systems (CIS) of this project at the thirteen (13) radio sites across the United Kingdom, Greece and The Netherlands. These requirements are stipulated in Section 14 of this SOW and shall be defined in detail in the Systems Requirements Specification (SRS) (CW) Annexes of this SOW.
- 1.1.4. The scope also comprises of CIS implementation, which also includes elements of CW. The Contractor's responsibility for the CIS portion of the project is to procure, install, integrate and accept the radio communications subsystem and data link communications upgrade of the SSSB system through the following (see also Section 3, para 3.1.3 below):¹
 - a. Replacement of HF transmitters and receivers with new solid state equipment.
 - b. 1.1.4.2 Replacement of UHF amplifier's with new equipment supporting SATURN standard having the same dimension and interfaces (F3).
 - c. 1.1.4.3 Replacement of HF and UHF antennas cabling, wiring, connectors and all necessary adaptation to the building in terms of penetration and lightning protection systems.
 - d. 1.1.4.4 Replacement of Direct Line of Sight (DLOS) antennas cabling, wiring, connectors and all necessary adaptation to the building (Greece only).

¹ Existing THN DTS's with Link-22 upgrade capability will not be considered for Link-22 upgrade due to higher costs involved.

- e. 1.1.4.5 Extension of fiber optic cabling (approx. 20KM) (Greece only).

- 1.1.5. On completion of the project, Territorial Host Nations (THN) United Kingdom, Greece and The Netherlands will assume full responsibility for Operation and Maintenance (O&M) activities. However, in line with normal practice the project will deliver tools, test equipment, documentation and initial training.

1.2. Purpose of the Project

- 1.2.1. The purpose of this project is to replace and modernize existing Ship-Shore-Ship Buffer (SSSB) obsolete radio and control equipment in the UK, GRC and NLD. The project will also rationalize the Buffer Centre (BC) structure (to be carried out by the NATO Communications and Information Agency (NCI Agency), extend the coverage area and prepare for the introduction of a Link 22 capability in addition to Link 11. Integration of full Internet Protocol (IP) networks will also reduce Operational & Maintenance (O&M).

1.3. Standards for interpretation of the Statement of Work

- 1.3.1. Throughout this Statement of Work (SOW), the following standards shall apply:
 - a. Whenever requirements are stated herein to "include" a group of items, parameters, or other considerations, "include" means "included but not limited to";
 - b. Whenever reference is made to a Section, tasks, or paragraph, the reference includes all subordinate and referenced paragraphs;
 - c. The order of the SOW requirements is not intended to specify the order in which they must be carried out unless explicitly stated. The SOW defines the activities the Contractor's process shall cover. (i.e., the Contractor's implementation plans determine the timing of Contractor detailed activities);
 - d. For the purpose of the SOW, the term 'Purchaser ' means the NATO Communications and Information Agency (NCI Agency), also known as the Host Nation (HN) and/or its authorised representatives;
 - e. For purposes of the SOW, the term "Territorial Host Nation (THN)" means the Territorial Host Nation of the United Kingdom, Greece and The Netherlands represented by the Ministry of Defence of the United Kingdom, Greece or The Netherlands (MOD-UK-GR-NL) and/or its authorised representatives;
 - f. The convention to be used for dates appearing in free text (e.g. quoting dates of meetings) is day-month-year and not month-day-year.

SECTION 2 PROJECT MANAGEMENT

2.1. Purchaser's Project Management Approach

- 2.1.1.** The Purchaser will manage the project using the PRINCE-2 Project Management methodology. Under this methodology the Project Executive (the Purchaser) controls the project through a Project Board which it chairs.
- 2.1.2.** The Contractor shall nominate a management-level representative to the Project Board. This representative shall attend Project Board meetings when called upon and where it becomes evident that the project will fail to meet its objectives in terms of time, performance, quality or cost. The Contractor representative shall have authority to commit the Contractor's resources.
- 2.1.3.** The role of the Contractor representative to the Project Board shall be:
 - a. Ensuring that the required Contractor-provided resources for the project are made available in accordance with the project plan;
 - b. Assessing the viability of delivering products on time and within the budget;
 - c. Represents the interests of those designing, developing, facilitating and implementing the projects products;
 - d. Accountable for the quality of products delivered and is responsible for the Technical Integrity/Civil Works of the project;
 - e. Providing a co-ordinated Contractor view.

2.2. Contractor's responsibility, Organisation and Personnel

- 2.2.1.** The Contractor shall establish a project management organisation for the purpose of performing and managing the efforts necessary to satisfactorily discharge his responsibilities under this Contract.
- 2.2.2.** The Contractor shall provide the necessary manpower and resources to conduct and support the management and administration of his operations in order to meet the overall objectives of the Contract.
- 2.2.3.** The Contractor shall get written approval of the Purchaser if any of the key personnel and responsibility changes occur in the Contractor's project organisation during the Contract. The list of key personnel identified for this project are
 - a. Project Manager;
 - b. Technical Lead;
 - c. Test Director
 - d. ILS Manager.

- 2.2.4.** During project execution, the project shall be controlled in accordance with the approved Project Implementation Plan (PIP). As part of the monitoring and control function the Contractor shall advise the Purchaser at all times of potential implementation problems and schedule risks.
- 2.2.5.** The Project Manager, as well as System Engineers and other engineers, working at THN or Purchaser premises/sites shall be required to provide evidence that personnel can read, write and speak English to Level 3333 in line with STANAG 6001 (Ed. 5) or higher. The same, or higher, shall apply to any Contractor's representative taking and compiling the Minutes of Meeting (MoM) at the various review meetings.
- 2.2.6.** The Purchaser reserves the right to request a replacement of personnel based on Contract performance reasons.

2.3. Project Implementation Plan (PIP)

2.3.1. General

- a. The Contractor shall prepare and submit a Project Implementation Plan (PIP) for Purchaser's approval that shall describe how the Contractor will implement the totality of the project, including details of the controls that will be applied. The PIP shall describe the processes and procedures that the Contractor will follow to plan, design, and test and install all the systems that are part of this Contract.
- b. The PIP shall identify how the Contractor intends to interact as part of the Project Board as described in SOW Section 2, para 2.1.
- c. The PIP shall identify all major Contractor operating units and any sub-contractors involved in the development of the system and shall describe the portion of the overall effort or deliverable item for which they are responsible for.
- d. The PIP shall cover all aspects, in detail, of the project implementation, including the Contractor's project management structure and project control processes, personnel assignments and external relationships necessary to provide the capability as required by this Contract.
- e. The PIP shall be sufficiently detailed to ensure that the Purchaser is able to assess the Contractor's plans and capability to implement the entire project in conformance with the requirements specified herein.
- f. The PIP shall define the major quality checkpoints that will be implemented while executing the project and the quality process to be used at each checkpoint.

- g. The PIP shall cite any references used in the quality management, such as methodologies, tools or best practice material.
- h. The PIP shall identify the organisation and responsibilities of the quality assurance team and its relation to the project team.
- i. Where sub-contracted quality resources are used, the PIP shall describe the controls and processes in place for monitoring the sub-contractor's work against agreed timelines and levels of quality.
- j. The Contractor shall ensure that the PIP, including associated plans, remains up to date throughout the duration of the Project to reflect the actual state of the Contractor's organisation and efforts. Any changes to the PIP will require the Purchasers approval.
- k. The PIP shall include the following Sections and provide the major plans required under this Contract:
 - i. PIP Section 1: Project Management and Control (PMC)
 - ii. PIP Section 2: System Engineering and Design (incl. Security)
 - iii. PIP Section 3: Quality Assurance (QA)
 - iv. PIP Section 4: Configuration Management
 - v. PIP Section 5: Design Influence
 - vi. PIP Section 6: Integrated Logistics Support
 - vii. PIP Section 7: Warranty Support
 - viii. PIP Section 8: Test and Evaluation (incl., if applicable: Security Test & Evaluation Plan – STEP)
 - ix. PIP Section 9: Technical Publication Development
 - x. PIP Section 10: Provisional System Acceptance (PSA) and Final System Acceptance (FSA)
 - xi. PIP Section 11: Documentation
 - xii. PIP Section 12: Training
 - xiii. PIP Section 13: Contractor Logistic Support (CLS)
 - xiv. PIP Section 14: Security Accreditation Plan (SAP)
 - xv. PIP Section 15: Risk Assessment and Management Plan (RAMP)
 - xvi. PIP Section 16: Site Preparation/Installations and Civil Works (CW)

- l. Within the dates outlined in the Schedule of Supplies and Services (SSS), the Contractor shall submit the draft PIP to the Purchaser for review. A presentation shall be held by the Contractor to the Purchaser in a PIP Review Meeting. This presentation shall consist of an outline of the salient features of planned project management and an assessment of the risk areas involved in the project schedule and meeting the requirements of the Contract. During the presentation of the Draft PIP, the Purchaser will discuss the preliminary design of the systems (and associated components) that is proposed including matters of interest with the Contractor.
 - m. Before and/or during the presentation, the Purchaser will provide initial comments and an assessment of the Draft PIP concerning the need for correction of error and/or inconsistency and the inclusion of material that has been omitted.
 - n. In line with the SSS and after receipt of the Purchaser's comments, the Contractor shall deliver, for Purchaser's acceptance, the final version of the PIP that shall address and incorporate all Purchaser comments concerning deviations from and omissions of Contract requirements. Purchaser's acceptance of the final PIP is expected in line with the SSS.
 - o. The final version of the PIP, as accepted by the Purchaser, shall be the official document against which the Contractor is expected to conduct the performance of the Contract and shall be used to measure Contract progress against the delivery requirements of the Schedule.
 - p. Purchaser's acceptance of the final version of the PIP does not constitute Purchaser approval of the Contractor's plan, but signifies that the Purchaser considers the plan to be a logical and satisfactory approach to the management of the required activities, based upon the information provided. This approval in no way relieves the Contractor from its responsibilities to meet the requirements stated in this Contract. The requirements of the Contract supersede the statements of the PIP in the case of any conflict, ambiguity or omission.
 - q. The Contractor shall provide copies of all documents, spreadsheets, Work Breakdown Structure (WBS), Gantt Charts, etc, that are presented in the PIP to the Purchaser in the quantities as specified in the SSS and format as specified in SOW Section 15 below.
- 2.3.2. PIP Section 1 – Project Management and Control (PMC)**
- a. In PIP Section 1 the Contractor shall establish, provide and maintain a Project Management and Control Plan (PMCP) that shall describe how the Contractor will implement the totality of the project, including details on the project control processes that shall be applied.

- b. The PMCP shall define in detail how the Contractor intends to manage this project from EDC through to Final System Acceptance (FSA) and throughout the Warranty period. It shall consider all aspects of project management and control and demonstrate by means of programme analysis and planning how all the critical dates defined in the Contract shall be met. In order to be compatible with the Purchaser's software used for project management purposes, all documents, worksheets, drawings, slides and schedules/plans shall be prepared using the software tools as indicated in SOW Section 15 below. This Section of the PIP shall include, but not be limited to, the following aspects:
 - i. A description of the management structure of the Contractor's Project Team Organisation (PTO) that shall indicate its relationship within the company structure;
 - ii. A list of personnel assigned to the Contractor's PTO that shall define their respective roles, responsibilities and authority;
 - iii. A description of Contractor and sub-contractor (or any third party) relationships that shall demonstrate how the Contractor effectively manages, monitors and controls the sub-contractor(s).
- c. As a part of the PMCP of the PIP, the Contractor shall also establish, deliver and maintain a Project Work Breakdown Structure (PWBS), as follows:
 - i. The PWBS shall define all work packages and the relationship between the work packages and the supplies and services to be delivered to the Purchaser. The Contractor shall capture 100% of the work defined by the project scope, as well as all deliverables – internal, external, and interim – in terms of the work to be completed, including project management, in the PWBS;
 - ii. The PWBS shall include a PWBS Dictionary that describes each component of the PWBS with milestones, deliverables, activities, scope, and dates, resources and quality;
 - iii. The PWBS shall decompose the work packages to a level that exposes all project risk factors and allows accurate estimation of each work item's duration, resource requirements, inputs/outputs and predecessors and successors;
 - iv. Activity or series of activities defined in the PWBS shall not be longer than a single reporting period;
 - v. The PWBS elements shall be coded sequentially to reveal a hierarchical structure;

- vi. The PWBS shall identify the scope of work for all PIP Sections and shall capture all associated deliverables – internal, external and interim - in terms of work to be completed;
- vii. The PWBS shall define interfaces between the Contractor's deliverables and Purchaser Furnished Equipment (PFE)/ Facilities/Information regarding the project.
- d. During the performance of the Contract, the Contractor shall not change the PWBS, its associated definitions, or any of its reporting elements without the approval of the Purchaser.
- e. The Contractor shall use the PWBS as the primary framework for Contract planning and reporting to the Purchaser. The PWBS shall define the products to be developed and produced, and relate the elements of work to each other and to the end product.
- f. As a part the PMCP of the PIP, the Contractor shall also establish, deliver and maintain a Project Master Schedule (PMS) that is in line with the Schedule of Supplies and Services (SSS) and the General Provisions that contains all Contract events and milestones. The PMS shall correlate with the PWBS. The PMS shall show the start and completion dates of each activity, using calendar year timescales divided into weeks and shall show the interfaces with other activities.
 - i. The PMS shall depict the sequence, duration, and relationship among PWBS, tasks, work packages and work items;
 - ii. The PMS shall identify the start and finish dates, duration, predecessors, successors, and resource requirements for each work item;
 - iii. The PMS shall include the delivery dates for all project products, including at least the initial version and the final one;
 - iv. The PMS shall include activity network, activity GANTT, Programme Evaluation Review Technique (PERT) charts, developed in formats interoperable with Microsoft ® (MS) Project 2010, showing detailed and high level schedules with associated resources and dependencies, milestone, and critical path views of the project schedule; Critical paths shall be clearly identified in the PMS;
 - v. The Contractor shall maintain the baseline version of the PMS in the relevant documentation folder.
- g. The PMCP shall cover the following areas as a minimum:
 - i. Project Scope;
 - ii. Major Deliverables;

- iii. Dependencies;
 - iv. Project organisation;
 - v. Internal structure which shall include a project organisational diagram;
 - vi. Roles and responsibilities of each organisational unit;
 - vii. Project resources, Key personnel, their qualifications, and their responsibilities (All resources shall be assigned to project task within the PIP);
 - viii. Organisational boundaries between the project organisation and the parent and subcontracted organisations;
 - ix. Project management processes;
 - x. Project start-up, which shall include staffing, schedule estimates and project infrastructure;
 - xi. Project control, which shall include monitoring, reporting, and change management of work packages;
 - xii. Issue Management (IM), which shall include the identification, reporting, assessment, and logging of project issues (including linkages to risk registers);
 - xiii. Communications Management (CM), Project Checkpoint Reports (refer to Para 2.4 below), and all other communications with the Purchaser;
 - xiv. Security Management (SM), which shall include personnel and facility (site) security;
 - xv. Purchaser involvement via meetings, reporting, modification and change, implementation, verification, approval, acceptance and access to facilities;
 - xvi. Sub-Contracting plan demonstrating that the Contractor can effectively manage, monitor and control the sub-contractors and that the sub-contractors will agree to abide by the requirements of the prime Contract as pertains to flow-down provisions.
- h. The Contractor shall identify in his PMCP the constraints of the implementation environment, their effects on the project execution and their mitigation measures.

2.3.3. PIP Section 2 - System Engineering and Design (incl Security)

- a. The Contractor shall provide in PIP Section 2, an outline of the System Engineering and Design for the system. This Section shall address the design of the system proposed in accordance with the System Engineering Design Document (incl. Security Design), which shall be part of this PIP Section 2 (see SOW paragraph 4.2 below).
- b. The PIP shall also address and include the System Safety Programme Plan (SSPP) (see SOW para 4.5), the Exposure to Radio Frequency Fields (see Section 4, para 4.5.8.cc), the Electromagnetic Interference and Compatibility (EMI/EMC) (see Section 4, Para 4.9) and the Lightning Protection (see Section 4.9.12). Those above plans shall be part of the PIP Section 2. During the presentation of the PIP, the Purchaser will review the preliminary design of the system (and associated components) that is proposed.

2.3.4. PIP Section 3 - Quality Assurance

- a. The Contractor shall provide in PIP SEC description of the Contractor's Quality Assurance Organisation and Quality Assurance (QA) / Quality Control (QC) System, which shall be in accordance with Section 6 below.

2.3.5. PIP Section 4 - Configuration Management (CM)

- a. The Contractor shall provide in PIP Section 4 a Configuration Management (CM) Plan (CMP) that shall define the initial Configuration Items CI(s), the organisation and procedures used to manage the configuration of the functional and physical characteristics of CI(s), including interfaces and configuration identification documents, as set forth in SOW Section 6 below.
- b. Configuration Management (CM), which shall include Configuration Item (CI) identification, identification and control of change requests and deficiency reports, configuration status accounting, auditing, and co-ordination of Contractor and Purchaser configuration management and change control processes, for both documentation and material deliverables (i.e. services).

2.3.6. PIP Section 5 – Design Influence

- a. The Contractor shall provide in PIP Section 5, a plan to fulfil the Design Influence requirements of the Contract as specified in SOW SECTION 8 below.

2.3.7. PIP Section 6 – Integrated Logistic Support (ILS)

- a. The Contractor shall provide in PIP Section 6, a plan to fulfil the ILS requirements of the Contract as specified in SOW Section 9 below.

2.3.8. PIP Section 7 – Warranty Support

- a. The Contractor shall provide in PIP Section 7, a plan to fulfil the Warranty Support requirements of the Contract as specified in SOW Section 11 below.

2.3.9. PIP Section 8 - Test and Evaluation

- a. The Contractor shall define in PIP Section 8 his proposed test organisation and provide a Test and Evaluation Plan (TEP) in accordance with SOW Section 12 below. Where applicable, this plan shall also include a Security Test and Verification (ST&V) Plan.

2.3.10. PIP Section 9 – Technical Publication Development

- a. The Contractor shall deliver a Technical Publications Development Plan (TPDP) as an annex to the ISP, covering the Contractor organization, planning and scheduling of the necessary activities for the development of the Technical Manuals in the form of Interactive Electronic Technical Publications (IETPs) in order to meet the requirements of SOW Section 10 below.

2.3.11. PIP Section 10 – Provisional System Acceptance (PSA) and Final System Acceptance (FSA)

- a. The Contractor shall provide in PIP Section 10 a plan to accomplish all the activities required to ensure successful Provisional System Acceptance (PSA), and successful Final System Acceptance (FSA), in order to meet the requirements of SOW Section 13 below.

2.3.12. PIP Section 11 - Documentation

- a. The Contractor shall provide in PIP Section 11 a detailed plan to deliver all documentation in accordance with SOW Section 15 below. The Contractor shall identify the documentation team and the individual responsible within his organisation to ensure such documentation is delivered on schedule and to the Contract requirements. The Contractor shall provide in PIP Section 11 a detailed review plan for all documentation, which will allow sufficient time for all documentation to be reviewed by the Purchaser prior to the final agreed delivery date.

2.3.13. PIP Section 12 - Training

- a. The Contractor shall provide in PIP Section 12 plans to fulfil the training requirements of the Contract as specified in SOW SECTION 16 below.

2.3.14. PIP Section 13 – Contractor Logistics Support (CLS)

- a. The Contractor shall provide in Section 13 of the PIP a Contractor Logistics Support (CLS) Plan, which shall describe the services that the Contractor shall perform during the Warranty period as set forth in SOW Section 9 below and during all contracted CLS periods if exercised.

2.3.15. PIP Section 14 - Security Accreditation Plan (SAP)²

- a. The Contractor shall provide in PIP Section 14 his plan to fulfil the Security Accreditation activities of the Contract as specified in SOW Section 5 below.

2.3.16. PIP Section 15 - Risk Assessment and Management Plan (RAMP)

- a. The Contractor shall provide in PIP Section 15 his Plan to fulfil the Risk Assessment and Management requirements of the Contract as specified in SOW Section 2, paragraph 2.7 below. The RAMP shall define the strategy for risk management and the way the risk management process, which shall include risk identification, risk assessment, risk mitigation, risk monitoring, and risk reporting, shall be conducted throughout the Contract duration.
- b. Risk management, which shall include the Contractor's and sub-contractor's process for risk identification, assessment, mitigation, monitoring, reporting and escalation of any issues, once identified.

2.3.17. PIP Section 16 – Site Installation and Civil Works

- a. The Contractor shall provide in PIP Section 16 its Plan to fulfil the Site Installation and Civil Works requirements of the Contract as specified in SOW Section 14 and SOW SRS (CW) Annexes C, F and H herein.
- b. If required, in order to mitigate potential disruption of national communication services by Contractor activities, the Contractor shall develop Plan in coordination with the Purchaser and THN's that shall ensure minimum disruption of provision of national communications services between the site preparation phase and Radio Site Acceptance Tests (RSAT). Such a plan shall be subject to the approval of Purchaser in cooperation with the THN's. The Contractor shall have delivered a preliminary plan and shall include, but not be limited to; a work schedule and task list for system installation that maximises the amount of on-air time and minimized off-air time for THN's communications services, until the THN's communications services could be supported as part of the system.

2.4. Project Checkpoint Reports (PCR)

2.4.1. The Contractor shall prepare and submit a Project Checkpoint Report (PCR) to the Purchaser in line with the SSS for the duration of the Contract. The PCR shall contain in a single consolidated document, as a minimum, the following information:

- a. Date of checkpoint

² This SAP addresses the Contractor's plans to fulfil the requirements of this Contract. Note that the actual SAP, as part of the Security Accreditation Support Package (SASP), will be produced by the Purchaser (NCI Agency), and the Contractor's SAP may provide necessary input.

- b. Period covered
- c. Follow-ups from previous reports
- d. Activities during the period
- e. Products completed during the period
- f. Quality work carried out during the period
- g. Tolerance Status (Costs, Delays and Performances).
- h. Actual or potential risk and issue update
- i. Work planned for the next period
- j. Products to be completed during the next period.
- k. Risk Register/Issues Log

2.4.2. The PCR may be appended to the Project Progress Report (PPR) for those periods when the two reports coincide.

2.5. Project Progress Reports (PPR)

2.5.1. The Contractor shall prepare and submit a Project Progress Report (PPR) to the Purchaser Project Management Team no later than 2 weeks in advance of any Project Progress Meeting (PPM) (see Section 2, Para 2.6).

2.5.2. The PPR shall summarise the progress since the previous PPM, accomplishments, schedule of service deliveries against progress, difficulties encountered and resolution/mitigation of any issues raised in the previous PPM.

2.5.3. The PPR shall include, but shall not be limited to:

- a. Overall project progress, which shall include the activities performed and works completed during the preceding reporting period.
- b. Schedule of deliverables against progress, difficulties encountered, resolution of any issues.
- c. The Contractor's Risk Log and Issue Log, which shall be compliant with PRINCE2.
- d. A list of Change Proposals with the current status
- e. Configuration Status Reports (CSR) for the system and all documentation.
- f. An up-to-date Project Plan (Gantt chart).
- g. A proposed agenda for the upcoming PPM, which may include a summary of items to be discussed

2.5.4. The Purchaser will confirm in writing the specific agenda with the Contractor, prior to each PPM and prior to the Contractor disseminating the agenda and meeting slides to stakeholders.

2.6. Project Progress Meetings (PPM)

- 2.6.1.** The Contractor shall organise and participate in Project Progress Meetings (PPM) as scheduled below, and chaired by the Purchaser. The Contractor shall ensure that the Contractor's Project Manager and appropriate support staff attend the meetings.
- 2.6.2.** The first Project Progress Meeting / Kick-Off Meeting (PPM#1 / KOM) shall be conducted in line with the SSS. The Contractor shall introduce to the Purchaser the individuals of his organisation (including major sub-contractors) that are responsible for critical missions in the proposed project implementation.
- 2.6.3.** The second Project Progress Meeting / Project Implementation Plan (PIP) Meeting (PPM#2 / PIP meeting) shall be conducted in line with the SSS (see Section 2, para 2.3.1 above).
- 2.6.4.** The third PPM (PPM#3) shall be conducted with the PDR Meeting, the fourth (PPM#4) with the Critical Design Review (CDR) Meeting, and the fifth (PPM#5) with the FAT.
- 2.6.5.** Thereafter PPMs will be held approximately every four (4) months, unless agreed otherwise. A PPM may be cancelled or postponed by the Purchaser without financial penalty.
- 2.6.6.** The PPM agenda proposed by the Contractor to the Purchaser approval shall include the following agenda items (non-exhaustive):
 - a. Approval of the Minutes of previous PPM
 - b. The Contractor's presentation of the Project Progress Report
 - c. Review of project risks and issues
 - d. Review of action items from previous meetings
 - e. Schedule Review
 - f. Discussion/resolution of problems and areas of concern
 - g. Any other business (AOB)
 - h. Date/Location of next meeting
- 2.6.7.** The Contractor shall be responsible for producing the Minutes of Meetings (MoM) for the PPM and providing a draft copy for Purchaser comments within one week following the PPM and prior to final dissemination. The Purchaser will then provide comments and/or corrections made against the draft copy to the Contractor within two weeks of receipt.
- 2.6.8.** The Contractor shall incorporate comments and/or corrections and return a final copy of the MoM to the Purchaser within one week of receipt of the Purchaser's comments and/or corrections.
- 2.6.9.** The Contractor shall not consider the MoM as the basis for changes to the terms and conditions or scope of work of the Contract in the absence of a formal Contract Amendment.

2.6.10. During the meetings the Contractor may be requested by the Purchaser to provide detailed presentations on specific items at the subsequent PPM. A copy of the presentation material used for these activity reviews shall be handed over to the Purchaser. The Contractor shall be responsible for the following specific actions in the conduct of reviews:

- a. Developing a schedule and agenda for accomplishing the required reviews;
- b. Co-ordinating the review, schedule and agenda with the Purchaser, and provide the Purchaser with appropriate Progress Reports prior to the review;
- c. Ensuring participation of sub-contractors, vendors and suppliers, as necessary;
- d. Organising and presenting briefings as necessary.

2.7. Risk Management Programme

2.7.1. The Contractor shall implement and maintain as part of his overall project management process a structured programme of risk identification, assessment and management. The programme shall address as a minimum the following areas.

- a. Risk Assessment and Management Plan (RAMP) as described in PIP Section 15. The RAMP shall define the strategy for risk management and the way the risk management process, which shall include risk identification, risk assessment, risk mitigation, risk monitoring, and risk reporting, shall be conducted throughout the Contract duration;
- b. The identification of risks for the completion of the SOW-related tasks;
- c. Analysis of potential risks to identify risk dependent areas;
- d. Assessment of the probability of each risk occurring, and quantification of its possible impacts;
- e. Identification of a risk owner for each risk;
- f. Alternative risk mitigation measures to decrease the effects of the potential risks identified;
- g. Mitigation plan for when risks become issues.

2.7.2. The Contractor shall require each major sub-contractor to implement a programme of risk identification, assessment and management. The Contractor shall be responsible for integrating these programmes into a single programme.

2.7.3. The Contractor shall appoint and identify a risk manager to be the focal point for the implementation of the risk management programme.

2.7.4. Risk Reporting

- a. The Contractor shall include in the PCR/PPR(s) a Section or another report on all identified risks in descending order of priority. The Section or report shall include a current assessment of the impact of each risk on work performance and schedules. The Contractor's plans/schedules for risk abatement, mitigation, and work-around shall also be presented.

2.7.5. Risk Status and Alarm Reporting

- a. Progress reports submitted by the Contractor shall address the status, potential impact and corresponding planning information for all identified risks. Any new risk area identified by the Contractor/sub-contractor having the potential for significant impact on the accomplishment of the Contract tasks or schedules shall immediately be brought to the attention of the Purchaser.

SECTION 3 SCOPE OF WORK

3.1. Overall requirements

- 3.1.1.** The scope of the project is to implement thirteen (13) new/updated SSSB radio sites in The United Kingdom, Greece and The Netherlands. DLOS shall also be required to connect between radio sites and buffer centres in Greece as shall approximately 20 kilometers of fiber optic cable.
- 3.1.2.** The scope also includes support to the integration of the thirteen (13) radio sites with the buffer centers located at locations in line with Figures 1 to 5 below, to facilitate communications for air and naval surveillance in the HF/UHF frequency ranges with data Link-11/Link-22 modes and voice mode. Radio sites covered within the Contract are indicated in green with dependencies to Buffer Centres/DLOS or implementation of the SSSB system indicated in red.

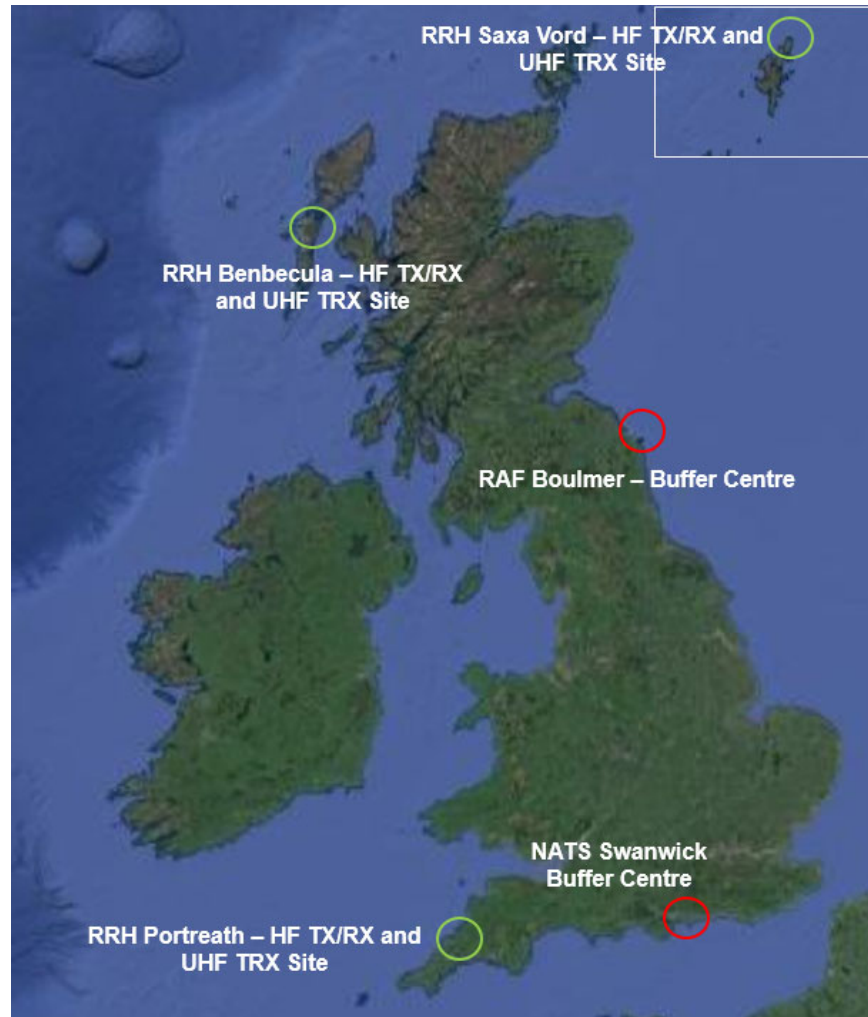


Figure 1: Site locations (United Kingdom)



Figure 1: Site locations (Greece Less Crete)

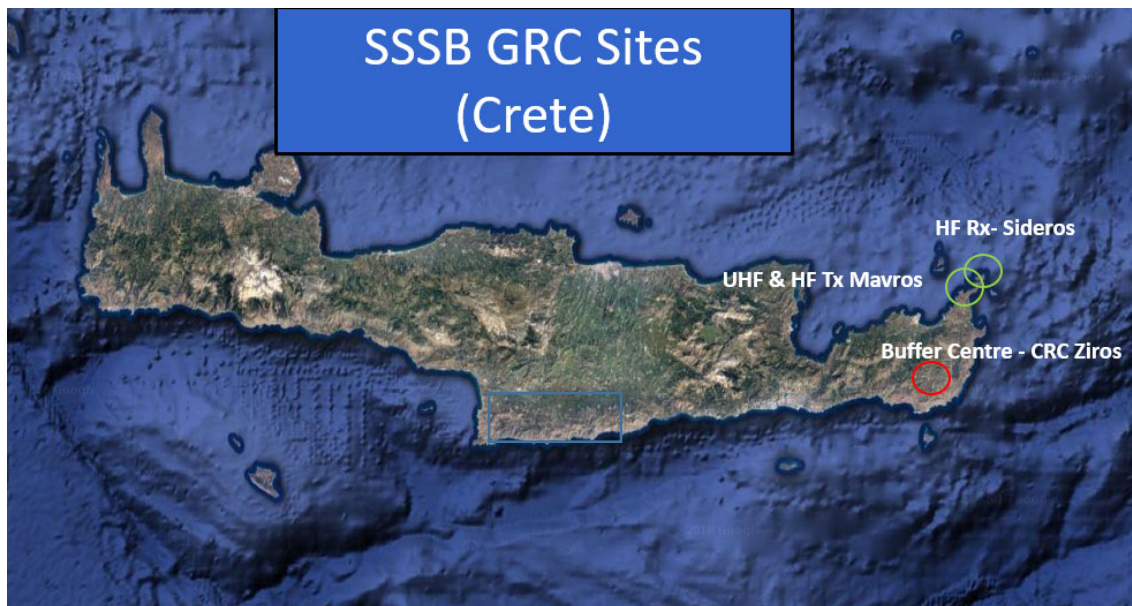


Figure 2: Greece Site locations (Crete)



Figure 3: Greece Site locations (Radio Relay Sites)



Figure 4: Site locations (Netherlands)

3.1.3. The CIS of this project can be sub-divided into the following:

a. Radio Communication Sub-system:

To be installed at the radio sites and dedicated to the Ship-Shore-Ship communication in HF (BLOS) and in UHF (LOS) in the Link-11/Link-22 modes for the data exchange and in voice mode for the operators coordination. To be interfaced with the inter-site communication sub-system.

b. Inter-site Communication sub-system:

This sub-system is dedicated to the connection between radio sites and the buffer centres. Implementation of the sub-systems between radio sites shall be the Contractor's responsibility. Implementation

of the sub-system between Buffer Centres and to the TX/RX/TRX Radio Sites will be the THN responsibility. Nevertheless, the Contractor shall support the integration and testing of the overall inter-site communication sub-system (including the sub-system between the radio sites, and between radio sites and the Buffer Centres).

c. Infrastructure facilities

The Civil Works (CW) associated with the general infrastructure (e.g. buildings, mains power, general HVAC, etc.) to host the equipment at the thirteen (13) Radio Sites is detailed in Annexes C, F and I of the SOW. CW will also include CW-related works for the installation of CIS equipment (e.g. antenna masts, cable trenching, indoor cabinets, etc). This includes any additional no-break (UPS) or additional HVAC components that may be required to enable the faultless operations of the CIS equipment to be installed at the thirteen (13) radio sites.

3.1.4. The SSSB Command and Control system to be installed at the buffer centers will be dedicated to the UK, GR and NL radio sites for:

- a. Management of the radio sub-systems;
- b. Translation of the Link-11 and Link-22 protocols into Link-1, JREAP-C and Link-11B in accordance with STANAG 5511, STANAG, 5516, STANAG 5522, STANAG 5601, etc. Presentation of the Air, Surface and Subsurface tactical picture;
- c. Management of the Voice coordination of the Link-11/Link-22 data link;
- d. Provide secure data encryption of Link-11/Link-22 (COMSEC);
- e. Monitoring of the correct operations of infrastructure and equipment.

3.1.5. Installation of the SSSB system at the buffer centers is not in the scope of this Contract, but will be accomplished by the Purchaser. However, system acceptance tests will have to be supported by the contractor.

3.1.6. The applicable System Requirement Specifications (SRS Tech) for is presented in SOW Annex A, D and G.

3.2. Operational Requirement

3.2.1. The detailed description of the operational requirement is presented in Section 2 of SOW Annexes A, D and G (SRS Tech Annexes).

3.3. Implementation Objectives

- 3.3.1.** The Contract shall be implemented as follows:
 - a. Design, Delivery and Acceptance of Civil Works phases
 - b. Design and Factory Acceptance Test (FAT) of CIS phases
 - c. Delivery, Installation and integration of CIS phase
 - d. Testing and Acceptance phase (RSAT, SAT, PSA, FSA)
- 3.3.2.** The implementation shall be completed and handed over by the Contractor to the Purchaser and THN's according to the timescales specified in the Schedule of Supplies and Services (SSS).
- 3.3.3.** The Contractor shall be responsible for the implementation fully integrated and operational SSSB Radio Sites and their intercommunication sub-systems as specified in Annexes SOW Annexes A to I. The Contractor shall provide all the necessary material and perform all the services required to execute the respective installation.
- 3.3.4.** During the Design and FAT phase the Contractor shall perform Factory Acceptance Tests (FAT) for any SSSB sub-system as agreed with the Purchaser in order to demonstrate compliance with the technical requirements of this Contract. The FAT(s) shall be completed in line with the SSS.
- 3.3.5.** Following the successful completion of the Civil Works phase and the CIS Design and FAT(s) phase the Purchaser will authorise the Contractor to start the delivery and installation activities.
- 3.3.6.** The Contractor shall perform the installations of the systems at the THN's facilities. The Contractor's activities shall include preparations for and execution of delivery, installation, integration, testing and preparing for acceptance and for system operational use. The Contractor shall provide the deliverables specified in the Schedule of Services and Supplies (SSS).

3.4. Purchaser's and THN's' Responsibilities

- 3.4.1.** The Purchaser is responsible for the administration of the Contract, which includes, but is by far not limited to negotiation of Contract amendments and payment of invoices.
- 3.4.2.** For clarification purposes the term Purchaser Furnished Equipment (PFE) relates to equipment that is owned by the Purchaser and delivered to, or made available to the Contractor. Purchase Furnished Property (PFP) relates to property in the possession of, or directly acquired by, the Purchaser or the THN and subsequently furnished to the Contractor for the performance of this Contract.
- 3.4.3.** The PFE and associated spares shall be formally handed over by the Purchaser to the Contractor between 6 weeks before the planned FAT

- 3.4.4.** The Purchaser and the THN's will provide the PFE to the Contractor as described in the SOW Annexes A, D and G. The PFP shall be provided as per the Site Information Data Packages in Annexes B, E and H.
- 3.4.5.** With regard to the PFE and PFP's, the Purchaser and THN's will obtain the following services and provide them to the Contractor:
- a. Make the PFE/PFP and services, available in due time to the Contractor;
 - b. Ensure timely availability of an appropriate installation environment, including prime power lines, communications lines and external connectivity, such as connections to NDN, according to the specifications provided by the Purchaser;
 - c. Ensure availability and timely access to installation sites and other related premises (pending timely RFV submissions by the Contractor via the appropriate channels);
 - d. Ensure timely availability of CW-related documentation, including building and site plans, required by the Contractor to plan, design and execute works according to this Contract;
 - e. Provide Prime Power Supply System (PSS), terminated at the MPDP. As stipulated in SOW Section 14/SOW Annexes A to I and Section 3.5 below, it is the Contractor's responsibility to provide and install SSSB-dedicated Power Distribution Panels (PDP) (with associated cabling and plugs) in such a manner that they will be integrated into the Prime Power Supply System (PPSS) (provided by THN's) at the sites. The integration into the site's PPSS is the Contractor's responsibility;
 - f. Provide NB PSS at the thirteen (13) Radio Sites, unless otherwise stated;
 - g. The THN's will be responsible for the provision of a local liaison Point of Contact (POC) for daily liaison with the Contractor on CW related matters. NCI Agency will maintain the relationship with the THN's for this purpose. However, the Contractor is responsible to the Purchaser for all works under this Contract, including Civil Works as stipulated in Section 14 and SOW Annexes A to I and in other relevant paragraphs of this Contract;
 - h. THN's will provide a pool of frequencies for testing of the SSSB System. These frequencies shall cover the range required to maintain HF and UHF communication throughout the day (in summer and winter time) and suitable for different range of HF and UHF communication distances;
 - i. THN's will provide the required IP connectivity over the NDN between the Radio Sites and the Buffer Centres;

- j. Dismantling, movement and reinstallation of existing utilities (i.e. water pipes, sewage system, gas pipes, communication lines, power lines, etc.) interfering with areas designated for the Contractor's works is a THN's responsibility. This activity will only be exercised if the Contractor's provided equipment and structures cannot be relocated to other areas that will void utility relocation and at the same time will assure full functionality of the systems;
- k. The THN's will provide training equipment or special equipment/tools requirements including those support equipment, such as, but not limited to, a Projector and Screen, White Board with White Board Markers, photo copier machine, etc.;
- l. The THN's will assure that the students, who will be selected for systems training, meet the requirements below:
 - i. Operators will have or will acquire knowledge of specific Operating Systems and Tools;
 - ii. Maintainers will have or will acquire knowledge of digital Radio technology;
 - iii. System Administrators will have or will acquire knowledge of specific Operating Systems and Servers and will also be instructed in digital radio and transmission techniques;
 - iv. Personnel selected to attend the courses (training) will meet the minimum Standardised Language Proficiency (SLP) of 3333 in English corresponding to NATO STANAG 6001.

3.5. Contractor's responsibilities and activities

- 3.5.1.** The services provided by the Contractor shall consist of design, procurement and delivery of hardware, software and documentation, as well as commissioning activities, installation, integration, testing and training, to meet all the requirements of project as detailed throughout this document. This shall include documentation to allow the Purchaser to customise the Radio Management sub-system to be provided as PFE to the Contractor.
- 3.5.2.** It shall be the Contractors responsibility to identify equipment that it will provide/procure with long lead times. Once approved by the Purchaser such equipment shall be procured in advance of any CDR meeting and approval. This shall ensure the Contractor can meet project delivery timelines as set out in the SSS.
- 3.5.3.** It is also the Contractor's responsibility to test the integration of the Contractor's provided equipment with relevant equipment, elements and systems provided as PFE and demonstrate that both, the Contractor's and PFE are compatible and function correctly as stipulated in this SOW. The Contractor is to inform the Purchaser

immediately if any provided PFE equipment/systems are shown to be broken or faulty providing full details of any /breakages/faults identified.

- 3.5.4.** After the formal PFE handover, the Contractor will be responsible for the PFE. In case of PFE faults, the Contractor will be allowed to use the spares but shall be responsible for replenishing PFE spares stocks. The contractor shall also be responsible for replacement or repair of PFE if damaged whilst in the possession of the Contractor.
- 3.5.5.** The Contractor shall inform the NCI Agency Project Manager (PM) and Contracting Officer (CO) as detailed in the Special Contract Provisions of all contractually relevant events.
- 3.5.6.** When applicable, the Contractor shall use the PFE-provided spares to ensure that NCIA provided PFE remains in a serviceable condition. Any spares used/consumed by the Contractor shall be replenished at the Contractor's expense.
- 3.5.7.** When applicable, all PFE and PFP shall be used by the Contractor to the maximum extent possible. All PFE and PFP not used by the Contractor for this project must be stored in a location to be defined by THN's.
- 3.5.8.** When applicable, the Contractor shall be responsible for the terms and conditions associated with any end user agreements /licenses/conditions associated with PFE/PFP (ie. ITAR). For PFE the logical chain for end user agreements shall be:
 - a. PFE – NCIA – Contractor Premises – End User
 - b. Other – Contractor – End User (if equipment is to be integrated into OSCC (no modules already integrated) then it shall be Contractor – NCIA – Contractor – End User)Any costs and liability involved shall be at the Contractors expense.
- 3.5.9.** When applicable, the Contractor shall arrange locations on site for storage of all equipment and structures dismantled and demolished by the Contractor under this Contract.
- 3.5.10.** Where applicable the Contractor shall dispose of any dismantled equipment and demolished structures, as stipulated in SECTION 14 of this SOW.
- 3.5.11.** Concerning Civil Works, the Contractor shall provide all the necessary calculations and fulfil all the necessary formalities, including but not limited to, obtaining and being aware of any required National permits, authorisations and their associated application timelines.
- 3.5.12.** The Contractor shall be instructed to cut the trees, shrubs and any other vegetation only if necessary for the SSSB project implementation and not for the Contractor's convenience and/or additional profit. Therefore, it needs to be noted that in case THN Law and regulations require to pay compensation (to national authorities,

local authorities or any other public or private institution or entity) for trees, shrubs and any other vegetation that have been cut and/or requires replanting any of them in other areas as a form of that compensation, or combination of both those measures, it shall be the Territorial HN responsibility.

- 3.5.13.** The Contractor shall execute any necessary site clearance works at on-site antenna farm locations. THN's will not be responsible for disposal of any waste material from these sites. It is the Contractor's responsibility to prepare relevant temporary storage areas at the locations as specified by the THN's prior to disposal of any associated waste material off-site. The disposal of any such material from the site, to a location less than 100 km away from the site, and as indicated by the THN's shall also be the responsibility of the Contractor.
- 3.5.14.** The Contractor shall provide and install SSSB-dedicated Power Distribution Panels (PDP) (with associated cabling and plugs) in such a manner that they will be integrated into Prime Power Supply (PPS) System (provided by the THN). The integration into the Prime Power Supply System is the Contractor's responsibility.
- 3.5.15.** No additional No Break backup power, or UPS, is anticipated. However, if it is subsequently found that additional UPS capacity is required for the correct operations of the CIS equipment in the facility building of the radio sites, then the provision of such additional UPS will be a Contractor's responsibility. Also, if replacement of battery pack(s) of existing UPS appliances is required, then the Contractor shall provide such replacement.
- 3.5.16.** The Contractor-provided systems and equipment under the prospective Contract shall be compatible with the existing infrastructure of the SSSB Radio Sites as presented in SOW SIDP Annexes B, E and H. More detailed information will be provided to the Contractor during Contractor site surveys (see Section 14, para 14.7). The Contractor shall confirm that the existing infrastructure is suitable for SSSB accommodation (in terms of floor space allocation, power budget, (augmented) UPS capacity, etc.). In order to assure proper coordination of CW packages and to execute above mentioned controls, the Contractor will liaise with the THN as specified at SOW Section 14 para 14.4.
- 3.5.17.** When applicable, the Contractor shall take into consideration the location of all underground/overhead utilities such as but not limited to Methane/natural gas/power cables/water/sewage networks etc, to avoid accidental damages that could be done while carrying out various earth or drilling works. Further detailed requirements can be found in the THN SRS (CW) Annexes C, F and I to this SOW.

SECTION 4 SYSTEM DESIGN AND ENGINEERING

4.1. General

4.1.1. As a minimum, the Contractor shall take into account the following non-exhaustive reference documentation for his implementation. Other reference documentation regarding communication system design and civil works are available through national delegations as well as referred to in the SRS Annexes to this SOW. The Contractor is responsible for ensuring that the latest version of documents are used at the time of implementation:

- a. SDIP-28/1 (Dec 2009) NATO Zoning Procedures
- b. SDIP-29/2 (Mar 2015) – Selection and Installation of Equipment for the Processing of Classified Information
- c. C-M(2002)49 - Security within the North Atlantic Treaty Organisation
- d. STANAG 4370 (Environmental testing and associated Allied Environmental Conditions Test Publications (AECTP))
- e. STANAG 7201 (The Human Engineering Test and Evaluation Procedures for systems, equipment and facilities)
- f. STANAG 4133 (Method of specifying electrical power supplies: standard types of electrical power)
- g. IEC-60364, Part 4, Chapter 41 (Electrical installations of buildings, Protection for safety, Protection against electric shock)
- h. IEC 60332:2020 SER (Tests on electric and optical fibre cables under fire conditions)
- i. IEC 60754 series (Test on gases evolved during combustion of materials from cables)
- j. IEC 62821 series (Electric cables - Halogen-free, low smoke, thermoplastic insulated and sheathed cables of rated voltages up to and including 450/750 V)
- k. ASTM E662-21 (Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials)
- l. MIL-STD-454 (Standard of Workmanship)
- m. MIL-STD-1472D (Consoles/Work-positions)
- n. MIL-STD-461-F (Electromagnetic Interference)
- o. MIL-STD-882E (System Safety)
- p. STANAG 2345 (Evaluation and Control of Personnel Exposure to Radio Frequency Fields, 3 kHz to 300 GHz)
- q. Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 (Environmental Noise Directive)

- r. STANAG 4372 – SATURN, A Fast Frequency Hopping ECCM Mode for UHF Radio, Dec 2008, NSA/1328(2008)-C3/4372
- s. STANAG 4246 – Have Quick UHF Secure and Jam-Resistant Communications Equipment, Jan 1987.
- t. STANAG 4205, Edition 3 – Technical Standards for Single Channel UHF Radio Equipment
- u. Final decision on MC 0538/1 NATO Policy on the use of STANAG 4372 (SATURN) dated 17 March 2017:

4.1.2. The Contractor shall implement a system engineering programme that shall be a continuing function throughout the duration of the Contract in order to provide technical integration and co-ordination of design, fabrication, installation and test activities.

4.1.3. The system engineering programme shall include:

- a. Compatibility of hardware and software;
- b. The justification for function and performance allocations to various sub-systems and equipment to achieve overall system requirements;
- c. Methodology for identification and resolution of technical problem areas that may develop during design, fabrication, installation and testing.

4.2. System Engineering and Design Plan (SEDP)

4.2.1. The Contractor shall provide, as part of the PIP Section 2 (see Section 2, para 2.3.3), a System Engineering and Design Plan (SEDP) that shall establish and define the system engineering programme. This shall also include all PFE provided.

4.2.2. The plan shall include:

- a. Hardware and software functional description;
- b. Development and preparation of detailed equipment design specifications in line with the technical approach appropriate to fulfil the Purchaser's performance requirements;
- c. Equipment performance calculations;
- d. The description of the hardware, software and mechanical integration of assemblies, sub-assemblies and components into a coherent system;
- e. Identification of interfaces throughout the system to ensure interface compatibility and interface control;
- f. Development and preparation of detailed engineering drawings;
- g. Technical reviews and reports;
- h. Co-ordination with fabrication, installation and testing activities;

- i. System Safety Programme Plan;
 - i. System Safety Hazard Analysis Report
 - ii. Environmental and Safety Requirements
- j. Installation Engineering Plan;
- k. An Electromagnetic Interference and Compatibility Plan.

4.3. Health and Safety (H&S) and Environmental Protection

4.3.1. General

- 4.3.2.** Contractor shall treat Health and Safety (H&S) as a continuous process which addresses all areas, including where the Contractor shall apply best practices in accordance with EU and respective national H&S legislation for all areas of design, installation, construction and build.
- 4.3.3.** The Contractor shall identify all hazards that exist and shall, as part of this activity, ensure that all personnel (operators and maintainers etc.) are provided with suitably designed and constructed equipment and are trained and provided with any necessary additional equipment to minimize the risk of accidents or injury.
- 4.3.4.** The infrastructure, equipment and installations that are subject to this SOW shall be designed and constructed in such a way that they do not run in a hazardous condition or put human safety at risk.
- 4.3.5.** The Contractor shall conduct a hazard review, consider and evaluate the risks and put in place control measures required to produce a statement with supporting evidence that the risks are as low as reasonably practical (ALARP).
- 4.3.6.** All equipment and installations provided by the Contractor shall be:
 - a. Ambient physicochemical and fluids resistant
 - b. New, of high quality and standard manufacturing (unless bespoke product is required), with proven experience and feedback of supportability performances
- 4.3.7.** If lifting devices, ladders, safety equipment, personal protective equipment, special tools or harnesses are required, the Contractor shall provide them.
- 4.3.8.** The ladders shall be compliant with following standards or THN equivalent:
 - a. EN 131-1:2015+A1:2019 Ladders. Terms, types, functional sizes
 - b. EN 131-2:2010+A2:2017 Ladders. Part 2: Requirements, testing, marking
 - c. EN 131-3:2018 Ladders. Marking and user instructions

- 4.3.9.** Personal protective equipment (PPE) shall be compliant with Regulation (EU) 2016/425 of the European Parliament and of the Council of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC or THN equivalent.
- 4.3.10.** For the operation and maintenance that shall be executed by the user no special or difficult techniques that require unusual dexterity or skill in removing or installing items shall be assumed.

4.4. H&S Applicable Directives and Standards

- 4.4.1.** The infrastructure, equipment and installations provided by the Contractor shall meet requirements stipulated in following publications or THN equivalents (including but not limited to following publications), as applicable:
 - a. Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on general product safety
 - b. Directive 2014/35/EU of the European Parliament and of The Council of 26 February 2014 – ‘low voltage directive’
 - c. Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment
 - d. Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
 - e. Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation
 - f. Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
 - g. IEC 60950 series: Information technology equipment – Safety
 - h. IEC 61580 (parts 1 to 7):2010 – Functional safety of electrical/ electronic/ programmable electronic safety-related systems
 - i. IEC 62821 series: Electric cables - Halogen-free, low smoke, thermoplastic insulated and sheathed cables of rated voltages up to and including 450/750V
 - j. IEC 61000 series – Electromagnetic compatibility (EMC)
 - k. IEC 60529 and AMD1: 1999 and AMD2: 2013 CSV – Degrees of protection provided by enclosures (IP Code)
 - l. EN 61340-5-1:2016 Electrostatics. Protection of electronic devices from electrostatic phenomena
 - m. MIL-STD-882E – Systems Safety, 2012

n. MIL-STD-1472G, DoD Design Criteria Standard, Human Engineering, 2012

- 4.4.2.** The above list of directives and standards does not relieve the Contractor from the obligation to comply with other applicable National Standards in respective THN.
- 4.4.3.** The Contractor shall clearly state which standards shall apply to each of the designed and installed deliveries.
- 4.4.4.** The Contractor shall note that additional applicable publications, which may introduce detailed H&S measures, are also listed in the SOW and its Annexes, in reference to specific deliveries.

4.5. H&S System Safety Programme Plan (SSPP)

- 4.5.1.** The Contractor shall apply engineering principles, criteria, and techniques to identify and eliminate safety hazards in the system in accordance with Military Standards (MIL-STD)-882E and equivalent THN law, if any.
- 4.5.2.** The Contractor shall design and/or select all equipment on the basis of inherent safety features that protect not only the human operators and maintainers but also the equipment itself.
- 4.5.3.** The Contractor shall establish a System Safety Programme in accordance with “MIL-STD-882E, Section 4”, to fulfil the safety requirements of the Contract.
- 4.5.4.** The safety analysis shall be conducted according to ISO 12100:2010 Safety of machinery – General principles for design – Risk assessment and risk reduction or THN equivalent.
- 4.5.5.** The Contractor shall provide, as part of the PIP Section 2 (see Section 2, para 2.3.3), a System Safety Programme Plan (SSPP) in accordance with MIL-STD-882E.
 - a. The Contractor shall describe its risk assessment method in the SSEP.
 - b. The Contractor shall document in their SSPP the procedures to control design, selection, procurement and manufacture of parts and materials. Revisions to the SSPP shall incorporate Purchaser-agreed changes, additions or deletions that have evolved during the conduct of the Programme.
- 4.5.6.** Safety verification shall be conducted at each site prior to SAT to ensure compliance with the SSPP. The safety verification shall verify the safety requirements for all types of hazards not eliminated by design. The Contractor shall document the safety verification process in the SSPP. The Contractor’s responsibilities shall be defined in the SSPP.
- 4.5.7.** The SSPP shall also include System Safety Hazard Analysis Report (SSHAR) as mentioned in MIL-STD-882E.

4.5.8. Environmental and Safety Requirements: SSPP shall also define Environmental and Safety Requirements as defined in the following sub-paragraphs:

- a. Environmental requirements shall be implemented and verified by the Contractor in accordance with National laws and regulations.
- b. The Contractor is obliged to comply with the national legislation concerning job accidents, incident prevention and hygiene at work. The Contractor is also obliged to make legal arrangements for protection of the life and security of all personnel and to guarantee medical assistance whenever necessary due to work place accidents. The same legal arrangements shall be applied to sub-contractor personnel under the Contractor's responsibility.
- c. Health and Safety (H&S) Hazards: The physical presence, operation and maintenance of the system shall pose no H&S hazards to personnel.
- d. Carcinogenic and Radio-active Materials, Mercury: Materials containing known carcinogenic substances, radio-active materials or mercury shall only be used with the prior authorisation of the Purchaser with the exception of Radium that is not to be used to achieve self-luminosity.
- e. Hazard Warning Labels: Equipment warning labels shall be attached wherever there is any potential electrical, chemical, electromagnetic radiation or heat hazard or a potential hazard caused by human contact with materials, particularly when removal of covers will expose the hazard.
- f. Hazard Warning Labels shall be as permanent as the normal life expectancy of the equipment on which they are affixed and shall be placed as close as possible to the point of danger.
- g. All warning instructions shall be provided in English and THN language.
- h. Any safety related warnings and cautions shall be documented in the related Sections of the manuals. Adequate labelling and marking shall be provided on the equipment and systems.
- i. Training and other provided documentation (for example user manuals, maintenance manuals etc.) shall prominently identify hazardous situations and the preparation, precautions and actions to avoid and contain them.
- j. The release of any toxic or corrosive fumes as a result of materials used, or under specified environmental and service conditions, such as heating, results in conflagration are to ensure that materials do not:
 - i. Form any acidic or corrosive alkali gases that may be released into the atmosphere.

- ii. Do not produce any toxic or corrosive fumes that would be detrimental to the performance of the equipment or health of personnel.
- iii. Do not produce any gases with the potential to produce an explosive atmosphere.
- k. Asbestos Materials: Equipment shall not contain any asbestos material.
- l. Glass Fibre Materials: Glass fibre materials shall not be used as the outer surface or covering on cables, wire or other items where they may cause skin irritation to operating personnel.
- m. Moving Part Protection: Any rotating or other moving parts such as ventilators, blowers, drive belts etc., shall be shielded or protected adequately to prevent accidental contact by and cause an injury to any personnel during operation and maintenance.
- n. Equipment Edges: Projecting and overhanging edges of equipment items shall be kept to a minimum. Edges and corners shall be rounded.
- o. When rounding of edges and corners is not possible, protective covers shall be applied.
- p. When protective covers are not possible or not reasonably practical for installation, sharp edges shall be marked with appropriate safety labels and marking.
- q. When packed, the equipment and material shall not expose any protruding elements which could either be damaged or damage persons or property during transportation.
- r. The Contractor shall design to ensure protection of the system and its operators against lightning and high potential discharge. Protection measures shall be compatible with the measures proposed for EMI/EMC as described in Section 4.9.
- s. All power cabling and electrical installations shall comply with European safety rules, including (but not limited to) IEC 61008, IEC 61009, IEC 60950 series, and IEC 60364 or THN equivalents.
- t. Cables shall have non-toxic, halogen-free, non-inflammable coat in compliance with IEC 60332, IEC 62821 series and IEC 60754 or THN equivalents.
- u. All electronic equipment shall be protected from electrostatic phenomena in accordance with IEC 61340 series or THN equivalent.
- v. Wires and cables shall be placed, mounted and protected as to prevent contact with rough irregular surfaces and sharp edges and to prevent wear due to vibration.

- w. For the dimensioning of the bending radius of cables the regulations of VDE 0298, part 3 or THN equivalent shall be followed.
- x. Cable harnesses shall be routed away from heat generating equipment and no wire or cable connection shall be in tension.
- y. All soldered connections shall be clean and smooth in appearance and shall provide excellent electrical conductivity. The insulation of soldered wires shall not show damage from the heat of the soldering operation.
- z. Dissimilar metals shall not be used in intimate contact unless suitably protected against electrolytic corrosion
- aa. All conductors and appropriate hardware shall be rated for the electrical current carrying capacity in accordance with the applicable industry standards.
- bb. Environmental Conditions Indoors, temperature, humidity: Equipment shall function without degradation under the environmental conditions as specified at SOW SRS Tech Annexes A, D and G.
- cc. RF Exposure Levels: The Contractor shall apply the doctrine stipulated in STANAG 2345 or equivalent Host Nation law for evaluation and control of personnel exposure to radio frequency fields 2 MHz to 400 MHz. It is the Contractor's responsibility to obtain the THN national regulations regarding this issue. RF fields generated by the system in operation shall not exceed the Permissible Exposure Levels (PEL) as specified in national regulations or in STANAG 2345, whichever is more restrictive. See also Section 4, para 4.5.8.cc.
- dd. Noise Levels: Noise generated by the system in operation shall not exceed the levels specified in the local regulations or Environmental Noise Directive (2002/49/EC).

4.6. Health & Safety in Project Progress Report (PPR)

- 4.6.1.** As a part of the Project Progress Reports the Contractor shall produce and update Safety Case Report.
- 4.6.2.** The Safety Case Report shall consist of at least three Sections:
 - a. Summary
 - b. Hazard log
 - c. Compliance report (Legislative and Requirements Compliance)
- 4.6.3.** The Safety Case shall include a clear statement regarding the current status of the Safety Case for the supplied infrastructure, equipment and installation.

- 4.6.4.** The Safety Case shall reference all local and nationally applicable standards and shall include, but is not limited to:
- a. National legislation
 - b. Safe use of equipment including lifting equipment and manual handling operations
 - c. Personnel protective equipment
 - d. Use of display screen equipment
 - e. Working at height
 - f. Radiation limits
 - g. Noise
 - h. Exposure to hot and cold surfaces
 - i. Exposure to chemical and toxic material
 - j. Electrical safety
 - k. Fire safety

4.7. H&S Environmental Protection

- 4.7.1.** The Contractor shall take all reasonable and practical measures to protect the public and its own employees against accidents, and to safeguard the environment and apply the best practices available in the field.
- 4.7.2.** Environmental requirements shall be implemented and verified by the Contractor, as a minimum, in accordance with European Union environmental protection regulations and the national implementation references (i.e. law, regulation) pursuant to the EU Directives or THN equivalent. Further detailed requirements are available in the THN SRS (CW) Annexes to the SOW.
- 4.7.3.** The design shall consider the environmental impact of the equipment during its life cycle and disposal, and the documentation shall provide the appropriate recommendations to the user.
- 4.7.4.** The Contractor shall maintain and make available upon request by the Purchaser:
- a. A copy of its environmental management system policy
 - b. Licenses and permits issued by the relevant authorizing authorities

4.8. H&S Activities at Purchaser's facilities

- 4.8.1.** When working at the Purchaser's facilities, the Contractor shall comply with all safety and security directives applicable to the site.

- 4.8.2.** The detailed procedures, instructions and guidance shall be obtained from the site commander/ the principal, the security manager and Health & Safety manager respectively at given site.
- 4.8.3.** The detailed procedures, instructions and guidance are specific to each territorial host nation, and given site within each territorial host nation.
- 4.8.4.** The detailed procedures, instructions and guidance vary depending on type of site activities that are to be performed by the contractor (a meeting, a site survey, installation works, construction works, demolition works, dismantling works etc.) and vary depending on type and number of tools, equipment and machinery to be used by the contractor at given site. Therefore, the Contractor applying for site access shall provide following information:

 - a. Purpose of the visit
 - b. Dates and timings of the visit
 - c. Number of visitors
 - d. Number, type, make and model of vehicles and machinery for which site access is requested
 - e. Brief description of scope of works performed during the visit
 - f. Further details as deemed required by the site commander/ the principal, the security manager and Health & Safety manager respectively at given site
- 4.8.5.** The Contractor shall be responsible for provision of Personal Protective Equipment (PPE) for its employees that meets respective territorial host nation standards, accordingly to the activities and scope of works to be performed during given site visit.
- 4.8.6.** Every site commander (or designated by him/her personnel) shall brief the Contractor's personnel providing Site Orientation and Health and Safety Briefing. As a minimum the briefing content shall include:

 - a.
 - b. Site orientation presentation
 - c.
 - d. Restricted access areas
 - e.
 - f. Hazards and risks on the site
 - g.
 - h. Health and safety on the site (including emergency, first aid procedures and relevant POCs)
- 4.8.7.** Each Contractor's team leader (or other Contractor's qualified representative) shall brief site personnel providing Site Works and

Health and Safety Briefing. As a minimum the briefing content shall include:

- a. Works overview
- b. Restricted access areas
- c. Hazards and risks related to performed works
- d. Health and safety of the construction/installation site (including emergency, first aid procedures and relevant POCs)

4.8.8. Both briefings shall be site specific and delivered before any Contractor activity starts at any given site.

4.8.9. Participation in the briefings shall be mandatory for every site and Contractor's personnel who is expected to be on site during the Contractor's activities. Every participant shall confirm in writing (signature in the participant list) reception of both H&S briefings.

4.9. Electromagnetic Interference and Compatibility (EMI/EMC) Control Plan

4.9.1. As part of the SEDP, an EMI/EMC Control Plan – to be provided by the Contractor – is required. The plan shall identify all measures taken to ensure electromagnetic compatibility of the SSSB system and its apparatus, in accordance with Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility and MIL-STD-461-G. The standards/norms applied by the manufacturers shall be mentioned. A Certificate of Compliance (CoC) to the mentioned norms shall also be included. In his design, the Contractor shall take into account the constraints of the site, number of simultaneous transmissions and EMC. An EMC study of the transmitter site shall demonstrate that Public and Occupational exposure levels are within limits stipulated in respective international and national guidelines.

4.9.2. With regards to EMC, the system and its electronic equipment, shall during its lifetime, operate within its defined specifications, and be to both military (NATO) and THN's National/Military environmental standards.

4.9.3. Power supply, HVAC, lights, other electrical and mechanical equipment and installations as well as buildings and structures shall not have any negative influence on the communication systems and vice versa.

4.9.4. Every system installed separately or in combination with other systems must comply with the EMC requirements.

4.9.5. The conducted interferences (currents) through cables and wiring caused by the SSSB system and its apparatus shall be in accordance with applicable European/British Norms.

- 4.9.6.** Electromagnetic Interference Radiated Immunity:
- a. The SSSB system shall remain functional within its specifications during and after exposure to external electromagnetic fields as per applicable European/British Norms.
 - b. The SSSB systems shall remain functional within its specifications during and after exposure to external electromagnetic fields caused by transmitters installed nearby, as per applicable European/British Norms.
 - c. The Contractor shall provide the EMC compatibility between equipment to demonstrate that the system works as a whole. The interoperability testing shall obviously be part of the system acceptance. EMC equipment level acceptance shall be done by verification of EMC compliance certificates.
- 4.9.7.** Electromagnetic Interference Conducted Immunity:
- a. The systems shall remain functional within their specifications during and after exposure to conducted interference / currents in general as per applicable EN norms.
 - b. The systems shall remain functional within their specifications during and after exposure to conducted interference currents entering via the power supply as per applicable EN norms.
 - c. The systems shall remain functional within their specifications during and after exposure to conducted interference currents caused by exposure to electromagnetic fields as per applicable EN norms.
 - d. Transients: Any shelters (if required) for equipment shall be able to handle fast transients / burst as per EN 61000-4-4.
- 4.9.8.** Electrostatic discharge: The systems shall remain functional within their specifications during and after an electro static discharge as defined in EN 61000-4-2.
- 4.9.9.** The Contractor shall develop a plan for control of Electromagnetic Interference (EMI). This plan shall form a sub-set of the System Engineering and Design Plan of the PIP Section 2 and shall include a description of the interference reduction programme and the engineering design procedures and techniques that shall be used to achieve conformance with the requirements of this Contract.
- 4.9.10.** The control plan shall also identify all measures taken to ensure EMC of the SSSB system is within the requirements of PFE.
- 4.9.11.** The EMI/EMC Control Plan shall contain and not limited to the following items:

- a. Management Controls: Specific organisational responsibilities, lines of authority and the control of implementation planning etc. shall be stated, together with details of the EMI/EMC requirements imposed on sub-contractors and test requirements placed upon testing establishments.
- b. Mechanical Design: The control plan shall describe criteria for selection at the design stage of the materials and manufacturing techniques to be employed so that inherent attenuation to electromagnetic emanations and susceptibility shall be provided, without compromising other mechanical considerations of individual equipment design and specifications.
- c. Electrical/Electronic Circuit Design: This Section shall fully describe the EMI suppression techniques that shall be applied to all parts and circuitry, in terms of both the generation of undesirable emanations and susceptibility to the fields and voltage levels as specified elsewhere in this Contract and, for the case of sub-systems/equipment units, levels allocated by the Contractor (including specific requirements placed on sub-contractors) for the various equipment units comprising the SSSB system.

4.9.12. Lightning Protection

- a. The SSSB system shall comply with the international standard for lightning protection – International Electro technical Commission (IEC)-62305:2020 series.
- b. The equipment shall not be damaged and the Communications and Information Systems (CIS) equipment shall continue to operate without degradation when subjected to the lightning waveforms conforming to STANAG 4370 edition 6, AECTP 250 - leaflet 254 atmospheric electricity and lightning.
- c. Appropriate Surge Protection Devices (SPD) and other lightning protection measures according to EN 61643-11:2011, IEC 61643-12:2020, IEC 61643-21:2000+AMD1:2008+AMD2:2012 CSV, IEC 61643-22:2015 and IEC 62305:2020 series or THN equivalent shall be used to provide sufficient protection for the equipment.
- d. The earth electrode shall be able to handle the lightning current for dispersal into the ground.
- e. The equipment shall withstand the effects of induced currents into the system as per EN 61000-4-5:2014 + A1:2017, Limit: Level 4.
- f. The Radio-Frequency (RF) coaxial cables from the antennas connected to the related CIS equipment shall be equipped with an appropriate SPD and provide sufficient protection.
- g. The SPD devices shall be able to handle the multiple strokes lightning flash consisting of average of 3-4 strikes.

- h. The Contractor shall provide and install the lightning protection measures for each equipment and CW that are provided and implemented by the Contractor.

4.10. TEMPEST Requirements

- 4.10.1.** In general the architectural design of the SSSB COMMS sites does not imply the usage of TEMPEST components. In lieu, National Security regulations may require to apply TEMPEST usage. Further details on current TEMPEST usage at each of the sites can be found in the respective SIDP annexes to the SOW.
- 4.10.2.** Equipment, separation, power supply and grounding shall be in accordance with Military Committee Communications & Information Systems Security & Evaluation Agency (SECAN) Doctrine and Information Publication (SDIP) 29/2 on separation of black and red systems.

4.11. System Design and Technical Reviews

- 4.11.1.** The System Design shall include the following activities, reviews, documents and reports:
- 4.11.2.** Technical Reviews (SRR, PDR and CDR):
 - a. The Contractor's system engineering programme shall include provision for three (3) Technical Reviews for each of the nations (including CW), the SRR, PDR and CDR. During technical reviews the Purchaser shall examine the functional requirements and the Detailed Design Specification (DDS). Reviews shall be broken down by nation in order to mitigate against any possible delays related to the other nations.
 - b. The schedule and planned conduct of the SRR, PDR and CDR and resulting documentation and reports shall be included in the SEDP as well as CW requirements laid down in the SRS (CW) Annexes of the SOW. The plans shall also identify and list specific CI(s) subject to technical reviews at sub-system and equipment levels. This listing shall be subject to updates until such time as the system hardware and software baseline is established.
 - c. The technical reviews shall include three review meetings as described as follows:
 - i. System Requirements Reviews (SRR) shall coincide with the submission of the Draft PIP (at the dates specified in the SSS);
 - ii. Preliminary Design Review (PDR) Meetings (at the dates specified in the SSS);
 - iii. Critical Design Review (CDR) Meetings (at the dates specified in the SSS).

- d. For each technical review, the Contractor shall:
 - i. Provide well-defined entry and exit criteria based on Contract requirements;
 - ii. Demonstrate, wherever possible, the products under review;
 - iii. Substantiate decisions with technical details and associated rationale;
 - iv. Ensure appropriate participation including that of sub-contractors, vendors, and suppliers;
 - v. Be able to host the review at an appropriate Contractor facility (or facilities), if not hosted at Purchaser or THN facilities (by mutual agreement);
 - vi. Provide administrative support, e.g. resources, materials, meeting rooms, security;
 - vii. Provide meeting agendas, at least 3 weeks before the meeting;
 - viii. Provide Minutes of Meetings (MoM) that document the proceedings including key points, decisions, action item list, any issues with associated rationale; open and unresolved items (action items) with their closure requirements and responsibilities. MoM of the technical reviews are to be provided to the Purchaser for review and comment not later than one (1) week after the meeting respective.
- e. Technical Reviews shall be conducted to demonstrate progress in converging on viable traceable system requirements that are balanced with cost, schedule and risk.
- f. Technical Reviews shall confirm the total system detailed design approach (integrated composite of people, product and process solutions) satisfies the functional baseline, risks are mitigated with closure plans for remaining risks demonstrating the required progress and that the total system is ready for detailed design

4.11.3. System Requirement Review (SRR)

- a. The Contractor shall conduct System Requirement Review (SRR) Meetings for each nation and provide a Requirements Analysis Report (RAR) before the PDRs, at the date specified in the SSS. This shall include both CW and technical requirements. A formal agenda shall be provided by the Contractor, and at the end of the meetings formal Minutes of Meeting (MoM) shall be produced that are to be provided to the Purchaser for review and comment within one (1) week of any meeting.

- b. The objective of this review is to ensure the CW and system requirements are understood adequately by the Contractor and a draft functional (requirements) baseline is established.
- c. During the meeting presentations on the results of the CW and System Requirements analysis shall be conducted (the result of requirements analysis shall be captured in the Requirements Analysis Report (RAR)). In addition, Purchaser / Contractor common requirements understanding, common functional and system design understanding shall be achieved.
- d. The SRR shall be conducted to demonstrate progress in converging on viable, traceable CW and system requirements that are balanced with cost, schedule and risk by confirming that:
 - i. Customer requirements (including environmental, usage modes, and other pertinent factors) were analysed and translated into system-specific functional and performance requirements;
 - ii. Technology validation and demonstration plans are complete and closure plans on technical demonstrations and maturations are achieving required progress;
 - iii. Critical technologies for personnel, product, and process solutions have been identified and assessed.
- e. SRR Entry Conditions
 - i. The Contractor shall present the results of the Requirement Analysis Report (RAR) together with an early identification of inconsistencies, conflicts, and incompleteness, potential problems and/or risk areas at the System Requirements Review (SRR);
 - ii. Approved Agenda (SRR).
- f. SRR Exit Conditions
 - i. RAR has been formally submitted by the Contractor and approved by the Purchaser;
 - ii. All action items as documented in the Minutes of Meeting (MoM) of the SRR meetings have been agreed by the Purchaser as closed;
 - iii. Overall Summary Schedules have been provided by Contractor;
 - iv. CW and Technical risks have been assessed and minimised;

- v. MoM have been recorded, reviewed by the Purchaser and approved.
- 4.11.4. Preliminary Design Review and Critical Design Review (PDR and CDR)**
- a. The Contractor shall provide the PDR Packages (PDR Draft documentation) prior to the PDR meetings and in line with the SSS, in order to allow the Purchaser and THN to review the documents, including the Draft version of the DDS.
 - b. The Contractor shall provide the CDR Packages (CDR Draft documentation) prior to the CDR meetings and in line with the SSS, in order to allow the Purchaser and THN to review the documents, this includes the Final Draft versions of the DDS (following the discussions at the CDR meetings. The Contractor shall finalise the Final DDS within two (2) weeks after this meeting).
 - c. Both CW and Technical Reviews, PDRs and CDRs, shall consider all aspects of the design and cover all functional and performance requirements. It shall include for each Configuration Item (CI):
 - i. Any allocated functional and performance requirements derived from overall requirements specified in the Contract;
 - ii. CI specifications which are to include drawings, schematic diagrams, models, manuals and other data as appropriate and address the following as a minimum:
 - 1) Functional specifications;
 - 2) Performance specifications (technical and environmental) including RAMT requirements;
 - 3) Interface requirement specifications;
 - 4) Interface control document (ICD) specifications. Under PDR/CDR reviews in order to carry out integration. The ICD's should be delivered to Purchaser in line with the SSS.
 - 5) Physical layout (form and fit), including human engineering;
 - 6) Sub-system integration requirements;
 - 7) Current fabrication status and test results available to validate the design approach and achievement of relevant specification;
 - 8) Site specifications.
 - d. In preparation and conduct of a CW and Technical Reviews the Contractor shall:
 - i. Host and develop the meeting agenda for the reviews;

- ii. Provide the Purchaser with appropriate CW and technical material including draft CI specifications in quantities specified in the SSS and in format specified in SOW Section 15, paragraph 15.3 below;
 - iii. Provide reports from, and ensure participation by sub-contractors, vendors and suppliers as necessary;
 - iv. Organise and present briefings as necessary;
 - v. Provide appropriate facilities, administrative services and summary meeting reports;
 - vi. Provide schedule, test and design data and supporting analysis for the reviews;
 - vii. Provide appropriate technical personnel at the reviews;
 - viii. Provide the Purchaser with draft copies of the summary meeting reports in the format specified in SOW Section 15, paragraph 15.3 below NLT two (2) weeks subsequent to the reviews.
- e. The principle purpose of Purchaser participation is to approve the Contractor's designs. Such approval is based upon Contractor-supplied information and in no way relieves the Contractor's obligation to deliver systems wholly in conformity with the technical and environmental performance specifications contained in this Contract. Sufficiently detailed information and test data shall be provided to assure the Purchaser that all functional and performance requirements have been achieved or have been modified to achievable limits without prejudice to contractual specifications.
- f. PDR Entry Conditions
- i. Approved Final PIP Documentation. SRRs have been conducted and all actions from the SRRs have been agreed and closed.
 - ii. Draft System & Sub-system Detailed Design Specifications (DDS) documentation received.
 - iii. Approved Requirement Analysis Reports (RAR) and Requirements Traceability Matrix (RTM)
 - iv. Interface Requirement Specifications documentation received.
 - v. As Designed Product Drawings and Associated Equipment Lists documentation received.

- vi. Installation Engineering Plan received.
 - vii. Site Activation Plan received.
 - viii. Site specifications received.
 - ix. The HW for related sites has been proposed by the Contractor.
 - x. Approved Agenda (PDR)
- g. PDR Exit Conditions
- i. The documents related to PDR reviews have been formally submitted by the Contractor and approved by the Purchaser.
 - ii. Site Preparation Data Package (SPDP) as defined in SOW SECTION 14 has been finalised and approved
 - iii. All actions items, as documented in the MoM of the PDR meeting, have been agreed by the Purchaser as closed.
 - iv. The HW for sites has been reviewed.
 - v. Overall Summary Schedule have been provided by Contractor.
 - vi. Technical risks have been assessed and minimised.
 - vii. RAMT deliverables have been agreed
 - viii. Civil Works Plans and Designs have been agreed.
 - ix. MoM has been recorded and approved.
- h. For PDR documentation, the Contractor shall deliver "Detailed Design Specifications (DDS)" in Draft form including:
- i. Equipment design specifications.
 - ii. Engineering data and drawings.
 - iii. Civil Works data, specifications and drawings
 - iv. Preliminary installation drawings for each installation location, as long as infrastructure requirements (power, cooling and civil works) and define the Configuration items, including drivers/software/firmware adaptations, are compliant with SOW SECTION 4.
- i. For PDR documentation, the Contractor shall deliver "Requirement Analysis Reports" and a 'Requirements Traceability Matrix' in compliance with SOW Section 4.

- j. For PDR documentation, the Contractor shall deliver “Interface Requirement Specification” in compliance with SOW Section 4.
- k. For PDR documentation, the Contractor shall deliver ‘As Designed Product Drawings and Associated Equipment Lists (including CW)’ in compliance with SOW Section 4.
- l. Critical Design Review (CDR) Entry Conditions
 - i. All exit objectives of the PDRs have been met:
 - ii. All documents related to the PDRs have been reviewed, commented upon, updated accordingly, delivered and approved by the Purchaser.
 - iii. CW and System Designs (As described in CW and System & Sub-system Detailed Design Specifications (DDS) Plans & Interface Requirement Specifications-IRS) are delivered.
 - iv. All actions items, as documented in the MoM's of the PDR meetings, have been agreed by the Purchaser as closed.
 - v. The MoM of the PDR meetings have been approved.
 - vi. All Documents related to CDR reviews have been submitted and these documents have been reviewed by the Purchaser.
 - vii. The HW for related sites has been proposed by the Contractor.
 - viii. Approved Agenda (CDR)
- m. Critical Design Review (CDR) Exit Conditions
 - i. Approvable documents related to CDR reviews have been formally submitted by Contractor and approved by NCI Agency.
 - ii. The HW for sites has been selected.
 - iii. All action items to CDR, as documented in the MoM of the CDR review meetings have been agreed by NCIA as closed.
 - iv. Overall Summary Schedule provided by Contractor.
 - v. Technical risks assessed and minimised.
 - vi. Revised PIP Documentation (if required).
 - vii. MoM recorded and approved.

- n. To be included in CDR documentation, the Contractor shall also deliver Interface Control and Management documents, defining detailed interface requirements throughout the system and resolving methods to ensure interface compatibility, including system design, communications infrastructure and any CW-related interface issues, if applicable (e.g. power supply, HVAC, fire extinguishing system, etc.). This shall also include the Application Programming Interface (API) documentation of the various interface components.
- o. An output of the CDRs shall be the CI specifications. The equipment covered by a CI specification shall be subject to configuration management once the specification has been approved. The Contractor shall provide the final version of CI specifications in a format specified in SOW Section 15, para 15.3 to the Purchaser in line with the SSS.

4.11.5. System & Sub-system Detailed Design Specifications (DDS)

- a. The purpose of the Detailed Design Specifications (DDS) is to provide visibility for the Purchaser into the proposed detailed design of the system, its development and to provide documentation against that the Purchaser may evaluate progress, foresee difficulties and provide guidance and recommendations to protect its interests.
- b. The Contractor shall deliver the DDSs to the Purchaser in Draft form as part of PDR documentation and in a final form as part of the Critical Design Reviews (CDR) according to the SSS. The DDS shall encompass the areas set forth in the PIP Section 2 in a refined and comprehensive manner to a minimum of CI level.
- c. The System & Sub-system DDS shall contain as a minimum (but not limited to) the following:
 - i. Conformance Matrix linking Contract Requirements to details of the design specification;
 - ii. Presentation of detailed equipment and Civil Works (as stipulated in Section 14) design specification;
 - iii. Potential information inputs to the Security design documentation generated by the Purchaser. (Refer to SOW Annex J);
 - iv. Equipment performance calculations;
 - v. Identification of interfaces and interdependencies throughout the system to ensure interface compatibility, including API documentation;
 - vi. Definition of the CI(s);

- vii. An Interface diagram (detailed);
 - viii. Software licensing, support and warranty agreements;
 - ix. Design for System Management and Configuration Tools including security considerations;
 - x. Proposed antenna definitions and specifications of materials used as to include requirements specified at Book II Part IV (SOW) Annexes A, D and G and their Appendices;
 - xi. The physical layout and operation principles of the SSSB system for each capability;
 - xii. Proposed system topology, routing and transport for each capability;
 - xiii. All design constraints identified in the Detailed Design Specification (DDS) Plan, for each capability;
 - xiv. Detailed description of how the Contractor's proposed system shall meet the functional requirements in the System Requirement Specifications (SRS Tech in SOW Annexes A, D and G) for each capability;
 - xv. Detailed description of the main design features of the interfaces with each relevant other system in the SRS Tech Annexes in line with the associated design constraints identified in the SRS Tech in SOW Annexes A, D and G for each capability;
 - xvi. A list of equipment (Hardware and software/firmware) planned to be delivered for each capability.
- d. The Purchaser will review the document and provide its comments and observations in the CW and Technical Reviews to be held according to the SSS.
 - e. The Contractor shall deliver the Draft version of the DDS to the Purchaser no later than two (2) weeks prior to the PDR meeting.
 - f. The comments and observations provided by the Purchaser shall be incorporated by the Contractor into the DDS.

- g. The Contractor shall deliver the Final Draft version of the DDS to the Purchaser in line with the SSS prior to the CDR meeting. Following the discussions at the CDR meeting, the Contractor shall deliver the Final DDS in line with the SSS after this meeting. Where Purchaser comments and observations have not been included into the Final Document, the Contractor shall include a separate annex noting the exclusion of such comments and observations and providing a rationale for the exclusion.
- h. It shall be noted that the DDS is the product of the Contractor. Review of the Draft version and delivery of the Final version does not imply acceptance of the detailed design by the Purchaser. It remains the sole responsibility of the Contractor to prove the design through the regime of testing set forth in the Contract and it shall be the sole responsibility of the Contractor in the event that the design proves deficient in terms of the Contract functional and/or performance requirements.

4.11.6. Interface Requirements Specification (IRS)

- a. The Contractor shall prepare an Interface Requirement Specification (IRS) document as part of the Detailed Design Specification (DDS) documentation that specifies the interfaces among the HW and SW components of the system.

4.11.7. Requirement Analysis Report (RAR):

- a. The Contractor shall prepare a Requirement Analysis Report (RAR)/Requirements Traceability Matrix (RTM) upon completion of the System Requirements Review (SRR). The RAR/RTM shall describe the result of requirement analysis indicating the inconsistent, incomplete, inadequately detailed, redundant and non-feasible requirements (if any). It shall also contain Contractor proposed changes and refinements.

4.11.8. 'As Designed' Product Drawings and Associated Equipment List

- a. The Contractor shall prepare product drawings and associated equipment lists to provide engineering data to support competitive procurement and maintenance for hardware. These drawings represent the highest level of design disclosure.

4.11.9. Site Activation Plan (SAP) :

- a. The Site Activation Plan is designed to supply information on the conditions and actions necessary to ensure a successful activation or operational transition of any new system.
- b. The content of the Site Activation Plan shall be provided in the Contractor's format and shall at least include:
 - i. A set of conditions that must exist prior to start of activation;
 - ii. A detailed priority listing of actions/events that must occur for a successful activation;

- iii. The responsibilities of the Contractor;
- iv. The responsibilities of the Purchaser;
- v. Time phasing of actions/events;
- vi. An assessment of impact on buffer centre operations.

4.12. Workmanship and Cabling

4.12.1. MIL-STD-454 Requirement 9 shall be applied as the Standard of Workmanship.

4.12.2. Weight Labelling: Items weighing more than the one-person values in table "Weight Limits" shall be prominently labelled with the weight of the object and the lift limitation, e.g. two-person lift, three-person lift, mechanical lift, etc.

Handling Function		Weight Limit (kg)
a.	Lift object from the floor and place it on a surface not greater than 1.5 m above the floor.	16
b.	Lift an object from the floor and place it on a surface not greater than 0.9 m above the floor.	20
c.	Carry an object up to 10 m.	19

4.12.3. European Community EMI Conformity/THN Regulations for COTS Items: Each COTS item, including cables, shall bear the European Community (EC)/THN Standards CE conformity marking and the Contractor shall present to the Purchaser a copy of the relevant Manufacturer's Declaration of Conformity i.a.w. the EC Council Directive 89/336/EEC/THN Standards on the approximation of the laws of the Member States relating to electromagnetic compatibility.

4.12.4. Cables/Connectors:

- a. Power cables shall be Low Smoke Zero Halogen (LSZH) cables. The preference for other cables is to LSZH cable standard as well. In all cases UK, GR and NL regulations and standards shall take precedence in this matter.

SECTION 5 SYSTEM SECURITY

5.1. Purpose

- 5.1.1.** This section describes how the project shall be organized with regards to system security in the various phases of the project and include system requirements that shall be met by the contractor design, implementation and deliverable for the system.
- 5.1.2.** The security requirements recorded on this section originate from the latest NATO Security Policy, Supporting Directives and Guidelines. These system security requirement express the minimum NATO security requirements for the system.

5.2. References

- 5.2.1.** NATO Security Policy, Supporting Directives, Supporting Documents and Guidance Documents on IFB release date are contained within the Roadmap version 3.0 dated 26 January 2021. The Roadmap includes, as a minimum, that the Contractor shall take into account the following non-exhaustive reference documentation for his implementation. All reference documentation regarding security system design are available through national delegations as well as referred to in the SRS Annexes to this SOW. The Contractor is responsible for ensuring that the latest version of documents, through national delegations, are used at the time of implementation:
 - a. C-M(2002)49-REV1 (14 Nov 2020) – NATO Security Policy
 - b. AC/35-D/2000-REV8 (25 Nov 2020) – Directive on Personnel Security
 - c. AC/35-D/2001-REV3 (25 Jan 2020) – Directive on Physical Security
 - d. AC/35-D/1030 (20 May 2005) – Guidelines on Physical Security
 - e. AC/35-D/2004-REV3 (15 Nov 2013) – Primary Directive on CIS Security
 - f. AC/35-D/2002-REV5 (25 Nov 2012) – Directive on the Security of Information
 - g. C-M(2008)0113 (27 Nov 2008) – The Primary Directive on Information Management
 - h. AC/35-N(2015)0022 (CISS) (20 Oct 2015) - Rules Of Engagement For Security Audits Of NATO CIS
 - i. AC/35-D/1016-REV3 (24 August 2017) - Guidelines for Security Inspections

- j. AC/35-D/1017-REV3 (29 Jun 2017) – Guidelines for Security Risk Management (SRM) of Communication and Information Systems (CIS)
- k. AC/35-D/1015-REV3 (31 Jan 2012) – Guidelines for the Development of Security Requirements Statements (SRSs)
- l. AC/35-D/1014-REV3 (31 Jan 2012) – Guidelines for the Structure and Content of Security Operating Procedures (SecOPs) for CIS
- m. AC/35-D/1039 (08 Oct 2008) - Guidelines on Business Continuity Planning For Communication and Information Systems (CIS)
- n. AC/35-D/1019-REV1 (12 Dec 2008) – Guidelines for the Security Evaluation and Certification of Communication and Information Systems (CIS)
- o. AC/35-D/1021-REV3 (31 Jan 2012) – Guidelines for the Security Approval or Security Accreditation of Communication and Information Systems (CIS)
- p. AC/322-D/0030-REV5 (23 Feb 2011) – INFOSEC Technical and Implementation Directive for the Interconnection of Communication and Information Systems CIS
- q. AC/322-D/0049-REV1 (29 Nov 2018) – Directive for Transmission Security
- r. AC/322-D(2019)0021 (25 April 2019) – Technical and Implementation Directive on Emission Security.
- s. AC/322-D/0048-Rev3 (18 Nov 2019) – Technical and Implementation Directive on CIS Security
- t. AC/35-D/2005-REV3 (12 Oct 2015) – Management Directive on CIS Security
- u. SDIP-28/1 (Dec 2009) – NATO Zoning Procedures
- v. SDIP-29/2 (Mar 2015) – Selection and Installation of Equipment for the Processing of Classified Information
- w. AC/322-D(2017)0016 (30 March 2017) - Technical and Implementation Directive on Supply Chain Security for COTS CIS Security Enforcing Products
- x. AC/322-D(2019)0041 (1 October 2019) - Technical and Implementation Directive on Introducing Secure Systems and Solutions Using Commercial Off the Shelf (COTS) Products into NATO

5.2.2. In case of inconsistency between NATO Security Policy Documentation and SSSB Specific Documentation, the NATO Security Policy Documentation takes precedence.

5.3. System Security Design & Engineering

- 5.3.1.** The contractor shall document the security design prior to PDR on the Detailed Design Specification (DDS) detailing on how the security requirements are met by the Contractor design.
- 5.3.2.** Security Configuration shall be performed in accordance with NATO Cyber Security Center (NCSC) security configuration guides.
- 5.3.3.** In the event that the NCSC security settings do not include guides for the solution selected then Center of Internet Security (CIS) Security Settings, US Department of Defence (DOD) Security & Technical Implementation Guidance (STIG) or custom security configuration guides shall be applied by the contractor.

5.4. System Security ILS

- 5.4.1.** The contractor shall document on the ILS documentation the security related maintenance activities including at minimum:
 - a. Applying security patches,
 - b. Change passwords,
 - c. Create /update / delete users,
 - d. Export / import data,
 - e. Collecting security logs,
 - f. Change IP addresses,
 - g. Apply security settings described on the DDS.

5.5. System HOTO

- 5.5.1.** The Contractor shall deliver the following security related information during the HOTO for all deliverables of this project:
 - a. Emergency User names & passwords
 - b. List of IP Addresses

5.6. System Security Requirements

- 5.6.1.** The overall System will be operated at NATO / National SECRET³ System-High.
- 5.6.2.** The Contactor shall delivered devices on the Radio Sites to be used as NATO / National UNCLASSIFIED.
- 5.6.3.** The Contactor design and implementation shall comply with the System Security Requirements as recorded on the document "IFB-

³ UK: UK SECRET, GR: ΑΠΟΡΡΗΤΟ / APORRITO, NL: Staatsgeheim GEHEIM

CO-15577-SSSB-Book-2 - Part - 4 - SOW - Annex J - System Security Requirements”.

5.7. Security Maintenance

- 5.7.1.** The Contractor shall deliver and apply security patches for all their deliverables within the scope of this project based on the following schedule:
 - a. On Radio Site Acceptance Test (RSAT) – 12 weeks apply security patches not older than RSAT-16 weeks
 - b. On Site Acceptance Test – 12 weeks apply security patches not older than SAT-16 weeks
 - c. On End of Warranty – 12 weeks apply security patches not older than end of warranty – 16 weeks.

5.8. System Security Obsolescence

- 5.8.1.** The Contractor chosen equipment shall be not reaching security obsolescence within 3 calendar years after the FSA.
- 5.8.2.** The contractor shall replace any equipment that is reaching security obsolescence within the 3 calendar years after the FSA.

5.9. Security Tests

- 5.9.1.** The Contractor shall document the security test approach on a Security Test Plan, annex to the Test Evaluation Plan (TEP).
- 5.9.2.** The contractor shall develop Test Cases for all system security requirements described on the System Security Requirements (IFB-CO-15577-SSSB-Book-2 - Part - 4 - SOW - Annex J - System Security Requirements) and the security requirements of this SOW and include them on the Test Cases Cross Reference (TCCR) Matrix.
- 5.9.3.** The Contractor shall support the purchaser / THN security audits and security requirement verification as part the Test Cases Cross Reference (TCCR) Matrix.
 - a. Unless agreed by the purchaser, the Contractor shall resolve all security issues detected during security audits and security requirement verification.

5.10. Security enforcing Product

- 5.10.1.** The Contractor shall select security enforcing products with Common Criteria Certification EAL 3+ as minimum and a Security Target that meets the purpose of usage.

SECTION 6 QUALITY ASSURANCE (QA)

6.1. Introduction

6.1.1. The following reference documentation applies for QA purposes. As a minimum, that the Contractor shall take into account the following non-exhaustive reference documentation for his implementation. All reference documentation regarding Quality Assurance are available through national delegations as well as referred to in the SRS Annexes to this SOW. The Contractor is responsible for ensuring that the latest version of documents, through national delegations, are used at the time of implementation:

- a. Allied Quality Assurance Publication (AQAP) - 2000
- b. AQAP - 2110
- c. AQAP - 2210
- d. AQAP - 2070
- e. AQAP 160 - NATO Integrated Quality Requirements for Software throughout the Life Cycle
- f. AQAP - 169 NATO Guidance on the use of AQAP - 160
- g. ISO/IEC 12207 – Software Life Cycle Process
- h. ISO/IEC 15288 – Systems and Software Engineering – System Life Cycle Process
- i. AQAP 2009 - NATO Guidance on the use of the AQAP-2000 Series
- j. AQAP-2000 Series
- k. AQAP 2050 - NATO Project Assessment Model
- l. AQAP 2105 - NATO Requirements for Deliverable Quality Plans
- m. AQAP 2310 - NATO Quality Management System Requirements for Aviation, Space and Defence Suppliers
- n. International Standards 9000 Series
- o. International Standard 10012-1 (ISO-10012-1)
- p. Applicable NATO Standardisation Agreements
- q. STANAG 4107
- r. STANAG 4427

6.2. Quality Control System

6.2.1. The Purchaser will apply STANAG 4107 and AQAP(s) specified above (Section 6, para. 6.1.1, references (a) thru (r)) that the Contractor shall herewith accept and agree to.

- 6.2.2.** The Contractor shall establish, document and maintain an effective QC System in accordance with 6.1.1 reference (a) and/or equivalent to ISO 9000 Series Standards throughout the life-cycle of the Contract.
- 6.2.3.** The Purchaser may delegate the Quality Assurance to the appropriate Government Quality Assurance Authority (GQAA) in accordance with STANAG 4107. The GQAA, when accepting the STANAG 4107 Request for GQAA Services, appoints his QA Representative(s) (QAR). The Purchaser, through their own Quality Assurance, however, will retain the overall supervisory and liaison authority concerning all QA/QC matters, and for this purpose will use their own QA Personnel. The term "National QAR" (NQAR) shall apply to any of the Purchaser-appointed QARs, whether nominated by the GQAA or by Purchaser QA. During the entire Contract implementation, the NQAR(s) within their own rights, defined in the Contract applicable AQAPs, shall assure the Contractors and sub-contractor's compliance with all contractual requirements.

6.3. Quality Assurance (QA) Programme

- 6.3.1.** The Contractor shall be responsible for the control of quality of all deliverables and associated contractual products throughout the life-cycle of the Contract.
- 6.3.2.** The QA Programme shall ensure that procedures are developed, implemented and maintained to adequately control the development, design, production, testing and configuration of all deliverables. The QA Programme will be described in the QA Plan outlined below. The programme is subject to review and/or rejection by the Purchaser, or its delegated representative(s), whenever it does not meet the QA requirements. It will be subject to review for adequacy, compliance and effectiveness. The overall QA Programme will adhere to the provisions of SOW Section 6 above Reference (a) and be consistent with the project philosophy of integrating COTS hardware and software as applicable.

6.4. Applicability

- 6.4.1.** The QA programme shall apply to all hardware, software and documentation being developed, designed, acquired, integrated, maintained, or used under the Contract. This includes non-deliverable test and support hardware and software. Firmware shall be controlled in the same manner as software. The QA programme shall also apply to CW throughout the life cycle of delivered infrastructure (with associated earth, electrical and ducting works, etc.) and systems (such as NB PSS, EPDP, HVAC, grounding, etc.). The QA programme is also applicable to the whole package of documents,

designs, plans and drawings pertaining to CW at any given stage of the project.

6.5. Organisation

- 6.5.1.** The Contractor shall designate at least one person to manage the QA function for this project. Contractor personnel within the QA organisation shall have sufficient responsibility, authority, organisational freedom and independence to review and evaluate activities, identify problems and initiate or recommend appropriate corrective action.
- 6.5.2.** Personnel performing QA functions shall have specific documented definitions of their assigned duties. In no case shall the Contractor QA personnel performing QA functions be the same personnel responsible for performing other tasks that are reviewed by QA.
- 6.5.3.** Contractor QA personnel shall participate in the early planning and development stages to ensure that attributes of good quality for life-cycle procurement are specified in programme plans, standards, specifications and documentation. After establishment of attributes, controls and procedures, Contractor QA personnel shall ensure that all elements of the QA Programme are properly executed, including inspections, tests, analysis, reviews and audits.
- 6.5.4.** A Contractor QA person shall be designated as the Contractor's QA Management Representative and point of contact to interface with the Purchaser on quality control matters or his delegated National Quality Assurance Representative (NQAR) and identified in the Quality Plan.

6.6. QA Plan

- 6.6.1.** The Contractor shall provide a QA Plan to the Purchaser in accordance with the requirements of the above mentioned AQAPs, and as amended herein. The QA Plan shall be submitted to the Purchaser for review as part of the PIP's Section 3 (see SOW Section 2, para 2.3.1.k.iii). The QA Plan shall be structured as a living document subject to revision / update, as and when required.
- 6.6.2.** The QA Plan shall reference, and/or document, and explain the Contractor's QA procedures for analysis, software support, development, design, production, installation, configuration management, control of Purchaser furnished property, documentation, records, programming standards and coding conventions, library controls, reviews and audits, testing, corrective action and certification as specifically related to this project.
- 6.6.3.** The QA Plan shall be compatible and consistent with all other plans, specifications, standards, documents and schedules that are used under this Contract. All Contractor procedures referenced in the QA

Plan shall either be submitted with the plan, or described in the plan and made available for review by the Purchaser upon demand.

6.7. Corrective Actions

- 6.7.1.** The Contractor's corrective action system shall ensure prompt detection, documentation and correction of problems and deficiencies. The corrective action system shall track all reported and recorded problems and deficiencies until their closure and clearance.

6.8. Sub-Contractor Control

- 6.8.1.** In the event that the Contractor sub-contracts any of the work contained in this Contract, the Purchaser reserves the right to perform reviews and audits at any of the sub-contractor(s) facilities. Such reviews and audits shall not be used by the Contractor as evidence of effective control of sub-contractor's quality. The Contractor shall conduct periodic audits of the sub-contractors.

6.9. Certificates of Conformity (CoC)

- 6.9.1.** When satisfied that the products and/or services provided by the Contractor are in conformance with the terms of this Contract, a CoC per Annex B to AQAP-2070 (see SOW Section 6, para 6.1.1, ref. (d)) shall be countersigned and stamped by the cognisant NQAR(s). The preparation of the CoC(s) shall be the responsibility of the Contractor.
- 6.9.2.** CoC(s) shall be required for all quantities of equipment contained in each Contract line item. The Contractor shall submit two (2) copies of the CoC(s) to the Purchaser on delivery of the equipment.

SECTION 7 CONFIGURATION MANAGEMENT (CM)

7.1. General

- 7.1.1.** Configuration Management (CM) applies processes and tools to establish and maintain consistency between products and product requirements. CM establishes a structure for products and product configuration information and selects, defines, documents and baselines product attributes in sufficient detail to support the product lifecycle.
- 7.1.2.** The following reference documentation applies for CM purposes: ACMP-2009 NATO Guidance on Configuration Management.
- 7.1.3.** The Contractor shall be responsible for the project HW and SW Configuration Management.
- 7.1.4.** The Contractor shall be responsible for establishing and maintaining an effective CM organisation to implement the CM programme in accordance with STANAG 4427 and managing the CM functions (configuration identification and documentation, configuration control, configuration status accounting, configuration audits).
- 7.1.5.** The Contractor shall be responsible for the application of all necessary CM procedures, in accordance with the requirement and guidance stated below, throughout the life of the basic Contract, and during the optional CLS (if applicable, see Section 11, Para 11.4).
- 7.1.6.** Whenever System or System/Equipment is mentioned the definitions will also include Supporting Systems, provided by the Contractor, such as augmented NB PSS (if applicable), antenna masts, aircraft warning lights, lightning protection and grounding.

7.2. Configuration Management Plan (CMP)

- 7.2.1.** The Contractor shall provide a CMP in accordance with ACMP-2009 NATO Guidance on Configuration Management, tailored to the requirements of the proposed technical solution. The CMP shall be periodically updated as required. The CMP shall be part of the PIP Section 4 (see SOW Section 2, para. 2.3.1.k.iv). The CMP shall be maintained during the optional CLS period as well (in case the optional CLS is executed).
- 7.2.2.** In producing the CMP, the Contractor shall define the organisation and procedures used to manage the functional and physical characteristics of CI(s), including interfaces and configuration identification documents. He shall ensure that all required elements of CM are applied in such a manner as to provide a comprehensive CM programme.

- 7.2.3.** The CMP shall fully address all disciplines and requirements within this SOW Section and shall as a minimum include, but not be limited to the following CMP Sections:
- a. Introduction
 - b. Organisation
 - c. Configuration Identification and Documentation (CID)
 - d. Configuration Control (CC)
 - e. Configuration Status Accounting (CSA)
 - f. Configuration Audits
 - g. Management tools/Interface management
- 7.2.4.** The Contractor shall provide detailed proposals for the documents that shall comprise the above baselines to be included in the CMP for approval by the Purchaser.
- 7.2.5.** The Contractor shall propose in the CMP a Requests for Deviation (RFD) (s) and Requests for Waiver (RFW) format based on the requirements given in ACMP-2009 NATO Guidance on Configuration Management.
- 7.2.6.** The Contractor shall propose a deliverable version control system as part of the CMP detailed below. This version control system shall allow for the unique identification of all changes to the deliverables, no matter how minor the change. The version control system shall also identify a difference between major and minor changes. Any doubt as to whether a revision constitutes a major or minor change shall be referred to the Purchaser for decision.
- 7.2.7.** The Contractor shall provide structure, content and initial details for this plan in the proposal phase so to show the concept of the activity.

7.3. Configuration Identification and Documentation (CID)

- 7.3.1.** The Contractor shall establish a configuration identification system. The system shall identify all documents necessary to provide a full technical description of the characteristics of the Hardware and Software CID(s) that require control at the time each baseline is established and shall include the relevant deliverables in the Contract.
- 7.3.2.** The Contractor shall designate as CIs all hardware elements (if any) down to the maintenance significant item level.
- 7.3.3.** The Contractor shall propose appropriate CID(s) in the CMP including an explanation of the rationale and criteria used in the selection process that shall be based on the criteria for selection of CID(s).
- 7.3.4.** The CID structure shall be in the form of a CI tree structure (an explicit part of the CMP) with the System being the top level CID and shall show the relationships between the lower level CID.

7.4. Configuration Control (CC)

- 7.4.1.** The Contractor shall describe his Configuration Control (CC) procedures in the CMP.
- 7.4.2.** The Contractor shall be fully responsible for the Configuration Control of all baselines and CIs in accordance with [ACMP 2009, 2017] and [ACMP-2000, 2017].
- 7.4.3.** The Contractor shall be responsible for issuing in a timely manner all approved changes and revisions to the functional, development and product baseline documents included in the Contract. This includes changes originated both by the Contractor and the Purchaser. Copies of change pages or documented revisions shall be provided in accordance with the Schedule of Deliverables. Where a change affects more than one document, or affects documents previously approved and delivered, the Contractor shall ensure that the change is properly reflected in all baseline documents affected by that change.
- 7.4.4.** The Purchaser must approve all changes prior to becoming effective.
- 7.4.5.** The Contractor shall define the Configuration Baseline Change procedures and shall submit Notice of Revision or Request for Deviations (RFD) and Request for Waivers (RFW) when required and approved by the Purchaser.

7.5. Configuration Status Accounting (CSA)

- 7.5.1.** The Contractor shall be fully responsible for the Configuration Status Accounting (CSA) for all CID(s) in accordance with ACMP-2009 NATO Guidance on Configuration Management. This system shall consist of reports that shall be prepared and delivered in a manner, format and schedule that shall be proposed by the Contractor in his CMP and approved by the Purchaser.
- 7.5.2.** Contractor shall prepare and deliver the CSA reports for each milestone and as requested by the Purchaser, including the optional CLS period.
- 7.5.3.** At the end of the Contract, the Contractor shall deliver a set of final CSA reports for each CID in quantities as specified in the SSS and in format as specified in Section 15 below.
- 7.5.4.** In addition, the Contractor shall develop and maintain a CSA Database using the appropriate database management and other related software tools for the entire period of the Contract.

7.6. Configuration Audits

- 7.6.1.** Configuration audits shall be established by the Contractor to demonstrate the actual status of all CI's and verify compliance with the specifications and other Contract requirements in accordance with

ACMP-2009 NATO Guidance on Configuration Management. The Contractor shall propose in the CMP detailed plan and procedures for the audits for Purchaser approval.

- 7.6.2.** The audits shall be carried out jointly by the Contractor and the Purchaser in accordance with the Contractor's approved CMP and shall consist of a Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA), see below:
- 7.6.3.** Functional Configuration Audit (FCA) is the formal examination of functional characteristics of a configuration item, or system to verify that the item has achieved the requirements specified in its functional and/or allocated configuration documentation. In this Contract, the FCA shall primarily consist of reviews of all the component-based requirements of the Contract, Contract documentation, tests or test results where necessary, to demonstrate the full compliance of the functional requirements of allocated components delivered to the Purchaser.
- 7.6.4.** Physical Configuration Audit (PCA) is the formal examination of the 'as-built' configuration of a configuration item and system against the technical documentation to verify the product baseline. In this Contract the PCA shall consist of a review and verification of design documentation against the delivered system and individual system components. The PCA shall also include a review of system-wise functional and performance requirements that were not reviewed at FCA.
- 7.6.5.** Audit Location. The FCA and the PCA shall be conducted after the FAT at the Contractors site/factory and after RSAT at site respectively. The Contractor is to ensure that after completion of the FCA and PCA Minutes of Meetings detailing these activities are published and distributed to the Purchaser for review.
- 7.6.6.** The Contractor shall draft a Configuration Audit Report for the FCA and PCA that summarises the results for the Purchaser's approval.
- 7.6.7.** The Contractor shall solve any deficiencies found during the Configuration Management Audits within the agreed timeframe and update the baseline accordingly.

7.7. Configuration Management Tools

- 7.7.1.** The various baselines referred in this SOW (see SOW Section 7, Para 7.8 below) shall be established by the Contractor using automated tools.
- 7.7.2.** The Contractor shall ensure that the Configuration Baselines and CIs are persistently stored, maintained and managed in the CMDDB.
- 7.7.3.** The Contractor, through the Configuration Management Database (CMDDB), shall provide the ability to easily trace higher and subordinate CIs using CI identifiers or other CI attributes.

- 7.7.4. The Contractor, through his provided version control/Configuration Management automated tool, shall include the capabilities for baselines management, source control versioning, configuration item identification, change request management, deficiency reporting management, and configuration status accounting.
- 7.7.5. The Contractor's software tool shall be agreed with the Purchaser prior to Contract signature. It would be expected that software is COTS and using MS applications.
- 7.7.6. The Contractor shall deliver the software tools and appropriate licenses (min. one for Purchaser and one for THN representative) to the Purchaser at the kick-off of the project.
- 7.7.7. The Contractor shall maintain a CMDB using the agreed software tools for the entire period of the Contract.
- 7.7.8. The Contractor shall transfer the current CMDB to the Purchaser upon request.
- 7.7.9. During the life cycle of the project and until the end of the (optional) CLS period (see SOW Section 11, para 11.4), all baselined documents created under this Contract shall be maintained by the Contractor in the CMDB using the agreed software tools to allow efficient update, automated tracking of changes through all affected CID(s) and baseline documents, and continued automated maintenance and printing of these documents, including tables, figures, and readings.
- 7.7.10. The Contractor shall provide read-only access to the Purchaser to audit and control its productions environments and configuration management tools (for software, documentation and hardware).
- 7.7.11. At the end of the contract, the Contractor shall transfer the current CMDB database to the Purchaser.

7.8. Baselines

- 7.8.1. Functional Baseline: The Contractor shall propose the CID that he considers to best describe the functional baseline, which includes all necessary functional characteristics, the test requirements, interface characteristics and the design constraints with the successful completion of SRR milestone. From this, the Contractor shall establish the Development and Product baselines as described below.
- 7.8.2. The Contractor shall maintain an up-to-date version of the Functional Baseline in the CMDB and ensure the relevant project documentation such as Requirements Traceability Matrix (RTM) is updated based on the approved FBL.
- 7.8.3. Development (Allocated) Baseline: The Contractor's Development Baseline shall meet the functional and non-functional requirements of

the system, and shall be comprised of the configuration documentation, which includes:

- a. Functional and system design documentation, development specifications, performance specifications, and interface characteristics and documentation,
- b. Requirements traceability matrix,
- c. The allocation of functional characteristics to CID(s),
- d. Design constraints,
- e. The verification and testing deliverables required to demonstrate achievement of the functional baseline.

7.8.4. The Contractor's initial ABL shall be established first at the successful completion of the PDR and shall be finally accepted at the successful completion of CDR. The Contractor shall maintain and update the ABL configuration during the System Baseline Reviews (SBR).

7.8.5. Product Baseline: The Contractor shall ensure its PBL meets the functional and non-functional requirements allocated in the FBL and the design of the ABL. The PBL shall be initially established before the testing events and shall be updated after the changes applied based on the outcomes of the testing events. The product baseline shall comprise the configuration documentation, which includes:

- a. All required HW and SW (including scripts, configuration files, licenses),
- b. List of open deficiencies,
- c. Product, material and process specifications,
- d. Engineering drawings,
- e. Other technical documentation for CID(s) that satisfactorily reflects the requirements of the functional and development baselines,
- f. Production acceptance test results/reports,
- g. Technical publications,
- h. Inventory documentation and SWDL,
- i. CMDB,
- j. Training documentation,
- k. Warranty and CLS documentation,
- l. .RTM.

7.8.6. Operational Baseline: The Contractor's developed OBL shall be initially established after successful completion of the PSA and then finally established after successful completion of FSA. It reflects the "as-deployed" configuration of the system. The Contractor's OBL shall be established site-specific, and contain all the artefacts from PBL reflecting the modifications for each sit, as applicable.

- 7.8.7.** The Contractor shall ensure that there is full traceability through all baselines back to the functional baseline.
- 7.8.8.** The Contractor shall maintain the baselines in a database established by the Contractor as specified under CM Tools.
- 7.8.9.** At the end of the Contract, the Contractor shall deliver the baseline documentation in quantities as specified in the SSS and in a format that complies with SOW Section 15 below. As part of the CM database, as specified under CM tools below, the Contractor shall transfer a copy of the current version of all baselines to the Purchaser at Contract completion.
- 7.8.10.** The complete baseline identifier shall include the specific baseline identifier (i.e. FBL, ABL, PBL, and OBL), site identification (if applicable) and security domain difference (if applicable). Final numbering scheme for the baseline identification may be modified with Purchaser agreement, and it shall be proposed for Purchaser approval within the CM Plan.

7.9. Engineering Change Proposals (ECP)

- 7.9.1.** Changes to the baselines and baselined CID(s) shall be processed as either Class I or Class II Engineering Change Proposals (ECPs) as defined in ACMP-2009 NATO Guidance on Configuration Management.
- 7.9.2.** The Contractor shall propose in the CMP an ECP format based on the requirements as laid out at that reference.
- 7.9.3.** The Contractor shall use the CC procedures specified in the CMP for the preparation, submission for approval implementation and handling of ECP(s) to baselined CID(s). When submitting ECP(s), the Contractor shall assign a priority rating of Emergency, Urgent or Routine. Extensions to the target times for processing Class I ECP(s) shall be mutually agreed upon by the Contractor and Purchaser. No Class I ECP shall be implemented until it has been approved by the Purchaser.
- 7.9.4.** Prior to implementation, all Class II ECP(s), (ie. an ECP proposing a change to approved configuration documentation for which the authority/Purchaser is the Configuration Documentation Configuration Authority (CDCA) or has been included in the Purchasers SOW and is not a Class I ECP), shall be submitted by the Contractor to the Purchaser for review and classification concurrence. If the Purchaser's representative does not concur with the classification, Class I ECP procedures shall be applied and the ECP shall be formally submitted to the Purchaser for approval or disapproval.
- 7.9.5.** All design changes shall be appropriately reflected in the technical documentation by the issue of appropriate changes or revisions. The Contractor shall provide all such changes/revisions to the Purchaser.

7.10. Requests for Deviation and Waiver

- 7.10.1.** If required, the Contractor shall prepare, handle, and submit for approval, Requests for Deviation (RFD) (s) and Requests for Waiver (RFW) as defined in ACMP-2009 NATO Guidance on Configuration Management.
- 7.10.2.** The Contractor shall be aware that permanent departures from a baseline shall be accomplished by ECP action, rather than by RFD.
- 7.10.3.** The Contractor shall propose in the CM Plan a RFD and RFW format based on the requirements in [ACMP 2009, 2017].

SECTION 8 DESIGN INFLUENCE

8.1. General

- 8.1.1.** The Contractor shall read and comply with the requirements of this Section in conjunction with the Section 9 Integrated Logistics Support (ILS) requirements.

8.2. Reliability, Availability, Maintainability and Testability (RAMT) Program

- 8.2.1.** The Contractor shall develop and maintain an effective RAMT Programme. This programme shall be planned, integrated, and developed in conjunction with system and equipment design, fabrication, installation and test activities to ensure the achievement of the overall programme objectives inherent in the RAMT criteria specified below and in SRS.
- 8.2.2.** RAMT Program planning details shall be outlined in Integrated Logistics Support (ILS) Plan.
- 8.2.3.** The Contractor shall ensure the design of the system includes sufficient redundancy and other Reliability, Maintainability, Availability and Testability measures to ensure the RAMT requirements in this Contract are achieved and attained at an optimal Total Cost of Ownership (TCO), minimising preventive maintenance, manpower requirement and usage of special-to-type tools and test equipment.
- 8.2.4.** Such measures taken to ensure fulfilment of RAMT requirements and optimisation of TCO shall be documented in the Support Case.
- 8.2.5.** The RAMT analysis shall clearly capture and display the RAMT characteristics of each main component, aggregated up to the level of sub-system, and subsequently the entire system. System breakdown in line with the configuration item structure shall be used as reference to perform the analysis.
- 8.2.6.** The Contractor shall develop and maintain a Reliability Block Diagram (RBD) of the entire system, relating all items (i.e. hardware down to LRU level and all software modules) based on failure dependencies, and explaining how the reliability of each item contributes to the success or failure of the entire system. Firmware shall be treated as being part of the pertinent LRU.
- 8.2.7.** The RBD shall clearly capture and display the MTBF, MTTR, Ao (operational availability) and Ai (intrinsic availability) characteristics of each item, assembly, sub-system, and the entire system. The results from the RBD shall be used to calculate and predict system Reliability, Maintainability, and Intrinsic Availability.
- 8.2.8.** A professional tool shall be used to develop and analyse RBDs. A general purpose tool such as Microsoft Excel shall not be used as the main tool. The tool shall be capable of exporting and reporting data

and results in electronic formats compatible with MS Office 2013 format. All data and results pertaining to the development and analysis of RBDs in this tool shall be made available to the Purchaser at the request of the Purchaser.

- 8.2.9.** The Contractor shall perform a functional Failure Modes, Effects and Criticality Analysis (FMECA) in accordance with MIL-STD-1629A, down to the hardware LRU and software CSCI level and documenting the effects of the failures also to the individual functions.
- 8.2.10.** Where catastrophic and/or safety critical failures have been identified through the FMECA, the Contractor shall perform a FTA down to the SRU or CSC level as appropriate for development items. If any the Contractor shall perform a FTA in accordance with MIL-HDBK-338B.
- 8.2.11.** The Contractor shall identify critical items as the items (hardware LRU and software CSCI) whose failure induce loss of critical function.
- 8.2.12.** The Contractor shall ensure that the first issue RAMT analysis is performed and delivered before PDR, updated before CDR and finally accepted at CDR, to include all relevant data to demonstrate compliance with the SRS and SOW requirements. Such data shall be documented in the Support Case as outlined below.
- 8.2.13.** The Contractor shall design the System and its support to enable at least 95% of HW and SW failures to be solved at HL1/2 and SL1/2 level and, in any case, to meet the Operational Availability requirements.

8.3. Logistic Support Analysis (LSA)

- 8.3.1.** The Contractor shall establish an LSA Process to manage the execution of the LSA tasks both for hardware and software required by this SOW and the interfaces with other activities within the Contract.
- 8.3.2.** The Contractor's LSA Process shall be a progressive and iterative effort, performed incrementally and in parallel with the design phases.
- 8.3.3.** The Contractor's LSA analysis shall include, as a minimum:
 - a. Functional and physical system breakdown structure with assigned Logistics Control Number (LCN) schemes, aligned with configuration items;
 - b. Task Analysis for identification of operational tasks, Service Management and Control (SMC) tasks; and administration and maintenance tasks (corrective, preventive, adaptive)
 - c. Level of Repair Analysis (LORA) to determine the most cost efficient level of Support/Maintenance needed to perform each Operational and Maintenance task, decision for repair or discard

- d. Planning and execution of the O&M Procedures Verification Test with references to the Master Test Plan.
 - e. Total Cost of Ownership Analysis, which shall include the warranty cost and all the operational costs and all the maintenance cost for all the support and Maintenance levels for at least 5 years after FSA
 - f. Obsolescence Analysis and Management for each software and hardware CI from end of sales, end of production and end of support perspective.
- 8.3.4.** The Contractor's analysis shall contain also the list of procedures needed to configure the capability for mission and/or exercise environment.
- 8.3.5.** The Contractor shall ensure that Operation tasks are identified through analysis of the functional and non-functional requirements of the new system taking into account mission scenarios and conditions under which the system will be operated.
- 8.3.6.** The Contractor shall ensure the analysis examines each system function allocated to personnel and determines what operator tasks are involved in the performance of each system function.
- 8.3.7.** The Contractor shall ensure that corrective and preventive maintenance tasks are identified using the RAM data and results, such as FMECA and RBD's.
- 8.3.8.** The Contractor shall ensure the SMC tasks are identified through analysis of all functions related to customer support and SMC.
- 8.3.9.** For each task, the Contractor shall determine the properties and physical resources required to execute the task. For that purpose, each task shall be analysed to identify and capture:
- a. The support level to be assigned;
 - b. Task type;
 - c. Location/ facility involved;
 - d. Manpower and Personnel
 - i. Personnel type (NMT or IMT);
 - ii. Personnel role (types of maintainers, administrators, operators)
 - iii. Skills required;
 - e. Task duration and frequency, reusing Mean Time Between Failures (MTBF) and Mean Time To Repair (MTTR) data available;
 - f. Tools and test equipment;
 - g. Spares and consumables;
 - h. Training requirement;

- i. Technical documentation;
 - j. Manpower required.
- 8.3.10.** For each task, the Contractor shall perform a cost calculation based on the properties and physical resource requirements of each task.
- 8.3.11.** The cost calculation shall provide an estimated annual cost for each task.
- 8.3.12.** The Contractor shall ensure the data and results of the Task Analysis are used as input to the development of technical publication (all manuals at any level of maintenance) and the development of training material.
- 8.3.13.** The Contractor shall provide all LSA relevant data (also known as LSAR) in ASD S3000L (last available issue) format. The data shall be delivered through agreed electronic distribution media (preferably via Data Exchange Sets (DEXs)).
- 8.3.14.** The Contractor shall analyze and select preventive maintenance tasks and develop a scheduled maintenance programme that is consistent with the maintenance concept described for the intended use of the system. The decision logic used for task selection shall implement the following priorities:
- a. Avoidance of safety and mission critical failures.
 - b. The achievement of system availability requirements
 - c. Sustainability of deployed operations in accordance with the intended use and the logistics support environment of the system
 - d. Minimization of Life Cycle Cost

8.4. Administrative Logistic Delay Time

- 8.4.1.** The Administrative Logistics Delay Time (ALDT) is the time the system/equipment is inoperable due to delays in maintenance that are attributable to administration and logistics delays.
- 8.4.2.** For the purpose of performing Ao calculations, the ALDT per hardware repair or software fault recovery is the sum of the time required to obtain the logistic resources (e.g. spares, tools and technician). It is calculated from the time the fault is reported to time of commencing the repair task.

<i>Support Level</i>	<i>ALDT for Sites</i>
HL 1/2	30 min
HL 3	72 h
SL 1/2	30 min
SL 3	72 h

8.5. Support Case

- 8.5.1.** The Contractor shall document the LSA and RAM process, resourcing and organization, inputs, outputs, methodology, and timelines within ILSP and in particular how the results of the RAMT analyses required in this SOW will be integrated in the Systems Engineering process to build the required RAMT into the system.
- 8.5.2.** The Contractor shall develop and maintain the necessary Support Cases in which all LSA and RAM activities shall be documented. The Support Case shall include:
- a. System description and breakdown down to lowest level of maintenance significant items (i.e. LRUs, SRUs) and in accordance with the CI structure and identifications
 - b. Functional descriptions for the systems and allocated to the subsystems, covering all operational modes and mission phases.
 - c. All COTS equipment datasheets, clearly indicating the reliability and maintainability characteristics which will be used as input for LSA and RAM.
 - d. Availability, Reliability, Maintainability and Testability analysis modelling, calculations and results (complete set of Reliability Block Diagrams (RBDs) per block/sub-system/location/system, FMECA including a list of critical items);
 - e. Spare part calculus, modelling and geographical distribution,
 - f. Recommended Items List (RIL) including spares, consumables, tools and test equipment with rationale and justifications,
 - g. The complete data for LSA activities and results,
 - h. The complete data set of the Task Analysis, including listings of all operation tasks, SMC tasks, administrative tasks, corrective maintenance tasks and preventive maintenance tasks;
 - i. References to the Master Test Plan and other relevant testing documentation for RAM requirements verification and validation;
 - j. The results of the Disaster Recovery Logistic Analysis.
 - k. The results from the O&M Procedures Verification Test;
 - l. The Total Cost of Ownership Analysis results
 - m. The Obsolescence Analysis results
- 8.5.3.** The Contractor's Support Case shall form a body of evidence, providing sufficient credibility that all LSA and RAMT requirements outlined in SOW Section 8, paras 8.2 and 8.3 and the SOW SRS Annexes have been met and providing credibility to the data used and the results achieved in all calculations and models.

- 8.5.4.** The Contractor's Support Case shall provide rationale and justifications for all data and formulas used in all intermediate and final calculations and models.
- 8.5.5.** The Contractor shall ensure that the first issue of Support Case is delivered before PDR encompassing all the design details up to the PDR milestone, updated before CDR and accepted at CDR, to include all relevant data to demonstrate compliance with the SRS and SOW requirements.

8.6. LSA, RAMT and Safety Requirements Verification

- 8.6.1.** LSA requirements of the system shall be verified by inspection, demonstration and test procedures during the official test events.
- 8.6.2.** The Contractor shall plan and perform an Operation and Maintenance Task Demo, to demonstrate the accuracy and correctness of the documented procedures in Support Case and in the manuals.
- 8.6.3.** The Reliability and Availability aspects of the system shall be verified:
 - a. After SAT by inspection and analysis of RAMT predictions and relevant RBDs
 - b. After PSA and until the end of warranty, the reliability and availability of each Site and of the SSSB System as a whole shall be observed and, if deviations from the target Reliability and Availability figures are recorded, the Contractor shall provide a detailed report and an action plan to meet the contracted Reliability and Availability before warranty expiration.
- 8.6.4.** The Maintainability requirement of the system shall be demonstrated by the Contractor according to MIL-STD-471A or equivalent. The demonstration shall be performed as part of the first RSAT. The results, conclusion and recommendations of the maintainability demonstration shall be captured in a maintainability demonstration report, to be included in the RAMT case report. The result of the demonstration shall be statistically analysed to verify MTTR requirement specified in SRS is met.
- 8.6.5.** The Contractor shall perform a Safety Workshop and Demonstration, presenting the whole safety program with the mitigations and sufficient evidence that the risk is minimized to the ALARP levels.

SECTION 9 INTEGRATED LOGISTIC SUPPORT

9.1. Integrated Logistic Support (ILS) Programme

- 9.1.1.** The Contractor shall establish an ILS Programme to manage the ILS activities within this Contract.
- 9.1.2.** The Contractor shall use the [ALP 10-2016] and [AIA/ASD SX000i, 2016] specification as guidance when establishing and conducting the ILS Process, in accordance with the requirements of the contract.
- 9.1.3.** The Contractor shall use [ADMP-1], [ADMP-2], [MIL-HDBK-338B], [MIL-HDBK-470A], [MIL-STD-1388-1A], [MIL-STD-1388-2B] and [ASD S3000L], or equivalent, as guidance when establishing and conducting the Logistic Support Analysis (LSA) programme, including the RAMT programme, in accordance with the requirements of the Contract. The Contractor shall appoint an experienced ILS manager to conduct the ILS Programme with functional subordinates to reflect the programme ILS managerial structure.
- 9.1.4.** The Contractor's ILS manager shall serve as the focal point for interface with the Purchaser in all matters relating to the ILS programme.
- 9.1.5.** The Contractor activities and milestones related to ILS shall be identified and included in the PMS of the PMP.

9.2. Integrated Logistics Support Plan (ILSP)

- 9.2.1.** The Contractor shall provide and maintain an Integrated Logistics Support Plan (ILSP) that shall incorporate Purchaser-approved changes, additions, and deletions.
- 9.2.2.** The Contractor shall develop the Integrated Logistics Support Plan (ILSP) in accordance with the requirements described in this Section and cover all the areas.
- 9.2.3.** The ILSP shall describe the Contractor's plans for the management control, design, procurement, interface, and integration of all elements of the Contractor's Integrated Logistics Support Programme with the system engineering and design processes.
- 9.2.4.** The Contractor shall cover the following topics at minimum including the processes to perform the related activities in ILSP:
 - a. The Contractor's ILS organization, roles, responsibilities and procedures;
 - b. ILS activities schedule with dependencies between different activities and deliverables;
 - c. Maintenance and Support Concept (including a description of Operational scenarios and Environments, Missions and capabilities in Peace and wartime);

- d. Planning of supply support (System Inventory, Codification, Recommended Spare Parts and Consumables list);
 - e. Design Influence and interfaces with other functional/technical areas (as an annex)
 - i. Reliability, Availability, Maintainability and Testability (RAMT) Programme planning, activities, processes (including testing);
 - ii. Logistics Support Analysis planning, reporting (such as LSAR), activities and processes;
 - iii. Support Case;
 - f. Support and Test Equipment Lists;
 - g. Computer Resources (licences, SWDL etc.);
 - h. Manpower and Personnel Requirements (including the qualification needed to support the system);
 - i. Technical Documentation (organization, process, inputs, reviews, release schedule)
 - j. Planning of packaging, handling, storage, and transportation (PHS&T);
 - k. Planning of supply chain security
 - l. Planning of obsolescence management and monitoring (as an annex).
- 9.2.5.** The Contractor shall provide an In Service Support Plan (ISSP) separately from the ILSP with an annex for Contractor Logistics Support Plan, in accordance with SOW Section 11. The ILSP shall be updated as required throughout the Contract Phases and it shall be flexible enough to be extended into the CLS phases
- 9.2.6.** The ILSP shall be structured as a living document subject to revision / update, as and when required.
- 9.2.7.** The Contractor shall apply as reference the documentation mentioned in this Section.
- 9.2.8.** The Contractor shall provide structure, content and initial details for this plan in the proposal phase so to show the concept of the activity.

9.3. Maintenance and Support Concept

9.3.1. General

- a. The Contractor shall align the Maintenance and Support Concept with the functional and non-functional requirements of the System both for hardware and software components.

- b. The Contractor shall ensure the Maintenance and Support Concept defines the tasks at any level of support and at any level of maintenance.
- c. The Contractor shall ensure the Maintenance and Support Concept defines the Delivered Baselines maintenance and supply flow amongst the various NATO locations, organisations, groups, and people.
- d. The Contractor shall ensure the Maintenance and Support Concept defines and describes the Maintenance and Support process interfaces to all other processes.
- e. The Contractor shall define the 2nd and 3rd Level Support process interfaces to the other processes, including the existing NCIA Service Desk (1st Level of Support).
- f. The Contractor shall ensure the Support process interface definition includes the input and output information, its structure, the communication path (i.e., Points of Contact (POC)), the time constraints for sending and receiving information, and quality criteria to evaluate the integrity of the interface.
- g. As an Annex of the ILSP and in accordance with the SOW, the Contractor shall develop and maintain the Maintenance and Support Concept that defines the maintenance and support environment, constraints, locations, procedures, artefacts, organisation and personnel skills to maintain the delivered baselines of the system.
- h. The Contractor shall design/deliver the system/elements and the Operation/Support/Maintenance documentation, training, instructions, and resources (skills, tools/test equipment) in order to allow the Purchaser to fully operate the system, to perform Level 1, Level 2 and Level 3 Maintenance and Support from the Provisional Site Acceptance (PSA).
- i. Starting from PSA and until FSA with all the sites are completed; the Contractor shall be responsible for the Level 2, Level 3 and Level 4 maintenance and support activities in each activated site within the scope of the Initial Operational Support.
- j. Starting from FSA and until the end of warranty period, all maintenance activities beyond Purchaser capabilities/skills (as per Maintenance Concept and Contractor delivered training and documentation) required to restore the System from a critical failure shall be carried on by the Contractor by dedicated on-site interventions and/or off-site resolutions.
- k. At each Support and Maintenance Level, the Contractor shall ensure the Support Concept describes the support environment, constraints, locations, procedures, artefacts, organisation and personnel.

- l. The Contractor shall ensure the procedural description includes objective(s), triggering event(s), input(s), output(s), task(s), roles and responsibilities (Responsible, Accountable, Consulted and Informed (RACI) format), constraints, exceptional case(s), and tool(s) support.
- m. The Contractor shall ensure the ILSP is based on the established Support Concept, approved by the Purchaser before the CDR milestone.
- n. Maintenance tasks are addressed both for hardware and software
- o. Maintenance tasks are performed on site, at military maintenance facilities, at industry maintenance facilities
- p. There shall be four (4) level of maintenance to ensure the highest possible availability of the Product.
 - i. The goal of Level 1 maintenance: implies a fast and easy exchange of LRUs performed on the Product by organizational personnel when a malfunction occurs
 - ii. The goal of Level 2 maintenance: implies exchange of LRUs and/or the replacement of modules, performed on the Product by organizational personnel when a malfunction occurs
 - iii. The goal of Level 3 maintenance: implies the repair of subassemblies, modules and LRUs after their replacement at maintenance Level 1 and Level 2. Testing on test-benches or integration tests can be included. Level 3 maintenance can be performed either on Product or at specific repair shops.
 - iv. The goal of Level 4 maintenance: all repairs and overhaul activities beyond Level 1 to Level 3 capabilities must be ensured.
 - v. Repair of subassemblies, modules and LRUs after their replacement at maintenance Level 1 to Level 3.
 - vi. Major modifications to improve the design and/or operational activities.

9.4. Hardware Maintenance Concept

9.4.1. Hardware Maintenance levels used are generally known as HL1, HL2 HL3 and HL4.

9.4.2. Organizational Maintenance (HL1) is Hardware maintenance capable of being carried out:

- a. On-site

- b. By relatively low technical skill level personnel performing preventive maintenance and changing Line Replaceable Units (LRU) on the basis of diagnostic outputs;
- c. Using Built-In-Test (BIT) facilities for start-up and on-line diagnostics, by referring to main equipment Technical Manuals (TM)
- d. No Tools and Test Equipment (TTE) are envisioned to be used
- e. Typical tasks will include visual inspection, preventative maintenance tasks, manual reconfiguration if necessary, external adjustments, removal and replacement of repairable LRUs
- f. Includes system failure recovery by the application of simple on-line diagnostics or technician initiated restart of the system and the use of off-line diagnostics which do not require external test module support
- g. Generation of equipment failure reports, supply requisitions and other pertinent maintenance and supply records

9.4.3. Organizational Maintenance (HL2) is Hardware maintenance capable of being carried out:

- a. On-site
- b. By higher technical skill level personnel performing preventive maintenance and changing Line Replaceable Units (LRU) on the basis of diagnostic outputs;
- c. Using Built-In-Test (BIT) facilities for start-up and on-line diagnostics, simple Tools and Test Equipment (TTE) (standard and special-to-type) in addition to BIT as a means for on-line and off-line diagnostics, and by referring to main equipment Technical Manuals (TM) to perform exhaustive fault isolation
- d. Simple either commercial or special to type TTE are envisioned to be used (e.g.: screwdrivers, multimeters, oscilloscope, adapters, peculiar support equipment);
- e. Where the fault is beyond the capabilities of HL1 technical support, HL2 activities will be performed by Support Site personnel (through on-site intervention).
- f. Where remote fault management is not feasible, technicians from the host site will travel to the remote site hand carrying relevant spares to perform maintenance tasks
- g. Generation of equipment failure reports, supply requisitions and other pertinent maintenance and supply records.

9.4.4. Intermediate Maintenance (HL3) is Hardware maintenance capable of being carried out:

- a. At maintenance facilities and through technical support and assistance or on-site intervention/work by maintenance personnel with skills enabling tasks to be accomplished within the relevant technologies.

- b. By higher technical skill level personnel performing:
 - i. repairing, testing and calibrating Line Replaceable Units (LRU), Shop Replaceable Units (SRU), and spare parts
 - ii. on-site investigations and major scheduled servicing/overhaul, detailed inspection, major equipment repair, major equipment modification, complicated adjustments, system/equipment testing,
 - iii. failure trend analysis including reporting to relevant Purchaser authorities and Post Design Services (PDS)
 - c. Repair tasks will be performed using Automatic Test Equipment (ATE), general purpose and special-to-type TTE, calibration equipment, any applicable support software, and the necessary equipment TMs and a Technical Data Package (TDP).
 - d. Where the fault is beyond the capabilities of HL1/2 technical support, HL3 activities will be performed by Support Site personnel (through on-site intervention)
 - e. Generation of equipment failure reports, supply requisitions and other pertinent maintenance and supply records.
- 9.4.5.** Depot Maintenance (HL4) is Hardware maintenance capable of being carried out:
- a. At maintenance facilities (industry or military) and through technical support and assistance or on-site intervention/work by maintenance personnel with skills enabling tasks to be accomplished within the relevant technologies.
 - b. Where the fault is beyond the capabilities of HL1-3 technical support, HL4 activities will be performed by the Contractor
 - c. Generation of equipment failure reports, supply requisitions and other pertinent maintenance and supply records.
- 9.4.6.** The hardware maintenance concept is based on the modularity of the equipment. The modules to be removed from the system/equipment for replacement repair or any other equipment maintenance will be considered as Line Replaceable Units (LRUs), with the following characteristics:
- a. Its failure can be detected and indicated by a BIT system or by abnormal condition/failure display, in conjunction with TMs and general-purpose test equipment.
 - b. It is easily accessed for replacement purposes.
 - c. It is easy to replace, through the use of a plug-in connector, screwed terminal, nut/bolt fixing or similar connector.

- d. It has minimal adjustment requirements, such as voltage level settings; adjustments may be carried out with the BIT or with general-purpose tools and test equipment.
- e. When only one LRU has failed, its replacement returns the system/equipment to full operational status.

9.5. Software Maintenance Concept

- 9.5.1.** Software Maintenance levels used are generally known as SL1, SL2 SL3 and SL4.
- 9.5.2.** Organizational Maintenance (SL1) is Software maintenance capable of being carried out with the same characteristics highlighted for HL1. SL1 are those functions/tasks in support of the on-site software that are within the capabilities of site maintenance personnel. This includes software failure recovery by the application of simple diagnostics, or site maintenance personnel initiated restart.
- 9.5.3.** Organizational Maintenance (SL2) is Software maintenance capable of being carried out with the same characteristics highlighted for HL2 e.g. SW settings, simple SW customizations (per site/instance), SW reloading/installation with automated or detailed procedures reported in the TMs, execution of scripts, management of users/profiles. SL2 are those functions/tasks in support of the on-site software that are within the capabilities of a System Administrator (SA).
- 9.5.4.** Intermediate Maintenance (SL3) is Software maintenance capable of being carried out with the same characteristics highlighted for HL3 e.g. SW/FW fine tuning (per site/instance), SW/FW bugs recording and reporting, SW/FW troubleshooting including Operating Systems. SL3 (on-site intervention) comprises those functions/tasks in support of the on-site software that require specialist intervention (SW System architects, SW programmers, experienced Systems' Administrators, Network specialists). The tasks can be performed either by software personnel visiting the site or by remote diagnostics if enabled by the System and allowed by Security.
- 9.5.5.** Depot Maintenance (SL4) is Software maintenance capable of being carried out with the same characteristics highlighted for HL4 e.g. SW/FW debugging, re-coding and testing (both in simulated and emulated environments), SW/FW patches creation and deployment. The tasks can be performed by software engineers in properly configured environments (SW development and testing facilities) under strict configuration control.
- 9.5.6.** Software Corrective Maintenance refers to changes necessitated by actual errors in a software product. If the software product does not meet its requirements, corrective maintenance is performed. Is a Reactive modification of a software product performed after delivery to correct discovered problems.

- 9.5.7.** Software Preventive Maintenance refers to the changes necessitated by detecting potential errors in a software product. Is a modification of a software product after delivery to detect and correct latent faults in the software product before they become effective faults.
- 9.5.8.** Software Adaptive and Perfective changes are enhancements to a software product. These changes are those that were not in the design specifications or the released software.
- a. Adaptive changes are those changes necessary to accommodate a changing environment. Adaptive changes include changes to implement new system interface requirements, new system requirements, or new hardware requirements. Is a modification of a software product performed after delivery to keep a software product usable in a changed or changing environment
 - b. Perfective changes improve the software product's performance or maintainability. A perfective change might entail providing new functionality improvements for users or reverse engineering to create maintenance documentation that did not exist previously or to change existing documentation. Is a modification of a software product after delivery to improve performance or maintainability
- 9.5.9.** The Contractor shall adopt the following maintenance approach when developing the logistic support concept:
- a. NATO Maintenance Task (NMT) will be performed by NATO personnel (military or civilian)
 - b. Industry Maintenance Task (IMT) will be performed by industry personnel under a Contractor Logistics Support arrangement.
- 9.5.10.** Maintenance tasks addressed to Hardware Maintenance levels HL1, HL2 and Software Maintenance Level SL1, SL2 shall be NMT.
- 9.5.11.** Maintenance tasks addressed to Hardware Maintenance levels HL3, and Software Maintenance Level SL3, shall be NMT or IMT based on Purchaser agreement.
- 9.5.12.** Maintenance tasks addressed to Hardware Maintenance levels HL3, and Software Maintenance Level SL3, if agreed to be IMT, will be subject to further investigation during CLS phase in order to envision a planned migration into NMT as part of the standard contractual scope.
- 9.5.13.** Maintenance tasks addressed to Hardware Maintenance levels HL4 and Software Maintenance Level SL4 shall be IMT.
- 9.5.14.** For Purchaser provided Hardware and Software, the Maintenance responsibility will be retained by the providing agency.

9.6. Manpower and Personnel

- 9.6.1.** The Contractor shall describe how the personnel requirements analysis will be performed in conjunction with the logistics analysis, and focus

on identifying the skills needed to operate, maintain, and support the system.

9.6.2. The results of the task analysis dictate the skill levels and personnel requirements for operational support for the fielded system. Hardware/Software integration, human factors engineering, and safety requirements are an integral part in determining the manpower and personnel requirements.

9.6.3. Personnel required for installation, checkout, operation, handling, and sustaining maintenance of the system and its associated test and support equipment shall be identified, trained, and available prior to any field testing.

9.7. Facilities and Installation

9.7.1. The Contractor shall include all facility requirements:

- a. Flow chart/schedule outlining for ensuring the facility meets specifications;
- b. Installation planning (data should be provided to the logistics engineers for the assessment of life cycle cost impacts related to support facilities);
- c. Power requirements, cabling diagrams, physical layouts, and accessibility for maintenance (essential inputs to the project database and maintainability task analyses).

9.8. Supply Support Concept

9.8.1. General

- a. The Contractor shall be responsible for the provision at each site of initial spares in sufficient quantities to ensure that the operational availability is achieved, whilst taking into account the MTTR and ALDT for HL1, HL2 and HL3.
- b. Serviceable spare parts held on site shall be sufficient as a minimum to maintain a 99% probability of replacing all LRUs which are expected to fail during any 7 days period without external support. This is to allow for a period of "closed-door" operations (CDO).
- c. The Contractor shall provide the final fully detailed and priced Recommended Spare Parts List (RSPL) and a Recommended Consumable Items List (RCIL) no later than one (1) month after CDR meeting that shall detail comprehensively all spares in a hierarchical breakdown.
- d. This RSPL and RCIL shall include as a minimum:

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Field	Description
Project Identifier	is a string of characters used to uniquely identify a Project and to differentiate it from other Projects.
Contract Identifier	is a string of characters used to uniquely identify a Contract and to differentiate it from other Contracts.
CLIN	Contract Line Item Number (number-10 digits maximum). Sequence number assigned to a particular line item in a given contract. The combination CLIN-Contract No. shall always be unique.
OEM Part identifier	is a string of characters that are unique to the issuing organization which is used to designate a HW or SW Part As Designed and to differentiate it from other designed parts. Part Number given to this item by the original manufacturer.
OEM Part Name	is a word or phrase by which the breakdown element is known and can be easily referenced
OEM Identifier	is a string of characters used to uniquely identify an organization and to differentiate it from other organizations. Code of the Company that has manufactured this item. This is an internationally recognized 5-digit code which is unique to that company (CAGE Code).
NSN	NATO Stock Number (number-13 digits). Identifies an item codified by one of the NATO countries' National Codification Bureaus. It shall always be linked to at least one part number with the corresponding manufacturer code (manco). It is recommended that the Contractor system integrator requests codification from the National Codification Bureau of the original manufacturer's country. If NSN is known prior to system delivery it shall be added in this field.
Vendor Part identifier	If any is a string of characters that are unique to the issuing organization which is used to designate a HW or SW Part As Designed and to differentiate it from other designed parts. Part Number given to this item by the vendor.
Vendor Part Name	If any is a word or phrase by which the breakdown element is known and can be easily referenced
Vendor Identifier	is a string of characters used to uniquely identify an organization and to differentiate it from other organizations. Code of the Company that has manufactured this item. This is an internationally recognized 5-digit code which is unique to that company.
Weight Unit of Measure	(e.g.: kg, g)
Unit Weight (packed)	Weight of the item packed (gross weight)
Unit Weight (unpacked)	Weight of the item unpacked (net weight)
Dimensions Unit of Measure	(e.g.: m, cm, mm)
Length	Item packed length
Width	Item packed width

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Field	Description
Height	Item packed height
Quantity	<p>is the amount of a product variant included in a contract Enter the quantity of the product variant included in a contract.*Note: Default value of 0</p> <p>Shows the quantity of this item ordered as individual item in this contract, i.e. if it is not delivered built-in in another unit. In case the item is not ordered as individual item or as spare unit but is built-in in another assembly, enter "0" (zero) in this field *Note: Serialised items shall only have a quantity of 1</p>
Failure Rate	<p>For a particular interval, the total number of failures within a population of an item divided by the total functional life of the population during the measurement interval.</p> <p>Assumption measurement intervals: 1,000,000 hours</p>
Failure Rate Data Source	<p>The source of the failure rates. Failure rate data can be obtained from sources such as appropriate reliability predictions, test and evaluation results, field data from past systems of similar design and environmental use, or failure rate data sources such as MIL-HDBK-217 etc.</p>
Part Category	<p>is a support classification that defines the role of a hardware or software part as designed in the context of product support.</p> <ul style="list-style-type: none"> • End Item • System Subsystem • Hardware Maintenance Significant Items (MSI) to be split into the following categories: <ul style="list-style-type: none"> ○ LS (Statistical Life LRUs) such as Computers, Power PCs, Switches, Routers, IF modules, RF modules, Breakers, Power Supplies, Monitors, Modems, Power Amplifiers etc. ○ LL (Limited Life LRUs) such as Batteries, flexible waveguides, oscillators, ○ II (Insurance Items) like docking stations, Keyboards, Mice, Cables, mechanical parts (e.g. Racks, drawers), simple E/M parts (e.g. patch panels,) ○ C[T] (Technical Consumables) such as fuses, gas dischargers cartridges, surge protection devices, lamps, bulbs, LEDs etc. ○ C[NT] (Non-Technical Consumables) such as POL (Petrol, Oils, Lubricants), water, gas, ○ C[G] (Generic Consumables) like printer cartridges, toners, printers' paper, ○ AP (Attaching Parts) like washers, gaskets (not EMI), nuts, bolts, screws, etc. • Software (SW) to be split into the following categories: <ul style="list-style-type: none"> ○ SWA (Application Software) such as Contractors' developed Application SW, COTS Application SW (e.g. MS Office, Adobe Acrobat etc.) ○ SWO (Software Operating Systems) such as Linux, Unix, MS Windows, LynxOS, Android, IOS etc. ○ Firmware ○ Device drivers • Support equipment and tools <ul style="list-style-type: none"> ○ CHT (Common Hand Tool) ○ CSE (Common Support Equipment) ○ PSE (Peculiar Support Equipment) • Facility (Test Facility, Operational facility, Training facility, Depot facility) • Training Equipment
Hardware Part Repairability	<p>is a support classification which defines whether the Hardware Part As Designed is repairable from a technical perspective (eg, a vendor/supplier standpoint) independent of customer maintenance concepts. Classifier:</p>

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Field	Description
	<ul style="list-style-type: none"> • repairable • non-repairable • NA (Not applicable)
Procurement Lead Time	For non-repairable and repairable parts. Time needed to procure the item To be provided in calendar days
Turn Around Time	For repairable parts Mandatory for repairable items only, not applicable for non-repairable items. This is the internal TAT (from reception of the item until the declaration of ready to ship). To be provided in calendar days.
Breakdown Element Identifier	is a string of characters used to uniquely identify a Breakdown Element and to differentiate it from other Breakdown Elements that comprise a product. Note: Can be used to establish a hierarchical structure of the technical system.
Breakdown Element Name	is a word or phrase by which the breakdown element is known and can be easily referenced.
Parent Breakdown Element Identifier	is a string of characters used to identify the parent of the Breakdown Element
Currency	Currency (text-3 digits). International 3-digit code (ISO) representing the currency in which the item purchase price (or the estimated value) is expressed.
Price	Item Price (number-11 digits). Unit price with 2 decimals.
Warranty Expiration Date	Warranty Expiration Date (date: DD/MM/YY). Shows the date on which the warranty of this item expires, which is usually N days after delivery of the item. If delivery is scheduled for a certain date, warranty expiration date = delivery date + warranty period in days.

Table 1 – RSPL and RCIL Requirements

- 9.8.2.** The Contractor shall provide RSPL and RCIL relevant data in ASD S2000M (last available issue) format. The data shall be delivered through agreed electronic distribution media (preferably via Data Exchange Sets (DEXs)).
- 9.8.3.** The Contractor shall provide a full set of Spare Parts to be delivered to each site after SAT and not later than one month before PSA, fulfilling the requirements set above and sufficient to meet the Operational Availability Requirements.
- 9.8.4.** The spare parts shall be packed in reusable containers, properly marked and protected, including Part Number, Serial Number (if applicable), NSN and part description (as per OEM part name).
- 9.8.5.** The Contractor shall organise a Provisioning Conference at his premises at a time and place to be mutually agreed:
- No less than 30 days after submission of the RSPL and RCIL and all relevant documentation including the full range of drawings
 - No less than 90 days prior to the PSA;

- c. Appropriate technical staff with knowledge of the equipment/project concerned shall be assigned by the Contractor to enable the Purchaser to make a reasoned selection of the spare parts, tools and test equipment etc. required.
- 9.8.6.** The Contractor shall provide the agenda and the minutes of the conference. Purchaser representatives will attend the meetings to ensure that proper assumptions, procedures and calculations are being used.
- 9.8.7.** The Contractor shall make available all relevant data and documentation including:
 - a. LSA documentation and reports
 - b. Technical Data Package (TDP)
 - c. Technical Manuals (TM)
 - d. The most recent deliverable configuration of equipment.
- 9.8.8.** Additional provisioning conferences shall be held when any change in equipment which affects the spare parts, repair parts, TTE or consumables requirements is proposed by the Contractor and approved by the Purchaser

9.9. Tools and Test Equipment

- 9.9.1.** The Contractor shall design the system to minimize or eliminate the need for special tools and test equipment. Any special tools and test equipment requirements shall be identified and/or any analysis planned shall be highlighted. The requirements and approach for calibration of support and test equipment shall be identified.
- 9.9.2.** The Contractor shall provide a fully detailed and priced Recommended Tools and Test Equipment List (RTTL) no later than one (1) month after CDR meeting, for standard and special-to-type tools, test equipment and test fixtures, cables, connectors, support equipment, such as cranes, lifting platforms, etc. in accordance with the SSS up to Level 2.
- 9.9.3.** Requirements for standard and special-to-type tools, test equipment and test fixtures, cables, connectors etc. to enable the prescribed maintenance shall be minimal, comprising no more than such items as radio tester, automated test equipment, torque screwdrivers, etc.
- 9.9.4.** Quantities of such items to be recommended shall be the minimum consistent with the number required per maintenance operation, with no allowances being included for redundancy.
- 9.9.5.** The list shall clearly indicate for what maintenance action the recommended item will be used, parameters to be measured (if applicable), minimum/maximum test equipment specification requirement etc

- 9.9.6.** After agreement on the lists with the Purchaser, the Contractor shall deliver the Tools and Test Equipment (one set per site) at no additional cost for the Purchaser, not later than 1 month before the PSA.

9.10. System Inventory

- 9.10.1.** The Contractor shall provide the Purchaser's IPS POC with a System Inventory in electronic Microsoft Excel format at least 15 (fifteen) working days before the first delivery of equipment.

- 9.10.2.** The System Inventory is site-specific and shall include all items furnished under this Contract, as follows:

- a. All main equipment – i.e. all CIS items, both COTS and Developed, down to replaceable item level, hierarchically listed conform configuration item decomposition, including groups and assemblies; all installed hardware, such as equipment racks; all LRU interconnecting equipment when they are special-to-type (e.g. special-to-type cables);
- b. All ancillary equipment – i.e. all secondary items not essential to the functioning of the system, but deemed essential to the operation of the system, such as an all-weather canopy or a tool box;
- c. All support equipment – i.e. all tools, test equipment and PHS&T equipment;
- d. All Purchaser Furnished Equipment (PFE);
- e. All Purchaser and Contractor provided software;
- f. All spare parts, to include all spares, repair parts, and consumables, separated into technical and non-technical consumables;
- g. All documentation, such as manuals, handbooks and drawings; and
- h. All training materials.

- 9.10.3.** The Contractor shall use the inventory template provided the Purchaser to develop and submit the System Inventory. This template will be provided by the Purchaser during the contract execution.

- 9.10.4.** The depth and content of the Inventory List shall be subject to the Purchaser Approval.

9.11. Marking and Labelling

- 9.11.1.** A nameplate in English language with non-erasable letters/numbers, giving the serial number, NCI Agency Contract number and the part number shall be properly attached in a prominent position on each major assembly to enable reading and control with easy access when installed.

- 9.11.2.** The marking of Items and Components, with the Original Equipment Manufacturer (OEM) part number, is to ensure proper and quick

identification of major equipment assembly, subassembly, and module down to printed circuit board or lowest level produced in the programme, as they are procured, stored and issued. This information is also necessary for positive identification upon removal for maintenance purposes and to prevent loss of utilisation of items, which have been separated from their original packages or containers.

- 9.11.3.** For the items requiring special handling and/or lifting up with additional tools due to heavy weight or high volume (dimensions), special plates including the weight, dimensions and lifting points information shall be provided on the items. Also these items shall have the adequate provisioning points to enable such special handling and lifting conditions.
- 9.11.4.** Marking and labelling shall be accomplished in a manner, which will not adversely affect the life and utility of the item or component.
- 9.11.5.** Whenever practicable, the marking and labelling shall be located in such a manner as to allow it to be visible after installation.
- 9.11.6.** The marking shall be as permanent as the normal life expectancy of the material on which it is applied and shall be such as required for ready legibility and identification. Marking shall be capable of withstanding the same environmental tests required of the part and any other tests specified for the marking itself. When possible, letters, numerals and other characters shall be of such size as to be clearly legible.
- 9.11.7.** All equipment shall be labelled in compliance with the Purchaser regulation and guidance. Labels shall at least contain the Contractor/OEM's name, identification, part number and serial number to ensure proper and quick identification of equipment down to the LRU level.
- 9.11.8.** The Contractor shall provide the details of the labelling approach in the CM Plan for Purchaser approval. The Contractor shall provide its labelling for the items that are configured and/or modified after procurement from the OEM. For these items, the Contractor shall assign a P/N for that specific configuration. The format and content of the labelling shall be provided to the Purchaser for
- 9.11.9.** Marking shall be capable of withstanding the same environment tests required of the part and any other tests specified for the label itself. When possible, letters, numerals, and other characters shall be of such a size as to be clearly legible.
- 9.11.10.** All labelling and marking shall be in English language.
- 9.11.11.** All equipment labels delivered by the Contractor shall contain a machine-readable code (e.g. barcode) compliant with [STANAG 4329] and [AAP-44(A)] and in accordance with the NATO coding scheme, which will be provided by the Purchaser at the request of the Contractor. In case NATO asset labels are provided by the Purchaser, the Contractor shall apply those labels in addition to the Contractor's labelling.

9.12. NATO Codification of Items

- 9.12.1.** In addition to the terms of the Clause 32 of the NATO Communications and Information Agency (NCI Agency) General Provisions, titled "NATO Codification" the Contractor shall support the codification of all equipment/spares to be delivered.
- 9.12.2.** The Contractor shall perform the NATO codification process in accordance with the requirements of AcodP-1 and the requirements of the STANAGs referenced and included in AcodP-1, i.e. STANAG 3150, STANAG 3151, STANAG 4177, STANAG 4199 and STANAG 4438.
- 9.12.3.** The Contractor shall guarantee that any subcontract entered into as a result of this Contract shall contain the standard NATO codification clause as above to provide NATO Stock Numbers (NSN) as follows:
 - a. All LRU(s);
 - b. All items shown in the RSPL, RCIL and RTTL;
 - c. All additional items selected at the Provisioning Conference;
 - d. Equipment/spare parts affected by Equipment Design Change Notices (EDCN) (s);
 - e. Those items substituted due to a Spare Parts Design Change Notice (SPDCN);
- 9.12.4.** The Contractor shall commence the codification action whenever the Purchaser has approved any of the items listed above for procurement.

9.13. Parts Obsolescence Management Plan (POMP)

- 9.13.1.** The Contractor shall establish and document a Parts Obsolescence Management Plan (POMP) included in the ILSP.
- 9.13.2.** The Contractor shall keep the Purchaser informed on the potential Diminishing Manufacturing Sources (DMS) problems or risks and the mitigation strategies through a DMS Report included in the Programme Reviews, during warranty and optional CLS periods.
 - a. In the event that the designation of a replacement item becomes necessary due to discontinuance of production, sale or support, the Contractor shall recommend a replacement or a last buy order.
 - b. In order to avoid development costs, OTS hardware, software and infrastructure replacement items with similar form, fit and function will be given first preference.
 - c. In the event the recommended OTS item is not fully compliant with the Contract Requirements, the Contractor shall, as part of the DMS Report, provide a recommendation either to implement the OTS solution and modify the requirement accordingly or redesign a suitable alternative. In the event that there is no OTS item available, the Contractor shall recommend a redesign of a suitable alternative.

- d. Implementation of the above recommendations shall be in accordance with ECPs.

9.14. Software Delivery

9.14.1. The Contractor shall provide a detailed Software Distribution List (SWDL), which shall detail comprehensively all Computer Software Configuration Items (CSCI) and associated software, firmware or feature/performance licenses provided under this Contract. The SWDL shall include, the following data elements:

- a. CSCI identification number;
- b. Nomenclature;
- c. Version number;
- d. Quantity
- e. License key (if applicable);
- f. License renewal date (if applicable);
- g. Warranty expiration date;
- h. Date of distribution;
- i. Distribution location (geographically);
- j. Distribution target (server); and
- k. Owner.

9.14.2. The Contractor shall make sure that all licenses are perpetual, unless they are commercially not available.

9.14.3. The Contractor shall make sure that all licenses are originally registered with the Purchaser or THN as end-user, before the acceptance of the systems. The Contractor shall confirm the end-user with the Purchaser upfront.

9.15. Packaging, Handling, Storage and Transportation (PHST)

9.15.1. General

- a. The Contractor shall establish and maintain a Packaging, Handling, Storage and Transportation (PHST) Programme.
- b. The Contractor shall identify all items which will be stored at the site or at the Contractor's repair facility and/or which may need transportation between the site and the Contractor's or vendor's repair facilities or depot. For these items, the Contractor shall identify the PHST and shall enter this PHST data into the LSAR for reporting purposes.

- c. The Contractor shall provide a PHST report based on LSAR data. The PHST report shall provide information critical to the PHST of spare parts and consumables. It shall include environmental and hazardous material information imperative for safe handling storage and transportation.
- d. The Contractor shall provide a single Packaging, Handling, Storage and Transportation Plan, which shall include details of the Contractor's proposed bar-coding system and shall give consideration to transportability, special handling/storage requirements and other hazards associated with the national/international transportation of items.
- e. The Contractor shall be responsible for establishing an adequate supply chain security process and taking the necessary measures. The Contractor shall allow and support ad-hoc spot checks and audits by the Purchaser of any of his supply chain security measures at any of the Contractor's locations and facilities used in the Contractor's supply chain relevant to this Contract.

9.15.2. Packaging

- a. The Contractor shall pack all spares and Contractor-provided Support Equipment in reusable containers suitable for the return of unserviceable similar items. These containers shall meet the requirements of NATO packaging level 3 of STANAG 4280 and shall protect the packed equipment from the environmental conditions.
- b. The Contractor shall provide any special packing instructions and shall also be responsible to provide any special-to-type container(s) for the shipment of repairable items, at no cost to the Purchaser. Marking (including bar coding) of packages and reusable containers will be in accordance with STANAG 4281 and STANAG 4329.
- c. The Contractor shall identify any special packing/removing requirements for equipment as required. The Contractor shall document these requirement data in the LSAR and include them in the PHST report.
- d. The Contractor shall be responsible for providing this special packing materials/containers for the initial delivery and for the items to be returned for warranty, without any additional cost to the Purchaser.
- e. The Contractor shall, for the purpose of transportation, package, create, or otherwise prepare items in accordance with the best commercial practices for the types of supplies involved, giving due consideration to shipping and other hazards associated with the transportation of consignments overseas.
- f. For items of supply such as spare parts, test equipment and tools etc, the Contractor shall preserve and package items to withstand the following:

- i. Long term storage for a minimum of five (5) years in a temperate climate and in permanent buildings, and temporary storage of up to six (6) months in enclosed transport vehicles;
 - ii. Movement including road (truck), rail, air, and sea, and handling by any means;
 - iii. THN will provide rooms for storage of the spare parts in permanent heated buildings/rooms. Spare parts shall be packed and prepared by the Contractor to be stored in such buildings. However, THN needs to know how much square meters Contractor will need to store spare parts.
- g. Special care shall be taken to ensure that, in dealing with equipment destined for installation in "clean areas", that due account be taken of the necessity to preserve the environmental conditions during unpacking and installation.
- h. The Contractor shall provide any special packing/containers required for the shipment of repairable items at no extra cost to the Purchaser.
- i. The Contractor shall establish the packing lists in such a way as to permit easy identification of the items to be delivered at the sites. These packing lists shall reflect the same wording and sequence as those used in the Contract schedule of supplies and in the invoices.
- j. Packing lists shall accompany the shipment. Each individual container/box from a consignment must have one packing list in a weatherproof envelope affixed to the outside of each container/box, indicating exactly what is contained inside. One packing list shall be put inside each container/box.
- k. The Contractor shall also furnish one copy of the packing list in the English language to the Purchaser and to the Freight Forwarder, the number of copies required by this Forwarder.
- l. The packing lists shall contain the following information as a minimum:
 - i. Shipping address;
 - ii. Package number;
 - iii. Contract number;
 - iv. Contract item number;
 - v. Item description;
 - vi. Part number;
 - vii. NATO Stock number (if available);

- viii. Serial number (if available);
 - ix. Quantity shipped;
 - x. Number of the corresponding Customs Form 30 (when required);
 - xi. Shipping dimensions & weight per separately packaged item
- m. Where manufacture is under Government Quality Assurance Authority (GQAA) surveillance, there is a requirement for Certificates of Conformance to be included with packing containers, three each per pack, one inside and two outside in a waterproof envelope.
- n. The packages or containers in which supplies are transported shall, in addition to normal mercantile marking, be marked with the following data on a separate nameplate (or transfer or stamping if nameplate is not practical):
- i. System/sub-system denomination;
 - ii. Purchaser Contract number;
 - iii. Contract Item Number Manufacturer's name and address;
 - iv. Shipping address.
- o. To enable boxes, crates and other containers to be identified easily and to ensure correct assignment of unique equipment to its appropriate site, a coding system shall be proposed by the Contractor for approval by the Purchaser.
- p. The packing and transportation of cryptographic equipment and documentation shall comply with NATO rules and be accomplished in accordance with Allied Military Security Guidelines (AMSG) 293 and AMSG 505.
- q. The Contractor shall provide a Transportation Report as a confirmation of delivery to the Purchaser's ILS POC within two weeks after each shipment. This confirmation shall summarize the supplies delivered, state the date of delivery, and provide a scan of the signature of the Purchaser POC on-site, receiving the supplies.
- r. The Contractor shall be responsible of removal and disposal of the packaging material after the installation at sites.

9.15.3. Handling and Storage

- a. The Contractor shall be responsible for all handling and storage of equipment, packages, boxes and containers during the project.
- b. The Contractor shall also be responsible for organising and operating any handling equipment and storage facilities required.

- c. The Contractor shall arrange all that is necessary to access the sites where equipment is handled or stored.
- d. At the Purchaser designated staging area, the Contractor shall unload the equipment and move the equipment to its final destination for installation. The Contractor may use any support equipment provided by the Purchaser, but remains responsible for requesting, organizing and using any support equipment required to offload and move equipment to its final destination. If such support equipment is not available on-site, then the Contractor shall be the ultimate responsible to arrange such equipment with the shipment.
- e. The Contractor shall detail the short term and long term storage conditions of all the equipment within its PHST report.

9.15.4. Transportation

- a. The Contractor shall be responsible for transportation and delivery of all equipment furnished under this Contract from its site in a NATO nation to its respective implementation destination as outlined in Annex B1.
- b. Ten (10) working days before each shipment of supplies, the Contractor shall provide the Purchaser with a Notice of Shipment comprising the following details:
 - i. Shipment Date;
 - ii. Purchaser Contract Number;
 - iii. CLIN;
 - iv. Consignor's and Consignee's name and address;
 - v. Number of Packages/Containers;
 - vi. Gross weight;
 - vii. Final/Partial Shipment;
 - viii. Mode of Shipment (e.g., road...);
 - ix. Number of Customs Declaration Form 302 Forms used.
- c. The Contractor shall be responsible for any insurance covering these shipments.

- d. The Contractor shall also be responsible for transportation of repaired/ replacement items under warranty to the original location. Return of unserviceable equipment to Contractor facility for (warranty) repair/replacement is the responsibility of the Purchaser. However, if there are any special packaging requirements and materials required for the shipment, the Contractor shall be responsible providing the guidance and the special packaging material. Additionally, any export/import regulations and requirements shall be specified and directed by the Contractor.
- e. All packages, boxes will be inspected visually by the Purchaser's POC at final destination to ensure that no damage has occurred during transport and that all packages, boxes and containers detailed in the packing list have been accounted for. The Purchaser will in no case open any package.
- f. The Purchaser shall not be liable for any storage, damage, or any other charges involved in transporting of supplies prior to the actual acceptance of such supplies at the designated destinations. The Contractor shall deal with the insurance.

9.15.5. Customs

- a. A Customs Declaration Form 302 is required for all shipments between any EU Nation and a non-EU Nation. The Contractor shall conform to the requirements of Clause 20 of the Contract General Provisions entitled "Notice of Shipment and Delivery" prior to the shipping of any items under this Contract.
- b. The Contractor shall be responsible for customs clearance of all shipments into the destination countries. It is the Contractor's responsibility to take into account delays at customs. He shall therefore consider eventual delays and arrange for shipment in time. Under no circumstances can the Purchaser be held responsible for delays incurred, even when utilising Purchaser provided Customs Declaration Form 302.
- c. Prior to a shipment by the Contractor, the Purchaser will upon request issue a Customs Declaration Form 302, which in some cases may facilitate the duty free import/export of goods. The Contractor shall be responsible for requesting the issue of a form 302 at least 10 (ten) working days prior to shipment. The request for a Customs Declaration Form 302 shall be included with the Notice of Shipment and accompanied by one (1) additional packing list. The request is normally processed by the Purchaser within three (3) working days. The requested Customs Declaration Form 302's will be sent by courier. The original Customs Declaration Form 302 shall accompany the shipment and therefore no fax or electronic copy will be used, nor provided to the Contractor.

- d. If a country refuses to accept the Customs Declaration Form 302 and requires the payment of customs duties, the Contractor shall pay these customs duties and the Purchaser shall reimburse the Contractor at actual cost against presentation of pertinent supporting documents. Should such an event occur, the Contractor shall immediately inform the Purchaser by the fastest means available and before paying, obtain from the Customs Officer a written statement establishing that his Country refuses to accept the Customs Declaration Form 302.
- e. The Contractor shall be responsible for managing and performing all activities that is necessary to obtain export licenses for the goods requiring such licenses.
- f. The Contractor shall provide a detailed list of the equipment requiring export licenses within ILSP. The Contractor shall provide the necessary procedures that needs to be applied for items to be relocated for repair or any other purposes.
- g. In the case of dangerous goods and goods requiring export licenses, the Contractor shall ensure that all required forms and certificates are provided and that all Host Nation regulations for such goods are followed. The Contractor shall provide a list of such equipment.

SECTION 10 TECHNICAL PUBLICATIONS (INCLUDING CIVIL WORKS)

10.1. Technical Publications Development Plan (TPDP)

- 10.1.1.** The Contractor shall deliver a Technical Publications Development Plan (TPDP) as an annex to ILSP, covering the Contractor organization, planning and scheduling of the necessary activities for the development of the Technical Manuals in the form of Interactive Electronic Technical Publications (IETPs)
- 10.1.2.** The Contractor shall deliver a Technical Publications Writing Style Guide (WSG) for the programme as part of the TPDP. This style guide shall identify programme style and format when generating Data Modules (DM), shall provide guidance on formatting, style and specification interpretation to ensure the content and style of all Data Modules (DM) in the Interactive Electronic Technical Publication (IETP) set is consistent. The WSG shall include illustrating guidance and a project Standard Numbering System (SNS) indicating the logistic breakdown and assigned SNS technical names.
- 10.1.3.** The Contractor shall plan and conduct combined Validation/Verifications with the Purchaser for the Technical Manuals both for new and modified document(s).
- 10.1.4.** The Contractor shall coordinate with the Purchaser to incorporate the Purchaser provided Verification schedule. Upon completion of Verification:
 - a. A tabulation of deficiencies detected will be submitted to the Contractor by the Purchaser.
 - b. A tabulation of actions taken to correct deficiencies shall be submitted to the Purchaser together with a Verification Certificate for each O&M Technical Manual.
- 10.1.5.** Errors and/or deficiencies detected shall be corrected by the Contractor prior to Final Review before acceptance. Deficiencies identified during the combined validation/ verification process and implemented Corrective Actions shall be captured and tracked within the draft Technical Manuals until they are accepted. Once corrected, the tracked Deficiencies and implemented Corrective Actions shall be deleted prior to final delivery. Final Version Technical Manuals shall be presented to the Purchaser for Final Review and Acceptance. Each Technical Manual presented for Final Review shall be accompanied by a Certificate of Conformity
- 10.1.6.** The Contractor shall provide structure, content and initial details for this plan in the proposal phase so to show the concept of the activity.
- 10.1.7.** The Contractor shall ensure all technical documentation shall be provided in the English language.

- 10.1.8.** The Contractor shall ensure the Classification of Technical documentation is at the lowest level possible.
- 10.1.9.** The Contractor shall ensure the all documents, however short, identify the complete name and version of the software they refer to, originator, date of production, the type of document, and Configuration Management information of the document itself.
- 10.1.10.** The Contractor shall submit all final and accepted versions of documentation deliverables also in modifiable electronic format, as well as Portable Document Format (PDF).
- 10.1.11.** The Contractor shall submit documentation in electronic format, intended for review by the Purchaser, with each modification identified through the change tracking feature or otherwise marked.

10.2. Publication Criteria

- 10.2.1.** The Contractor shall ensure all Manuals are printable if required and therefore the page format shall be A4, printable in loose-leaf form, and possible to be presented bound in stiff backed covers with 4-ringed binders which permit the removal and insertion of individual pages and drawings.
- 10.2.2.** The Contractor shall ensure each page contains the appropriate NATO classification of the manual at the top and bottom of each page.
- 10.2.3.** The Contractor shall ensure all pages containing drawings and schematic diagrams are of the same size as other pages of the manuals.
- 10.2.4.** The Contractor shall place the appropriate security classification in the identification block of each drawing.
- 10.2.5.** The Contractor shall deliver soft copies of any composed or compiled documentation in Compact Disc Read-Only Memory (CD-ROM) or digital versatile disc (DVD) format.
- 10.2.6.** The Contractor shall ensure all documentation delivered in this Contract is compatible with Microsoft Office Professional and Adobe PDF.
- 10.2.7.** The Contractor shall deliver O&M Manuals in Microsoft Office Professional or PDF format, if available. If not available in this format, another common format may be accepted. If the commercial documentation is not available in CD-ROM, another form of electronic media is acceptable with the prior authorization of the Purchaser PM.
- 10.2.8.** The Contractor shall ensure the physical support of electronic, optical or soft copies of documents display the highest level of the classification of their contents.

- 10.2.9. The Contractor shall ensure the Header and/or Title of the directory structure of documentation provided in soft copy format bears a reminder of the highest classification level of its contents.
- 10.2.10. For ease of handling, the Contractor shall separate unclassified from classified documentation and provided it on separate CD-ROMs or DVDs.

10.3. Manual Issuing Schedule

- 10.3.1. The Contractor shall provide all the technical documentation as outlined in the SSS to enable the Purchaser to perform a detailed review as the content matures and leave sufficient time for the updates resulted by the review. The Contractor shall include the TPDP and manual issuing schedule within the first version of ILSP for approval, to provide Purchaser enough visibility for the schedule. This schedule shall enable the Purchaser to conduct at least 4 review cycles before final versions are provided starting with S1000D tailoring in CDR meeting.
- 10.3.2. In line with the SSS and prior to the delivery of the system at the first location, the Contractor shall submit a copy of the final technical and training publications to the Purchaser for review.
- 10.3.3. The Contractor shall provide the final versions of each Technical Publication, and Training Material in the requisite number of copies prior to FSA and in line with the SSS.
- 10.3.4. Any resulting recommended changes, corrections and/or additions submitted by the Purchaser shall be incorporated by the Contractor in the final version.
- 10.3.5. Until the expiration of the warranty, the Contractor shall remain responsible for any changes to the manuals and training material required as a result of any omission or inaccuracy discovered in use or, whenever changes/modifications in equipment or spare parts are made under the Contractor's responsibility.
- 10.3.6. The Contractor shall deliver two copies on CD-ROM of the technical documentation for each of the sites, plus two copies for the NCI Agency.
- 10.3.7. In addition to the "Manual Issuing schedule", the Contractor shall update all Manuals as needed throughout this contract.

10.4. Technical Manuals (TMs) (Including CW)

- 10.4.1. The Contractor shall provide all TMs generated and assembled, based on a single and structured Interactive Electronic Technical Publications (IETP) data repository (CSDB – Common Source Database).

- 10.4.2.** The Contractor shall provide all IETPs in ASD S1000D (last available issue) format. The data shall be delivered through agreed electronic distribution media (preferably via Data Exchange Sets (DEXs)).
- 10.4.3.** The Contractor shall manage and deliver changes according to the ASD S1000D (last available issue).
- 10.4.4.** The Contractor shall develop and issue system User Manuals and Maintenance Manuals as per requirements of personnel operating and maintaining the system and equipment in accordance with the Maintenance Concept.
- 10.4.5.** The User Manuals shall address the operation of the systems with step by step instructions and shall be based on the Task Analysis. The Manual shall describe the complete system by functional blocks and CI descriptions, operation, settings and fine tuning of the System /Equipment to achieve maximum performance.
- 10.4.6.** The Contractor shall ensure that each and every procedure include as a minimum the following information:
 - a. Location/facility involved (if the operation is performed remotely, it has to be specified);
 - b. Personnel type and skills required;
 - c. Task duration and frequency, reusing MTBF and MTTR data available;
 - d. Manpower required;
 - e. Tools and special tools required (if any);
 - f. The steps needed to perform the operation.
- 10.4.7.** The Maintenance Manuals shall address the system as a single entity, with appropriate drawings of the mechanical, electrical and electronic assemblies and sub-assemblies that comprise the system /equipment in sufficient detail to allow technical staff to maintain the system at site level in accordance with the Maintenance Concept.
- 10.4.8.** In addition, a single, comprehensive maintenance manual shall be provided for each individual Radio Site. These maintenance manuals shall also provide the maintenance schedule for each site, and associated procedures.
- 10.4.9.** The Contractor shall ensure the Maintenance Manual contains a full illustrated product breakdown list. The Contractor shall ensure that all CIs and all items required for maintenance are included in this full product breakdown list.
- 10.4.10.** The Contractor's Maintenance Manual shall provide functional descriptions and specifications, with appropriate drawings, of the mechanical, electrical, and electronic assemblies, sub-assemblies, physical and logical components, indicators/switches and

positions/displays, configuration files and interfaces that comprise the system.

- 10.4.11.** The Contractor's Maintenance Manual shall provide information, illustrations, and procedures required for: preventive and corrective maintenance, administration, deployment, installation, configuration, provisioning, disaster recovery, backup/restore, BIT/condition monitoring, fault finding and fault isolation/ troubleshooting techniques, test remove/ replace; dismantling and check out of each hardware and software item with relevant safety instructions.
- 10.4.12.** The Contractor's Maintenance Manual shall provide description of all the configuration settings for the modules, services and components/ how configuring the logging and uses of performance counters/ where finding the log files/ the different categories of logging/ the different performance counter categories.
- 10.4.13.** The Contractor's Maintenance Manual shall define the in-depth, step-by-step procedure how to perform the 1st, 2nd and 3rd level corrective and preventive maintenance tasks and SM&C tasks, based on the Task Analysis.
- 10.4.14.** The Contractor shall ensure that each and every procedure include as a minimum the following information:
 - a. The support level to be assigned;
 - b. Location/facility involved (if the operation is performed remotely, it has to be specified);
 - c. Personnel skills required;
 - d. Task duration and frequency (if applicable), reusing MTBF and MTTR data available;
 - e. Manpower required;
 - f. Tools, test equipment and special tools required (if any);
 - g. The steps needed to perform the procedure.
- 10.4.15.** The as-built drawings (ABDs) shall provide full details of how all civil works and major assemblies of the supplied equipment have been physically installed and mechanically/electrically integrated. This shall also include, but not be limited to, drawings of intra-rack and inter-rack cabling, etc. These drawings shall comply with the standards described in SOW Section 15, para 15.11.1.
- 10.4.16.** In-depth specification and lower level repair and maintenance of sub-assemblies and major system components (including those for CW related equipment) shall be addressed by the Original Equipment Manufacturers (OEM) manuals unless it has been agreed that specific activities are NLM. Operations and maintenance of the integrated system shall be addressed in the User and Maintenance Manuals.
- 10.4.17.** The Contractor shall:

- a. Provide all of the necessary Laptops, hardware components and other peripherals required to accommodate the IETP and to share IETP data between all IETP user sites.
 - b. Distribute IETP Data viewer software and associated licences
 - c. Provide the IETP data repository.
 - d. Incorporate into the IETP all information necessary for the operation and maintenance of the systems under contract.
 - e. Provide product documentation for all item related activities which shall be adequate for the development, control, test, acceptance, use and maintenance of all applicable deliverables, (including optional items if any).
 - f. Provide portable IETP Viewing Equipment
- 10.4.18.** Until the expiration of the warranty, the Contractor shall remain responsible for any changes to the manuals required as a result of any omission or inaccuracy discovered in the use, or whenever changes/modifications in equipment or spare parts are made under the Contractor's responsibility. Changes to the final manual shall be done in accordance with changes procedure for IETPs.

10.5. Original Equipment Manufacturer (OEM) Technical Manuals

- 10.5.1.** The Contractor shall provide Original Equipment Manufacturer (OEM) Technical Manuals for all assemblies, sub-assemblies, components and parts that the Contractor obtains from other manufacturers/vendors and incorporates into the system and test equipment.
- 10.5.2.** The OEM TMs shall provide detailed information necessary for the system operators, to disassemble and assemble the units down to the lowest Line Replaceable Unit (LRU) level of maintenance. The manuals will also provide the necessary drawings/schematics, specifications, wiring diagrams, etc., to allow the operators to troubleshoot, and fully understand, the design and operation of the particular equipment.
- 10.5.3.** The OEM TMs are to supplement the Operators Manuals and thus be expected to be referenced in the latter as a way of providing specific details on a particular piece of equipment. The Contractor is required to provide the OEM Manuals on CD-ROM, and in hardcopy, with exactly the same number of copies of each to the HN sites together with the associated equipment
- 10.5.4.** The OEM TMs shall be delivered in one of the other common use formats and integrated into the IETPs.

SECTION 11 WARRANTY AND SUPPORT

11.1. Warranty and Support Planning

- 11.1.1.** The Contractor shall provide warranty and optional Contractor Logistic Support (CLS) during warranty and post-warranty period for the Contractor supplied SSSB system as specified in the Purchaser accepted In Service Support Plan and CLS Plan.
- 11.1.2.** During Warranty and CLS, the Contractor shall ensure that all reliability, availability, and maintainability requirements, specified in the Implementation Contract CO-15577-SSSB, continue to be met. In particular, the Contractor shall ensure, through a combination of spare parts selection and provision, site intervention, system engineering, help desk support and other activities that the availability and reliability requirements for the systems are achieved. As part of the CLS activities, the Contractor is required to maintain and take corrective action as required on the current baseline documentation, and exercise custody, maintain and update all parts of the Technical Documentation. In addition the Contractor shall provide seamless access of all such documentation and information to the Purchaser or its authorised representative on an unrestricted basis.
- 11.1.3.** The Contractor shall provide the following documents to describe the warranty and support services and provisions until FSA, during warranty and post-warranty periods.
 - a. In Service Support Plan (ISSP)
 - b. Contractor Logistics Support (CLS) Plan
- 11.1.4.** The Contractor shall provide an In Service Support Plan (ISSP) detailing the responsibilities and services until FSA and during the Warranty period, to cover the following topics at minimum with practical instructions:
 - a. The Contractor's Support organization, roles, responsibilities, processes and procedures (between PSA and FSA; and during warranty);
 - b. Description of the system of interest (SOI) in scope of integrated support,
 - c. Description of the integrated support concept, including the maintenance concept, warranty concept, customer support concept, service management & control concept, ITSM processes including but not limited to the incident, problem management, release and deployment management, and configuration and change management;

- d. Description of the Purchaser and Host Nation maintenance and support organization involved in the operation, maintenance and support activities of the SSSB systems; their interfaces and interactions with each other associated with each level of maintenance and support and ITSM processes;
 - e. Description of sub-contractors, vendors and other third parties that will be involved in warranty and support,
 - f. Description of the parties involved, their responsibilities for the various levels of support (with indication of start and end dates), interfaces, response times and POC details;
 - g. Description and allocation of operation, SM&C and corrective and preventive maintenance tasks required to operate and maintain the system;
 - h. Description of the Sustainability measures (obsolescence management, failure reporting, performance monitoring, reliability and availability assessment and reporting);
 - i. Procedures to follow when any part of the system fails; response times for analyses and resolution by the Contractor,
 - j. Comprehensive lists of all available spares, consumables, and software licenses (SWDL), support software tools, COTS documentation, technical documentation, training documentation and manuals.
- 11.1.5.** The Contractor shall provide the ISSP at PDR and CDR milestones for Purchaser review. The Contractor shall provide the final ISSP as part of PSA and FSA milestone achievement.
- 11.1.6.** The Contractor shall provide a Contractor Logistics Support (CLS) Plan as an annex to the ISSP, detailing the responsibilities and services under the optional CLS services during the warranty and post-warranty.
- 11.1.7.** The Contractor shall provide a CLS Plan describing the basis execution of a prospective CLS Contract. This plan shall be detailed enough to form a comprehensive understanding of how he proposes to meet the optional CLS requirements of this SOW during warranty and post warranty periods separately. This Plan shall detail the following:
- a. The Contractor's proposed CLS Management Organisation and Structure;
 - b. Additional resources not under the direct control of the CLS PM that may be accessed during periods of "surge" demand, Corporate Structure of the Prime Contractor and the administration of the prospective CLS project within the overall corporate structure;
 - c. Description and details of the optional CLS services and sub-services that will be made available;

- d. SSSB Service Catalogue;
 - e. CLS Strategy, including intervention on each site, preventive and repair activities, spares replenishment plan and process, identifying the items of equipment (assemblies and sub/assemblies) that are to be repaired and services to be provided by the Prime Contractor with its internal "in-house" resources during the support period;
 - f. The location of the repair facilities that will be utilised, and/or the source within the corporate organization of the service and expertise required;
 - g. Description of proposed method to meet intervention response and repair times if site or mission critical support availability is endangered;
 - h. Description of how CLS shall be fulfilled during times of crisis and conflict;
 - i. Method for site personnel to inform CLS Contractor when spares have been used and when assistance is needed;
 - j. Method of recording and proposed measurable criteria for evaluating the Contractor's performance during CLS;
 - k. Description of the strategy for replacing hardware that can no longer be economically supported by the Contractor or sub-contractors.
 - l. Description of how CM procedures will continue to be implemented on the hardware and software/firmware during the CLS period.
 - m. Description of the proposed logistic and maintenance information processes, detailing how the information from sites and the Contractor's maintenance facilities will be collected, stored and made available for evaluation.
 - n. Identification of the proposed sub-contractors/vendors during the CLS period, including the firm, the nation of origin, the major items (assemblies, sub-assemblies) or services, and a letter of intent from the proposed sub-contractor that details its willingness to enter into a sub-contract with the Contractor, if the CLS Contract is awarded.
 - o. Description of how the QA/QC Programme of the Prime Contractor and sub-contractors will meet the provisions of this Contract, including the applicable certificates (such as ISO) that the sub-contractors Quality Programme conforms to the requirement of the QA requirements in the Main Contract and the CLS Contract.
- 11.1.8.** The Contractor shall release the CLS Plan during the project execution as per ISSP release schedule.
- 11.1.9.** After the project execution, the Contractor shall release an updated CLS Plan at the end of each contracted support (i.e. warranty or optional CLS year) period to cover the activities, services and pricing for the optional upcoming CLS period. This CLS Plan shall be

released three months prior to the end of existing support period to provide the Purchaser or Territorial Host Nation sufficient time to decide on the activation of the new period.

- 11.1.10. Additionally, the Contractor shall release the updated CLS Plan 4 weeks after the start of the new CLS period to cover the activities planned and proposed for the contracted CLS period.

11.2. Until Final System Acceptance (FSA)

- 11.2.1. During the implementation phase of the SSSB system (ending at FSA) the Contractor shall provide their own resources (spare parts, tools and test equipment, manpower and skills) to maintain the System at all levels.
- 11.2.2. Throughout the implementation phase of the SSSB system, the Contractor shall maintain comprehensive repair records to enable detailed fault analysis, and early detection of failures/maintenance trends. Periodically, the Contractor will be required to forward the results of these analyses for review by the Purchaser.
- 11.2.3. From the PSA until FSA, the Contractor is responsible for the execution of all the Support Activities/Services beyond NLM at no additional cost for the Purchaser. This includes but it is not limited to:
 - a. Corrective and preventive maintenance beyond NLM, including replenishment of local stocks, spare parts provision and repair and calibration of RTTEL, if any
 - b. Provision of Spare Parts, facilities and Tools beyond NLM.
 - c. On-site interventions beyond NLM
 - d. IETPs and LSAR updating
 - e. Design and implementation of updates/upgrades of the SSSB System to meet and continue to fulfil both functional and non-functional Contractual requirement, including resolution of obsolescence that might arise in the period.
- 11.2.4. In the period from PSA to FSA the System will be operated and maintained (up to NLM) by NATO/THN personnel. The Purchaser will monitor both System performance and CLS performance in order to collect enough information to decide to continue with CLS after the end of the warranty.
- 11.2.5. If the Contractor becomes aware at any time before acceptance by the Purchaser that a defect exists in any supplies, the Contractor shall coordinate with the Purchaser and promptly correct the defect.

11.3. Warranty Period

- 11.3.1. General Requirements

- a. The Contractor shall warrant that all equipment, software (including license validity until end of warranty), civil works, documents, system design, production and implementation provided under this Contract including all installation and civil works conform to the requirements and is free of any defect in material, code or workmanship for a period starting at PSA until the date of FSA plus minimum one (1) year.
- b. The Contractor shall warrant that all equipment and software delivered under the Contract are genuine and free of any malicious components, firmware and software, for a period of at least 1 year starting at FSA.
- c. The Contractor shall acknowledge and provide a corrective action for the failed components within NBD after the initiation of the warranty request. In the case of a failure could not be identified to an LRU level and/or could not be isolated within 3 business day (starting with the warranty request) even with on-call assistance from the Contractor, the Contractor shall dispatch a field engineer to provide a solution on-site.
- d. In the event Major deficiencies⁴ occurring in the warranty period with downtime induced or required for their correction and relevant solution implementation, the warranty period shall be extended for all sites by the amount of downtime that was required for the correction and implementation.
- e. Any replaced part during the warranty period shall be under minimum 1 (one) year OEM warranty beginning from the replacement date, if the remaining warranty period is less than one year.
- f. The Contractor shall provide a specific Customer PoC for all warranty and support requests. The Contractor shall detail all the warranty and support requirements in its ISSP including the roles and responsibilities.
- g. The Contractor shall ensure that the warranty conditions remain valid even if the equipment is moved or relocated during the warranty period.
- h. The maximum repair Turn Around Time (TAT) shall not exceed ten (10) days for any unit after the equipment has been received at the Contractors Plant. This shall include in-processing, trouble shooting, repair and check-out and delivery to the Site or Depot.

⁴ Major deficiencies are any malfunction, error, anomaly, deviation etc. preventing the Systems to meet the original contract performance requirements, including RAMT and CLS

- i. The Contractor shall be responsible for the provision of any alternative or superseding items, should the original part be no longer available, ensuring compliance with the original design and System provided by this Contract. However, in such cases the Contractor shall propose the original alternative item for the Purchaser approval. The alternative item shall conform to all the specified quality requirements within the scope of the contract and standards.
- j. Defect magnetic, solid state and electronic media storage devices shall remain the Purchaser's property, at no additional cost, and not be returned to the Contractor when being replaced under warranty. Any such defect storage devices shall be replaced by the Contractor with new storage devices at no additional cost to the Purchaser.
- k. During the warranty period, the Contractor shall be responsible for supplying all COTS hardware and software upgrades and updates.
- l. The availability of COTS hardware and software upgrades and updates shall be made known to the Purchaser and, if proposed for introduction by the Contractor for whatever reason, including any corrective action for an identified fault, shall always be subject to Purchaser approval.
- m. The Contractor will not be responsible for the correction of defects in the Purchaser furnished property, except for defects in installation, unless the Contractor performs, or is obligated to perform, any modifications or other work on such property. In that event, the Contractor shall be responsible for correction of defects that result from the modifications or other work.
- n. The Contractor shall be responsible for shipment and delivery of faulty items for repair or replacement, and of the repaired or replaced item to the affected site at no additional cost to the Purchaser.
- o. The Contractor shall provide Technical Assistance to the Purchaser or his representatives during the warranty period. Technical assistance information details shall be indicated in the ISSP.
- p. The Technical Assistance shall provide on-call support in English for requests that correspond to information demands limited to the perimeter of delivered products, evolution proposals, problem reports, or any information needed by the Purchaser or its representatives.
- q. The Contractor shall provide an updated set of Technical Publications one month prior to the end of the warranty period. This updates shall cover the corrections and improvements resulted from the changes in the system or feedback received from THN.

- r. The Contractor shall provide a Performance Report every 3 months to summarize the failures and corrective actions including comprehensive repair records to enable detailed fault analysis, and early detection of failures/maintenance trends. The Contractor shall summarize the change in PBL and OBL in the report and shall update the user documentation (operation, maintenance, deployment) every 3 months to reflect the baseline change in the system.

11.4. Optional Contractor Logistics Support (CLS) Services (During Warranty)

11.4.1. General

- a. The Contractor shall provide the CLS services, applicable to all system including civil works, detailed under this Section during the warranty period, if the options are activated by the Purchaser or THN. These services shall be individually optional for Purchaser to activate as required basis during the warranty.
- b. The Contractor shall comply with the requirements listed in

C. Service Code	Type of Services	Sub-Service Code	Type of Sub-Services	Notice Times by THN	Response Times by the Contractor	Imp Cor Tim
SC01	Maintenance and Support	SC01-SS01	On-Site Intervention Services	N/A	Service confirmation by NBD Service available on-site within 3 Business Days from the written request from THN	Inter com Bus from requ
		SC01-SS02	Off-Site Intervention/Support Services	N/A	SME Service available within 1-hour from Customer request via call or in written	As THN
SC02	Supply Support	SC02-SS01	Stock Replenishment	N/A	Service confirmation by NBD	Rep rece Bus from requ
		SC02-SS02	Stock Replenishment (in case end of production, end of sale, end of support)	N/A	Service confirmation by NBD ECP provision within 3 business days	Rep rece Bus from writ ECP
		SC02-SS03	Stock Replenishment (design change)	N/A	Service confirmation by NBD ECP provision within 3 business days	Rep rece mon writ ECP *If the inst don Cor SC0

SC03	Obsolescence Management	SC03-SS01	OBS Monitoring	NLT 3 months before the end of the CLS term	Service the first Monday of each month	N/A
		SC03-SS02	OBS Solution	NLT 6 months after ECP submission	Service the first Monday of each month	Rep rece Bus from app TH
SC04	Sustainability	SC04-SS01	Post Design Services (PDS)	N/A	Service every 6-months	Imp time as p
		SC04-SS02	Failure Reporting Analysis and Corrective Action System (FRACAS)	N/A	Service the first Monday of each month	N/A
SC05	Data Management	SC04-SS01	Technical Publications	NLT 3 months before the end of the CLS term	Update release service the first Monday of each month	N/A
		SC04-SS02	Configuration Management	NLT 3 months before the end of the CLS term	Update release service the first Monday of each month	N/A
SC06	Training	SC04-SS01	Operation and Maintenance Training	NLT 3 months before the requested session.	Service confirmation by NBD	Trai com 3-m writ from

- d. Table 1 Optional CLS Services Requirements (during warranty) while providing the CLS services outlined in this Section.
- e. As part of the CLS Plan, the Contractor shall provide an SSSB Service Catalogue including, but not limited to, the following information:
 - i. Detailed of the proposed activities for each service and sub-service described herein,
 - ii. A comprehensive list of all individual CI's down to lowest Maintenance Significant Item, with their existing and proposed pricing for procurement and repair
 - iii. A comprehensive list of all individual licenses, quantities and validity end date, with their existing and proposed pricing for procurement and repair
 - iv. A list of SME types available for technical assistance and support services
 - v. Personnel, timelines, tools for each sub-service

11.5. SC01 Maintenance and Support

11.5.1. SC01-SS01 On-Site Intervention Services

- a. The Contractor shall provide on-site interventions during business days between 08.00-17.00 for all issues arising on the SSSB System beyond the expertise of NATO personnel (covering Level 2 and/or Level 3 Maintenance and Support).
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including different technical assistance SME's.

11.5.2. SC01-SS02 Off-Site Intervention/Support Services

- a. The Contractor shall provide Remote support during business days 08.00-17.00 CET for all issues arising on the SSSB System beyond the expertise of NATO personnel (covering Level 3 Maintenance and Support).
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including different technical assistance SME's.

11.6. SC02 Supply Support

11.6.1. SC02-SS01 Stock Replenishment

- a. The Contractor shall replenish the local stocks upon use of one of the spare parts for NLM activities or provision of spares not held on site (including LRUs, SRU's, consumables, tools and test equipment etc.)
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including the procurement prices per product, including the shipment costs.

11.6.2. SC02-SS02 Stock Replenishment (with obsolescence)

- a. If the specific spare part is not available due to end of production, end of sale or end of support, the Contractor shall provide a comparative price proposal (via an ECP) with two options: replenish the spare stock with a life time buy and activate the SC03-SS02 OBS Solution Service to replenish the spare stocks with a FFF replacement part.
- b. This service shall be based on the Engineering Change Proposal (ECP) by the Contractor for each obsolete item type and submitted with the obsolescence reports.

11.6.3. SC02-SS03 Stock Replenishment (with design change)

- a. If the spare part is not available and/or the Customer requests a design change for that specific part being effected, the Contractor shall activate the SC04-SS01 Post Design Services to replenish the spare stocks.

- b. This service shall be based on the Engineering Change Proposal (ECP) by the Contractor in accordance with the requested and required design change scope.

11.7. SC03 Obsolescence Management

11.7.1. SC03-SS01 OBS Monitoring

- a. The Contractor shall perform continuous obsolescence monitoring and reporting on the possible life cycle issues with the items that came to end of sales, end of production and end of support.
- b. This service shall be based on the Obsolescence Report released by the Contractor monthly (as required) in each CLS term.

11.7.2. SC03-SS02 OBS Solution

- a. The Contractor shall provide FFF Replacement of the obsolete items upon agreement based on the ECP submitted by the Contractors, including all product replacements, material and workmanship costs.
- b. This service shall be based on the Engineering Change Proposal (ECP) by the Contractor for each obsolete item type and submitted with the obsolescence reports.

11.8. SC04 Sustainability

11.8.1. SC04-SS01 Post Design Services (PDS)

- a. The Contractor shall provide PDS including redesign, recoding, rebuilding part of the system in case of Supportability Problems or in case of poor performance (including functional characteristics and non-functional figures such as RAMT) and releasing ECP's.
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term.

11.8.2. SC04-SS02 Failure Reporting Analysis and Corrective Action System (FRACAS)

- a. The Contractor shall maintain comprehensive repair records and perform fault analysis, to identify early detection of failures/maintenance trends. The Contractor shall keep this records in a specialized tool, and provide it to THN in regular basis.

11.9. SC05 Data Management

11.9.1. SC05-SS02 Configuration Management

- a. The Contractor shall maintain the Configuration Management Database with the changes to the baselines, products, and/or documentation.

- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term.

11.10. SC06 Training

11.10.1. SC06-SS01 Operation and Maintenance Training

- a. The Contractor shall provide training for operation, maintenance and instructor trainings as requested by the Purchaser.
- b. The Contractor shall update the training material to cover the changes and feedback received by THN during warranty and CLS.
- c. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including the training prices per session for each training type.

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Service Code	Type of Services	Sub-Service Code	Type of Sub-Services	Notice Times by THN	Response Times by the Contractor	Implementation Completion Times	Pricing	Activation
SC01	Maintenance and Support	SC01-SS01	On-Site Intervention Services	N/A	Service confirmation by NBD Service available on-site within 3 Business Days from the written request from THN	Intervention completion within 5 Business Days from the written request from THN	Price per day - SSS (N/A if SC00-SS02 activated)	Per occurrence
		SC01-SS02	Off-Site Intervention/Support Services	N/A	SME Service available within 1-hour from Customer request via call or in written	As required by THN request	Price per hour - SSS (N/A if SC00-SS02 activated)	Per occurrence
SC02	Supply Support	SC02-SS01	Stock Replenishment	N/A	Service confirmation by NBD	Replenishment received within 10 Business Days from the written request from THN	Price Per Product Catalogue (N/A if SC00-SS02 activated)	Per occurrence
		SC02-SS02	Stock Replenishment (in case end of production, end of sale, end of support)	N/A	Service confirmation by NBD ECP provision within 3 business days	Replenishment received within 20 Business Days from the written approval of ECP by THN*	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence
		SC02-SS03	Stock Replenishment (design change)	N/A	Service confirmation by NBD ECP provision within 3 business days	Replenishment received within 3-months from the written approval of ECP by THN* *If requested by the HN, the installation shall be done by the Contractor as per SC01-SS01.	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence
SC03	Obsolescence Management	SC03-SS01	OBS Monitoring	NLT 3 months before the end of the CLS term	Service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00

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		SC03-SS02	OBS Solution	NLT 6 months after ECP submission	Service the first Monday of each month	Replenishment received within 20 Business Days from the written approval of ECP by THN*	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence
SC04	Sustainability	SC04-SS01	Post Design Services (PDS)	N/A	Service every 6-months	Implementation time to be agreed as per ECP	Price TBD per ECP	Per occurrence
		SC04-SS02	Failure Reporting Analysis and Corrective Action System (FRACAS)	N/A	Service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
SC05	Data Management	SC04-SS01	Technical Publications	NLT 3 months before the end of the CLS term	Update release service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
		SC04-SS02	Configuration Management	NLT 3 months before the end of the CLS term	Update release service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
SC06	Training	SC04-SS01	Operation and Maintenance Training	NLT 3 months before the requested session.	Service confirmation by NBD	Training completion within 3-months from the written request from THN	Price per session (N/A if SC00-SS02 activated)	Per occurrence

Table 1 Optional CLS Services Requirements (during warranty)

11.11. Optional Contractor Logistics Support (CLS) Services (Post-Warranty)

11.11.1. General

- a. The Contractor shall provide optional CLS services during post-warranty period. This services shall be either in framework on-demand CLS services based or firm fixed price (i.e. all inclusive) CLS services based. The Purchaser or THN will have the right to activate either option in any CLS period.
- b. The CLS services shall cover all CIS, non-CIS and civil works elements for each sub-service identified.
- c. The Contractor shall renew the CLS contract yearly if requested by THN and/or Purchaser, and prices are to remain valid for that period.
- d. The Contractor shall maintain sufficient spares, test and other maintenance equipment, Automated Test Equipment (ATE) facilities, and all repair documentation including Manual etc., to support the Optional CLS Contract throughout its life.
- e. As part of the CLS Plan, the Contractor shall provide an SSSB Service Catalogue including, but not limited to, the following information:
 - i. Detailed of the proposed activities for each service and sub-service described herein, with their existing and proposed pricing
 - ii. A comprehensive list of all individual CI's down to lowest Maintenance Significant Item, with their existing and proposed pricing separately listed for procurement and repair, including the transportation costs as per INCOTERMS DDP
 - iii. A comprehensive list of all individual licenses, quantities and validity end date, with their existing and proposed pricing for procurement and repair
 - iv. A list of SME types available for technical assistance and support services
 - v. Personnel, timelines, tools for each sub-service
- f. The Contractor shall provide the SSSB Service Catalogue as part of the CLS Plan, NLT 3-months before the end of the current CLS period.
- g. The Contractor shall comply with the requirements listed in

	Type of Services	Sub - Service Code	Type of Sub-Services	Notice Times by THN	Response Times by the Contractor	Implementation Completion Times	Pricing	Activation
SC00	Contract or Logistics Support Management	SC 00-SS 01	Framework On-Demand CLS Services	NLT 1 month before the end of the CLS term or warranty term	Service confirmation within 10 Business Days	Completion within 1 year from the initiation of the CLS period	Price per year	Per yearly CLS term
		SC 00-SS 02	Firm Fixed Price CLS Services	NLT 1 month before the end of the CLS term or warranty term	Service confirmation within 10 Business Days	Completion within 1 year from the initiation of the CLS period	Price per year	Per yearly CLS term
SC01	Maintenance and Support	SC 01-SS 01	On-Site Intervention Services	NAT	Service confirmation by NBD Service available on-site within 3 Business Days from the written request from THN	Intervention completion within 5 Business Days from the written request from THN	Price per day - SSS (N/A if SC00-SS02 activated)	Per occurrence
		SC 01-SS 02	Off-Site Intervention/Support Services	NAT	SME Service available within 1-hour from Customer request via call or in written	As required by THN request	Price per hour - SSS (N/A if SC00-SS02 activated)	Per occurrence

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		SC 01-SS 03	Repair on Need Services	NAT	Service confirmation by NBD Service available within 3 Business Days	Repair completion within 10 Business Days from receipt of failed component in Contract or facility	Price Per Product Catalogue (N/A if SC00-SS02 activated)	Per occurrence
SC02	Supply Support	SC 02-SS 01	Stock Replenishment	NAT	Service confirmation by NBD	Replenishment received within 10 Business Days from the written request from THN	Price Per Product Catalogue (N/A if SC00-SS02 activated)	Per occurrence
		SC 02-SS 02	Stock Replenishment (with obsolescence)	NAT	Service confirmation by NBD ECP provision within 3 business days	Replenishment received within 20 Business Days from the written approval of ECP by THN*	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence
		SC 02-SS 03	Stock Replenishment (with design change)	NAT	Service confirmation by NBD ECP provision within 3 business days	Replenishment received within 3-months from the written approval of ECP by THN *If requested by the HN, the installation shall be done by the Contract or as per SC01-SS01.	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence

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		SC 02-SS 04	License Management	NLT 1 month before the end of the CLS term or warranty term	Service as required	Service as required	Price per license type ((N/A if SC00-SS02 activated))	With activation of SC00
SC03	Obsolescence Management	SC 03-SS 01	OBS Monitoring	NLT 1 month before the end of the CLS term or warranty term	Service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
		SC 03-SS 02	OBS Solution	NLT 6 months after ECP submission	Service the first Monday of each month	Replenishment received within 20 Business Days from the written approval of ECP by THN*	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence
SC04	Sustainability	SC 04-SS 01	Post Design Services (PDS)	NAT	Service every 6-months	Implementation time to be agreed as per ECP	Price TBD per ECP	Per occurrence
		SC 04-SS 02	Failure Reporting Analysis and Corrective Action System (FRACAS)	NAT	Service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
SC05	Data Management	SC 05-SS 01	Technical Publications	NLT 1 month before the end of the CLS term	Update release service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02	With activation of SC00

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				or warranty term			activated)	
		SC 05-SS 02	Configuration Management	NLT 1 month before the end of the CLS term or warranty term	Update release service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
SC06	Training	SC 06-SS 01	Operation and Maintenance Training	NLT 3 months before the requested session.	Service confirmation by NBD	Training completion within 3-months from the written request from THN	Price per session (N/A if SC00-SS02 activated)	Per occurrence

- i. Table 2 Optional CLS Services Requirements (Post-Warranty) while providing the CLS services outlined in this Section.
- j. For the first CLS year after end of warranty, the prices shall be directly aligned with the SSS prices. For the further renewals, the Contractor is authorised to request a price revision if the contract to be renewed. The price revisions shall be limited to the amounts reflected for each period in a governmentally approved inflationary index of the producing country. The Contractor shall fully comply with the implementation contract SOW requirements while providing the services detailed in the following sections, as applicable for each specific area. This shall include but not limited to the functional requirements, non-functional requirements and support requirements (PHST, Supply Support, Training, Technical Publications etc.).

11.12. SC00-SS01 Framework On-Demand CLS Management

11.12.1. Base Requirements

- a. The standard post warranty services shall be based on an open framework contract that includes optional services to be activated by THN on demand basis, up to 9 years in total after the warranty.
- b. The CLS services shall cover all CIS, non-CIS and civil works elements for each sub-service identified.

- c. The Contractor shall provide the framework type on demand services in accordance with the details provided in this table, and include only the mandatory services under this SC00 Service. This shall include:
 - i. Ability for THN to activate the listed services in this document
 - ii. Assignment of a dedicated Customer Support Manager
 - iii. Quality assurance activities required to deliver the services and products described under CLS services
 - iv. Ad-hoc Customer Support meetings via call as requested by the Purchaser
 - v. Provision of monthly CLS reports and having quarterly face to face meetings in THN facilities
 - vi. Provision of SSSB Service Catalogue
- d. All services detailed below shall be understood as options that can be activated independently from each other by the Purchaser/THN. Therefore, these options shall be priced separately, and they can only be activated with the prior activation of SC00-SS01.

11.13. SC01 Maintenance and Support

11.13.1. SC01-SS01 On-Site Intervention Services

- a. The Contractor shall provide on-site interventions during business days between 08.00-17.00 for all issues arising on the SSSB System beyond the expertise of NATO personnel (covering Level 2 and/or Level 3 Maintenance and Support).
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including different technical assistance SME's.

11.13.2. SC01-SS02 Off-Site Intervention/Support Services

- a. The Contractor shall provide Remote support during business days 08.00-17.00 CET for all issues arising on the SSSB System beyond the expertise of NATO personnel (covering Level 3 Maintenance and Support)
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including different technical assistance SME's.

11.13.3. SC01-SS03 Repair on Need Services

- a. The Contractor shall provide repair services on site or in factory of all faulty items of the SSSB Systems Removed and Replaced on site by Purchaser/THN personnel (NLM)
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including the repair prices per product.

11.14. SC02 Supply Support

11.14.1. SC02-SS01 Stock Replenishment

- a. The Contractor shall replenish the local stocks upon use of one of the spare parts for NLM activities or provision of spares not held on site (including LRUs, SRU's, consumables, tools and test equipment etc.)
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including the procurement prices per product.

11.14.2. SC02-SS02 Stock Replenishment (with obsolescence)

- a. If the specific spare part is not available due to end of production, end of sale or end of support, the Contractor shall provide a comparative price proposal (via an ECP) with two options: replenish the spare stock with a life time buy and activate the SC03-SS02 OBS Solution Service to replenish the spare stocks with a FFF replacement part.
- b. This service shall be based on the Engineering Change Proposal (ECP) by the Contractor for each obsolete item type and submitted with the obsolescence reports.

11.14.3. SC02-SS03 Stock Replenishment (with design change)

- a. If the spare part is not available and/or the Customer requests a design change for that specific part being effected, the Contractor shall activate the SC04-SS01 Post Design Services to replenish the spare stocks.
- b. This service shall be based on the Engineering Change Proposal (ECP) by the Contractor in accordance with the requested and required design change scope.

11.14.4. SC02-SS04 License Management

- a. The Contractor shall renew all the licenses, as per requested by THN in yearly basis.
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including the yearly license renewal prices.

11.15. SC03 Obsolescence Management

11.15.1. SC03-SS01 OBS Monitoring

- a. The Contractor shall perform continuous obsolescence monitoring and reporting on the possible life cycle issues with the items that came to end of sales, end of production and end of support.
- b. This service shall be based on the Obsolescence Report released by the Contractor monthly (as required) in each CLS term.

11.15.2. SC03-SS02 OBS Solution

- a. The Contractor shall provide FFF Replacement of the obsolete items upon agreement based on the ECP submitted by the Contractors, including all product replacements, material and workmanship costs.
- b. This service shall be based on the Engineering Change Proposal (ECP) by the Contractor for each obsolete item type and submitted with the obsolescence reports.

11.16. SC04 Sustainability

11.16.1. SC04-SS01 Post Design Services (PDS)

- a. The Contractor shall provide PDS including redesign, recoding, rebuilding part of the system in case of Supportability Problems or in case of poor performance (including functional characteristics and non-functional figures such as RAMT) and releasing ECP's.
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term.

11.16.2. SC04-SS02 Failure Reporting Analysis and Corrective Action System (FRACAS)

- a. The Contractor shall maintain comprehensive repair records and perform fault analysis, to identify early detection of failures/maintenance trends. The Contractor shall keep this records in a specialized tool, and provide it to THN in regular basis.

11.17. SC05 Data Management

11.17.1. SC05-SS01 Technical Publications

- a. The Contractor shall update of IETMs, LSAR, Configuration and Technical Documentation when required.

- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term.

11.17.2. SC05-SS02 Configuration Management

- a. The Contractor shall maintain the Configuration Management Database with the changes to the baselines, products, and/or documentation.
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term.

11.18. SC06 Training

11.18.1. SC06-SS01 Operation and Maintenance Training

- a. The Contractor shall provide training for operation, maintenance and instructor trainings as requested by the Purchaser.
- b. This service shall be based on the SSSB Service Catalogue released in the beginning of each CLS term including the training prices per session for each training type.

11.19. SC00-SS02 Firm Fixed Price CLS Services

11.19.1. General

- a. The Contractor shall provide the yearly all-inclusive CLS services including all services listed here with their respecting requirements, up to 9 years in total after warranty.
- b. The Contractor shall provide all-inclusive CLS services with a single yearly pricing for all services in accordance with the details provided in this table, and prices are to remain valid for that period. This shall include:
 - i. Assignment of a dedicated Customer Support Manager
 - ii. Ad-hoc Customer Support meetings via call and face to face as requested by the Purchaser
 - iii. Quality assurance activities required to deliver the services and products described under CLS services
 - iv. Provision of monthly CLS reports and having quarterly face to face meetings in THN facilities
 - v. Provision of SSSB Service Catalogue
 - vi. Automatic activation of services SC01-SC06 and all their sub-services

11.19.2. Services

- a. The Contractor shall provide all the services and sub-services described under the Section 11.11 and 11.12, fully included under the firm fixed price contract.
- b. Following assumptions shall be considered under the firm fixed price:
- c. Repair and replacement services will exclude the user induced failures or damage.
- d. License renewals shall cover all licenses in the total quantity that was initially provided for implementation.
- e. Full Stock Replenishment (SC02-SS02 and SC02-SS03), OBS Solution (SC03-SS02) and PDS (SC04-SS01) services will be limited to the provision of the related ECP. In case, ECP is accepted by the Purchaser, an amendment shall be made to the contract to adjust the scope and the price.

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Service Code	Type of Services	Sub-Service Code	Type of Sub-Services	Notice Times by THN	Response Times by the Contractor	Implementation Completion Times	Pricing	Activation
SC00	Contractor Logistics Support Management	SC00-SS01	Framework On-Demand CLS Services	NLT 1 month before the end of the CLS term or warranty term	Service confirmation within 10 Business Days	Completion within 1 year from the initiation of the CLS period	Price per year	Per yearly CLS term
		SC00-SS02	Firm Fixed Price CLS Services	NLT 1 month before the end of the CLS term or warranty term	Service confirmation within 10 Business Days	Completion within 1 year from the initiation of the CLS period	Price per year	Per yearly CLS term
SC01	Maintenance and Support	SC01-SS01	On-Site Intervention Services	NAT	Service confirmation by NBD Service available on-site within 3 Business Days from the written request from THN	Intervention completion within 5 Business Days from the written request from THN	Price per day - SSS (N/A if SC00-SS02 activated)	Per occurrence
		SC01-SS02	Off-Site Intervention/Support Services	NAT	SME Service available within 1-hour from Customer request via call or in written	As required by THN request	Price per hour - SSS (N/A if SC00-SS02 activated)	Per occurrence
		SC01-SS03	Repair on Need Services	NAT	Service confirmation by NBD Service available within 3 Business Days	Repair completion within 10 Business Days from receipt of failed component in Contractor facility	Price Per Product Catalogue (N/A if SC00-SS02 activated)	Per occurrence

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SC02	Supply Support	SC02-SS01	Stock Replenishment	NAT	Service confirmation by NBD	Replenishment received within 10 Business Days from the written request from THN	Price Per Product Catalogue (N/A if SC00-SS02 activated)	Per occurrence
		SC02-SS02	Stock Replenishment (with obsolescence)	NAT	Service confirmation by NBD ECP provision within 3 business days	Replenishment received within 20 Business Days from the written approval of ECP by THN*	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence
		SC02-SS03	Stock Replenishment (with design change)	NAT	Service confirmation by NBD ECP provision within 3 business days	Replenishment received within 3-months from the written approval of ECP by THN *If requested by the HN, the installation shall be done by the Contractor as per SC01-SS01.	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence
		SC02-SS04	License Management	NLT 1 month before the end of the CLS term or warranty term	Service as required	Service as required	Price per license type ((N/A if SC00-SS02 activated))	With activation of SC00
SC03	Obsolescence Management	SC03-SS01	OBS Monitoring	NLT 1 month before the end of the CLS term or warranty term	Service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00

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		SC03-SS02	OBS Solution	NLT 6 months after ECP submission	Service the first Monday of each month	Replenishment received within 20 Business Days from the written approval of ECP by THN*	Price TBD per ECP (N/A if SC00-SS02 activated)	Per occurrence
SC04	Sustainability	SC04-SS01	Post Design Services (PDS)	NAT	Service every 6-months	Implementation time to be agreed as per ECP	Price TBD per ECP	Per occurrence
		SC04-SS02	Failure Reporting Analysis and Corrective Action System (FRACAS)	NAT	Service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
SC05	Data Management	SC05-SS01	Technical Publications	NLT 1 month before the end of the CLS term or warranty term	Update release service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
		SC05-SS02	Configuration Management	NLT 1 month before the end of the CLS term or warranty term	Update release service the first Monday of each month	N/A	Price per CLS Term (N/A if SC00-SS02 activated)	With activation of SC00
SC06	Training	SC06-SS01	Operation and Maintenance Training	NLT 3 months before the requested session.	Service confirmation by NBD	Training completion within 3-months from the written request from THN	Price per session (N/A if SC00-SS02 activated)	Per occurrence

Table 2 Optional CLS Services Requirements (Post-Warranty)

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SECTION 12 TEST AND EVALUATION (T&E)

12.1. General

- 12.1.1.** All deliverables to include Civil Works, hardware, software and firmware supplied by the Contractor under this Contract shall be tested to meet the requirements of this Contract.
- 12.1.2.** Test shall be performed for each equipment/sub-system/system as per the following phases:
 - a. Phase 1 – Civil Works Delivery and Acceptance
 - b. Phase 2 – Factory Acceptance Test(s) – FAT (Shall also include but not limited to major non-CIS support/system deliverables such as power generators and UPS).
 - c. Phase 3 – Radio Sites and System Acceptance Tests:
 - i Phase 3a – Radio Site Acceptance Tests - RSAT
 - ii Phase 3b – System Acceptance Test - SAT
- 12.1.3.** Formal testing is initiated by a TRR (Test Readiness Review). The primary purpose of this review is to evaluate test progress and to verify that scheduled tests may begin. There is one (1) TRR per Test Phase, or Sub-phase. The Contractor shall prepare a TRR Report for each TRR.
- 12.1.4.** System/sub-system tests shall be performed at the Contractor premises during Factory Acceptance Tests(s) (FAT), and at individual Sites as part of the Radio Site Acceptance Tests (RSATs).
- 12.1.5.** The Contractor shall be responsible for integrating the PFE into his test programme to the extent that PFE is an integral part of the system, sub-system or network, as specified in SOW Section 3, para's 3.4.4 and 3.4.5.
- 12.1.6.** The FAT and the RSAT testing shall be the responsibility of the Contractor who shall provide all the personnel, documentation, equipment, test data and facilities required for installation, commissioning and execution of the tests. The Contractor shall be entirely responsible for the co-ordination and performance of the tests, and shall ensure that an adequate number of Contractor's engineers and technicians are present to ensure the timely completion of all tests. The Contractor shall provide the necessary duly calibrated test equipment, tools and any other items required for the satisfactory completion of the tests and the recording of their results. This shall include but not be limited to the following:
 - a. Performance Measurement instruments;
 - b. Protocol Analysers;
 - c. Installation tools;

- d. Test Plans and Procedures;
 - e. Any transmission services/resources required to achieve test configuration.
- 12.1.7.** For the two types of tests (FAT and RSAT) that are the responsibility of the Contractor, the Purchaser will provide Special Test Tools (including any support personnel) to generate and monitor Link-11 and Link-22 analogue signals. The Contractor shall describe in its test plan how the Purchaser-provided special test tools shall be integrated into the test procedures. The Purchaser will provide technical information on these special test tools at the request of the Contractor.
- 12.1.8.** The SAT testing will be the responsibility of the Purchaser. It is the intention of the Purchaser to commence SAT testing within six (6) weeks of acceptance of the (last) RSAT. The Contractor shall support the Purchaser in his testing. This support shall include, but not be limited to:
- a. Personnel;
 - b. Protocol Analysers;
 - c. Installation tools;
 - d. Test Plans and Procedures;
 - e. Any transmission services/resources required to achieve test configuration.
- 12.1.9.** The Contractor shall assign and provide a Test Director and Test Operators, and the Purchaser and/or his designated representative will attend and witness the testing.
- 12.1.10.** The Purchaser shall have the right to demand repetition of tests, proof of the validity of the test equipment calibration, and performance of reasonable additional tests to clarify that in the Purchasers opinion are doubtful or marginal results. The Contractor shall make available to the Purchaser, all facilities, information and assistance necessary to permit a valid interpretation of the test results.
- 12.1.11.** Prior to the commencement of the tests, the test environment shall be baselined and no changes to hardware, software, firmware and/or configuration shall be introduced by the Contractor unless explicitly authorised in writing by the Purchaser. Failure to do so by the Contractor shall render the complete testing null and void.
- 12.1.12.** Prior to commencement of RSAT and SAT phases the Contractor shall verify to the Purchaser that all National (THN) Level Entry Readiness Conditions have been met and that the Contractor is fully prepared and ready to start testing. Verifications are to take place three (3) weeks prior to start of RSAT /SAT phases and before any physical travel to sites by stakeholders.
- 12.1.13.** Prior to commencement of RSAT and SAT phases the Contractor shall verify to the Purchaser that it has sufficient Engineering Service

Support resource available to provide support to all RSAT and SAT test phases.

12.2. Test Plan

- 12.2.1.** The Contractor shall provide, as part of the PIP Section 8, a system Test and Evaluation Plan (TEP) describing all the activities necessary to complete the entire test programme as outlined below. The plan shall also indicate the stage at which FSA shall be held in accordance with SOW Section 13 below.
- 12.2.2.** The Contractor shall describe in the Test Plan the global organisation, including relationships between the different actors involved (that shall cover all testing stages).
- 12.2.3.** The Contractor shall provide a flow diagram that identifies the overall sequence of tests, the location, and Contractor and Purchaser equipment and personnel involved in each test, and the relationship of test events to project milestones.
- 12.2.4.** The Contractor shall describe the tasks that will permit to meet testing requirements.
- 12.2.5.** The Contractor shall identify all CI(s) that are subject to the test programme and shall indicate by which method the items will be evaluated.
- 12.2.6.** The Contractor shall identify (in a Traceability Matrix) each requirement, derived business use case or derived system use case, and the proposed methodology of validation where testing is proposed for each of the associated test case(s).
- 12.2.7.** The Contractor shall identify the tests associated with each testing stage and identify any tests that can only be performed at the Purchaser's facility (in particular tests of interfaces requirements).
- 12.2.8.** The Contractor shall identify the Contractor's requirements for configuration and support of the Purchaser's test facility.
- 12.2.9.** The Contractor shall include in the Test Plan as annexes, templates for:
 - a. Test Case description (business test cases and system test cases);
 - b. Test procedure description;
 - c. Test waiver request;
 - d. Test results sheet;
 - e. Test report template.

12.3. Testing

- 12.3.1.** Test Procedures Definitions

- a. Analysis/Certification (A/C): Test by A/C consists of design documentation/calculation or certification of recognised third party government laboratory or Manufacturer documentation and/or CoC based mainly on Test Results etc. that can prove that the requirement is met without performing the test. An example is the reliability analysis.
- b. Demonstration: Demonstration is defined as the determination by actual operation and/or adjustments as to whether or not an item has the capability of performing its specific function(s) in accordance with the conditions and the requirements of the performance specifications. This verification method consists essentially in a functional/ operational test.
- c. Testing: Testing is defined as the determination by comparison of the results of qualitative and/or quantitative data collected by appropriate instrumentation during the systematic exercising of an item to the stated requirements of the performance specification that the item exhibits conformity. Tests shall be carried out whenever a) or b) above do not cover the requirements.
- d. Inspection: Inspection is defined as the determination by simply visual inspection as to whether or not an item conforms to the performance specification.

12.3.2. Test Procedures (FAT and RSAT)

- a. Before each major test (FAT and RSAT), a Test Readiness Review (TRR) shall be conducted by the Contractor with the participation of the Purchaser and the Contractor. The Contractor shall not proceed to a formal test until authorised by the Purchaser.
- b. The Contractor shall submit the final and approved test procedures for FAT and RSAT to the Purchaser for approval before the TRR and no later than two (3) weeks prior to the execution of the tests. The FAT procedures of the operational use of the radio equipment and RSAT with the draft procedures to be delivered in accordance to the SSS, three (3) months before the tests.
- c. In addition to the Test Procedure of the Contractor, the Purchaser will instruct the contractor on implementing Tactical Datalinks related Functional Tests which will become part of the final Test Procedure
- d. Following approval by the Purchaser, printed copies of the co-ordinated and approved test procedures (Final) shall be issued and distributed prior to the first application of the test. Approval of the Test Procedure by the Purchaser will be for the application of the tests only and shall not represent an agreement that the test documents supersede the requirements of the Contract.
- e. At the FAT during the first test step:

- i. The Contractor shall provide a detailed pre-filled equipment list covering all equipment under test.
 - ii. This list will be physically verified.
 - iii. Based on manufacturer and serial numbers, the individual equipment will be assigned to the different COMMS sites. This assignment shall be also represented at the equipment list.
- f. The Contractor shall ensure that four (4) hard copies of the relevant Test Procedure are made available at each site for Purchaser's use.
- g. Each test procedure shall include, as a minimum, but not limited to the following:
- i. Scope;
 - ii. Approach;
 - iii. Testing Environment with a block diagram of the test layout;
 - iv. List of all required test equipment;
 - v. A detailed step-by-step procedure written so that the procedure can be clearly understood and followed by the Test Group;
 - vi. Objectives and expected test results with permissible test limits;
 - vii. Test data sheet(s);
 - viii. Requirements Coverage and Test Matrix;
 - ix. Observations Sheets;
 - x. Signature Sheets.
- h. The Contractor shall provide the Purchaser with information and assistance as required during the review and evaluation of the test procedures. Modification of inaccurate or inadequate test procedure and any subsequent work arising there from shall be carried out at the Contractor's expense, including re-testing due to deficiencies identified by the Purchaser.

12.4.3 Test Readiness Review (TRR) Meetings

- a. TRR Meetings (if required) shall be conducted by the Contractor before each test stage to determine whether the Contractor is in fact ready to begin testing. A TRR will also be conducted by the Purchaser with the Contractor's participation before the SAT.

- b. TRRs shall be conducted, as required and per SSS, to confirm completeness of test procedures, and to assure readiness for the testing. TRR shall confirm that:
 - i. Test procedures comply with test plans and descriptions, demonstrate adequacy to accomplish test and verification requirements (see also SOW 12, para 12.2.3 above).
 - ii. Pre-test predictions and informal test results indicate testing will confirm necessary performance. Should these not be available then the Contractor shall justify the lack thereof.
 - iii. Required operation and support documents are complete and accurate.
- c. The Contractor shall conduct TRRs at various stages of system development including but not limited to the following:
 - i. Prior to initiation of any Contractor formal testing;
 - ii. Prior to Phase 1 Factory Acceptance Test (FAT);
 - iii. Prior to Phase 2a Radio Site Acceptance Tests (RSAT) or any part thereof.
- d. The outcome of TRR is the decision to proceed or not with test execution in accordance with the entry criteria required by the TRR checklist approved by the Purchaser. There is one TRR per test event. The decision to proceed is formalised by the Test Order sign-off.
- e. The Contractor shall present the following for review (this will compose in more detail the TRR checklist):
 - i. Requirements changes: Requirements Specs that have been approved since SRR that impact testing;
 - ii. Design changes: Any changes on the design that have been made since PDR/CDR that impact testing (ECPs);
 - iii. Description of Configuration items under test (HW/SW/Licenses);
 - iv. Test environment (test tools);
 - v. Resources;
 - vi. Problems;
 - vii. Test limitations;
 - viii. Schedules.

- ix. Test Readiness Review (TRR) Report
- f. For each formal test event, the Contractor shall prepare a TRR Report for each separate TRR.
- g. HW Installation Checkouts consist of a visual inspection of installation workmanship, installed equipment's in accordance with the drawings & as-designed lists, cabling, equipment/cables labelling on the basis of a checklist.
- h. Contractor and their sub-contractors perform their HW Pre-Checkouts in advance using the checklist.
- i. Results of Contractor HW Pre-Checkouts are recorded in checkout booklets per cabinet and for other installed equipment.
- j. When Contractor HW Pre-Checkouts are completed the Contractor shall state to the Purchaser their readiness for HW Installation Checkouts.
- k. HW Installation Checkouts are conducted with the participation of Purchaser/ THN and Contractor/ Subcontractors.
- l. During HW Checkout findings/results/action items are recorded in the Checkout Checklists and will be corrected/completed by the Contractor/sub-contractors.
- m. The corrections will be checked at the next hardware checkout depending on the deadline.
- n. The Contractor will need to provide the following required documentation (3 weeks prior to the Installation Checkout Meeting):
 - i. Checkout Checklists
 - ii. Cabinet Drawings
 - iii. Work Station Drawings
 - iv. Operations and Technical Room Layout Drawings
 - v. PDP Drawings
 - vi. Interconnection Drawings
 - vii. Cable Data Sheets
 - viii. Equipment Certificate of Conformities (CoCs)
 - ix. As-Designed Configuration Index
 - x. Draft As-Built Drawings (ABDs)
 - xi. Other as required for the this specific project like Antennas

- o. At the end of the Installation Checkout meeting, the Installation Checkout Report shall be provided with all the findings and Action Items (AIs)
- p. AIs shall be solved before declaring the installation to be completed.
- q. Installation Check-Out shall be part of the Site Installation Acceptance.

12.4. Requirements Coverage and Test Matrix

12.4.1. The Contractor shall develop and provide as part of the Test and Acceptance Plan the Requirements Coverage and Test Cases Cross Reference (TCCR) Matrix. The matrix shall provide the mapping of the requirements into individual test cases and shall identify Test Case group (i.e. System, Sub-system etc.) and numbers. In some cases additional specific detailed requirements might be present in their respective Sections, but these requirements are always related to the same overall requirement and shall thus be reflected in the details of the Test Steps to be included in the related Test Case. The matrix shall contain but not be limited to:

- a. Contract Reference
- b. Requirement Definition
- c. Related Test Case Reference
- d. Related Test Procedure Overview

12.5. Factory Acceptance Test (FAT)

12.5.1. A representative scaled down system shall be assembled and installed at the Contractor's facilities to perform the FAT. These tests shall demonstrate the functionality of TX and RX systems and shall include at least one (1) test case for each module/function. The main installation activities for FAT shall include:

- a. The installation material at the Contractor's Facilities shall represent (up to a reasonable and to be agreed extent) the system intended to be installed on site;
- b. The connection/integration of the sub-systems:
 - i. Transmitting (HF-TX) Site Equipment,
 - ii. Receiving (HF-RX) Site Equipment
 - iii. Transceiver (HF-UHF) Site Equipment
- c. System Configuration;
- d. The site installation, inspection and pre-testing.

12.5.2. All Transmitters and Receivers at the FAT shall include:

- a. Radio communications equipment (including all Transmitters, Receivers, Transceivers and all Audio Data Matrixes) functional tests (on the Test Bed);
- b. SSSB Radio operational test using Special Test Equipment (STE) provided by the Purchaser;
- c. Open System Communication Control (OSCC) (PFE) remote supervision and control integration tests;
- d. Versatile Link Interface/Remote (VLI/R) (PFE).

12.5.3. Entry/Exit conditions

- a. Entry conditions as defined by FAT TRR
 - i. Sites Survey conducted and reports delivered to Purchaser
 - ii. PIP delivered to Purchaser, reviewed and accepted by the Purchaser
 - iii. RSPL delivered to reviewed and accepted by the Purchaser.
 - iv. RTTL delivered to, reviewed and accepted by the Purchaser.
 - v. Site Installation Specifications delivered, reviewed and approved by to Purchaser.
 - vi. FAT procedures, reviewed, accepted and approved by the Purchaser.
 - vii. PDR and CDR were completed
- b. Exit conditions
 - i. All test criteria shall be passed successfully.
 - ii. Recorded deficiencies that the Purchaser classifies as mandatory shall be cleared.
 - iii. Acceptance of the FAT Report by the Purchaser.

12.5.4. The Purchaser acceptance of the FAT Test Report shall grant permission to the Contractor to proceed with the delivery and installation of the SSSB systems at sites. Delivery of equipment post-successful FAT to individual radio sites shall be at the Contractors expense.

12.6. Radio Site Acceptance Test (RSAT)

12.6.1. After installation and integration, RSATs shall be performed with the following objectives:

- a. To verify the functionality of the contractual item HW, FW and SW of SSSB equipment as individual sub-systems, per each Radio Site.
 - b. To demonstrate that the sub-systems are fully functional.
- 12.6.2.** During this phase RSAT functional tests shall take place to verify that SSSB system equipment and sub-systems, after installation and interconnections, are fault-free, working properly and meet the relevant design specifications.
- 12.6.3.** The testing will include:
- a. Equipment functional tests.
 - b. Sub-systems functional tests.
 - c. Site system tests: including and not limited to testing of the system security, complete power supply, power load tests, switching between Main Power Supply System and SB and NB PSS, redundancy of power supplies, testing of electrical safety (RCD), Air conditioning units, Aircraft Warning Lights, etc.
 - d. Conformity of Sub-systems to the corresponding Detailed Design Specification at sub-system level.
- 12.6.4.** Entry/Exit conditions
- a. Entry conditions:
 - i. Successful and formal CW acceptance by the Purchaser/THN in line with Section 14 of the SOW and requirements detailed in SRS (CW) Annexes C, F and I of the SOW.
 - ii. TRR and Completion of Radio Site Installation report(s) accepted.
 - iii. RSAT procedures, reviewed, accepted, and approved by the Purchaser.
 - iv. Site Installation Specifications (Final), reviewed, accepted, and approved by the Purchaser.
 - v. Successful completion of training of the test personnel if required.
 - b. Exit conditions:
 - i. All test criteria shall be passed successfully.
 - ii. Recorded deficiencies which the Purchaser classifies as mandatory have been cleared.
 - iii. Delivery, review and acceptance of the RSAT Report(s) by the Purchaser

- 12.6.5.** The Purchaser acceptance of all RSAT Test Reports shall allow the System Acceptance Test (SAT) to commence.

12.7. System Acceptance Test (SAT)

- 12.7.1.** After RSAT, a SAT shall be performed with the following objectives:
- a. To verify the integration of the system.
 - b. To demonstrate that the system is fully functional (i.e. each main function of the system shall be tested under real operational conditions).
 - c. To demonstrate that the SSSB system is able to remote control the individual thirteen (13) Radio Sites from the Buffer Centres, and that the system is fully functional.
- 12.7.2.** During this phase, functional tests shall take place to verify that:
- a. The system equipment and sub-systems/system after integration, are fault-free, working properly and meet the relevant design specifications.
 - b. The system is able to fully meet all the operational objectives and requirements as set forth in SOW Section 3, para 3.2 above.
- 12.7.3.** The testing will include:
- a. System Functional Integration tests;
 - b. Conformity of System to the corresponding Detailed Design Specification at system level;
 - c. Operational tests to verify that the system fully meets the operational requirements as stated in SOW para 3.2 above.
- 12.7.4.** Entry/Exit conditions as per SAT TRR as follows:
- a. Entry conditions:
 - i. SAT procedures co-ordinated with the Contractor;
 - ii. Individual Radio Sites Report(s) delivered, reviewed and accepted.
 - b. Exit conditions:
 - i. All test criteria shall be passed successfully;
 - ii. Recorded deficiencies are cleared;
 - iii. Acceptance of the SAT Report by the Purchaser and the THN.
- 12.7.5.** The Contractor shall provide full engineering support in preparation in conducting SAT's at the SSSB Comms sites.

12.8. Test Reports

- 12.8.1.** The Contractor shall supply the completed test reports for FAT and RSAT that fully document the outcome of the tests within two (3) weeks of completion of the respective tests procedures, for Purchaser review and acceptance.

12.9. Test Data Sheets (TDS) and Test Results

- 12.9.1.** Test results shall be recorded on Test Data Sheets (TDS). The Test Procedures that are issued and submitted to the Purchasers for approval shall include blank TDS's that specify the data to be collected and the method of use for recording the results of the tests. The test data sheets shall contain, as a minimum, space for insertion of:

- a. Test location and date.
- b. Name and Organisation details for Test Director, Contractor and Purchaser Representative.
- c. Equipment type and serial number(s).
- d. Test procedure reference number and issue number.
- e. Type and serial numbers of test equipment employed.
- f. Test results.
- g. Observations.
- h. Comments.
- i. Signature of the official representatives of the Contractor and the Purchasers representative.

- 12.9.2.** One (1) copy of the test data sheets shall be provided to the Purchaser at the completion of testing. Where appropriate, back-up information such as photographs and graphic information used during testing shall be appended to the test data sheets.

- 12.9.3.** Draft Test Reports may be submitted with hand-written entries in the Test Result Fields, in the Test Data Sheets and in the Observation sheets.

12.10. Test Failure Procedure

- 12.10.1.** If the tests to be performed do not provide result in accordance with the completion criteria relevant to the test being performed (i.e. failures), the subject test(s) will be withdrawn from the testing suite and a preliminary investigation into the cause of the failure shall be carried out and an observation report shall be provided by the Contractor.

- 12.10.2.** Testing may resume with the next test after the withdrawal of the failed tests, if the successful termination of the withdrawn tests is not a pre-

requisite to the following tests. This shall be subject to the approval of the Purchaser.

- 12.10.3.** The point at which testing of the withdrawn test(s) is to recommence will be proposed by the Contractor who shall provide the reasons for his proposal and details of remedial action taken in a written reply to the observation(s) raised. Either at that time, or subsequently, it shall be subject to the endorsement by the Purchaser.
- 12.10.4.** The procedure shall permit other test series to be carried out should the Contractor propose that it is practical to continue testing, while a particular test has been withdrawn for investigation.
- 12.10.5.** In the event that a particular series of tests meet the criteria after more than one attempt at any test, the Purchaser may request the repeat of the test(s) relating to that specification paragraph.
- 12.10.6.** All tests shall be done to verify that the equipment provided under this Contract meets the specified requirements; their results shall be recorded and any failure to complete a test successfully shall be recorded as deficiency.

SECTION 13 ACCEPTANCE CRITERIA – CIVIL WORKS (CW), PROVISIONAL SYSTEM ACCEPTANCE (PSA) AND FINAL SYSTEM ACCEPTANCE (FSA)

13.1. Introduction and Overview

- 13.1.1.** This Section outlines the Provisional System Acceptance (PSA) and Final System Acceptance (FSA) procedures, by which the deliverable items and services, for which the Contractor is responsible under this Contract, will be respectively provisionally and finally accepted by the Purchaser.
- 13.1.2.** The procedure and documentation necessary at each stage of acceptance are defined to ensure that all contractual requirements are completed and that all deliverables are supplied to the Purchaser.
- 13.1.3.** The Contractor shall address the PSA/FSA Procedure as part of the PIP Section 8.
- 13.1.4.** As an overview to tests to be conducted, the table below provides details of Buffer Centres, Radio Sites and DLOS Locations, as well as to the types of tests to be conducted. Detailed information on entry, exit and acceptance criteria are laid out in more detail further in SOW Section 13 below.

CP9A0101 GBR GRC NLD PROJECT - OVERVIEW TESTS					
BUFFER CENTRE	COMMS SITE	DLOS CONNECTION	UNDERGROUND F/O LINE TEST	RSAT	SAT
BOULMER	Saxa Vord HF TX/UHF			X	X
	Saxa Vord HF RX				
(SWANWICK)	Portreath HF TX/RX/UHF			X	X
ZIROS	Mavros HF RX			X	X
	Sideros HF TX/UHF				
LARISSA	Kythira HF TX/RX/UHF			X	X
PARNIS	Kartsinoudi HF TX			X	X
	7th AF Radar Station				
	Limnonari HF RX				
ALL		Pagia <-> Kartsinoudi		X	X
		Pagia <-> 7th Air Force Radar Station			
		Pagia <-> Efstratios			
		Pagia <-> Skopelos			
		Skopelos an<-> Pilion			
		Limnonari <-> Efstratios			
		Cape Mavros <-> Kyriamadi			
		Cape Sideros <-> Kefalas			
		Larissa <-> Pilion			
			X Kyriamadi to Palaikastro		
NIEUW MILLIGEN	Den Helder UHF			X	X
	Den Helder HF RX				
	Zeewolde HF TX				
	Noordwijk HF RX/UHF				

13.2. CWA – Civil Works Acceptance

- 13.2.1.** Civil Works Acceptance (CWA), shall be planned, organized and executed by the Contractor in accordance to all relevant Territorial Host Nations Law and regulations.
- 13.2.2.** The CWA will consist of a series of inspections, test and commissioning events where all methods of verification (design analysis, certifications, inspections, demonstrations, tests) shall be executed.
- 13.2.3.** During the acceptance events the Contractor shall demonstrate that various criteria are met such as but not limited to:
 - a. Building regulations
 - b. Stability
 - c. Functionality
 - d. Technical specifications
 - e. Fire protection
 - f. Physical security
 - g. Environmental protection
 - h. Health and safety
- 13.2.4.** The CWA will require participation of various experts (the list is not exhaustive) as follows:
 - a. the Contractor's Architect and Engineer (A/E) company accredited and maintaining a permanent office in the THN.
 - b. the Contractor's engineers, technicians and testers with formal qualifications and experience to assure safe, accurate and complete acceptance of the entire civil works scope
 - c. THN representatives from Fire and Rescue, Utility providers (Gas, Water, Electricity etc), fuel installation certifying body, MOD security experts, THN/MoD H&S experts etc.
- 13.2.5.** It is the Contractor's responsibility to plan, arrange and coordinate participation of various experts to be able to demonstrate to the Purchaser that all Civil Works deliveries meet SOW requirements and are executed in accordance to all relevant Territorial Host Nations Law and regulations.
- 13.2.6.** The detailed civil works acceptance plan as well as commissioning, testing and acceptance procedures shall be produced by the Contractor and are subject to the Purchaser/THN approval.
- 13.2.7.** As part of the civil works acceptance, the contractor shall obtain the following certifications (the list is not exhaustive):
 - a. Building energy efficiency certificate.

- b. Electrical installation conformity certificate.
- c. HVAC installation conformity certificate.
- d. Fuel supply system installation conformity certificate (including cathodic protection of the fuel tanks).
- e. Lighting protection conformity certificate.
- f. Fire protection installation conformity certificate.
- g. Environmental impact assessment as stipulated in Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU or THN equivalent on the assessment of the effects of certain public and private projects on the environment (for details consult relevant THN rules and regulations).
- h. Licensed installer's certificate for each type of installation.

13.2.8. The certificates shall be issued by independent companies, public authorities or specialists duly accredited in the THN to execute all inspections as legally required in the THN for any given type of installation and scope of works.

13.2.9. The Contactor shall also deliver for Purchaser's review and verification the following:

- a. Individual certificates of conformity for each electrical power panel, UPS, power generator, HVAC unit, heating boiler, valve, pump, control panel etc., fuel tank, security system components (cameras, intrusion detection system etc.), fire protection installation components according to respective regulations and directives stipulated in relevant Sections of SOW SRS (CW) Annexes and the core SOW.
- b. Certificates of conformity for construction products according to Regulation (EU) No 305/2011 of the European Parliament of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC or THN equivalent.
- c. Product warranty statements
- d. Material supply dockets
- e. Product data sheets

13.2.10. The Contractor shall plan the sequence of acceptance events taking into consideration that some of the acceptance events shall happen in a specific order and in stages. For example, majority of installations require acceptance (including tests) before they are concealed/covered by other installations, concrete works or buried. The sequence and stages of acceptance events are subject to the approval of the Purchaser and relevant building inspection experts mentioned in para 13.2.8 above.

- 13.2.11.** In case the Contractor covers, buries or conceals, in any other manner, installations or their parts, or any other elements of civil works before acceptance and without agreement with the Purchaser/THN authorities and relevant experts mentioned in para 13.2.8 above, the Contractor will be required to uncover the concealed items to allow for their acceptance and testing. If that situation occurs, all related additional costs and efforts, including repair and replacement of potential damages to any of the equipment, installations and other elements of civil works shall be the sole responsibility of the Contractor.
- 13.2.12.** As the final stage of Civil Works acceptance process the contractor shall provide to the Purchaser:
- a. Site manager/ site foreman written sworn declarations that the works were performed according to the design and in compliance to all relevant THN Law and regulations.
 - b. Certificate of Occupancy issued by THN government agency/authorities.
 - c. Up to date Construction Site Log book /diary.

13.3. PSA – Provisional System Acceptance

- 13.3.1.** The Provisional System Acceptance (PSA) is the act by which the Purchaser provisionally accepts all supplies and services provided by the Contractor.
- 13.3.2.** The PSA is the act by which the Purchaser acknowledges that the Contractor has met all those obligations required in the Contract, which enables a provisional operational use of the Contract deliverable(s) by the Purchaser. At PSA a list is agreed by the Contractor and the Purchaser showing all deficiencies and their mutually acceptable clearance dates.
- 13.3.3.** The system shall receive provisional acceptance (PSA completion) after the successful completion of the following phases:
- a. Successful provision and installation of all supplies and services in accordance with the PSA Section of the SSS (excluding options) at sites and other designated locations.
 - b. Satisfactory completion of applicable (hardware and software) Factory Acceptance Tests (FAT) and System Acceptance Tests (RSAT & SAT).
 - c. Successful completion of any retrofit activity and/or regression testing resulting from previous testing activities with resolution of all deficiencies.
 - d. Successful provision and delivery of consumables, spare parts, COTS and other software licences, passwords and documentation.

- e. Successful completion of the Training (see Section 16) and all Contract requirements, except warranty.
- f. Successful completion of Provisional System Acceptance (PSA) activities with closure of all observations and deficiencies (see Section 13, para 13.5 above).
- g. The PSA shall be the milestone by which the documentation referred in Section 5 of this SOW are accepted by the Purchaser.

13.4. PSA Entry Conditions

13.4.1. The Contractor shall satisfy all the following PSA entry condition:

- a. All hardware and software deliverables and installation works (incl. documentation, test equipment, spares, licences, etc.), for which the Contractor is responsible under the terms of the Contract have been supplied and provisionally accepted by the Purchaser.
- b. An initial Operational Unit Inventory (OUI) has been provided that details all the deliverables supplied under the terms of the Contract.
- c. The SIS documentation has been supplied with updates to accurately reflect the “As Built” configuration (ABDs) at the time of PSA, and verification of the accuracy of the documentation has taken place.
- d. CoC(s) have been supplied that the equipment conforms to the contractual standards and applicable manufacturing standards.
- e. All observations and deficiencies have been resolved by the Contractor.
- f. SAT Reports have been submitted by the Contractor and accepted by the Purchaser.
- g. A QA Report has been supplied by the Contractor's QA organisation.
- h. A complete list of keys and any passwords and/or codes necessary for the Purchaser to operate the system day to day has been supplied to the Purchaser.
- i. Successful completion of the Training and all Contract requirements, except warranty.

13.4.2. The Purchaser will provide the confirmation that the Contractor has fulfilled all requirements to allow THN to initiate the system security accreditation activities.

13.5. Deficiencies

13.5.1. A deficiency is a formal record of any aspect that could jeopardise successful completion of the Contract.

- 13.5.2.** A deficiency is cleared when the Purchaser has endorsed that the corrective action taken in respect of the Deficiency has been completed to the Purchaser's satisfaction.
- 13.5.3.** Deficiency classification is the classification that the Purchaser assigns to a deficiency. The categories for classification are defined as:
- a. Critical: Departure from the specification that must be rectified prior to the completion of SAT as applicable and before PSA can take place. The date by which this must be completed shall be agreed. Sole discretion for definition of critical deficiencies lies with the Purchaser.
 - b. Deferment: Departure from the specification that may be rectified before or after the Test Procedure; the date by which this must be completed shall be agreed. Deferments that are not completed by the due date shall become critical for PSA unless the due date is modified by agreement.
 - c. Omission: A departure from the specification where it is agreed that no remedial action is necessary.
- 13.5.4.** Deficiencies shall be handled in accordance with the following procedures:
- 13.5.5.** The Contractor shall submit all deficiencies to the Purchaser for endorsement of the clearance action taken. Sole discretion for definition of critical deficiencies lies with the Purchaser
- 13.5.6.** A deficiency shall be recorded when recognising any aspect that could damage successful completion of the Contract. These aspects shall include but not be limited to:
- a. A design shortage or deficiency revealed in any design, implementation or test specification.
 - b. Any shortage or deficiency revealed by inspection or application of testing procedures.
 - c. Any comment raised by the Contractor concerning any aspect of the Contract.
 - d. Any comment raised by the Purchaser or his designated representative concerning any aspect of the Contract.
- 13.5.7.** Deficiency sheets shall be maintained by the Contractor and shall record the following information:
- a. The serial number of the deficiency sheet.
 - b. The deficiency.
 - c. Sufficient information to define the context of the deficiency in terms of the articles to which it applies, the state of articles (including any appropriate environmental details, as applicable), and the date of the deficiency.

- d. The authorised personnel endorsing the deficiency.
- e. Any clearance action taken, such as repair and testing, a specification modification, receipt of a written reply from the Contractor etc., as applicable.
- f. The authorised personnel endorsing the clearance and the date of clearance.

13.6. PSA Report (PSAR)

13.6.1. The Contractor shall provide the Provisional System Acceptance Report (PSAR) prior to the PSA meeting.

13.6.2. The documents listed below shall comprise the PSAR that shall be prepared by the Contractor:

- a. PSAR cover document: To serve as an introductory document to summarise the content of the PSAR package and refer to, respectively include, the items here below.
- b. CoC: To confirm that the equipment offered conforms to the contractual standards and to National codes, laws, regulations, local rules and practices of the country of installation (UK, GR and NL).
- c. Deficiency Summary Sheets: To list any outstanding deficiencies. A remarks column shall briefly record the technical or operational significance and a decision column shall record the policy decision taken in respect of each deficiency. A clearance date column and a signature column are also required.
- d. SAT Reports.
- e. An Operational Unit Inventory (OUI) of provided supplies that shall detail all the deliverables furnished by the Contractor to meet the terms of the Contract for the PSA. The inventory shall include all licences identifiers and keys.
- f. Status of codification action.
- g. Status of training provision.
- h. Final versions of SIS and SPDP documentation, with updates, to accurately reflect the "As Built" configuration, as well as Final site logbooks.
- i. Acknowledgement of COTS and other software licences delivery.
- j. A QA Report provided by the Contractor's QA Organisation.
- k. Acknowledgement by the MoD's of UK, GR and NL and NCI Agency that all keys and password lists (THN specific) have been received.

13.7. PSA Meeting

- 13.7.1.** When the Purchase declares that there are no major/critical deficiencies open from the PSAT Report, regardless of classification type, then the PSA meeting may be requested to be scheduled in line with SSS. The Purchaser shall have sole discretion and responsibility in determining whether small clusters of deficiencies are classed as critical.
- 13.7.2.** The PSA meeting shall be convened and chaired by the Purchaser when he considers that all the deliverables are ready for PSA. The Contractor shall arrange the taking, typing and distribution of Minutes of Meeting of the PSA meeting.
- 13.7.3.** PSA shall be granted by written confirmation from the Purchaser by means of a formal PSA Acceptance letter.

13.8. Operational Evaluation Period (OEP)

- 13.8.1.** The Operational Evaluation Period (OEP) is a period in which the Purchaser may perform an operational assessment of installed components of the SSSB System before its Final System Acceptance.
- 13.8.2.** The OEP shall commence after the SSSB System has successfully passed its Provisional System Acceptance (PSA) and it will terminate before the Final System Acceptance (FSA). The nominal duration of the OEP shall be eight (8) weeks in total, in one single consecutive period, with the exact start date and end date to be agreed between Contractor and Purchaser not later than at PSA.
- 13.8.3.** The primary purpose of the OEP is to evaluate the reliability and maintainability performance of installed components of the SSSB System and the SSSB System as a whole, and to detect any deficiencies that may have not been discovered until the PSA. Any potential deficiencies discovered during OEP shall be recorded by the Contractor and addressed before FSA.
- 13.8.4.** Within the OEP the Contractor shall support and maintain the installed SSSB System. Further, the Contractor shall provide technical advice and guidance to site technicians of THN in the isolation and elimination of faults at levels HL1/2 and SL1/2, as well as assist THN's personnel to complete warranty claim forms and to provide on-the-job training as required.

13.9. FSA – Final System Acceptance

- 13.9.1.** The Final System Acceptance (FSA) is defined as the act by which the Purchaser accepts the final and complete system provided by the Contractor.
- 13.9.2.** The FSA is the act by which the Purchaser has evaluated the delivered and installed systems of the system as a whole and

determined that there are no non-conformities that would prevent full operational use of the system by the Host Nation personnel. At FSA there shall be no outstanding deficiencies present.

- 13.9.3.** The FSA represents the full test of the SSSB system including Buffer Centre and Communication Sites. The Contractor shall provide full engineering support in preparation and during the conduct of the SAT at the SSSB Comms sites.
- 13.9.4.** The system shall receive all final acceptances (FSA completion) after the successful completion of the following phases:
 - a. Successful completion of all PSA's as per Section 13, para 13.3 above, incl. successful completion of all PSA-related requirements listed in that PSA Section of the SOW.
 - b. Successful completion of the SSSB System-level Operational Evaluation Period (see Section 13, para 13.8). Any potential deficiencies discovered during OEP shall be addressed by the Contractor.
 - c. Successful provision and installation of all supplies and services in accordance with the SSS (excluding options) at sites and other designated locations.
 - d. Successful completion of any final retrofit activity and/or regression testing resulting from previous phases, including the OEP, with resolution of all potentially remaining deficiencies.
 - e. Successful provision and delivery of consumables, spare parts, COTS and other software licences, passwords and documentation (in addition to any items already delivered at PSA).
 - f. Successful security accreditation (Approval To Operate, ATO) granted by the relevant authorities of THN.

13.10. FSA Entry Conditions

- 13.10.1.** FSA's will nominally start six (6) months after the conclusion of all PSA's. During the period between PSA's and FSA's the relevant authorities of THN's will carry out relevant security accreditation activities and ultimately provide Approval To Operate (ATO).
- 13.10.2.** Within the period between PSA's and FSA's, THN's will also conduct an Operational Evaluation Period (OEP). The OEP is defined in Section 13, Para 13.8 above.
- 13.10.3.** The Contractor shall satisfy all the following FSA entry condition:
 - a. All hardware and software deliverables and installation works (incl. documentation, test equipment, spares, licences, etc.), for which the Contractor is responsible under the terms of the Contract have been supplied and provisionally accepted by the Purchaser.

- b. If applicable, an update of the Operational Unit Inventory (OUI) has been provided that details all the deliverables to be supplied under the terms of the Contract.
- c. If applicable, an update to the SIS documentation has been supplied, including any updates to accurately reflect the "As Built" configuration (ABDs) at the time of the FSA's, and verification of the accuracy of the documentation has taken place.
- d. If applicable, an update to the CoC(s) has been supplied that the equipment conforms to the contractual standards and applicable manufacturing standards.
- e. All remaining observations and deficiencies have been resolved by the Contractor.
- f. If applicable, an update to the QA Report has been supplied by the Contractor's QA Organisation.
- g. If applicable, an update to the complete list of keys and any passwords and/or codes necessary for the Purchaser to operate the system day to day has been supplied to the Purchaser.

13.11. FSA Report (FSAR)

- 13.11.1.** The Contractor shall provide the Final System Acceptance Reports (FSAR) prior to the FSA meetings.
- 13.11.2.** The FSAT documents shall refer to, respectively include, any updates to the documentation already provided with the PSAR. For details see 13.6 above.

13.12. FSA Meeting

- 13.12.1.** The FSA meeting shall be convened and chaired by the Purchaser when he considers that all the deliverables are ready for FSA. The Contractor shall arrange the taking, typing and distribution of Minutes of Meeting of the FSA meeting.
- 13.12.2.** FSA shall be granted by written confirmation from the Purchaser by means of a formal FSA Acceptance letter.

SECTION 14 SITE PREPARATION AND INSTALLATION REQUIREMENTS/ CIVIL WORKS

14.1. General

- 14.1.1.** The purpose of this Section is to define the Civil Works (CW) scope and directly associated activities (including but not limited to obtaining building permit and disposal of hazardous material) to be implemented by the Contractor. The requirements defined herein shall be met to enable site and facilities preparation for installation and proper functioning of the system.
- 14.1.2.** The Civil Works element consists of complete preparation of the 13 (thirteen) radio sites (including but not limited to site preparation, new buildings erection where indicated, building renovation (both design and implementation phase), antenna foundations, antenna masts, (including DLOS antennas for sites in Greece), associated ducting, internal roadworks and warning signs, various utilities and installations, associated earthworks and landscaping etc.). Details of requirements are provided further in SOW Annexes C, F and I. (SRS (CW) Annexes).
- 14.1.3.** Applied technologies, equipment and building works provided by the Contractor shall be modern, reliable and represent current state of art. At the same time they shall enable Operation and Maintenance (O&M) cost lowering to the maximum possible/practicable extend throughout their life cycle.
- 14.1.4.** The material and equipment installed shall be produced by entities recognized as reputable and experienced in their designated fields of production. Typical and Commercial of the Shelf (COTS) material and equipment shall be used to the maximum possible extent assuring that spare parts and consumables will be available throughout the life cycle of respective services, buildings, elements, devices and equipment. Equipment in a development stage is not to be considered without prior approval of the Purchaser.
- 14.1.5.** All the warning signs and warning labels installed by the Contractor shall be provided in both English and THN languages. They shall be of sufficient quality and durability to withstand local weather conditions (including UV protection/resilience) and assure at least seven (7) years of operation without substantial degradation.
- 14.1.6.** All the works listed herein shall be planned, designed and implemented according to respective national legislation and national Health and Safety (H&S) regulations, including, but not limited to, the Construction Law, Law on Environmental Protection and the Security regulations of both NATO and the THN.
- 14.1.7.** The Contractor shall be aware of any THN national or local permit/regulation requirements that would be required as part of any Civil Works, and if not implemented would have a detrimental effect

on delivery. The design and implementation of the works listed herein shall also be compliant with respective THN regulations addressing local seismic conditions (including introduction of technical and structural measures to create safe environments for personnel and protection of all constructions and equipment provided and installed by the Contractor).

- 14.1.8.** A list (but not limited to) of required/recommended environmental to be considered are as follows:
- a. Planning Permission/Applications;
 - b. Building Standards Approval/Adherence;
 - c. Environmental Regulations
 - d. HAZMAT Regulatory Permits (Approval to Radiate/Operate)
 - e. Aviation Authority (Military and Civilian)
 - f. Maritime Authority (Military and Civilian)
 - g. Permissions to carry out works in known archaeological areas.
- 14.1.9.** The contractor shall provide to the Purchaser a permits matrix with the following information:
- a. Permit/Approval Description
 - b. Details of the institution/body responsible for approving the permit;
 - c. Address of institution/body responsible for approving the permit
 - d. Email address of Institution/body responsible for approving the permit.
 - e. Telephone number Institution/body responsible for approving the permit
 - f. Details of approximate time required the complete process (in days)
 - g. Confirmation if provision of permit is THN responsibility (Yes/No)
 - h. Confirmation if provision of permits is the Contractors responsibility (Yes/No).
 - i. Any additional remarks that may be of use.
- 14.1.10.** THN's will provide the sites incorporating all existing facilities and interfaces as per SOW Annex B, D and F (SIDP Annexes) and as defined in the SOW para 3.4 and 3.5 above (PFE and PFP). Further on, the Contractor shall become acquainted with the particularities and details of the radio sites, by performing the Site Survey activities as outlined in SOW Section 14, para 14.7 below.
- 14.1.11.** The Contractor shall install the system equipment in the equipment area of buildings that are either provided by the THN's or have been built specifically by the Contractor to house the equipment (ie. New Builds). This equipment area will allow installation of either free-standing equipment or equipment racks.

- 14.1.12. The Contractor shall notify the Purchaser thirty (30) working days ahead of their intention to start his installation activities at a particular site. The notification shall include names, nationality, passport numbers and security clearances of the installation team (this is to ease the proper registration of Contractor personnel working at the site (see also SOW Section 14, para 14.5).
- 14.1.13. The Contractor shall take into account, working and implementation environment and any constraints as defined in the SOW Annex B, E and H (SOW SIDP Annexes) and as identified during the Site Survey activities.

14.2. Co-ordination between the Contractor and the Purchaser

- 14.2.1. In view of reducing the interface problems, the Purchaser, during execution of this Contract, will promote and co-ordinate the exchange of information between the THN and the Contractor.
- 14.2.2. Any proposed requirements put forward by the Contractor to the THN shall only be taken into account after consultation with the Purchaser.
- 14.2.3. Any change that may affect the scope of this Contract shall be processed through the Purchaser (see also SOW Section 7, para 7.5).

14.3. Liaison with the Host Nation/Territorial Host Nation

- 14.3.1. Once Site Surveys have been carried out, the Contractor shall provide to the Purchaser, a detailed Site Preparation Data Package (SPDP) for all sites. Upon revision of the SPDP, the Purchaser will coordinate a meeting in the THN between the Contractor, the Purchaser and THN to finalise the site facilities requirements and to achieve the approval of the SPDP by the Purchaser. The planned Beneficial Occupancy Date (BOD), representing the date when the Contractor can start any site preparation works on site(s), will be recorded at the meeting.
- 14.3.2. As referred below, the SPDP shall also include the conditions that must exist before the BOD. On completion of the site preparation related responsibilities and PFE delivery by the THN as defined in SOW Section 3, para's 3.4.4 and 3.4.5 before the BOD, a Preliminary Acceptance Inspection (PAI) to the sites shall be conducted with the participation of the Contractor, Purchaser and the THN. The purpose of the PAI is to verify that the sites meet the requirements in the SPDP and are ready for installation of the equipment (to meet the entry condition before BOD). This shall also include a statement from the Contractor that all necessary permits and permissions have been applied for and that they have been approved. Without such a statement the Purchaser, in conjunction with the THN, will not give approval for any PAI's to take place nor confirm any BOD's.

- 14.3.3.** The Contractor shall not start any works on sites of the systems before receiving a Site Readiness Statement and approval confirming the BOD date from the Purchaser/THN.
- 14.3.4.** The Contractor shall, in co-ordination with the Purchaser and the THN, conduct site visits to ensure that the site preparations are in line with the requirements specified in the SOW. It is the Contractor's responsibility to identify errors and/or omissions prior to the Site Readiness Statement. The Contractor shall plan for, as a minimum, joint (THN, Purchaser and Contractor) site visits at each site as follows:
 - a. The Contractor's Site Surveys (in line with the SSS) shall be conducted in order to collect necessary information for the SPDP preparation;
 - b. SPDP co-ordination meeting with the THN per SOW Section 14, para 14.4.1 above;
 - c. One (or more) independent site visit(s) during the conduct of site construction works; the most convenient time is to be co-ordinated between the THN and the Contractor;
 - d. Preliminary Acceptance Inspection (PAI).
- 14.3.5.** All visits to a site shall be planned in co-ordination with the Purchaser or delegated THN representative(s).
- 14.3.6.** It is the Contractor's responsibility to assure protection of the equipment and materials delivered by the Contractor under this Contract during the installation time.
- 14.3.7.** Costs of utilities consumed by the Contractor (such as power, water, heating, etc.) shall be at the Contractor's expenses from the Start of Installation (SOI) date until Final System Acceptance (FSA) by the Purchaser. The Contractor shall agree before SOI with the THN on how to measure and account for the cost of utilities.

14.4. Access to the sites and use of existing facilities and utilities

- 14.4.1.** Vehicle access to the sites will be possible. There may be possibilities for outdoor non-secure storage (the Contractor is required to coordinate storage issues with THN). The storage area preparation may require some site adjustment works (levelling, vegetation removal, etc.) and fencing (temporary and only if it is the Contractor's intent to have storage areas protected by a fence). Preparation of any storage areas is the Contractor's responsibility. THN's are not obliged to provide any outdoor or indoor secured storage facilities on the sites.
- 14.4.2.** It may be possible to connect to existing electrical power at the sites or to water supply. The utility costs, equivalent to respective average costs applied in the THN at any given month, is the Contractor's responsibility (see also Section 14, para 14.4.7 above). In case any

special installation/device is required (e.g. temporary PDP, water taps, etc.) it is the Contractor's responsibility to provide that installation/device. THN's, upon request, will assist in obtaining required information and permissions.

- 14.4.3.** THN's will provide, upon request, information on the possibility and terms and conditions (if applicable) of Contractor access to facilities such as office space, communication devices (to include internet access), workshops, storage, sanitaria, rest area, etc. at its sites. However, THN's will not be able to guarantee access to any communication and/or IT services including internet. It is the Contractor's responsibility to organise his own means of communications as required. The Contractor should also refer to the SRS and SIDP annexes of this SOW for further information.

14.5. Health and Safety obligations, building permit and associated licenses

- 14.5.1.** Appointment of a Health and Safety (H&S) Coordinator / Inspector and Site Supervisor is the Contractor's responsibility. Both of the above mentioned officials shall be either EU and/or THN accredited.
- 14.5.2.** The H&S Coordinator/Inspector shall be an independent role from the Site Supervisor and cannot be executed by the same person.
- 14.5.3.** Development and implementation of the H&S Plan at any given stage of the project is the Contractor's responsibility.
- 14.5.4.** The Contractor is responsible for obtaining all of the required building, environmental permits and related documents in accordance with THN Law.
- 14.5.5.** THN's are ready, upon request, to advise the Contractor, and where possible and necessary to assist, in the process of obtaining building permits and other related national and local authorisations.
- 14.5.6.** The Contractor shall prepare all necessary applications for building permits, and any other necessary permits, according to THN legislation. A non-exhaustive list of required documents is listed below (see also the SRS (CW) Annexes):
- a. Design/ description of demolition works (in preparation for masts and antennas installation, internal roads construction, cable ducting, levelling etc.);
 - b. Building design with the technical solution for new buildings, building refurbishments, antenna masts, antenna foundations, power supply, and other Civil Works planned for each site respectively, checked by UK, GR and NL technical authorities for the essential requirements;
 - c. Environmental impact report (not only limited to human, but also visual and nature impacts);
 - d. Designer's Professional Certificate(s)/Qualifications;

- e. Document(s) confirming the designer's professional membership in the relevant Chamber of Engineers;
 - f. Technical documentation for site organisation and preparation; this documentation shall meet the requirements as stipulated in THN law and regulations and shall present, amongst other, the following information: all preparation works for construction execution including materials/equipment storage sites, temporary connections to utilities, temporary fences for site protection, access to the sites, and provisional constructions erected by the Contractor.
- 14.5.7.** It is the Contractor's responsibility to fulfil environmental obligations after the works are finished if and when applicable (e.g., clean-up and restoration of the construction area, etc.). This requirement shall be met according to respective THN Law and regulations.
- 14.5.8.** It is the Contractor's responsibility to obtain any necessary Permits for use according to THN Building/Construction Laws.
- 14.5.9.** Buildings, masts and equipment shall be supplied with all required homologation, certifications, operational and maintenance manuals both in English and THN languages. These manuals/documentation are required as early as possible during the technical design preparation stage. It is the Contractor's responsibility to provide the above mentioned documents.
- 14.5.10.** For further requirements on the Contractor see Contract Special Provisions Articles 31 and 32.

14.6. Site Surveys and Site Survey Reports

- 14.6.1.** Before the submission of the draft PIP, the Contractor shall perform site surveys at each site to determine any requirements to prepare the site locations to receive the equipment for installation. All site surveys shall be conducted by in line with the SSS. The Contractor shall also verify the listing of existing equipment and other site specific details made available by the THN, as preliminarily stipulated in SOW Annex B. Any possible additional requirements for Civil Works shall also be identified. The Contractor shall collect required data during these site surveys in order to be able to produce the Site Preparation Data Package (SPDP) for each site respectively, as stipulated at SOW Section 14, para 14.8.
- 14.6.2.** In line with the SSS and following the completion of the site survey, the Contractor shall prepare a draft Site Survey Report (SSR) that provides, but is not limited to the following information: all available and usable floor plan layouts, cable routing, configuration and wiring assignments, antenna farm layout with associated cabling and ducting, antenna access roads layout, PSS system layout and schematics, graphical depiction of Contractor provided equipment and its integration with equipment, elements and systems provided as

PFE, basic civil works requirements. Beside the graphics and schematics, the Contractor shall also provide relevant information in narrative form, including where applicable matrixes, tables and item lists. The Contractor shall submit the draft SSR as specified in the SSS and in the format specified in SOW Section 15, para 15.4 below to the Purchaser for review within three (3) weeks after the relevant Site Survey.

- 14.6.3.** The SSR shall also include a Site Survey Plan. The Site Survey Plan shall contain but not be limited to draft site survey workbooks of checklists, fill in forms, installation sketches, contact information, installation specifications and any other documentation proposed to support site surveys.
- 14.6.4.** Purchaser and THN's will provide comments in line with the SSS after receipt of the draft SSR. After receipt of the Purchaser's comments, the Contractor shall deliver the final version, including the incorporation of all Purchaser comments, within one (1) week.

14.7. Site Preparation Data Package (SPDP)

- 14.7.1.** The Contractor shall provide the SPDP documentation that shall include, but not be limited to, the following detailed information in a form of narrative text supported by illustrations:
 - a. Specific implementation structure, responsibilities, lines of control and sub-contractor management structure in connection to CW preparations and the subsequent implementation of the sites;
 - b. Listing of the existing equipment and structures to be built/refurbished/dismantled/demolished, clearly indicating the ones that are to be built, re-used or disposed of by the Contractor or re-installed;
 - c. Listing and status/working conditions of non-project related equipment that has to be temporarily dismantled to allow works to continue by the Contractor;
 - d. Listing of equipment and facilities to be installed including functional description of each component, as well as general equipment specifications, to include the following:
 - i. Physical specifications - height, length, width, and weight (floor loading) of each equipment rack, cabinet and console;
 - ii. Equipment rack, cabinet and console templates;
 - iii. Manufacturer's specific machine configuration and space requirements;
 - iv. Maintenance access requirements for each equipment rack, cabinet and console;

- e. Equipment layout, including consideration of space between power and communication lines, as stipulated in the references listed in SOW Section 14, para 4.1.1 above (specifically references g and h in that Section);
- f. Special requirement for movement of equipment on site;
- g. List of companies and names of the Contractor's / sub-contractors personnel working at the sites during installation;
- h. Site facilities and utilities requirements (electricity, water, etc.) during installation time;
- i. Design, installation and construction drawings developed to approximately 30-35 percent level of design detail as well as timelines for execution of associated building works be that new build or building refurbishment;
- j. Detailed site layout plans, including detailed layouts (placement) of all equipment racks, cabinets and consoles, showing equipment racks, transmitters, antennas, cable and other ducts, No-Break (NB), Power Supply sub-System (UPS), etc., as and if applicable, including the specific equipment layout;
- k. Equipment specifications to include dimensions and weight (floor loading);
- l. Maintenance access requirements for the equipment;
- m. Any additional action that the Contractor might need, such as provisional dismantling of electrical/electronic equipment, during installation of the antennas or CIS equipment under this Contract.
- n. Heat load budget and Heating, Ventilating and Air Conditioning (HVAC) interface requirements for the system equipment that shall contain but not limited to:
 - i. Heat load calculation;
 - ii. Operating and non-operating environment conditions (temperature range, relative humidity range, atmospheric pressure, ingress protection (IP rating));
 - iii. Pressure and any special heating/cooling capacity requirements.
- o. A complete power budget of the SSSB system at each respective radio site, and equipment power interface requirements.
- p. Electrical diagrams including location and description of Electrical Power Distribution Panels (EPDPs), NB PSS elements (UPS), integration and interface with SB PSS and Prime Power Supply System provided by THN, electrical power utilisation plan, including but not limited to:
 - i. Location and description of power supply panel;

- ii. Input voltages, frequency, and tolerances;
- iii. Safety and secure grounding⁵;
- iv. Electrical power (in kVA) required for each equipment rack, cabinet and console and the type of termination to THN's power supply, cable connections, terminal strip, etc.;
- v. Phasing number and colour code of conductors per cabinet/rack;
- vi. Location of power and signal entry points through walls, incl. their approximate hole sizes;
- vii. Inter-unit cabling, ducting and connection;
- q. No-break PSS (UPS); if existing NB (UPS) appliances require replacement of currently installed battery pack(s), (e.g. due to expired lifetime of the batteries or damage) then the Contractor, upon approval by the Purchaser, shall provide such replacement battery pack(s). If additional NB (UPS) capacity is required then the Contractor, upon approval by the Purchaser, shall provide such additional UPS appliances in addition to the existing capacity.
- r. Antenna Civil Works requirements with regard to the supporting structure and foundations.
- s. Other CW requirements that are the Contractor's responsibility as stipulated in Section 14, para 14.19.
- t. A lighting plan to include general and special lighting requirements.
- u. A cooling plan showing equipment air conditioning requirements, and any other special cooling requirements. This data shall include:
 - i. Operating area environment (temperature range, relative humidity range, atmospheric pressure).
 - ii. Equipment air conditioning requirements (equipment heat output, location for each equipment rack, cabinet and console, equipment operating and non-operating environmental conditions, e.g. temperature, atmospheric pressure and relative humidity).

⁵ *Ground, Safety: Ground to protect personnel and equipment from electric shock and damage in the case of faults occurring in the equipment. The safety ground may be considered a secure ground if it is contained within an Inspectable space.*

- v. Any additional action that the Contractor might need to undertake, such as provisional dismantling of electrical/electronic equipment during installation of the antennas or CIS equipment under this Contract.
 - w. Shipping requirements and related information will need to include:
 - i. Engineering Implementation Schedules including milestone date of delivery of Contractor and Purchaser Furnished Equipment.
 - ii. The time and real estate required by Contractor Personnel at the installation sites in order to ascertain delivery routes and perform equipment installations.
 - iii. Special requirement for movement of equipment on-site and within the allocated facility (e.g. the use of cranes, etc.).
- 14.7.2.** In the SPDP, as defined and listed in the SOW Section 14, para 14.7.1 above, the Contractor shall thoroughly describe the Civil Works, power and site preparation requirements, that must be accomplished prior to the start of the installation of the delivered Systems.
- 14.7.3.** If the Contractor identifies any additional requirements not covered under the responsibilities listed in SOW Section 3, para 3.4 at the time of or after SPDP submission, the Contractor shall pay the additional costs to fulfil such requirements.
- 14.7.4.** Requirements as set out in the SRS (CW) Annexes to the SOW shall be indicated in the SPDP in order to quantify the magnitude of total Civil Works that must be accomplished on-site prior to arrival of the equipment for installation.
- 14.7.5.** Additional Facility's adaptation works (including complete package of Civil Works) at sites.
- 14.7.6.** Those works described above as necessary prior to the installation of the delivered System, shall be included in the deliverable "Preparation of Site".
- 14.7.7.** The SPDP shall be provided in quantities as specified in the SSS and in a format as specified in SOW Section 15, para 15.11.1, as necessary.

14.8. Installation Engineering Plan (IEP)

- 14.8.1.** The Installation Engineering Plan (IEP) as part of the SPDP/SIS is required to define, explain and monitor the engineering method and procedures to be used by the Contractor, and to present the system design in terms of work statement/order requirements. It provides the Purchaser with the opportunity to monitor and review the Contractor's engineering efforts and to determine performance-cost trade-offs that may be required.

- 14.8.2.** The Contractor shall provide, as part of the PIP Section 2 (see Section 2 para 2.3.3), the Installation Engineering Plan (IEP), which shall contain the following:
- a. The IEP shall define the activity specific implementation structure, responsibilities, lines of control, sub-contractor management structure.
 - b. Listing of Major and Minor Equipment to be installed: This listing shall contain a brief functional description of each item, its operating characteristics, and any abnormal criteria required for installation.
 - c. Engineering Implementation Schedules: These schedules shall cover milestone dates such as delivery of Contractor furnished equipment (CFE) and Purchaser Furnished Equipment (PFE); installation; number of required tests; interface with other systems.
 - d. Planned Layout: This Section shall contain the criteria for the planned equipment layout, a block diagram to show signal flow, considerations of radio frequency interference and radiation effects, interface tie-ins, and considerations such as efficiency of the proposed configuration in terms of access requirements for operation, maintenance, installations, and removal. It shall include consideration of space between equipment and walls, ceilings, other installations and utilities. References shall be made to all applicable system drawings and recommendations for maximum and/or minimum configurations.
 - e. Protocol of receipt of DHS (Delivery of Hardware on Site).
 - f. Checkout procedures
 - g. Noise levels Report
 - h. Electromagnetic levels Report
- 14.8.3.** Proof of Receipt of the DHS on Site: This document constitutes proof of delivery by the Contractor of the hardware items. The HW delivered on site is verified against two lists: shipping manifest/list (check qty/identification of boxes/pallets) and items lists (once the boxes are open, and it is verified that the right qty of equipment has been delivered on site iaw As-Designed products lists). Damage or incidences are recorded in the Protocol of receipt. But this document does not constitute a formal handover of the ownership of the equipment.
- 14.8.4.** Checkout procedure: This will cover the checklist to be inspected once the installation is done: Equipment is properly installed, labels properly affixed, grounding, equipment labels identification, power connection, all equipment is installed in the rack iaw the cabinet orientation and the list of equipment. This checkout procedures can also be used prior to the Acceptance of the Installation/Integration.

14.9. Site Installation Specification (SIS)

- 14.9.1.** The Contractor shall provide to the Purchaser and THN, for each site, Site Installation Specification (SIS) documentation with information as stipulated below.
- 14.9.2.** The SIS document is a very detailed and upgraded document, based on Site Survey Report (SSR) and Site Preparation Data Package (SPDP) as appropriate and detailed in SOW Section 14.
- 14.9.3.** The Contractor shall deliver the SIS to the Purchaser in line with the SSS as well as installation drawings, specifications and standards that he intends to employ during production and installation. The Final version of the SIS shall be delivered to the Purchaser in accordance to the SSS. Before delivery of the Final version the SIS is to be reviewed and discussed as laid out in the paragraphs below.
- 14.9.4.** The Purchaser may reserve time in line with the SSS for the review of the SIS package and to send the comments to the Contractor. The Contractor shall prepare and submit the SIS covering each of the sites within two (2) weeks of receipt of the Purchaser's comments. The SIS shall be detailed enough to allow assessment of the magnitude of site installation works to be performed by the Contractor at each site.
- 14.9.5.** Upon review by the Purchaser and THN of the SIS, the Purchaser may co-ordinate a meeting, with the participation of THN and Contractor in order to provide comments on the SIS. This meeting may coincide with a PPM, if possible.
- 14.9.6.** After this meeting, an updated version of the SIS shall be provided (if required) by the Contractor for approval. Parties will aim at finalising the site facilities requirements so that each site will be ready before delivery of the SSSB CIS equipment to the sites.
- 14.9.7.** Approval of the SIS by the Purchaser in no way relieves the Contractor of his responsibilities to achieve the contractual and technical requirements of this Contract.
- 14.9.8.** The schedule for submission of deliverables and approved SIS shall be incorporated in the PIP.
- 14.9.9.** The Contractor shall provide for each site a complete SIS with updated "As Designed" drawings of how all of the major assemblies of the Purchaser/Contractor supplied equipment are to be physically installed and mechanically/electrically integrated.
- 14.9.10.** The SIS documentation, as a minimum – but not limited to, shall consist of:
 - a. All applicable floor and wall plans to include cable penetrations, and routing;
 - b. Physical details of all equipment, apparatus and devices;

- c. Location plans with complete details of all cross-connection frames and patch panels;
- d. Location plans of all ancillary equipment, terminations and/or connections;
- e. Plans and descriptions presenting all grounding conductors, electrodes, joints and their connections to the existing earthing and grounding systems;
- f. Physical details of all rack cabling, cabinet cabling, cable runs and cable routing with length, cable numbers and cable functions to include as appropriate all connections, connectors and sockets;
- g. Details covering all wiring termination points including wire numbers and colour coding, if applicable;
- h. The functions of all inter-connecting cables with their codes, colour code and the function of each separate conductor;
- i. The physical details covering all cable trays and ducts for inter-communication equipment being part of this Contract;
- j. The list and layout of equipment as well as cabinet orientation to be installed including functional description of each component;
- k. Site layout, System/equipment site installation plans and programme, antenna farm area installation;
- l. The implementation structure, responsibilities and management control of sub-contractor(s);
- m. Exact location of HF-TX, UHF and HF-RX antennas, as well as microwave DLOS antennas/towers, taking into account the existing electromagnetic circumstances on the sites;
- n. Analysis of the design approach applied for each sub-system. The analysis shall also describe the design approach applied for equipment and structures that will be installed and implemented by the Contractor under the Civil Works package. The Contractor shall also describe the measures taken to ensure efficient and effective integration of sub-systems into respective systems and consequently into the complete SSSB System;
- o. Definition of Civil Works, relevant dismantling and demolition works and other tasks realized as a part of site preparation and site restoration that are the Contractor's responsibility as stipulated in Section 14 of this SOW. Physical details of all Civil Works equipment and structures shall be presented both graphically and in narrative form including where applicable plans, diagrams, matrixes, tables and item lists and as detailed in the SRS (CW) Annexes of the SOW.

- p. Identification of interfaces throughout the system to ensure interface compatibility as well as interfaces with communications infrastructure, power supply, cooling system and fire extinguishing system.

14.10. Recording of on Site Activities

- 14.10.1.** Throughout the implementation of the project, the Contractor shall maintain at each site in line with THN legislation a logbook, in which every incident, event and major activity shall be recorded on a daily basis.
- 14.10.2.** Incidents or events should include, but not be limited to: Equipment failure, personnel incidents or accidents, registration of visitors, power failures, lightning strike affecting the site, etc.
- 14.10.3.** Major activities include, but are not limited to: earth works, concrete pouring, building/facilities construction, antenna assembly, etc.
- 14.10.4.** Additionally, the following information (non-exhaustive list) shall be recorded in the logbook: Quantity and quality of material and equipment delivered to the sites (including remarks on rejected material/equipment due to non-compliance with required specifications or/and quality standards), number of personnel and names of team leaders conducting major activities, weather and environmental conditions affecting conducted works.
- 14.10.5.** When no incident happened, and no major activities were conducted, the words “No significant event to report” shall be noted in the logbook. The logbook records shall be reviewed, approved and signed by the site supervisor on a daily basis. The logbook shall be delivered to the Purchaser as a part of the PSA documentation (and any updates to the logbooks as part of FSA documentation). Nevertheless, the Purchaser reserves the right to review the logbook at any given time during the project implementation. The logbook shall be presented for review either during site visits or sent to the Purchaser via email as a scanned copy. The logbook shall also meet all requirements as stipulated in Section 15, para 15.9 of this SOW.

14.11. Disposal of Non-Reused Equipment and Structures

- 14.11.1.** The Contractor shall be responsible for dismantling of all radio, computer and non-CIS equipment, if any, that will not be re-used for the system, as described and approved in the SPDP and the SRS (CW) Annexes.
- 14.11.2.** The Contractor shall not dismantle any existing equipment on sites not related to the equipment and its installation (e.g. fences, any surveillance systems, etc. such as the CCTV system). Further, the continued operation of such systems shall not be interrupted by the works executed by the Contractor or its sub-contractors.

- 14.11.3.** If any non-project related equipment has to be temporarily dismantled (or services interrupted) in order to allow the works to be performed by the Contractor or its sub-contractors, it shall only be dismantled (interrupted) if strictly necessary for the purpose of this project, and after agreement with THN. Once temporary works have been completed, the equipment shall be re-installed (services restored) by the Contractor and shall be in the same working conditions prior to being dismantled (interrupted).
- 14.11.4.** The Contractor shall move all non-re-used equipment and material (including but not limited to buried cables and ducts) that has been dismantled and all structures demolished by the Contractor to a location within the respective site premises for temporary storage, as required. Such temporary storage area shall be assigned/approved by the THN. Subsequent responsibility for the disposal and transport to designated disposal facilities, of equipment and demolished structures that are identified in the SPDP as requiring to be disposed of will lie with the Contractor.
- 14.11.5.** It is the Contractor's responsibility to calculate, obtain respective data and make assumptions reference disposal costs. It is also the Contractor's responsibility to obtain information concerning the distances from individual sites to facilities / areas where material can be disposed of. THN may only advise on request if time and circumstances allow. For information on example disposal locations closest to the sites and associated approx. disposal costs, please consult SOW SIDP Annex's B, E and H.

14.12. Hazardous Material Disposal

- 14.12.1.** Disposal of any material, but not limited to, containing Asbestos or hazardous chemical materials is THN's responsibility.

14.13. Buried Utilities and infrastructure

- 14.13.1.** The Contractor shall request from the THN plans of all current buried utilities and infrastructure and where it is deemed necessary shall carry out additional surveys to identify and confirm that existing buried utilities and infrastructure are in line with those already provided by the THN. Any additional buried utilities or infrastructure found shall be reported to the THN. Repair and associated costs for any subsequent damage to THN buried utilities and infrastructure caused by the Contractor or its sub-Contractors shall be the responsibility of the Contractor.

14.14. Explosive Ordnance and Munitions

- 14.14.1.** There is a very low risk of any unexploded munitions or ordnance being found, or other explosive remnants from military and/or non-

military activities. However, in the event this occurs, the Contractor will be legally bound to report that fact to the local THN authorities at the earliest opportunity. Subsequent disposal, once the site has been secured in line with national safety protocols and procedures, will be conducted by THN Explosive Ordnance Disposal (EOD) personnel.

14.15. Equipment Installation

- 14.15.1.** The equipment shall be installed and integrated by the Contractor at the thirteen (13) radio site locations and DLOS locations where the equipment will have been delivered according to the SSS and SRS Tech Annexes A, D and G of this SOW.

14.16. Interfaces

- 14.16.1.** The Contractor shall provide the detailed equipment power budget and interface requirements in the SPDP (see SOW Section 14, para 14.8 above) and define the appropriate power supply and interface requirements.
- 14.16.2.** The Contractor shall specify the equipment heat load in the SPDP (SOW Section 14, para 14.8 above) and define the appropriate cooling capacity required for cooling of the equipment area, comparing that to the existing HVAC capacity as present on the sites.

14.17. Installation Workmanship / Techniques

- 14.17.1.** It is the Contractor's responsibility to properly connect equipment, provided under this Contract, to ground and earth systems installed either by the Contractor or by THN. The grounding and earthing connections shall be executed in accordance with THN safety regulations and respective NATO CIS Security Requirements.
- 14.17.2.** The Contractor shall supply all the necessary material, labour and support equipment required to meet the specifications in the Contract.
- 14.17.3.** All materials and equipment supplied by the Contractor shall be installed in strict conformity with the manufacturer's instructions and as specified by the relevant drawings and specifications.
- 14.17.4.** The installation work is to be carried out by personnel specifically qualified for this kind of work.
- 14.17.5.** The Contractor shall comply with all local installation guidance and safety regulations. Especially, all the electrical works that have been performed by the Contractor shall be compliant with requirements set forth in IEC-60364, Part 4, Chapter 41 ("Electrical installations of buildings, Protection for safety, Protection against electric shock").
- 14.17.6.** Cables shall be segregated according to the signals being transferred (e.g. power cables shall be separated from signal cables). Power and

signal cables connected to the equipment that may process any classified data shall be isolated in accordance with the requirements stipulated in the documents referred to in SOW SECTION 4 (para 4.1.1 specifically references g and h).

- 14.17.7.** In order to minimize emission of fume and/or acid gas in case of fire, use of Low Smoke and Fume (LSOH-low smoke halogen free) cables is required (IEC 60332:2020 SER, IEC 60754 series, IEC 62821 series and ASTM E662-21 apply or THN equivalent).

14.18. Civil Works at Radio Sites

- 14.18.1.** Antenna Field preparation and installation of HF, UHF and LOS antennas shall be in accordance with the requirements laid out in SOW SRS (Tech) Annexes A, D and G Sections 4.6 to 4.8 as well as SOW (SRS (CW) Annexes C, F and I.

SECTION 15 DOCUMENTATION

15.1. General

- 15.1.1.** The Contractor shall provide programme and technical documentation as covered in the various Sections of this SOW. The Purchaser will review the documentation and will provide comments to the Contractor in line with SSS (unless specified otherwise in this SOW, or agreed between Purchaser and Contractor).
- 15.1.2.** The documentation consists of, but not limited to, the following main functional groups:
- a. Project Management Documentation (as per Section 2);
 - b. System Design and Engineering Documentation (as per Section 4) including System Acceptance Documentation (as per Section 13) and Civil Works (CW) Documentation (as per Section 14);
 - c. System Security Documentation (as per Section 5);
 - d. Quality Assurance Documentation (as per Section 6);
 - e. Configuration Management Documentation (as per Section 7);
 - f. Integrated Logistics/Product Support Documentation and Technical Manuals (as per Section 9 and Section 10)
 - g. Site Preparation and Installation Requirements/Civil Works (as per Section 14);
 - h. Documentation (as per Section 15);
 - i. Training Documentation (as per Section 16).

15.2. Liability and Amendments

- 15.2.1.** The Contractor shall be the responsible authority for the issue, control, and distribution of amendments to delivered documentation in the format provided for the associated equipment or system until expiration of the warranty period.
- 15.2.2.** The Contractor shall apply as reference the documentation mentioned in this SOW for each relevant delivery.
- 15.2.3.** Two (2) weeks after receipt of the Purchaser's comments, the Contractor shall answer and propose a solution to the comment issues for Purchaser's agreement. The amended version of the relevant delivery shall incorporate all Purchaser amended comments as per agreement.
- 15.2.4.** The Contractor shall propose the status of Purchaser's comments. The status of Purchaser's comments will be:
- a. Open: the Contractor has received the comment;

- b. On Going: the Contractor is asked to work or re-work the Purchaser's comments;
- c. Request for closure: the Contractor proposes solution to the comment issue;
- d. Closed: the Purchaser accept the proposed solution to comment issue.

15.2.5. The Contractor shall be the liable for the data coherence provided through all media (hard copy format and soft copy format) and standards required (e.g.: S1000D, S2000M, S3000L) until expiration of the warranty period.

15.3. Documentation Submission Plan

15.3.1. The Contractor shall prepare and maintain a complete record of all documentation required under this Contract. The document record will be required to be submitted as part of the documentation and shall be continuously updated throughout the life of the Contract to reflect the current status of all documents.

15.3.2. The Contractor shall also maintain version control of all documentation submitted throughout the project life cycle.

15.3.3. The Contractor shall deliver contractual documentation as specified in the table below, and in the SSS. This list does not waive the Contractor from delivering any of the documentation items specifically covered by the Contract and Purchaser-approved PIP.

15.3.4. For the purposes of the Documentation Submission Plan Table below, the definitions for Delivery Timelines is as follows:

- a. Draft. (version 0.1) To be submitted to the Purchaser for review no later than 30 days prior to the SSS delivery date. The Contractor should be aware that should the Purchaser deem the document deliverable not to be of sufficient standard/quality then it will be rejected without any further review by the Purchaser. Any associated costs as a result of re-work/delays to document delivery due to poor quality/standard will be bourne by the Contractor.
- b. Initial Version. The initial versions shall be delivered by the Contractor (version 0.2) to the Purchaser no later than one week after receiving the Purchaser's comments.
- c. Final Version. The Final versions shall be delivered by the Contractor (version 1.0) to the Purchaser in line with the SSS where additional updates are required from the PSA date in preparation for FSA.

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Document	SOW Reference	SSS Reference (CLIN)	Delivery Timelines (EDC +)			Update
			Draft	Initial Version	Final Version	During CLS
Project Implementation Plan (PIP)	SOW 2.3		20 weeks	24 weeks	26 weeks	
Project Checkpoint Reports	SOW 2.4		As required	As required	As required	
Project Progress Reports	SOW 2.5		As required	As required	As required	
Site Survey Reports	SOW 14.7		15 weeks	N/A	18 weeks	
Site Preparation Data Package (SPDP)	SOW 14.8		20 weeks	N/A	24 weeks	
Site Installation Specifications (SIS)	SOW 14.9		55 weeks	N/A	59 weeks	
Technical Design Reports (System Requirements Review) (SRR)	SOW 4.11		20 weeks	24 weeks	26 weeks	
Interface Control and Management Documents	SOW 4.11		24 weeks	PDR's	58 weeks	
Detailed Design Specifications (DDS)	SOW 4.11		PDR's	56 weeks	58 weeks	
Technical Design Reports (Preliminary Design Review) (PDR)	SOW 4.11		34 weeks	PDR's	40 weeks	
Technical Design Reports (Critical Design Review) (CDR)	SOW 4.11		53 weeks	56 weeks	58 weeks	
FAT Test Procedures	SOW 12.3		76 weeks	N/A	80 weeks	
FAT Functional Configuration Audit	SOW 12.3		N/A	FAT's	FAT's + 2 weeks	
FAT Test Reports	SOW 12.9		N/A	N/A	FAT's + 2 weeks	
RSAT Test Procedures	SOW 12.7		RSAT – 13 weeks	N/A	RSAT – 3 weeks	
RSAT Report(s)	SOW 12.9		N/A	N/A	RSAT's + 2 Weeks	
Configuration Management Plan (CMP)	SOW 7.2		6 Weeks	PDR	CDR	Yes
Configuration Baselines (FBL, ABL, PBL, OBL)	SOW 7.8		As required	As required	As required	Yes
Configuration Status Accounting Report	SOW 7.5		As required	As required	FSA	Yes

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Document	SOW Reference	SSS Reference (CLIN)	Delivery Timelines (EDC +)			Update
			Draft	Initial Version	Final Version	During CLS
PCA and FCA Report	SOW 7.6		CDR	PSA-6 weeks	PSA-4 weeks	N/A
Configuration Management Database	SOW 7.7		As required	As required	FSA	Yes
Integrated Logistics Support Plan (ILSP)	SOW 9.2		6 Weeks	PDR	CDR	N/A
Reliability Availability Maintainability Testability (RAMT) Case Report	SOW 8.2		6 Weeks	PDR	CDR	N/A
In Service Support Plan	SOW 11.1		CDR	PSA	FSA	N/A
Contractor Logistics Support (CLS) Plan	SOW 11.1		CDR	PSA	FSA	Yes
Technical Publication Development Plan (TPDP)	SOW 10.1		6 Weeks	PDR	CDR	N/A
Writing Style Guide (WSG)	SOW 10.1		6 Weeks	PDR	CDR	N/A
Parts Obsolescence Management Plan	SOW 9.6		6 Weeks	PDR	CDR	Yes
Diminishing Manufacturing Sources (DMS) Report	SOW 9.6		CDR	PSA-8 weeks	FSA-8 weeks	Yes
Repair Price List	SOW 11.1		CDR	PSA	FSA	Yes
Support Case	SOW 8.6		6 Weeks	PDR	CDR	N/A
Packaging, Handling, Storage and Transportation (PHST) Documentation	SOW 9.7		As required	As required	As required	Yes
Recommended Spare Parts List (RSPL)	SOW 9.6		6 Weeks	PDR	CDR	N/A
Recommended Consumable Items List (RCIL)	SOW 9.6		6 Weeks	PDR	CDR	N/A
Recommended Tools and Test Equipment List (RTTL)	SOW 9.6		6 Weeks	PDR	CDR	N/A
System Inventory	SOW 9.6		As required	As required	As required	Yes
Software Distribution List (SWDL)	SOW 9.6		As required	As required	As required	Yes
User Manuals	SOW 10.4		SAT-8 weeks	PSA-8 weeks	FSA-8 weeks	Yes
Maintenance Manuals	SOW 10.4		SAT-8 weeks	PSA-8 weeks	FSA-8 weeks	Yes
As-Built Drawings	SOW 10.4		SAT-8 weeks	PSA-8 weeks	FSA-8 weeks	Yes
OEM Technical Manuals	SOW 10.4		SAT-8 weeks	PSA-8 weeks	FSA-8 weeks	Yes
Training Needs Analysis (TNA) Report	SOW 16.2		6 Weeks	PDR	CDR	N/A

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Document	SOW Reference	SSS Reference (CLIN)	Delivery Timelines (EDC +)			Update
			Draft	Initial Version	Final Version	During CLS
Training Plan	SOW 16.3		PDR	CDR	SAT-8 Weeks	N/A
Training Course Materials (including CBT)	SOW 16		CDR	Training-12 Weeks	Training- 4 weeks	Yes
Training Report	SOW 16.23		CDR	Training + 2 weeks	Training + 4 weeks	Yes
Deficiency Summary sheets and Clearance Report	SOW 13.5		N/A	N/A	PSA	N/A
Logbooks (part of PSA)	SOW 13.6		N/A	N/A	PSA	N/A
Provisional System Acceptance Report (PSAR)	SOW 13.6		N/A	N/A	PSA	N/A
Deficiency Summary sheets and Clearance Report (update)	SOW 13.10		N/A	N/A	FSA	N/A
Final System Acceptance Report (FSAR)	SOW 13.11		N/A	N/A	FSA	N/A

15.4. Documentation Acceptance Process

- 15.4.1.** All documentation is subject to Purchaser approval.
- 15.4.2.** All documentation is to be free of company logo's as well as any disclaimers,
- 15.4.3.** Documentation shall be distributed as follows:
- For all documents unless otherwise instructed: an electronic copy to the Purchaser's Project Manager,
 - For contractual documents: in addition to one hard copy and an electronic copy to the Purchaser's Contracting Officer
 - With the exception of contractual documents, an electronic copy to the Collaborative Environment.

Time/ Actors	T = 0	T+ 2weeks	T+4 weeks	T+5weeks	T+6weeks	T+7weeks
Contractor	Submit Document to Purchaser		Update Document based on Purchaser comments		Further updates, if required	
Purchaser		Review & send comments if any to Contractor; otherwise accept		Accepts updated documents, or further comments, which should be minor if the first set of comments have been addressed		Accepts updates if updates have been incorporated

- 15.4.4.** "One week" and multiples thereof shall be understood as 5 working days, Monday - Friday. This mainly applies to the period of Purchaser's review of a document, from the time the document is uploaded or delivered by the Contractor and vice versa.
- 15.4.5.** Approval of a document or other deliverable shall not be interpreted to imply any Purchaser endorsement of the content. It shall remain the sole responsibility of the Contractor to meet the full system performance requirements and to prove such performance through the regime of testing and other assurance mechanisms set forth in the Contract and it shall be the sole responsibility of the Contractor to remedy any performance shortfall in the event of any identified deficiency in terms of the contract functional and/or performance requirements. The Contractor's responsibility in this regard extends beyond FSA through warranty, responsibility for any latent defects.
- 15.4.6.** All the documentation within the scope of this project shall be consistent in terms of content. Any inconsistencies that are detected between documents at any time until the end of this project shall be corrected upon Purchaser notification.
- 15.4.7.** The Contractor shall provide a first draft (version 0.1) of each deliverable for Purchaser review by the date specified in the Schedule of Supplies and Services or as agreed between the Purchaser and Contractor.
- 15.4.8.** The first draft shall be substantially complete and correct, and delivered in accordance with the delivery dates specified in the Work Package and the Schedule of Supplies and Services. To ensure the completeness and correctness, the Contractor shall complete the internal review cycle between the related functions before presenting a version to the Purchaser.
- 15.4.9.** The Purchaser reserves the right to return without review a document that has significant deficiencies.
- 15.4.10.** The Contractor shall not rely on the Purchaser review to fill in deficiencies or obtain missing Purchaser information.
- 15.4.11.** The Purchaser shall provide comments, corrections, and suggested changes to the Contractor within two weeks of receipt. However, if a set of documentation deliverables provided for review, then Purchaser will reserve the right to extend the review period accordingly.
- 15.4.12.** The Contractor shall resubmit the document as a revised draft incorporating the Purchaser's comments within two weeks after receipt, unless specified differently in the Work Package.
- 15.4.13.** The Purchaser shall provide comments, corrections, and suggested changes to the Contractor within two weeks of receipt, unless specified differently in the Work Package. If the Contractor submits more than one document (or 400 pages of content) for review at the same time, the Purchaser will reserve the right to extend the review period accordingly.

- 15.4.14.** The Contractor shall provide the Final (version 1.0) document within two weeks of receipt of the Purchaser's comments on the revised draft, unless specified differently in the Work Package.
- 15.4.15.** The Contractor shall include and integrate all document review and acceptance activities in the overall Project Master Schedule (PMS) of the PMP in the PIP.

15.5. Civil Works (CW) Documentation

- 15.5.1.** Whenever CW documentation is mentioned the definition shall also include documents concerning other devices, equipment and installation, provided by the Contractor as stipulated in SOW Section 14.
- 15.5.2.** The Contractor shall provide the various CW documentation as described in paragraphs mentioning CW in SOW Section 14. The documentation format shall be as described in SOW Sections 15, para's 15.1 to 15.8 as applicable.
- 15.5.3.** The CW documentation shall address and present graphically, in narrative form and in relevant tables, matrixes, part lists and calculations requirements as stipulated in the EN Eurocodes/THN Equivalent's and other listed below references (as applicable, including but not limited to):
 - a. Basis of structural design (EN 1990)
 - b. Actions on structure (EN 1991)
 - c. The design of concrete (EN 1992), steel (EN 1993), composite steel and concrete (EN1994), timber (EN 1995), masonry (EN 1996) and aluminium (EN 1999) structures
 - d. Geotechnical design (EN 1997)
 - e. The design, assessment and retrofitting of structures for earthquake resistance (EN 1998)
 - f. Construction Products Directive (COUNCIL DIRECTIVE 89/106/EEC), particularly Essential Requirement 1 "Mechanical resistance and stability" and Essential Requirement 2 "Safety in case of fire"
 - g. ISO Standards pertaining technical, construction and building drawings including relevant installations
 - h. ISO standards pertaining technical product documentation and document management
 - i. IEC 60617 – Graphical symbols for use in electro-technical diagrams
 - j. IEC 60417 – Graphical Symbols for Use on Equipment

- k. ISO 6790 – Equipment for fire protection and firefighting --
Graphical symbols for fire protection plans – Specification

15.6. As-Built Drawings

- 15.6.1.** As-Built Drawings (ABDs) shall be self-sufficient and independent of any other documents.
- 15.6.2.** There shall be a master list of As-Built Drawings provided for each site respectively.
- 15.6.3.** The master list of As-Built Drawings shall contain at the minimum the following information: site identification and the master list title, issue of the master list, and following data references for every listed drawing (ie. Ordinal number, number, title, issue, and number of sheets).
- 15.6.4.** The As-Built Drawings shall be compiled in a drawing package for each site respectively. The compilation shall be done against the ordinal numbers assigned to every drawing in the respective master list.
- 15.6.5.** The title of each drawing and each master list plus all included text and annotations shall be in English.
- 15.6.6.** The number and scale of each drawing (where applicable) shall be clearly indicated, in addition to the issue number of each drawing.
- 15.6.7.** Definition(s) may be given on the drawing, if used, or on a summary sheet(s) at the front of the document.
- 15.6.8.** All drawings shall be to a scale of not less than 1:50.
- 15.6.9.** As-Built Drawings shall cover the following where necessary:
 - a. Floor and wall plans to include the physical details of all installed equipment, apparatus and devices, plus CW modifications and new structures implemented by the Contractor.
 - b. The physical details of all installed equipment, apparatus, devices etc., if not visibly depicted due to the original scale of the drawing, shall be presented in an appropriate scale to enable clear identification as to their type and function. If applicable, narrative description are to be inserted.
 - c. All plans and drawings necessary to represent new buildings, refurbished buildings, antenna farms, antennas, masts, their foundations, associated cabling, ducting (with connections to equipment and devices provided as PFE), roads and other CW implemented by the Contractor in a correct and complete format.
 - d. Location plan with complete details of all cross-connection frames and patch panels.

- e. A plan showing the descriptions of all grounding and earthing conductors, electrodes and joints and where they are connected to any existing earthing system.
 - f. Physical details of all cable racking and cable numbers and cable functions to include as appropriate all connections, connectors and sockets.
 - g. Details covering all wiring termination points including wire numbers and colour coding, if applicable.
 - h. Ancillary equipment details to include, as appropriate, connection points and termination points.
 - i. The functions of all inter-connecting cables, with their codes, colour code and the function of each separate conductor.
 - j. Drawings showing only an axonometric view of any given piece of equipment are not acceptable. The drawings shall depict all the necessary interconnections, including an inside view of installed equipment and dimensions.
- 15.6.10.** A Purchaser approved “As-Built Product Drawings and Associated Equipment List” will be the basis upon which acceptance of site(s) installation and integration will be gauged.

15.7. Format for As-Built Drawings

- 15.7.1.** The As-Built Drawings (ABDs) shall be provided in electronic format (Autocat and PDF). Final versions of the ABDs shall be printed on no larger than A1 sized sheets of paper, if required by the Purchaser.
- 15.7.2.** A consistent numbering system for the ABDs shall be adopted that reflects the Contract, project, system, assembly and/or sub-assembly and sequence number.
- 15.7.3.** The scale of all ABDs shall be quoted where applicable.
- 15.7.4.** The appropriate NATO security handling classification shall be on the top and bottom of each drawing. In addition, each drawing shall also contain the security classification in the identification block of the drawing which is required to be located in the lower right hand corner.

15.8. Delivery and Verification of As-Built Drawings per Site

- 15.8.1.** Before the system is tendered for PSA, the Contractor shall deliver two complete sets of marked-up ABD packs.
- 15.8.2.** A joint review of the ABD documentation shall be conducted between the Purchaser, THN and the Contractor.
- 15.8.3.** Upon completion of the review the Contractor shall edit, produce and deliver the required number of copies of the final Draft version four (4)

weeks prior to conducting the formal PSA activities. The Final version of the ABD documentation shall be delivered at PSA.

- 15.8.4.** If changes to previously delivered documents have to be made, the Contractor shall deliver replacement drawings/schematic diagrams and/or aperture cards as appropriate.
- 15.8.5.** The Final version of the overall level ABD documentation will be required to be delivered at PSA as specified in the SSS, to each Radio Site.

15.9. Logbooks per Site

- 15.9.1.** From the start of each type of integration activity of the system, the Contractor shall keep a logbook of all events concerning that system through to FSA.
- 15.9.2.** In particular the logbook shall record all Contractor activity and equipment performance.
- 15.9.3.** All equipment failures, or parts replacements, shall be documented in the logbook with a traceable means to determine reasons for failure of the specific (serial numbered) equipment.
- 15.9.4.** The logbook shall be used as an input to assess the reliability of the equipment.
- 15.9.5.** All logbooks shall be periodically countersigned by the Purchaser's representative and a copy handed over to the Purchaser during FSA.
- 15.9.6.** The Contractor may retain the original logbook but is not to maintain a parallel equipment-related activity logbook or similar record for company use only.
- 15.9.7.** The Purchaser reserves the right to review the logbook at any given time during the project implementation. The logbook is to be presented for review, either during site visits, or sent to the Purchaser via email as a scanned PDF copy.

15.10. Hard Copy Format

- 15.10.1.** Technical Manuals (TM) shall be also issued in hard copy format
- 15.10.2.** Two releases of TMs shall be issued for each type of equipment with a draft version first (soft copy) followed by the final version (soft and hard copies).
- 15.10.3.** The Contractor shall submit copies of each manual (as specified in the SSS) to the Purchaser for review no later than two (2) months prior to the delivery of the system at the first site location. Any resulting recommended changes, corrections and/or additions submitted by the Purchaser shall be incorporated into the requisite number of copies of the Purchaser approved versions. The Contractor shall submit the manuals within the time frame as specified in the SSS.

- 15.10.4.** The Contractor shall deliver the approved copies of each manual at the time of FSA for all subsequent systems.
- 15.10.5.** The Contractor shall deliver hard copies of the Operators' Manuals as specified in the SSS separately for each SSSB Site.

15.11. Soft Copy Format

- 15.11.1.** Soft copies of all documentation, produced and compiled by the Contractor, shall be delivered in CD-ROM or DVD format to the Purchaser and THN and shall be compatible with the latest versions of the Microsoft Office ® software suite to ensure compatibility with previous versions. Microsoft Project and Adobe Portable Document Format (PDF) documents are to follow the basic naming convention of [SSSB-15577]-[title]-[date"yyyy.mm.dd"]-[version]-[originator].
- 15.11.2.** As-Built Drawings (ABDs) are required to be delivered in the software format, most typically AutoCAD, Visio and/or PDF formats.
- 15.11.3.** The physical support of the electronic, optical or soft copies shall display the highest level of the NATO security handling classification of its contents.
- 15.11.4.** The header and/or title of the directory structure of the documentation provided in soft copies shall bear a reminder of the highest NATO security handling classification level of its contents.
- 15.11.5.** For ease of handling, NATO unclassified documentation shall be separated from NATO classified documentation and provided on a separate CD-ROM or DVD, whenever possible.
- 15.11.6.** The Contractor shall deliver soft copies of the Operators' Manuals as specified in the SSS separately for each SSSB Site.

15.12. Language

- 15.12.1.** All documentation is to be provided in English to a minimum Level of 3333 in line with STANAG 6001 (Ed. 5) or higher (also refer to Section 2, para 2.2.5 of this SOW).
- 15.12.2.** The Contractor shall provide documentation affecting safety hazard and health protection matters in both English and the THN language.

SECTION 16 TRAINING**16.1. Training Programme**

16.1.1. The Contractor shall create, provide and maintain a training programme for all hardware, software and system level that will enable the Purchaser's/THN's personnel to gain the necessary skills and knowledge to test, operate and maintain (Level 1/2/3) the system and its support equipment.

16.1.2. For the training purposes, student groups shall include the personnel assigned for the following functions in the SSSB System, of which definitions and tasks are set forth in Annexes A, D and G of this SOW:

<i>Training Types</i>	<i>Student Groups</i>
Test Personnel	THN and/or Purchaser Personnel (Test Witnesses)
System Operation Training(including non-CIS equipment/systems)	THN and Purchaser Personnel (System Operators)
System Maintenance and System Administration Training (including non-CIS equipment/systems)	THN and Purchaser Personnel (System Technicians)
Train the Trainer Training	THN and Purchaser Personnel (Trainers/Instructors)
Site Transition Training	THN Personnel (Local personnel)

16.1.3. The training programme shall consist of the appropriate courses and course modules, supporting the required levels of knowledge and quantities of students to be trained. It is the sole responsibility of the Contractor to assure that all training, provided at the different levels outlined below, allows for control, operation and maintenance of the SSSB system in accordance with the expected operational requirements and maintenance concept:

Required level of knowledge:	Test Personnel	Operators	Maintainers	Trainers
SSSB System Functionality	Y	Y	Y	Y
SSSB System and Radio Maintenance	N	N	Y	Y
SSSB System Operations	N	Y	N	Y

Maximum amount of students to be trained	THN UK/ Purchaser	THN GRC/ Purchaser	THN NLD/ Purchaser
Operators	12	12	12
Maintainers/System Administrators	12	12	12
Trainers/Instructors	12	12	12
Test Personnel	12	12	12
Local Site Personnel*	4	4	4

* Estimated number shall be considered as per installation site.

16.1.4. The Contractor shall design, develop, deliver and maintain the following types of training, as approved base on the outcome of Training Needs Analysis (TNA):

- a. Classroom Training
- b. On the Job Training
- c. Computer Based Training (CBT)

16.1.5. As part of the system implementation, the Contractor shall provide on-site training to all support staff designated by the THN Site PoC and on all tasks required to operate, maintain and recover the system.

16.1.6. The Contractor shall provide each training session for a maximum of 6 persons per session, unless otherwise approved by the Purchaser.

- 16.1.7.** The Contractor shall use the Training Needs Analysis (TNA) to refine the number of training sessions needed for each role.
- 16.1.8.** The Contractor shall deliver any additional training sessions that may be deemed necessary after completion of TNA at no additional cost to the Purchaser.
- 16.1.9.** Training Courses shall be completed before the PSA milestone, with the exception of the Test Crew trainings which shall be provided before the official test events start.

16.2. Training Needs Analysis (TNA)

- 16.2.1.** The Contractor shall base the Training Process and Procedures on the results of the Contractor's TNA.
- 16.2.2.** The Contractor shall detail its approach and planning on how the TNA process will be performed and managed within its Training Plan.
- 16.2.3.** The Contractor shall conduct a TNA in accordance with the [BiSC D-075-007, 2015]. The TNA shall include (as a minimum):
 - a. A Target Audience Analysis
 - b. A Performance Gap Analysis
 - c. A Difficulty, Importance and Frequency (DIF) Analysis;
 - d. A Training Delivery Options Analysis
- 16.2.4.** The Contractor shall base the TNA on the tasks resulting from Task Analysis carried out as part of the LSA Process and on the possible gaps highlighted during the site surveys (so called Target Audience Analysis).
- 16.2.5.** The Contractor shall ensure the TNA considers all assigned staff roles involved in SSSB UK-GR-NL (System operation, administration, maintenance and support at all levels).
- 16.2.6.** The Contractor shall identify the eventual prerequisite of the personnel for training participation as part of the TNA.
- 16.2.7.** The Contractor shall perform the TNA and create the courses as applicable for different types of System operation, administration, maintenance and support at all levels as they are assigned within Purchaser organization.
- 16.2.8.** The Contractor shall deliver a TNA Report that captures the results of the TNA for Purchaser approval. The TNA report shall include the following:
 - a. A description of the TNA approach and activities
 - b. An account of the operation, support, corrective and preventive maintenance tasks considered in the TNA

- c. The results of the Target Audience Analysis, the Performance Gap Analysis the DIF Analysis and the Training Options Analysis
- d. The final list of Performance Objectives in the form of Table 2 of Annex H of [BiSC D-075-007, 2015].
- e. The final list of Learning Objectives in accordance with Annex G of [BiSC D-075-007, 2015].
- f. One or more Course Control Document II – Course Proposals in accordance with Annex L of [BiSC D-075-007, 2015] as summaries of the proposed E&IT solutions

16.2.9. Hands on training for Operators and Maintainers shall be carried out at the radio sites.

16.3. Training Plan

16.3.1. General/Aims

16.3.2. The Contractor shall develop and provide a SSSB System Training Plan in accordance with the requirements outlined in this Section of the SOW in a format that subject to approval by the Purchaser. The Training Plan shall be updated based on the results of the TNA.

16.3.3. The Final version of the Training Plan, as accepted by the Purchaser, shall be delivered in line with the SSS and before start of any training, and shall be the official document against which the Contractor is expected to conduct the training.

16.4. Training Approach

16.4.1. The Contractor shall describe in this plan the approach to training, milestones, organization and resource requirements, management structure, inter-relationships and other tasks related for training development.

16.4.2. The Contractor shall recommend in this plan the mode(s) of training (e.g., formal classroom, individual computer-based, on-the-job, commercial or a combination) and the rationale for these recommendations for each type of training (User , Administrator, etc.).

16.4.3. Where commercial courses are proposed, the Training Plan shall include as much of the information required in paragraphs below together with a justification for the use of commercial courses.

16.4.4. The Training Plan shall provide information on the training to be provided to THN personnel. The training plan shall identify appropriate courses or course modules necessary to provide initial training for all initial site personnel and to meet specific training requirements to test personnel, THN instructors and software support site personnel. The Contractor will be required, if feasible, to consolidate instructors from all sites onto a single set of courses and provide options to consolidate

system managers training. The Plan shall include the following information for each course:

- a. Course description. This shall be a narrative explanation of the subject matter of the specific course. The course format, objectives, and training materials shall be described in sufficient detail to ensure the students will receive the required level of training. A proposed syllabus shall be included detailing the subject matter to be covered. Any breakdown into modules shall be described in detail.
- b. Student prerequisites (if required).
- c. Course length (including time devoted to each area of the course).
- d. Method of presentation for each element of the syllabus (showing a breakdown of methods, i.e. lecture, demonstration, hands-on and directed study, etc.).
- e. Method of evaluation. Establish minimum acceptable written and performance standards and a method of evaluation of directed study. A plan shall be included to verify that each student achieved at least the minimum course objectives through written and performance tests.
- f. List of training materiel and training equipment required (Contractor-provided documents or materiel shall be included). This shall include the appropriate standards for electronic data.
- g. Description of the minimum training equipment capability requirements together with the logistic support requirements associated with use of the training equipment.
- h. Recommended maximum size of course. Recommended location of training and type of facility required (classrooms, auditorium, facilities, etc.).
- i. List of measurable objectives (tasks) required by graduates to demonstrate successful completion of course.
- j. Proposed training course schedules.
- k. Inter-dependencies with other related programme milestones and to the test and evaluation schedules.
- l. Number of hours of hands-on training to be provided to each student

16.5. Training Need Analysis Considerations

- 16.5.1.** The Contractor's Training Plan shall take the TNA results into consideration, and based on the TNA results it shall propose the specific courses for all maintenance levels and operation.

16.6. Training Resources/Support

- 16.6.1.** The Contractor shall develop and provide a Training Plan that describes the support to be provided by the Purchaser (manpower, services, and material).
- 16.6.2.** The THN will provide the following basic facilities: room, power supply, tables, chairs, network connectivity. The Contractor shall provide all other facilities, services and equipment (including servers and workstations for students and teachers, network equipment, all required software, etc.) necessary to carry out the On-Site Training activities.
- 16.6.3.** The Contractor's Training Plan shall describe the basic physical classroom and infrastructure required to perform the training in Purchaser locations.
- 16.6.4.** THN will provide the necessary facilities (i.e. training room) and support equipment for training (i.e. a VGA Projector and screen, white board with white board markers and the availability of a photocopier machine) as stated in the approved Training Plan.

16.7. Training Schedule

- 16.7.1.** Training shall be conducted and completed before each site activation and/or PSA.
- 16.7.2.** The Training Plan shall contain a training schedule that shall be in the form of a course block time table, showing the sequence of periods of instruction.
- 16.7.3.** In addition to the required information for each course, the Training Plan shall include the proposed training schedule for each site, indicating the courses or modules required for each trainee and optimising the trainees' learning and attendance requirements. The Plan shall also show the overall training schedule, and demonstrate that sufficient resources and redundancy (such as instructors, training facilities and training equipment) will be provided for each course.

16.8. Training Documentation

- 16.8.1.** The Contractor shall develop and provide a Training Plan that describes the training documentation for each course including but not limited to the syllabuses, schedules, course pre-requisites (both for attendees and physical resources), course descriptions and training materials, method of evaluations and instructors.

16.9. Course Structure/Syllabus

- 16.9.1.** Each block shall show the lesson title and its assignment as: classroom, hands-on equipment, CBT and/or testing.

- 16.9.2.** The Training Plan shall furthermore contain a course syllabus providing the following information:
- a. Course title;
 - b. Security classification;
 - c. Total duration in hours for each course
 - d. Total duration in hours (see para Section 16, para 16.6.2 below);
 - e. Course objectives;
 - f. General course information;
 - g. Training equipment or special equipment/tools requirements including those support equipment to be provided by the THN (e.g. VGA projector and screen, white board, copy machine, etc.);
 - h. Maximum number of student working positions;
 - i. Classroom requirements.

16.10. E-Learning Training / Computer Based Training (CBT)

- 16.10.1.** The Contractor SHALL prepare all e-learning training material in compliance with the Sharable Content Object Reference Model (SCORM) edition 2004.
- 16.10.2.** All e-learning material prepared by the contractor should be compatible and deliverable on the NATO Advanced Distributed Learning (ADL) platform.
- 16.10.3.** The Contractor SHALL produce CBT/E-Learning material that complements classroom and/ or hands on training by defining and explaining key concepts and terminology of the operational processes as incorporated into the delivered capabilities features and functions.
- 16.10.4.** The Contractor SHALL produce a CBT/E-Learning Package that allows modifications by the Purchaser to reflect changes in the training concept and/or content without any additional cost to NATO.
- 16.10.5.** The Contractor SHALL produce a CBT/E-Learning Package to provide the system administrators with a generic view of the system functionalities, operational aspects, troubleshooting and maintenance.

16.11. Training for Operators:

- 16.11.1.** The Contractor shall conduct training for the SSSB Operator personnel. The related training material shall be delivered in accordance with the SSS of the project.
- 16.11.2.** The training shall cover all aspects required to configure and operate radio communication equipment and software functionality within the SSSB System and any of its sub-systems. It shall include as necessary control aspects for all operational features of hardware, firmware and software of the system.

- 16.11.3.** After training, the Operators shall be able to operate the SSSB system at their locations within the THN.
- 16.11.4.** The Contractor is to recommend the number of courses required to be held for training of operator personnel. All training shall be held at locations within the THN as agreed with the Purchaser.
- 16.11.5.** Exact dates for the courses shall be mutually agreed by the parties and shall be consistent with the requirements of the SSS.

16.12. Training for Maintainers:

- 16.12.1.** The Contractor shall conduct training for the SSSB Maintenance personnel. The related training material shall be delivered in accordance with the SSS of the project.
- 16.12.2.** The training shall cover all aspects required to install, dismantle, configure, maintain and troubleshoot the system and any of its sub-systems. It shall include as necessary control aspects for all hardware, firmware and software maintenance aspects.
- 16.12.3.** After the training, the maintainers shall be able to configure, maintain, troubleshoot, provide failure isolation and hands on training for the respective hardware, firmware and software of the system at the locations within the THN.
- 16.12.4.** The Contractor is to recommend the number of courses required to be held for training of operator personnel. All training shall be held at locations within the THN as agreed with the Purchaser.
- 16.12.5.** Exact dates for the courses shall be mutually agreed by the parties and shall be consistent with the requirements of the SSS.

16.13. Train the Trainer Training:

- 16.13.1.** All Instructors (Instructors for Operator training, and Instructors for Maintenance training) shall be provided with all the training courses (i.e. operation, maintenance, site transitioning).
- 16.13.2.** Additionally, the Contractor shall train the Instructors with the courses specific to the creating, modifying, updating the training package in terms of format and content including the points related to the teaching and learning criteria.
- 16.13.3.** The training shall include all the required control aspects as well as all operational, hardware and software maintenance aspects.
- 16.13.4.** The Contractor shall certify that, after the training, instructors are able to perform the Operators and Maintainers training courses for personnel.

16.14. Site Transition Training:

- 16.14.1.** The Contractor SHALL ensure the Transition Training provides all necessary information for on-site Purchaser personnel to understand the system and its components, installation, connections and wirings, system components, preventive maintenance tasks, system shut-down and restart, disaster recovery, corrective maintenance tasks (e.g. troubleshooting, removal/replacement, software installation), system safety and configuration system back-up procedures,.
- 16.14.2.** This training SHALL aim to enable the on-site transition to operations for each site, and therefore it may have certain commonalities with the 'Systems Operations' and 'System Administration and Maintenance' training.

16.15. Duration of Training courses

- 16.15.1.** For all training courses, the Contractor shall recommend the course length in the submitted Training Plan which will be subject to Purchaser approval and acceptance.
- 16.15.2.** The Contractor shall assume that the daily course instruction shall not exceed six (6) hours per day.
- 16.15.3.** Courses shall only to be scheduled on normal working days and not on weekend or public holidays.

16.16. THN Personnel Qualifications

- 16.16.1.** It is the responsibility of the THN to assure that the students meet the requirements for training attendance.
- 16.16.2.** The training of THN personnel shall be developed on the assumption that they are military operators with a minimum electronics and/or IT background.

16.17. Contractor Instructors

- 16.17.1.** The qualification of the Contractor Instructors shall be provided as part of the Training Plan, for Purchaser approval. Contractor Instructors shall be certified engineer/technicians, and thoroughly familiar with the subject matter. They shall have proven experience in preparing and conducting training in similar systems. Experience of the selected Contractor Instructors shall be proven within through provision of CV's and provided for Purchaser approval. Purchaser will reserve the right to reject a candidate, and request alternatives.
- 16.17.2.** The Instructors shall meet a minimum of SLP 3333 in English corresponding to the NATO STANAG 6001. Because the students will be THN personnel, the Instructor shall be obliged to use easily understandable English.

16.17.3. All instructors shall have a security clearance of “NATO S****T”.

16.18. Training Documentation

16.18.1. Training material is to be designed and developed in such a way to be suitable for use during the Contractor-conducted training and for the training of all categories of future replacement personnel by THN Instructors.

16.18.2. The package shall include the following capabilities as a minimum:

- a. Definition of the final training objectives;
- b. Emulation of real equipment behaviour;
- c. Choice between mandatory and optional lessons, steps and points as determined by course entrance tests;
- d. Topics to be covered for each lesson, step and point;
- e. For each topic, video clips, animation, still photos and tests as necessary for the full explanation of the topic;
- f. Exercises for every lesson;
- g. Test at the end of every lesson;
- h. Results of the tests per lesson and per course;
- i. Evaluation of the quality of the course by relating the test results to the course objectives through cumulative statistical analysis.

16.18.3. The Contractor shall make maximum use of the results of the TNA and available technical manuals for the preparation of training material.

16.18.4. Training material shall not duplicate any information readily available in other documents unless justified by specific training needs and shall adhere to documentation standards set out in SOW Section 15 above.

16.18.5. The Contractor shall ensure the materials follow an existing instructional methodology that links training objectives with course structure, instructional techniques, course content, and assessment tools.

16.18.6. The Contractor shall include in the training presentation materials, all slides or other information to be presented by the instructor during the course.

16.18.7. The Contractor shall provide student training handbooks, training syllabus, course description, quick reference card, training certificate and course evaluation feedback form for each training course.

16.18.8. The training handbook shall be used as the student's main working document.

16.18.9. The training handbook shall provide the student with the necessary information on all lesson objectives and contents, guidance for all

course learning activities and cross-references to assist the students in achieving the course objectives.

- 16.18.10.** An instructor guide shall be provided as a compliment to the training handbook.
- 16.18.11.** The instructor guide shall contain all the necessary information to prepare, conduct and evaluate lessons, exercises, examinations and their corresponding answer sheet. This shall include fault-finding or fault-isolation exercises and classroom or practical examinations with the associated answers.
- 16.18.12.** The documentation shall contain sufficient instructions to guide students through all specified training. Existing manufacturer's training and service manuals, preferably in electronic format, can be used in so far as they meet the specified course requirements. The training documentation should be for students with the pre-requisite knowledge on similar equipment or relevant theory, use of general electronic test equipment and a basic knowledge of hand tools. Training documentation stored in an electronic database shall meet the requirements set forth in the Contract SOW and Procurement Specification(s), ensuring that the areas discussed below are accessible and completely detailed. Instructions shall be provided on how to electronically access database information.
- 16.18.13.** The Contractor's format will be subject to Purchaser approval. The material for each course or module shall include a table of contents. This shall include a listing of all major subjects and the page number or image on which they appear, or instructions on how to electronically access the data.
- 16.18.14.** For each course, the training documentation shall consist of course documentation for trainees and instructor material to support a training programme. The training documentation shall cover, as a minimum, all the topics identified in the course syllabuses included in the Training Plan.
- 16.18.15.** All training material prepared and delivered under this Contract shall be subject to review and approval by the Purchaser.
- 16.18.16.** The Contractor shall deliver the following documentation for each type of training to the Purchaser in advance and with sufficient time for review. This will allow for coordination and negotiation of any necessary changes in the early stages of development of the material:
 - a. A representative lesson plan from each of the proposed training handbooks;
 - b. The corresponding Sections from the Instructor Guide;
 - c. Any proposed teaching aids.
- 16.18.17.** The Contractor shall subsequently submit two complete sets of Draft training material (electronic format only) in line with the SSS and

before the start of the first training course to permit the Purchaser to review.

16.18.18. The Contractor shall deliver the final version of the training material to the Purchaser in line with the SSS and prior to the start of the first training course.

16.18.19. The course material shall be designed to guide the students in obtaining the required skills through the training programme. The course material shall provide adequate information about the Sections listed below. Relevant Sections shall include a number of exercises to evaluate student understanding of information provided in that Section. Each Section may refer the student to other supplementary written and/or audio-visual material (e.g. charts, CD/DVD material, video, or other commercially available electronic media), which shall be included in the training package. Course material shall include the following Sections, as appropriate.

- a. General information about the system, software or equipment for which the training will be carried out.
- b. Required Material. Data indicating all equipment and material required by the student, including test equipment, audio-visual material, tools, and supplies.
- c. Installation and preparation instructions.
- d. Operating information, covering all personnel who interface with the system concerned, during all phases of its use.
- e. Technical description.
- f. Hardware Maintenance, covering routine inspections and adjustments, preventive maintenance and corrective maintenance (troubleshooting and repair) at relevant maintenance levels.
- g. Software Maintenance covering system recovery following software problems on-site and in-depth adaptive, perfective and corrective software maintenance at the responsible support site.
- h. System Management, including the system manager functions and all other specialised areas, such as security, database, network and communications management.
- i. Reference data.

16.18.20. Training and all related training documentation shall be provided in the English language at level 3333 in line with STANAG 6001 (Ed. 5) or higher (also refer to Section 2, para 2.2.5 of this SOW).

16.18.21. Instructor Material

16.18.22. Guidance for Instructors shall be provided with guidance including:

- a. Student exercises including all answers and other marking guidance.

- b. Descriptions of points where instructor involvement, observation, or action is necessary or recommended to ensure safety or verify student performance.
- c. Instructional system, module and equipment malfunctions to be introduced by the instructor and diagnosed and repaired by the student. A minimum of five (5) malfunctions is required for each separately identifiable system, module or circuit. The malfunctions should approximate as nearly as possible, problems likely to occur, and may consist of a combination of system maladjustments and bad components. The list of malfunctions are to include but not be limited to:
 - i. Actions required by instructors to install malfunctions and are to include exact components or modules to be replaced or adjusted.
 - ii. Description of symptoms caused by malfunctions.
 - iii. Test equipment and tools required to detect and isolate the malfunction, or procedures required to recover software functionality.
 - iv. Suggested allowable time for students to diagnose malfunctions.

16.19. Trainer Presentation

- 16.19.1.** The Contractor will be prepared to provide demonstration lessons, randomly selected by the Purchaser in order to provide evidence of the preparedness of the lessons and capabilities of the instructor.
- 16.19.2.** The Purchaser can require this demonstration at a mutually agreed time and location prior to the commencement of any formal training.

16.20. Quantities

- 16.20.1.** The Contractor is to deliver the following quantities of training documentation for each type of training. This is in supplement to what needs to be provided for each student (E= Electronic, P=Printed Version):

<i>Description</i>	<i>Draft Type</i>	<i>Printed Qty</i>	<i>Electronic Qty</i>
Instructor guide	Electronic	Printed (each Instructor)	Electronic (each Instructor)
Student handbook and Quick Reference Cards	Electronic	Printed (each student)	Electronic (each student)

<i>Description</i>	<i>Draft Type</i>	<i>Printed Qty</i>	<i>Electronic Qty</i>
Instructor guide for Train the Trainer	Electronic	Printed (each student)	Electronic (each student)
Student handbook for Train the Trainer	Electronic	Printed (each student)	Electronic (each student)
Syllabus and Course Description	Electronic	Printed (each student)	Electronic (each student)
Training Certificate	Electronic	Printed (each student)	Electronic (each student)
Training Course Evaluation Feedback From	Electronic	Printed (each student)	Electronic (each student)

- 16.20.2.** An additional soft copy of each type of training documentation is also to be provided in accordance with the provisions stated in SOW Section 15, para 15.11 above.

16.21. Training Assessment and Evaluation

- 16.21.1.** At least two calendar weeks prior to the start of a course the Contractor shall provide a written certification that all required/agreed training staff, facilities, equipment and other resources are ready and prepared to conduct the training.
- 16.21.2.** The Contractor is to submit to the Purchaser a course report written within two (2) weeks after completion of the course. This report shall contain:
- Course designator.
 - Course start date.
 - Course Completion date.
 - Names of attending students.
 - Student attendance and performance record.
 - Individual test results.
 - Student course critique.
 - Actions taken or recommended.
 - Problems encountered (if any).
- 16.21.3.** The performance record is to be based on the results of regular test(s) performed by the trainees during/after the training lessons to evaluate their understanding of the taught subject matter.
- 16.21.4.** The Contractor shall provide each graduate at the end of the courses with a personal certificate. One copy of each certificate is to be submitted to the Purchaser.

- 16.21.5. The Contractor is not to release students from the course without the prior approval of the THN's or Purchaser's representative.
- 16.21.6. The Contractor shall assume that the Purchaser can nominate up to two (2) members of the Project Team, NCI Agency or THN, to attend each course in a monitoring role; such attendees will be in addition to the planned course size.
- 16.21.7. The training is to be assessed through threshold knowledge test(s) for nominated personnel with a pass/fail criteria. If the total test results represent 50%, or more fail results, the Contractor is to report that fact to the Purchaser and THN and repeat the concerned lecture(s) at no additional costs.
- 16.21.8. The Contractor shall consolidate and forward student feedback to the Purchaser following each training course in the form of a Training Evaluation Report. The report shall also recommend changes and improvements to the training plan based on the consolidated student feedback.
- 16.21.9. The Contractor shall revise/refine and reissue course material and CBT products to reflect the consolidated student feedback and proposed improvements in the training evaluation report.

16.22. Trainee and Training Course Completion Report and Certificates of Training

- 16.22.1. Description Purpose: the Trainee and Training Course Completion Report provides the results and evaluation of training for presentation of each course carried out. Certificates of Training will be provided for each Trainee who completes the course satisfactorily.
- 16.22.2. Source documents: the applicable issue details of documents cited herein, including their approval dates and dates of any applicable amendments, notices and revisions are to be as specified in the Contract.
- 16.22.3. Format: The format of the completion report shall use Appendix C of MIL-STD-1379 and Section 16, para 16.1.3 above as guidance.
- 16.22.4. Content: The Completion Report and Certificates of Training shall contain the following:
- 16.22.5. Front matter: Content of the front matter shall use Appendix C of MIL-STD-1379 as well as in line with Section 16, Para 16.1.3 above as guidance.
- 16.22.6. Evaluation of Training: the Evaluation of Training shall consist of the following:
 - a. Name of Contractor. The name of Contractor shall be the complete name of the Contractor or sub-contractor conducting the course.
 - b. Instructor in charge.

- c. Course information consisting of:
 - i. Course title.
 - ii. Location of the course.
 - iii. Duration and dates of the course.
 - iv. Course aims and objectives.
 - v. System/equipment/software covered by the course.
 - vi. Grading system for the course (e.g. pass levels, distinction levels).
 - vii. Total number of trainees.
 - viii. Number of trainees achieving each grade
- d. Trainee's information consisting of:
 - i. Name of each Trainee.
 - ii. Rank/grade of each Trainee.
 - iii. Branch of service/agency and parent unit of each Trainee.
 - iv. Attendance information for each Trainee.
 - v. Individual and cumulative total grade in quantitative terms for each Trainee.
 - vi. Instructor's evaluation of each Trainee.
 - vii. Any specific certification required following training (e.g. for test operators).
- e. Instructor evaluation of training consisting of:
 - i. Considerations regarding course material, course presentation, value of training aids, tools and equipment, remarks and recommendations of overall course.
 - ii. All problems encountered during the conduct of the course, such as students without agreed pre-requisites, deficient subject coverage, equipment failures and documentation deficiencies. Recommendations for any supplemental training that may be required shall also be included.
- f. A Certificate of Training shall be completed for each trainee who satisfactorily completes the course. The certificate shall contain, as a minimum, the following:

- i. Name of organisation conducting the training;
- ii. Title of the course;
- iii. Subject matter, if not apparent from the course content;
- iv. Location where the course took place;
- v. Dates of the course;
- vi. Rank/grade of trainee;
- vii. Parent unit of trainee;
- viii. Statement of satisfactory (or better) completion of the course;
- ix. Any specific certification resulting from the course;
- x. Signature and name of responsible training officer.

SECTION 17 ABBREVIATIONS**17.1. List of Abbreviations used in this SOW****A**

"	inch
A/C	Analysis/Certification
ABD	As-Built Drawing
ACCS	Air Command and Control System
ACE	Allied Command Europe
ACMP	Allied Configuration Management Publication
ACP	Allied Communication Publishing
AD	Air Defence
ADLT	Average Delivery Lead Time
ADP	Automatic Data Processing
AECTP	Allied Environmental Conditions Testing Publication
AEW	Airborne Early Warning
AF&AD	Air Force and Air Defence
AFPL	Approved Fielded Products List
AI	Action Item
Ai	Inherent Availability
AIS	Automatic Identification System
ALDT	Administrative Logistics Delay Time
AMD	Amendment
AMDC2	Air and Missile Defence Command and Control
AMSG	Allied Military Security Guidelines
ANSI	American National Standards Institute
AOB	Any Other Business
AOR	Area of Responsibility
AP	Attaching Part
API	Application Programming Interface
AQAP	Allied Quality Assurance Publication.
ASL	Above Sea Level
ATDS	Airborne Tactical Data System
ATE	Automatic Test Equipment
ATO	Approval To Operate
AWACS	Airborne Warning and Control system

B

BCC	Buffer Control Centre
BCST	Broadcast
BER	Bit Error Rate
BIT	Built-In Test
BITE	Built-In Test Equipment
BLOS	Beyond Line-Of-Sight
BOD	Beneficial Occupancy Date

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BOS	Buffer Operational Server
BSCC	Buffer System Control Centre
C	
C[G]	Generic Consumables
C[NT]	Non-Technical Consumables
C[T]	Technical Consumables
C2	Command and Control
CALS	Computer-aided Acquisition and Logistic Support
CAOC	Combined Air Operation Centre
CAT	Computer Aided/Assisted Training
CC	Configuration Control
CCA	Circuit Card Assemblies
CCTV	Closed Circuit Television
CDO	Closed Door Operations
CDR	Critical Design Review
CD-ROM	Compact Disc Read Only Memory
CE	Compromising Emanations
CEE	Central and Eastern Europe
CENELEC	European Committee for Electro-technical Standardization
CFE	Contractor Furnished Equipment
CHT	Common Hand Tool
CI	Configuration Item
CID	Configuration Identification and Documentation
CIS	Communications and Information Systems
CISS	Communication Interface and Switching System
CLC	CENELEC (in document references)
CLD	Central Logistics Depot
CLEW	Conventional Link Eleven Waveform
CLIN	Contract Line Item Number
CLS	Contractor Logistics Support
CM	Configuration Management
CMP	Configuration Management Plan
CO	Contracting Officer
CoC	Certificate of Conformity
COMSEC	Communication Security
COTS	Commercial Off-The-Shelf
CP	Capability Package
CRC	Control and Reporting Centre
CSA	Configuration Status Accounting
CSCI	CS Configuration Item
CSDB	Common Source Database
CSE	Common Support Equipment
CSI	CRC System Interface
CSR	Configuration Status Report
CUN	Common User Network

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CV	Curriculum Vitae
CW	Civil Works
D	
DDS	Detailed Design Specifications
DEX	Data Exchange Set
DHS	Delivery of Hardware on Site
DLE	Data Link Equipment
DLOS	Direct Line-Of-Sight
DM	Data Module
DMS	Diminishing Manufacturing Source
DRACAS	Data Reporting Analysis and Corrective Action System
DRD	Design Requirements Document
DREM	Distant Remote
DSA	Designated Security Authority
DSL	Digital Subscriber Line
DTE	Data Terminal Equipment
DTS	Data Terminal Set
DVD	Digital Versatile Disc
E	
E&M	Receive and transmit (Ear and Mouth)
EC	European Community
ECIA	Electronic Components Industry Association
ECP	Engineering Change Proposal
EDC	Effective Date of Contract
EDCN	Equipment Design Change Notice
EDCN	Equipment Design Change Notice
EE	Environmental Engineering
EEA	European Economic Area
EEC	European Economic Community
EIA	Electronic Industries Alliance
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMI/EMC	Electromagnetic Interference and Compatibility
EN	European Norm
EOD	Explosive Ordnance Disposal
EP	Electronic Portion
EPDP	Electrical Power Distribution Panels
ETSI	European Telecommunications Standards Institute
EU	European Union
F	
FAT	Factory Acceptance Test
FCA	Functional Configuration Audit
FDDI	Fibre Distributed Data Interface
FES	Fire Extinguishing System
FIP	Fleet Interface Point

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FIS	Facility Security Clearance Information Sheet
FM	Frequency Modulation
FOCIS	Fibre Optic Connector Intermateability Standard
FRACAS	Failure Reporting Analysis and Corrective Action System
FSA	Final System Acceptance
FSAR	Final System Acceptance Report
FSC	Facility Security Clearance
G	
GMT	Greenwich Mean Time
GPS	Global Positioning System
GQAA	Government Quality Assurance Authority
GRP	Glass-Reinforced Plastic
GSM	Global System for Mobile Communications
H	
H&S	Health and Safety
HCDR	High Capacity Data Radio
HF	High Frequency
HL	Hardware Maintenance Level
HMI	Human Machine Interface
HQ	Head Quarters
hrs	hours
HVAC	Heating, Ventilating and Air Conditioning
HW	Hardware
I	
IAW	In Accordance With
ICAO	International Civil Aviation Organization
ICB	International Competitive Bidding
ICC	Integrated Command and Control
ICD	Interface Control Document
IDU	In-Door Unit
IEC	International Electrotechnical Commission
IECEE	IEC system of conformity assessment schemes for Electro-technical Equipment and components
IEEE	Institute of Electrical and Electronics Engineers
IEP	Installation Engineering Plan
IETF	Internet Engineering Task Force
IETM	Interactive Electronic Technical Manual
IETP	Interactive Electronic Technical Publications
IFB	Invitation for Bid
II	Insurance Item
ILS	Integrated Logistics Support
ILSP	Integrated Logistics Support Plan
IMA	Issue Management
IMA	Inverse Multiplexing for ATM

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IMT	Industry Maintenance Task
INFOSEC	Information Security
IP	Ingress Protection
IP	Internet Protocol
IPS	Ionospheric Prediction Software
IREM	Intermediate Remote
IRS	Interface Requirements Specification
IS	Inspectable Space
ISB	Independent Side Band
ISO	International Organization for Standardization
IT	Information Technology
ITU	International Telecommunication Union
ITU-R	ITU Radio communication Sector
ITU-T	ITU Telecommunication Sector
J	
JREAP	Joint Range Extension Application Protocol
JW	Jednostka Wojskowa (Military Site ID)
K	
KOM	Kick-Off Meeting
L	
LAN	Local Area Network
LC	Limited Competition
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LL	Limited Life
LLC	Low-Level Controller
LORA	Level of Repair Analysis
LOS	Line-of-Sight
LPS	Lightning Protection System
LRU	Line Replaceable Unit
LS	Statistical Life
LSA	Logistic Support Analysis
LSAR	Logistic Support Analysis Report
LSB	Lower Side Band
LSF	Low Smoke and Fume
LSZH	Low Smoke Zero Halogen
LT	Low Tension
M	
m/s	meter per second
MASE	Multi Aegis Site Emulator
Mbps	Megabit per second (Mbit/s)
M-BSSC	Main Buffer System Control Centre
MDF	Main Distribution Frame
MDI	Media Dependent Interface
MF	Medium Frequency

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MFL	Multi Frequency Link
MIL	Military
MIL-STD	Military Standard
MMR	Minimum Military Requirement
MOC	Maritime Operations Centre
MOD	Ministry of Defence
MoM	Minutes of Meeting
MPDB	Main Power Distribution Board
MPDP	Main Power Distribution Panel
MPS	Message Processing System
MRL	Maritime Rear Link
MS	Microsoft ®
MSI	Maintenance Significant Item
MTA	Maintenance Task Analysis
MTBCF	Mean Time Between Critical Failures
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
MTTRS	Mean Time To Restore the System
N	
NA	Not Applicable
NADGE	NATO Air Defence Ground Environment
NAE	NATO Airworthiness Executive
NAEW	NATO Airborne Early Warning
NAMSA	NATO Maintenance and Supply Agency
NATINAMDS	NATO Integrated Air and Missile Defence System
NATO	North Atlantic Treaty Organization
NAVAIR	U.S. Naval AIR systems Command
NAVSEA	U.S. Naval SEA systems Command
NB	No Break
NC	NATO CONFIDENTIAL
NCB	National Competitive Bidding
NCI Agency	NATO Communications and Information Agency
NDN	National Defence Network
NFPA	National Fire Protection Association
NGCS	NATO General Communication System
NICE	NATO Internet Crypto Equipment
NILE	NATO Improved Link Eleven
NLM	NATO Level of Maintenance
NLT	Not Later Than
NM	Nautical Mile(s)
NMT	NATO Maintenance Task
NPA/NPO	NATO Programme/Project Agency Office
NQAR	National Quality Assurance Representative
NR	NATO RESTRICTED
NS	NATO SECRET

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NSA	NATO Standardization Agency
NSA	National Security Authority
NSA/DSA:	National Security Authority/Designated Security Authority
NSN	NATO Stock Number
NSWAN	NATO SECRET Wide Area Network
NTDS	Naval Tactical Data System
NU	NATO UNCLASSIFIED
O	
O&M	Operation and Maintenance
ODU	Out-Door Unit
OEM	Original Equipment Manufacturer
OEP	Operational Evaluation Period
OJT	On-the-Job Training
ORLA	Optimum Repair Level Analysis
OSCC	Open System Communication Control
OTS	Off The Shelf
OU	Operating Unit
P	
PABX	Private Automatic Branch eXchange
PAI	Preliminary Acceptance Inspection
PB	Performance Based
PB	Project Board
PBL	Performance Based Contractor Logistic Support
PCM	Pulse Code Modulation
PCR	Project Checkpoint Report
PDF	Portable Document Format
PDH	Plesiochronous Digital Hierarchy
PDR	Preliminary Design Review
PDS	Post Design Services
PEL	Permissible Exposure Level
PEP	Peak Envelope Power
PERT	Programme Evaluation Review Technique
PFE	Purchaser Furnished Equipment
PFP	Purchaser Furnished Property
PHST	Packaging, Handling, Storage and Transportation
PIP	Project Implementation Plan
PM	Project Manager
PMCP	Project Management and Control Plan
PMS	Project Master Schedule
POC	Point Of Contact
POL	Petroleum, Oils and Lubricants
POMP	Parts Obsolescence Management Plan
POTS	Plain Old Telephone Service
PPM	Project Progress Meeting
PPR	Project Progress Report

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PSA	Provisional System Acceptance
PSAR	Provisional System Acceptance Report
PSC	Personal Security Clearance
PSI	Project Security Instructions
PSS	Power Supply System
PSTN	Public Switching Telephone Network
PTO	Project Team Organisation
PTP	Precision Time Protocol
PTT	Push-To-Talk
PWBS	Project Work Breakdown Structure
Q	
QA	Quality Assurance
QAM	Quadrature Amplitude Modulation
QAR	QA Representative
QC	Quality Control
QoS	Quality of Service
QPSK	Quadrature Phase-Shift Keying
Qty	Quantity
R	
RADAR	Radio Detection and Ranging
RAM	Reliability, Availability and Maintainability
RAMP	Risk Assessment and Management Plan
RAMT	Reliability, Availability, Maintainability and Testability
RAR	Requirements Analysis Report
RBD	Reliability Block Diagram
R-BSCC	Remote Buffer System Control Centre
RCD	Residual Current Device
RCIL	Recommended Consumable Items List
RF	Radio Frequency
RFC	Request For Comments
RFP	Request For Proposals
RFV	Request For Visit
RMC	Radio Management Console
RMS	Round Mean Square
RMS	Radio Management System
RMSS	Radio Management Sub-System
RoIP	Radio over IP
RON	Repair On Need
RRS	Receiver Radio Site
RS	Radio Site
RSAT	Radio Site Acceptance Test
RSPL	Recommended Spare Parts List
RTTL	Recommended Tools and Test Equipment List
RX	Receiver

S

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SAA	Security Accreditation Authority
SAASM	Selective Availability Anti-spoofing Module
SAP	Security Accreditation Plan
SASP	Security Accreditation Support Package
SAT	System Acceptance Test
SB	Short Break
SBC	Single Board Computer
SDH	Synchronous Digital Hierarchy
SDIP	SECAN Doctrine Information and Publication
SEC	Security Evaluation and Certification
SECAN	NATO Security and Evaluation Agency
SEDP	System Engineering and Design Plan
SHEF	Safety, Health, Environmental and Fire
SIMPLE	Standard Interface for Multiple Platform Link Evaluation
SINAD	Signal to Noise And Distortion
SINCGARS	Single Channel Ground and Airborne Radio System
SIS	Site Installation Specifications
SITP	Site Installation Transition Plan
SL	Software Maintenance Level
SLEW	Single Tone Link Eleven Waveform
SLP	Standardised Language Proficiency
SM	Security Management
SNR	Signal to Noise Ratio
SNS	Standard Numbering System
SOC	Sector Operation Centre
SOI	Start Of Installation
SOW	Statement Of Work
SPC	Signal Processing Controller
SPDCN	Spare Parts Design Change Notice
SPDCN	Spare Parts Design Change Notice
SPDP	Site Preparation Data Package
SRR	System Requirements Review
SRS	System Requirement Specifications
SRU	Shop Replaceable Unit
SSB	Single Side Band
SSPP	System Safety Programme Plan
SSR	Site Survey Report
SSS	Schedule of Supplies and Services
SSS	SPC Serial Splitter
SSSB	Ship Shore Ship Buffer
STANAG	Standardization Agreement
STE	Special Test Equipment
STEP	Security Test and Evaluation Plan
SW	Software

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SWA	Application Software
SWO	Software Operating System
T	
T&E	Test and Evaluation
TADIL	Tactical Digital Information Link
TAT	Turn Around Time
TBCE	Type "B" Cost Estimate
TCCR	Test Cases Cross Reference
TDL	Tactical Data Link
TDM	Time Division Multiplex
TDP	Technical Data Package
TDS	Tactical Data System
TDS	Test Data Sheet
TEP	Test and Evaluation Plan
THN	Territorial Host Nation
TIA	Telecommunications Industry Association
TM	Technical Manual
TOD	Time of Day
TPDP	Technical Publications Development Plan
TR	Technical Report
TRA	Technical Requirement Analysis
TRR	Test Readiness Review
TRX	Transceiver
TTE	Tools and Test Equipment
TX	Transmitter
U	
UCCI	Universal Communication Controller Improved
UHF	Ultra High Frequency
UPS	Uninterruptible Power Supply
USB	Upper Side Band
USB	Universal Serial Bus
UT	Universal Time
UTP	Unshielded Twisted Pair
V	
VLI	Versatile Link Interface
VoIP	Voice over IP
VSWR	Voltage Standing Wave Ratio
W	
WAN	Wide Area Network
WBS	Work Breakdown Structure
WSG	Writing Style Guide
X	
Y	
Z	

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