IFB-CO-15577-SSSB-UK-GR-NL

SSSB

PART I - SCHEDULE OF SUPPLIES AND SERVICES (SSS)

(THIS SECTION WILL BE DERIVED FROM THE BIDDING SHEETS SUBMITTED BY THE SUCCESFULL BIDDER)

IFB-CO-15577-SSSB-UK-GR-NL

SSSB

PART II - SPECIAL CONTRACT PROVISIONS

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1. INTERPRETATION, DEFINITIONS, AND ACRONYMS

1.1. This Clause hereby supplements Clause 2 of the NCIO General Provisions.

1.2. As used throughout this Contract, acronyms shall have meanings specified in 40.

1.3. “Days”: calendar days;

1.4. “Deliverables”: the items, features or services to be delivered by the Contractor at a Milestone Date or at any other stage during the performance of this Contract as listed in Part I (SSS) and as more particularly described in the SOW, the SRS, the Technical Solution or any other relevant contract document;

1.5. “Installation Sites”: the NATO premises as set out in Contract Schedules and the SOW and or such other sites as the Purchaser shall from time to time notify to the Contractor through a Contract Amendment;

1.6. The definition of “Purchaser” for the purposes of this Contract is hereby modified from the definition of NCIO General Provisions Clause 2 “Definitions of Terms and Acronyms” to “NATO C&I Organisation, as represented by the General Manager, NCI Agency. The Purchaser is the legal entity who awards and administers the Contract and stands as one of the Contracting Parties. The definition of Purchaser encompasses any legal successor to the NATO C&I Organisation and its designated representative, as may be agreed by the NATO member Nations.”

1.7. Territorial Host Nation (THN): United Kingdom, Greece and the Netherlands are the Territorial Host Nations for this project. NCI Agency has been authorised to act as Technical and Procurement Agent (Purchaser) on behalf of the THN and is vested with the acquisition authority.

2. ORDER OF PRECEDENCE

2.1. This Clause hereby supersedes Clause 1 of the NCIO General Contract Provisions.

2.2. If there is any conflict between the clauses and the schedules and/or any annexes to the schedules and/or any other documents referred to in this

Contract, the conflict shall be resolved in accordance with the following order of precedence:

2.2.1. The Signature Page

2.2.2. Part I (Contract Schedule of Supplies and Services)

2.2.3. Part II (Special Contract Provisions) and Annexes

2.2.4. Part III (NCIO General Contract Provisions) and Annexes

2.2.5. Part IV (Statement of Work)

2.2.6. The Purchaser's provided clarifications, issued throughout the bidding period relevant to IFB-CO-15577-SSSB-UK-GR-NL

2.2.7. Pre-award Clarifications dated…..

2.2.8. The Contractor's proposal (Technical Proposal and Price Quotation) in response to IFB-CO-15577-SSSB-UK-GR-NL.

3. SCOPE OF WORK

3.1. The scope of this Contract is to procure and install the radio communication equipment for the United Kingdom-Greece-Netherlands Ship Shore Ship Buffer (SSSB) system.

3.2. This Contract encompasses procurement, design, manufacturing, delivery of equipment, installation, integration, testing, acceptance and ILS support as defined in the Statement of Work (SOW) and Annexes of the Contract.

3.3. The Contractor shall provide the supplies and services indicated in the Schedule of Supplies and Services (SSS) and further described in the SOW and Annexes, and perform the work described in the SOW and Annexes for the implementation of the above stated project.

4. PARTICIPATING COUNTRIES

4.1. This Article supplements Clause 9 of the Contract General Provisions.

4.2. The following NATO member nations have agreed to fund this acquisition effort: (in alphabetical order): ALBANIA, BELGIUM, BULGARIA, CANADA,

CROATIA, CZECH REPUBLIC, DENMARK, ESTONIA, FRANCE, GERMANY, GREECE, HUNGARY, ICELAND, ITALY, LATVIA, LITHUANIA, LUXEMBOURG, THE NETHERLANDS, NORWAY, POLAND, PORTUGAL, ROMANIA, SLOVAKIA, SLOVENIA, SPAIN, TURKEY, THE UNITED KINGDOM, and THE UNITED STATES.

4.3. The Contractor may issue sub-contracts to firms and purchase from qualified vendors in any Participating Country. None of the work, including project design, labour and services, shall be performed other than by firms from and within Participating Countries, as per NATO policy.

4.4. The Contractor shall notify in writing to the Purchaser immediately upon being informed of any change in the nationality of its Subcontractor(s) which would prevent the Contractor from further complying with Clause 9.3 in the General Provisions. Upon receipt of this information from the Contractor, the Purchaser may, within three months from this notification, require the Contractor to find an alternate subcontractor, complying with the requirements set out in Clause 9.3 above.

4.5. Unless authorized by NATO Policy, no material or items of equipment down to and including identifiable sub-assemblies delivered under this Contract shall be manufactured or assembled by a firm other than from and within a Participating Country.

4.6. The Intellectual Property Rights to all design documentation and system operating software shall reside in participating NATO member countries, and no license fee, or royalty charges shall be paid by the Contractor to firms, individuals or governments other than within the NATO member community.

5. CONTRACT TYPE

5.1. This Clause hereby supersedes Clause 7 of the NCIO General Contract Provisions.

5.2. The Basic Contract is a Firm Fixed Price Contract for a duration of 5 years, but also contains Options to be liquidated in accordance with the Contract terms as stipulated below.

5.3. CLINs 10.22 and CLINS 18 to 23 are contractual options and contain, amongst others, a number of extensions for in total up to an additional 9 years. These options shall be exercised, if any, according to Clause 9 below.

5.4. The Total Price of this Contract is as stated on the signature page of the Contract or any Amendment thereto. The Purchaser assumes no liability for

costs incurred by the Contractor in excess of the stated Total Price, except as may be authorised under certain provisions of this Contract.

6. INVOICES AND PAYMENT TERMS

6.1. Clause 25 “Invoices and Payments” of the NCI Agency’s Contract General Provisions is supplemented as follows:

6.2. Following Purchaser acceptance, in writing, payment for supplies and services furnished shall be made in the currency specified for the relevant portion of the Contract.

6.3. The term of the Contract may not be exceeded without prior approval of the Purchaser. In no case will the Purchaser make payment above the total of the corresponding CLINs.

6.4. No payment shall be made with respect to undelivered supplies; works not performed, services not rendered and/or incorrectly submitted invoices.

6.5. No payment will be made for additional items delivered that are not specified in the contractual document.

6.6. The invoice amount is exclusive of VAT and exclusive of all Taxes and Duties in accordance with Clause 26 (Taxes and Duties) of the Contract General Provisions.

6.7. Invoices shall be submitted to the following e-mail address: accountspayable@ncia.nato.int. No paper invoices will be accepted.

6.8. All invoices shall include the Purchase Order Number, Contract Number, Amendment Number (if any) and the Payment Milestone number.

6.9. The Purchaser will make payment within sixty (60) days of receipt by the Purchaser of a properly prepared and documented invoice.

6.10. The Contractor shall be entitled to submit invoices and payment will be made as soon as all CLINs associated with a given Payment Milestone identified in Annex D, have been accepted by the Purchaser in writing. Where

appropriate the Contractor may combine multiple Payment Milestones under one invoice.

6.11. Invoicing for Contract Options (if exercised):

6.11.1. CLINs 10.22 shall combine the invoice of the exercised options, if any, with Payment Milestone nr 6 in Annex D.

6.11.2. CLINs 18 to 23: For the options exercised, the Contractor shall submit an invoice at the end of each 6 month period at the rate of 50% of the respective annual CLIN value (for the duration identified in the CLIN) provided the services during the previous 6 months were performed successfully as described in the Statement of Work and Service Credits, if any, were subtracted.

7. CONTRACTOR RESPONSIBILITY

7.1. Notwithstanding the right of the Purchaser to review the Contractor's efforts and progress, and particularly with reference to, specifications, and data items and other deliverables, which may be provided for elsewhere in this Contract, it is expressly understood that the Contractor is completely responsible for the compliance of Contract end items with the provisions of this Contract, and any reviews and approvals given by NCI Agency do not relieve the Contractor of this responsibility.

8. PRICING OF CHANGES, AMENDMENTS AND CLAIMS

8.1. This Clause hereby supplements Clause 19 of the NCIO General Contract Provisions.

8.2. Contractor’s pricing proposals for Changes, Amendments and Claims shall be priced in accordance with the schedules of forward labour rates components established in the Contract Schedule of Supplies and Services, or, if not defined in the latter, which were submitted in the Contractor’s bid incorporated in the Contract by reference.

8.3. The Contractor shall be bound by the stated labour rates and COTS components prices.

8.4. The offered Bidding Sheets provided pricing information relevant to any COTS Products necessary for the purpose of successfully performing all Contract tasks. The Purchaser reserves the right to provide COTS hardware and software products as Purchaser Furnished Equipment, should it be possible for the Purchaser to get better prices through existing Enterprise Agreements or Basic Ordering Agreements. The Contractor will be notified by

the Purchaser Contracting Authority in writing as to what COTS items will be removed from the contract scope, and the contract price shall be reduced in accordance with the pricing information provided in the Bid. The Purchaser shall inform prior to PDR Milestone M2 in Annex D, which COTS products will be provided by the Purchaser.

9. OPTIONS

9.1. CLIN 10.22 and CLINs 18 to 23 of the Contract Schedule of Supplies and Services represent Contract options for additional scope or extensions to be performed by the Contractor within the framework of this Contract.

9.2. The Purchaser is not obliged to exercise any Option and shall have the right to unilaterally exercise any optional sub-items of the optional CLINs at the prices stated in the Schedule of Supplies and Services of the Contract, and to be notified at any time from Contract award to 30 days before the end of the Warranty.

9.3. The Contractor will be notified by the Purchaser (or possibly THN after FSA) in writing as to what Option will be exercised and in what combination and this minimum ninety (90) days before the required Performance Start Date.

9.4. The Contractor understands that there is no obligation for the Purchaser to exercise any of the aforementioned optional sub-items and that the Purchaser bears no liability should it decide not to exercise the options (totally or partially). Further, the Purchaser reserves the right to order another Contractor (or the same), to perform the tasks described in the optional line items of the current Contract through a new Contract with other conditions.

9.5. The quoted unit prices are firm fixed prices throughout the duration of the contract and are independent of the actual quantity of units or other options exercised nor shall it impact the execution of any other CLINs. The Purchaser is not obliged to exercise any option or quantity.

9.6. In case any options of CLINs 18 to 23 of the Contract is exercised, the performance guarantee for the Contract that is normally valid until the end of the warranty period will be extended (and possibly transferred to the THN upon Purchaser decision) to the end of the option period unless a new performance guarantee for these options is provided by the Contractor.

9.7. SubCLINs of the Post-Warranty CLS Service Options (CLINs 19, 21 and 23) each have a duration of 3 years and its prices are to remain valid for that period. As from FSA + 4 years, with a six (6) months' notice, the Contractor is authorised to request for price Re-Determination. Price Determinations are to

be limited to the amounts reflected for each period of 3 years in a governmentally approved inflationary index of the Contractors country.

9.8. In addition to the above, the Purchaser reserves the right to order any foreseeable or additional Contract tasks or deliverables, listed or not, either occasionally or at a further stage in the life of the project, which it deems necessary for the successful completion of the project. The additional tasks and/or deliverables shall be priced in using the "CLIN Labour Price Breakdown Bidding Sheets" rates provided by the Contractor as part of its proposal and included in this Contract by reference, in accordance with the provisions of Clause 8 above.

9.9. The Purchaser may, in writing, place an order for such additional tasks throughout the entire Contract period. Such an order may be placed within the framework of this Contract via the issuance of a Contract Amendment or be formulated via the issuance of a new contractual instrument. If such additional tasks impact the schedule of the Major Milestones in Annex D, a re-schedule of those Milestones impacted shall be agreed by the parties.

10. RISK OF LOSS OR DAMAGE

10.1. This Clause hereby supplements Clause 24 of the NCIO General Contract Provisions.

10.2. Risk of loss or damage to Deliverables covered by this Contract shall remain with the Contractor until, and shall pass to the Purchaser upon Acceptance by the Purchaser or receipt of the supplies by the Purchaser at the destination specified in the Contract, whichever is the later.

10.3. Notwithstanding paragraph 10.4 below, the risk of loss or damage to supplies which fail to conform to the requirements of the Contract shall remain with the Contractor until cure and Acceptance, at which time 10.4 below shall apply.

10.4. Notwithstanding paragraph 1.1 above the Contractor shall not be liable for the loss of or damage to supplies caused by the negligence of officers, agents or employees of the Purchaser acting within the scope of their employment.

11. COTS PRODUCTS REPLACEMENT

11.1. If any COTS products specified in the Contract are upgraded or discontinued by their original providers for commercial or technological reasons, the Contractor shall propose their substitution by the new versions that are intended as market replacement of the original products. The

proposed items shall provide at equivalent or enhanced performance without a price or life-cycle support cost increase.

11.2. The Contractor shall provide price and performance data to support an improvement in performance and/or a reduction in price and/or life-cycle support costs. If necessary for evaluation by the Purchaser, the Contractor shall provide a demonstration of the proposed items. Should the Purchaser decide that the proposed item(s) should be included in the contract, an equitable price adjustment will be negotiated and the proposed item(s) shall be added to the Contract by bilateral modification under the authority of this Clause.

12. NATO USE OF THIRD PARTIES

12.1. The Purchaser shall have the right to use third parties, including commercial entities, to assist it in the management of this Contract and the evaluation of the Contractor's performance.

12.2. The Contractor shall have the right to require third parties to sign a non-disclosure agreement that contains conditions normally considered reasonable by the Contractor’s industry. Any third party non-disclosure agreement proposed by the Contractor shall be subject to approval by the Purchaser.

12.3. The Contractor shall permit such third parties full and free access to its premises, and all data (including software), deliverable and non-deliverable, generated and/or used under this Contract, as and when required for the purposes of monitoring this Contract and shall ensure the same right of access to the premises of its subcontractors, by the inclusion in any such subcontracts of a provision substantially as set forth in this Article. For the purposes of this Article, data shall not include financial data unless authorised by the Contractor, with the exception of any specialized commercial audit firms engaged by the NATO Contracting Authority or National audit agencies.

13. CONTRACT ADMINISTRATION

13.1. The Purchaser reserves the right to re-assign this Contract to a representative(s) for administrative purposes, in whole or in part, provided that the Purchaser shall always be responsible for his obligations under the Contract and for actions or lack of actions of its assigned administrator. The Purchaser undertakes to advise the Contractor in writing whenever this right is to be exercised.

13.2. The Purchaser is the NATO Communications and Information Agency

(NCI Agency,). The Purchaser is the Point of Contact for all contractual and technical issues. The Contractor shall accept Contract modifications only in writing from the Purchaser's Contracting Authority.

13.3. All notices and communications between the Contractor and the Purchaser shall be written and conducted in English. Contract modifications only become valid when received in writing from the General Manager, NCI Agency, and his authorised representative.

13.4. Formal letters and communications shall be personally delivered or sent by mail, registered mail, courier or other delivery service, to the official points of contact quoted in this Contract. Telefax or other electronic means may be used to provide an advance copy of a formal letter or notice which shall subsequently be delivered through the formal communications means.

13.5. Informal notices and informal communications may be exchanged by any other communications means including telephone and e-mail.

13.6. All notices and communications shall be effective upon receipt.

13.7. Official points of contact are:

PURCHASER

Contractual issues:	**Technical issues:**
NCI Agency	NCI Agency Oude Waalsdorperweg 61
B-1110 Brussels	2597 AK The Hague
Belgium	Netherlands
POC: Martin Steenwege Tel: +32 2 707 8335	POC: Margaret Lovgren Tel: + 31 (70) 374 1913
Email: martin.steenwege@ncia.nato.int	E-mail:Margaret.Lovgren@ncia.nato.int

CONTRACTOR

Contractual issues:	**Technical issues:**
POC: Tel:	POC: Tel:
E-mail:	E-mail:

14. TECHNICAL DIRECTION

14.1. The Contract will be administered by the Purchaser in accordance with the Clause 13 of these Contract Special Provisions entitled “Contract Administration”.

14.2. The individuals working on this Contract shall perform the effort within the general scope of work identified in the Contract Part IV - Statement of Work (SOW). This effort will be directed on a more detailed level by the Purchaser’s Project Manager who will provide detailed tasking and instruction on how to proceed.

14.3. The Purchaser reserves his right to assign a Technical Representative who will provide the Contractor personnel with instruction and guidance, within the general scope of work, in performance of their duties and working schedule.

14.4. Neither the Purchaser’s Project Manager as identified in Clause 13 of these Contract Special Provisions, nor any Technical Representative has the authority to change the terms and conditions of the Contract. If the Contractor has reason to believe that the Project Manager/Technical Representative is requesting products and services on terms inconsistent with that in the scope of the Contract, the Contractor shall immediately inform the Purchaser’s Contracting Authority for confirmation of the actions. Failure to obtain confirmation that the action of the Project Manager is under the authority of the Contract shall render any subsequent claim null and void.

14.5. Upon receipt of such notification above, the Purchaser’s Contracting Authority will:

14.5.1. confirm the effort requested is within scope, or

14.5.2. confirm that the instructions received constitute a change and request a quotation for a modification of scope and/or price, or

14.5.3. rescind the instructions.

14.6. All changes to the project management documentation, including the implementation schedules, agreed between the parties shall bear a formal version number and a date from which the change applies.

14.7. **Notwithstanding the above, project management documentation, particularly any implementation schedule such as Project Management Schedule and PIP, shall not affect the original major performance milestone dates as specified in clause 15.2 nor waive the associated**

Liquidated Damages.

14.8. **The Purchaser will bear no liability for changes to the Contract which are not expressly authorized by the Contracting Officer in writing.**

14.9. **Similarly the Purchaser shall not be liable for costs incurred by the Contractor resulting from changes in Contract performance authorized by other than the Contracting Officer.**

15. LIQUIDATED DAMAGES

15.1. This Clause replaces Clause 38 (Liquidated Damages) of the Contract General Provisions.

15.2. Time is of the essence for this Contract. Therefore, if the Contractor fails to:

15.2.1. meet the delivery schedule of the Deliverables/CLINs of the major performance milestones specified in Annex D of the Contract Special Provisions, or

15.2.2. obtain acceptance of the Deliverables/CLINs or to acceptably perform the services of the major performance milestones specified in Annex D of the Contract Special Provisions,

15.3. The actual damage to the Purchaser for the delay will be difficult or impossible to determine. Therefore, in lieu of actual damages the Contractor shall pay to the Purchaser, for each day of delinquency in achieving the deadline or milestone, fixed and agreed liquidated damages of 0.1% (one tenth of one per cent) per day of the associated payment set forth in the schedule of major performance milestones and payments provided in Clause 6 and Annex D of the Contract Special Provisions.

15.4. In addition to the liquidated damages referred to in Clause 15.2., the Purchaser shall have the possibility of terminating this Contract in whole or in part, as provided in Clause 39 (Termination for Default) of the Contract General Provisions. In the event of such termination, the Contractor shall be liable to pay the excess costs provided in Clause 39.5 (Termination for Default) of the Contract General Provisions.

15.5. The Contractor shall not be charged with liquidated damages when the delay arises out of causes beyond the control and without the fault or negligence of the Contractor as defined in Clause 39.6 (Termination for Default) of the Contract General Provisions. In such event, subject to the provisions of Clause 41 (Disputes) of the Contract General Provisions, the

Purchaser shall ascertain the facts and extent of the delay and shall extend the time for performance of the Contract when in his judgement the findings of the fact justify an extension.

15.6. Liquidated damages shall be payable to the Purchaser from the first day of delinquency and shall accrue at the rate specified in Clause 15.2. above to max 10% of the Total Contract Value. These liquidated damages shall accrue automatically and without any further notice being required.

15.7. The amount of Liquidated Damages due by the Contractor shall be recovered by the Purchaser in the following order of priority:

15.7.1. By deducting such damages from the amounts due to the Contractor against the Contractor's invoices or from the value of the relevant Payment Milestone.

15.7.2. By proceeding against any surety

15.7.3. By reclaiming such damages through appropriate legal remedies.

15.8. The rights and remedies of the Purchaser under this clause are in addition to any other rights and remedies provided by law or under this Contract.

16. CONTRACTOR'S EMPLOYEES

16.1. The Contractor shall provide and pay, as required, qualified personnel as needed for the proper performance of the services required under this Contract; it shall strictly comply with all Territorial Host Nation Labour Laws, tariffs and social security and other regulations applicable to the employment of its personnel.

16.2. The Purchaser shall not be responsible for securing work permits, lodging, leases nor tax declarations, driving permits, etc., with national or local authorities. Contractor's employees, agents, or representatives are not eligible for any diplomatic privileges nor NATO employee benefits.

16.3. The Contractor shall inform his employees, agents, and representatives under this Contract of the terms of the Contract and the conditions of the working environment.

16.4. Full Time Equivalent (FTE) for Contractor's personnel working at NATO facilities shall represent 220 working days of a standard 8 hours a day from Monday through Friday. The daily start and end times are set by the Purchaser's Technical Representatives.

16.5. Contractor's personnel working at NATO facilities shall observe local NATO holidays (the ones applicable to the NATO site where the individual is supposed to work at the corresponding time). Access to NATO facilities on weekend or holiday period will only be available at the discretion of the local authorities. Any request for time off shall be coordinated and approved in advance by the NATO Technical Representative or his representative.

17. KEY PERSONNEL

17.1. Contractor's employees or agents specifically identified in ANNEX B shall be considered as key personnel for the performance of the Contract. Without prejudice to other applicable stipulations of the contract, key personnel shall be subject to the terms and conditions specified below.

17.2. A key personnel assigned to this Contract shall remain working on the Contract for as long as required by the terms of the present Contract unless the Purchaser agrees to a replacement who is equal or better qualified. Such a replacement will be in accordance with article 17.7 and is without extra cost to the Purchaser, this includes not a higher rate of the nominee and a suitable free of charge hand over period for the accepted nominee.

17.3. Any change of status or reorganisation of the Contractor's practice, or any change in the responsibility for the execution of the Contract shall be reported to the Purchaser immediately when the change or reorganisation is promulgated.

17.4. The Contractor shall guarantee that suitable backup personnel will be available to promptly remedy situations of key personnel non-availability that may endanger the performance of services or deliverables set in the contract.

17.5. All Key Personnel must certify and sign the Declaration attached hereto at Annex B and provide it to the NCI Agency Contracting Officer prior to the commencement of any performance under this Contract.

17.6. The Purchaser reserves the right to reject a Contractor's staff member after prior acceptance if the Purchaser determines during Contract performance that the individual is not providing the required level of support. The Purchaser will inform the Contractor in writing in case such a decision is taken, and the Contractor shall propose a replacement within fifteen (15) days after the Purchaser's written notification.

17.7. The Purchaser shall approve any replacement or additional key personnel according to the following procedure:

17.7.1. The Contractor shall provide the name(s) and qualifications statement(s) of a nominee(s) for review (as defined in para 17.7.2) by the

Purchaser a least twenty (20) days before the intended date of replacement or the date when the nominee(s) is/are required to start work under the contract. Contractor nominee(s) shall be interviewed and approved by NCI Agency, before substitution acceptance is granted in writing by the Purchaser contracting Authority.

17.7.2. The Contractor shall provide a CV for the personnel proposed. The CV shall clearly stipulate:

17.7.2.1. Full details of professional and educational background;

17.7.2.2. Evidence that the nominee is equal or better qualified than the to be replaced individual.

17.7.3. If the Purchaser accepts the nominations, this acceptance will be notified in writing to the Contractor, who will be authorized to assign the nominated personnel to the Contract on the date(s) established in the stated notification.

17.7.4. If the Purchaser considers a nominee or nominees to be inappropriate for the required services, the Contractor will be so notified and shall have not more than ten (10) days (+ remaining days of elapsed twenty (20 days) of para 17.7.1) to submit alternate nominees.

17.8. If the Contractor fails to provide in due time a compliant candidate, the Purchaser reserves the right to provide a replacement from a Third Party and/or may terminate this Contract in whole or in part as provided in the first paragraph of the clause 39 entitled “Termination For Default” of the NCIO General Contract Provisions, and in that event the Contractor shall be liable, in addition to the excess costs provided in second paragraph of the “Termination For Default” clause, for such liquidated damages accruing until such time as the Purchaser may reasonably obtain delivery or performance of similar services.

17.9. The delay stated above shall be counted from the day the Purchaser notifies the Contractor, in accordance with paragraph 17.6. above, that the alternate nominees are considered to be non-compliant or inappropriate for the required services according to the requirements of the Contract.

18. INDEPENDENT CONTRACTOR

18.1. The Personnel provided by the Contractor are at all times employees of the Contractor and not the Purchaser. In no case shall Contractor personnel act on behalf of or as an agent for NATO or any of its bodies. In no way shall the Contractor personnel claim directly or indirectly to represent NATO in an official capacity or claim themselves to be NATO employees.

18.2. The Contractor shall inform his employees under this Contract of the terms of the Contract and the conditions of the working environment.

18.3. The Purchaser shall not be responsible for securing work permits, lodging, leases nor tax declarations, driving permits, etc., with national or local authorities. Personnel employed under this Contract are not eligible for any diplomatic privileges or NATO employee benefits.

19. INTELLECTUAL PROPERTY RIGHTS

19.1. The Contractor shall assume all liability and indemnify the Purchaser, its officers, agents and employees against liability, including costs for the infringement of any patents or copyright in force in any countries arising out of the manufacture, services performed or delivery of supplies, or out of the use or disposal by or for the account of the Purchaser of such supplies. The Contractor shall be responsible for obtaining any patent or copyright licences necessary for the performance of this Contract and for making all other arrangements required to indemnify the Purchaser from any liability for patent or copyright infringement in said countries.

19.2. The Contractor shall exclude from his prices any royalty pertaining to patents which in accordance with agreements reached between NATO countries may be utilised free of charge by member nations of NATO and by NATO organisations.

19.3. The Contractor shall report in writing to the Purchaser during the performance of this Contract:

19.3.1. The royalties excluded from his price for patent utilised under the agreements mentioned in the paragraph above,

19.3.2. The amount of royalties paid or to be paid by the Contractor directly to others in performance of this Contract.

20. CONFIDENTIALITY AND NON-DISCLOSURE

20.1. For purposes of this clause, "Confidential Information" shall include all information pertaining to any part of this Contract or any program related to this Contract that is not marked “Non-Confidential”.

20.2. Confidential Information does not include information that is: (a) publicly known at the time of disclosure or subsequently becomes publicly known through no fault of the Contractor; (b) discovered or created by the Contractor before disclosure by the Purchaser; (c) learned by the Contractor through

legitimate means other than from the Purchaser or its representatives; or (d) is disclosed by the Contractor with the Purchaser's prior written approval.

20.3. Without prejudice to other obligations imposed by NATO Security regulations, the Contractor shall hold and maintain the Confidential Information in strictest confidence for the sole and exclusive benefit of the Purchaser. The Contractor shall carefully restrict access to Confidential Information to employees, sub-contractors and third parties as is reasonably required and shall require those persons to sign nondisclosure restrictions at least as protective as those in this contract. The Contractor shall not, without prior written approval of the Purchaser, use for the Contractor's own benefit, publish, copy, or otherwise disclose to others, or permit the use by others for their benefit or to the detriment of the Purchaser, any Confidential Information. The Contractor shall return to the Purchaser any and all records, notes, and other written, printed, or tangible materials in its possession pertaining to Confidential Information immediately if the Purchaser requests it in writing.

20.4. The provisions of this clause and the associated Contractor’s duties shall survive the termination of this Contract and remain in effect until the Purchaser sends the Contractor written notice releasing the Contractor from the obligations imposed by this clause, or for a further period of three (3) years after Contract close-out, whichever occurs first, and without prejudice to other obligations imposed by applicable NATO Security regulations.

20.5. The Contractor shall include the substance of the language of this clause in any subcontract/Contract issued for the purpose of the fulfilment of the obligations contracted under this Contract regardless of the legal nature of the entity subscribing such subcontract. Additionally, Contractor’s key personnel mentioned in clause 17 (Key Personnel) above shall be required to sign the Non-Disclosure Declaration at ANNEX B.

20.6. The Contractor agrees that compliance with the obligations imposed by the terms of this clause is of the essence and that failure to abide to these terms shall constitute sufficient grounds for the termination of the Contract for default.

21. CONFLICT OF INTEREST

21.1. A conflict of interest means that because of other activities or relationships with other persons or entities, a Contractor is unable, or potentially unable to render impartial assistance or advice to the Purchaser, or the Contractor’s objectivity in performing the Contract work is, or might be otherwise impaired, or the Contractor has an unfair competitive advantage. Conflict of interest includes situations where the capacity of a Contractor (including the Contractor’s executives, directors, consultants, subsidiaries, parent companies or subcontractors) to give impartial, technically sound advice or objective performance is or may be impaired or may otherwise result

in a biased work product or performance because of any past, present or planned interest, financial or otherwise in organizations whose interest may substantially affected or be substantially affected by the Contractor's performance under the Contract.

21.2. The Contractor is responsible for maintaining and providing up-to-date conflict of interest information to the Contracting Officer. If, after award of this Contract or task order herein, the Contractor discovers a conflict of interest with respect to this Contract which could not reasonably have been known prior to award, or if any additional conflicts or potential conflicts arise after award, the Contractor shall give written notice to the Contracting Officer as set forth below.

21.3. If, after award of this Contract herein, the Purchaser discovers a conflict of interest with respect to this Contract or task order, which has not been disclosed by the Contractor, the Purchaser may at its sole discretion request additional information to the Contractor, impose mitigation measures or terminate the Contract for default in accordance with Clause 39 (Termination For Default).

21.4. The Contractor's notice called for in paragraph 21.2 above shall describe the actual, apparent, or potential conflict of interest, the action(s) the Contractor has taken or proposes to take to avoid or mitigate any conflict, and shall set forth any other information which the Contractor believes would be helpful to the Contracting Officer in analysing the situation. Any changes to the Contractor's Conflict of Interest Mitigation Plan, if any is incorporated in the contract, should be also detailed.

21.5. The Contractor has the responsibility of formulating and forwarding a proposed mitigation plan to the Contracting Officer, for review and consideration. This responsibility arises when the Contractor first learns of an actual, apparent, or potential conflict of interest.

21.6. If the Contracting Officer in his/her discretion determines that the Contractor's actual, apparent, or potential conflict of interest remains, or the measures proposed are insufficient to avoid or mitigate the conflict, the Contracting Officer will direct a course of action to the Contractor designed to avoid, neutralize, or mitigate the conflict of interest. If the parties fail to reach agreement on a course of action, or if having reached such agreement the Contractor fails to strictly adhere to such agreement during the remaining period of Contract performance, the Contracting Officer has the discretion to terminate the Contract for default or alternatively refrain from exercising any further Option or Work Package under the contract.

21.7. The Contractor's misrepresentation of facts in connection with a conflict of interest reported or a Contractor's failure to disclose a conflict of interest as required shall be a basis for default termination of this contract.

22. PURCHASER FURNISHED PROPERTY AND SERVICES

22.1. This Clause hereby supplements Clause 13 of the NCIO General contract Provisions.

22.2. The term "Purchaser Furnished Property/Equipment" as used in this clause refers to items of equipment, material or property furnished by the Purchaser to the Contractor that shall be subject to overhaul, repair, modification, test, embodiment or other work as specified in the Contract to be performed by the Contractor, as listed in Part IV – Statement of Work.

22.3. The Contractor will have no right for any claims in reference to a delay in the Purchaser's confirmation of site readiness and PFE availability, as long as the delay does not exceed thirty (30) calendar days from the declared availability dates.

22.4. The Purchaser shall provide the Contractor with property and services for the performance of the contract as listed in the Statement of Work. PFE may be further updated during the course of the contract, as required.

22.5. Purchaser reserves the right to determine that COTS products will be provided, in whole or in part, as Purchaser Furnished Property and Services. The Purchaser shall inform prior to PDR Milestone M2 in Annex D, which COTS products will be provided by the Purchaser.

22.6. The Purchaser makes no warranty whatsoever with respect to the PFE (including models, software, and data).

22.7. Should at any time the Contractor discover that the PFE is not adequate for its intended use, or contains insufficient or erroneous material such that the Contractor cannot progress the objectives or schedule of the Contract, the Contractor shall document such findings and forward such findings to the Purchaser’s Contracting Authority within twenty-one (21) days of discovery.

22.8. The Contractor, in his findings, shall include a statement as to whether he considers that he can provide sufficient information as to make such PFE sufficient for use or correct the errors. If the Contractor considers that it is possible for him to do so, he shall include with his findings a proposal to do so including a cost proposal.

22.9. Upon receipt of the findings, the Purchaser’s Contracting Authority shall determine if there is validity to the Contractor’s claim and whether the source of the PFE can provide updates or corrected material. The Purchaser and the Contractor will consult to determine the optimum approach to rectify the situation.

22.10. The Purchaser's Contracting Authority, if it accepts the Contractor's proposal to rectify deficient PFE, shall issue a Change Order pursuant to the Clause of the Contract entitled changes, and negotiate an amendment to the contract.

22.11. The foregoing provisions for adjustment are the exclusive remedy available to the Contractor, and the Purchaser shall not be otherwise liable for deficiencies of PFE. If the course of action to remedy the deficient PFE impacts the schedule and Major Milestones, the execution period for Contractor will be automatically extended by a period equivalent. The Contractor will not be responsible for delays attributable for this reason.

23. COMPREHENSION OF CONTRACT AND SPECIFICATIONS

23.1. The Contractor warrants that he has read, understood and agreed to each and all terms, clauses, articles, specifications and conditions specified in the Contract and that this signature of the Contract is an acceptance, without reservations, of the said Contract terms within their normal and common meaning.

23.2. The specifications set forth the performance requirements for the Contractor's proposed work as called for under this Contract. Accordingly, notwithstanding any conflict or inconsistency that hereafter may be found between achievement of the aforesaid performance requirements and adherence to the Contractor's proposed design for the work, the Contractor hereby warrants that the work to be delivered will meet or exceed the performance requirements of the said specifications.

23.3. The Contractor hereby acknowledges that he has no right to assert against the Purchaser, its officers, agents or employees, any claims or demands with respect to the aforesaid specifications as are in effect on the date of award of this Contract.

23.3.1. Based upon impossibility of performance, defective, inaccurate, impracticable, insufficient or invalid specifications, implied warranties of suitability of such specifications; or,

23.3.2. Otherwise derived from the aforesaid specifications, and hereby waives any claims or demands so based or derived as might otherwise arise.

23.4. Notwithstanding the "Changes" clause or any other clause or article of the Contract, the Contractor hereby agrees that no changes to the aforesaid specifications that may be necessary to permit achievement of the performance requirements specified herein for the Contractor's proposed work shall entitle the Contractor either to any increase in the firm fixed price as set

forth in this Contract or to any extension of the delivery times for the work beyond the period of performance in the SSS.

24. WARRANTY PERIOD

24.1. This Clause hereby supplements Clause 27 of the NCIO General Contract Provisions.

24.2. The Contractor shall provide a SSSB System Warranty delivered under this Contract, for a period of twelve (12) months following the granting by the Purchaser of the FSA. Such Warranty will be in accordance with the warranty requirements in Part IV – Statement of Works and shall cover all hardware, software and all services provided as part of this Contract. Until FSA, SSSB System to be provided under this Contract shall be under the Contractor's responsibility.

24.3. During the SSSB System Warranty period, the Contractor shall perform in-depth analysis of failures of equipment and components and parts thereof, and functional performance failures to due sub-system or equipment group malfunctions. Such failures shall not be limited to hardware, but shall include failures due to application or embedded software.

24.4. Critical faults during the SSSB System Warranty period that takes one or more elements of the SSSB Systems sites offline (except for normally scheduled downtime due to maintenance procedures) will have the result of extending the SSSB Warranty for all sites by the period for which the single SSSB site is offline. This period is determined by the entry of the critical failure in the SSSB System Manager's logbook until the time the SSSB System Manager makes the entry into the logbook that the SSSB System has been restored to full operation.

24.5. Such extension of the SSSB System Warranty period will not apply in cases where the Contractor can convincingly demonstrate that the critical failure was due to THN negligence or a wilful act on the part of THN personnel.

24.6. Corrective action required by the Contractor under the SSSB System Warranty also applies to errors or omissions in any delivered documentation which could not have reasonably been discovered prior to the Final System Acceptance under this Contract. Errors or omissions in delivered documentation may not be considered as a basis for extension of the SSSB System Warranty, as set forth in paragraph 24.4 above, except where evidence can demonstrate that such an error or omission was the cause of a critical system failure that caused a SSSB site to be offline.

24.7. The Contractor shall correct all Warranty Period Incidents arising during the Warranty Period without any cost to the Purchaser.

24.8. If the Contractor fails to correct any Warranty Period Incidents within the timeframe specified in Clause 27 of the NCIO General Contract Provisions, or if no specific timeframe has been established in the referred Clause or in the SOW for the type of incident concerned, within 30 working days of notification, the Purchaser may on 10 working days written notice:

24.8.1. correct the Warranty Period Incident or employ a third party to correct it; and

24.8.2. deduct from the prices to be paid, draw from the performance guarantee, or recover as a debt due from the Contractor, all reasonable costs in so doing.

24.9. The Contractor shall deploy all such additional resources as are reasonably required to remedy any Warranty Period Incident as efficiently and quickly as possible.

24.10. If replacement parts are fitted by the Contractor as part of the warranty the parts removed shall become the Contractor's property unless required by the Purchaser at the Purchaser's discretion. Notwithstanding that, faulty hard disks removed from NATO SECRET equipment shall not be returned to the Contractor but destroyed by the NATO site personnel in accordance with applicable NATO security regulations.

24.11. Notwithstanding Clause 27.6 of the NCIO General Contract Provisions, if prior agreed upon by the Purchaser, the Contractor has the possibility to repair the Failed component instead of providing a new replacement.

25. PERFORMANCE GUARANTEE

25.1. This Clause hereby supplements Clause 8 of the NCIO General Contract Provisions.

25.2. As a guarantee of performance under the Contract, the Contractor shall deposit with the Purchaser within thirty (30) calendar days from the Effective Date of Contract, or the Contract Signature Date by both parties, whichever is the later, a bank guarantee (the “Performance Guarantee”) of 10% of the total contract value.

25.3. The Purchaser may allow reductions in the amount of the Performance Guarantee in accordance with the Purchaser’s cost estimate of the work remaining to be completed under the Contract. In order to benefit from such reductions, the Contractor must provide the Purchaser with an updated copy of the Project Master Schedule for completion of the remaining work, and detailed cost breakdowns, prepared in accordance with the pricing principles

and standards established in the Contract, which indicate the percentage of work completed for each Contract line item. These requests for reduction shall be submitted in writing to the point of contact established in paragraph **Error! Reference source not found.** above.

25.4. The reductions specified in paragraph 25.3 above shall be treated as a concession to the Contractor and, therefore, shall be supported by sufficient consideration. Further, the decision to accept or reject an application for reduction of Performance Guarantee shall be a unilateral decision made solely at the discretion of the Purchaser.

25.5. In addition, the following paragraph replaces paragraph 8.4 of the Contract General Provisions in its entirety, as follows:

25.5.1. The Standby Letter of Credit shall be issued by a financial institution listed in (n)ANNEX I either on its own behalf or as a confirmation of the Standby Letter of Credit issued by a different bank not listed in (n)ANNEX I to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Purchaser of a written demand therefore. Neither the financial institution nor the Contractor can revoke or condition the Standby Letter of Credit.

26. SECURITY

26.1. This Clause hereby supplements Clause 11 of the NCIO General Contract Provisions.

26.2. The overall security classification of this Contract in its entirety is NATO UNCLASSIFIED.

26.3. The Contractor shall furnish the following services in accordance with the agreed terms, conditions and specifications set forth hereinafter and in the Project Security Instructions.

26.4. All Contractor and Sub-Contractor(s) personnel working on this Contract (excluding Contractor personnel who are not entering a Class II area or equivalent and thus have no access to classified systems or information) shall have a security clearance of “NATO SECRET” confirmed to the Purchaser by the relevant National Security Authority.

26.5. The Contractor shall notify the Purchaser and the site security officer where they are employed of any changes to a PSC of a Contractor or Sub-contractor employee.

26.6. All individuals who no longer require access to NATO Classified Information shall be made aware of their continuing responsibility to protect such information and the consequences of failing to do so. In accordance with national laws and regulations, an acknowledgement, in writing or an equivalent method which ensures non-repudiation, shall be used for such debriefing.

26.7. All staff shall possess a valid passport or ID card and shall maintain its validity for the duration of the Contract.

26.8. Key Personnel shall sign the ANNEX B TO CONTRACT SPECIAL PROVISIONS: NON-DISCLOSURE DECLARATION before beginning any work within this Contract.

26.9. All NATO CLASSIFIED material entrusted to the Contractor shall be handled and safeguarded in accordance with the applicable security regulations.

26.10. The Contractor shall be required to possess a Facility clearance of "NATO SECRET" for those sites in which he intends to handle and store NATO classified material in the conduct of work under this Contract.

26.11. The Contractor shall be required to process electronic information on Communication & Information Systems (CIS) with a security accreditation on NR and in accordance with Part IV – Statement Of Work - ANNEX K - Project Security Instructions. The Purchaser bares no responsibility for delays imposed by the security accreditation process by the National Security Agency or Designated Security Agency. NSA/DSA for this project is described in Part IV – Statement Of Work - ANNEX K - Project Security Instructions.

26.12. At the end of the Contract, during Final System Acceptance, the Contractor shall deliver all the documentation and information collected and generated in support of this Contract to the Purchaser. This includes a certificate that no copies are retained at the Contractor’s facilities. Additionally, any equipment that had been connected to a classified network during this Contract shall be returned / handed over to the Purchaser (i.e. laptops, USB keys, hard disks, etc).

26.13. It is the responsibility of the Contractor to ensure that his personnel obtain the required security clearances and transmit this information to the sites to be visited in adequate time that the site may perform the appropriate administration. Contractors are advised that the personnel security process may be lengthy. The Purchaser bears no responsibility for

the failure of the Contractor to secure the required clearances for its personnel within the necessary time.

26.14. Any delay in the project resulting from the Purchaser denying access to NATO and/ or THN sites to Contractor personnel for security reasons shall not be the basis for excusable delay under the terms of the Contract.

26.15. In the performance of all works under this Contract it shall be the Contractor's responsibility to ascertain and comply with all applicable NATO and National security regulations as implemented by the THN and by the local Headquarters.

26.16. The Contractor shall note that there are restrictions regarding the carriage and use of electronic device (e.g. laptops, cell/mobile telephones) in Purchaser and THN locations. The Contractor shall be responsible for satisfying and obtaining from the appropriate site authorities the necessary clearance to bring any such equipment into the facility.

26.17. The Contractor bears full responsibility and liability under the Contract for delays arising from the failure of the Contractor to adhere to the security requirements. Failure to comply with the Article 26 of Special Provision or with the Part IV – Statement Of Work - ANNEX K - Project Security Instructions for the period of performance of this Contract shall not be grounds for any delay in the scheduled performance of this Contract and may be grounds for termination under Clause 39 of this Contract entitled "Termination for Default".

27. SUPPLEMENTAL AGREEMENTS / EXPORT CONTROLLED INFORMATION

27.1. The Contractor has submitted all relevant draft supplemental agreement(s), documents and permissions prior to Contract award, the execution of which by the Purchaser is/are required by National Law or regulation. If any supplemental agreements, documents and permissions are introduced after Contract award, and it is determined that the Contractor failed to disclose the requirement for the execution of such agreement from the Purchaser prior to Contract signature, the Purchaser may terminate this Contract for Default, in accordance with the clause 39 "Termination For Default" of the NCIO General Contract Provisions.

27.2. Supplemental agreement(s), documents and permissions, the execution of which by the Purchaser is/are required by National Law or regulation and that have been identified by the Contractor prior to the signature of this contract, but have not yet been finalised and issued by the appropriate governmental authority, are subject to review by the Purchaser. If such supplemental agreement(s), documents and permissions are contrary to

cardinal conditions of the signed Contract between the Parties, and the Parties and the appropriate governmental authority cannot reach a mutual satisfactory resolution of the contradictions, the Purchaser reserves the right to terminate this Contract and the Parties agree that in such case the Parties mutually release each other from claim for damages and costs of any kind, and any payments received by the Contractor from the Purchaser will be refunded to the Purchaser by the Contractor.

28. SCHEDULE OF SITE INSTALLATIONS

28.1. The Contractor shall update the Project Management Control Plan (PMCP) specified in Section 2.3.2 of the SOW based on the results of Site Surveys. This Plan shall contain a detailed schedule of site installation and activation that shall comply with the time limits established in the Contract Schedules – SSS (Part I).

28.2. The item number of each System in the SSS is not indicative of the order of installation of the NCI Systems at the sites. The Contractor shall be responsible for delivery at the site of destination in accordance with the SSS. The Purchaser may change the order of site installation and activation up to 30 days prior to scheduled delivery at no change in the Contract price and delivery schedule. If the Purchaser makes a change in destination in less than 30 days prior to scheduled delivery, the Contractor may consider this to be a change in accordance with the clause of this Contract entitled "Changes".

28.3. If the Contractor foresees that Delivery of the SSSB System may be accelerated, the Contractor may notify the Purchaser and the Purchaser may concur with such early delivery (deliveries) if it can meet its site readiness and inspection and acceptance obligations. The Purchaser reserves the right to refuse such requests for early delivery and insist the Contract delivery schedule be maintained in an unmodified form.

28.4. The Contractor shall start work on each site, only after notification by the Purchaser that the site is ready for start of work.

29. DIFFERING SITE CONDITIONS

29.1. The Contractor had the opportunity to verify the drawings, data provided and ask for clarifications. Consequently, the Contractor shall have no recourse to claims of additional work and cost in connection with activities performed under this Contract, except if during the site survey additional effort and cost

is discovered by circumstances that could not have reasonably been foreseen (e.g., buried obstacles that are not shown on any drawings furnished).

29.2. If the Contractor encounters a situation that, consistent with this Clause, would be the cause of unforeseen additional effort and cost, he shall report this immediately to the Purchaser, and inform in writing the NCI Agency Contracting Authority, who will then make a determination as to the resolution of the difficulty.

29.3. The Contractor shall note that instructions or requests to perform additional tasks other than what is set forth in the SOW shall not be honoured except as such instructions are issued by the Purchaser's Contracting Authority.

30. CONTRACTOR AND PURCHASER SYSTEM INSTALLATION RESPONSIBILITIES

30.1. The Contractor shall be responsible for the installation of the equipment delivered under this Contract that comprises the SSSB-UK-GR-NL Systems with its supporting systems such as (augmented) UPS, and the CW portion implemented by the Contractor. The Contractor is responsible for the integration of the equipment into a functional SSSB System on site.

30.2. The Contractor shall be responsible for connecting, mounting, installing, integrating and cabling of the delivered equipment within the sites and at the interface with the National Digital Network (NDN) and at the interface with Power Supply System. The Contractor shall be responsible for connecting all the SSSB equipment with the requisite utility outlets.

31. LIAISON WITH PURCHASER DURING SITE PREPARATION ACTIVITIES

31.1. The Contractor acknowledges that it has taken the steps reasonably necessary to ascertain the nature and location of the installation work, and that during the site surveys it has investigated and satisfied itself as to the general and local conditions that can affect the work or its cost, including uncertainties of weather, or similar physical conditions at the site and the character of equipment and facilities needed preliminary to and during work performance.

31.2. It is the responsibility of the Contractor to provide its installation requirements to the Purchaser in order that these requirements are considered into the site preparation activities of the Purchaser and THN's. Failure to

provide such information in complete and timely manner may lead to site preparation delays for which the Purchaser may hold the Contractor liable.

31.3. It is the responsibility of the Contractor to insure that its installation requirements have been incorporated into the final architectural and engineering drawings of each site or to document to the Purchaser where such drawings and plans are deficient.

32. PROTECTION OF WATER, LAND, EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

32.1. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site that are not to be removed and that do not unreasonably interfere with the work required under this Contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during Contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Authority.

32.2. The Contractor shall protect from damage all existing improvements and utilities

32.2.1. at or near the work site, and

32.2.2. on adjacent property of a third party, the locations of which are made known to or shall be known by the Contractor.

32.3. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this Contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Authority may have the necessary work performed and charge the cost to the Contractor.

33. OPERATIONS AND STORAGE AREAS

33.1. The Contractor shall confine all operations (including storage of materials) on THN premises to areas authorized or approved by the Contracting Authority. The Contractor shall hold and save the Purchaser, its

officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

33.2. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Authority and shall be built with labour and materials furnished by the Contractor without expense to the Purchaser. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Authority, the buildings and utilities may be abandoned and need not be removed.

33.3. The Contractor shall, under regulations prescribed by the Contracting Authority, use only established roadways. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any national or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

33.4. All costs for loading, unloading, transport, handling and recycling are the responsibility of the Contractor; as well as the costs of landfills and the taxes inherent in the evacuation of excavation products if such taxes are due by NCI Agency /THN.

34. SITE CLEAN UP

34.1. The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Purchaser. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Purchaser.

35. AVAILABILITY AND USE OF UTILITY SERVICES

35.1. The Purchaser and the THN's will make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies. Unless otherwise provided in the Contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Territorial Host Nation Governments or, where the utility is produced by the Territorial Host Nation, at reasonable rates determined by the

Territorial Host Nation. The Contractor shall carefully conserve any utilities furnished without charge.

35.2. The Contractor, at its expense and in a workmanlike manner satisfactory to the Territorial Host Nation representatives, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. After Individual Site Acceptance of each site by the Purchaser, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

35.3. The Contractor shall not be billed for utility usage after FSA.

36. PLACE AND TERMS OF DELIVERY

36.1. This Article supplements Clause 20 of the Contract General Provisions.

36.2. All deliverables under this Contract shall be delivered DDP ("Delivered Duty Paid") as defined by the INCOTERMS published by the International Chamber of Commerce (Publication No. 560) to the places and at such times as stipulated in the Schedule of Supplies and Services. The Contractor shall note that the Purchaser is exempt from customs duties and Value Added Tax as per Clause 26 – "Taxes and Duties" of the Contract General Conditions.

36.3. Partial deliveries are acceptable as long as all related shipping costs are born by the Contractor and subject to advance notification and agreement from the Purchaser.

36.4. The Contractor shall, for the purpose of transportation, package, crate, or otherwise prepare the various supplies in accordance with the best commercial practises for the type of supplies involved, giving due consideration to shipping and other hazards associated with the transportation of consignments overseas.

36.5. The Contractor will have no right for any claims in reference to a delay in the Purchaser's confirmation of start of work, as long as the delay does not exceed thirty (30) days. This includes the delivery of all Purchaser Furnished Equipment (PFE).

37. ENGINEERING CHANGE PROPOSALS (ECP)

37.1. Engineering Change Proposals (ECP) as defined in this Clause are proposals for changes relevant to tasks, deliverables, technical requirements, processes, schedules or any other term of the contract which are submitted in written form by the Contractor upon request from the Purchaser or

independently when such changes are necessary in light of varied facts or circumstances which prevent the execution of the contract in its form.

37.2. Any Engineering Change Proposal (ECP) submitted by the Contractor to the Purchaser shall, in any case contain as a minimum the following elements:

37.2.1. The signature pages following the template provided in ANNEX H and providing all the information required in this template.

37.2.2. A sequential number of ECP identification

37.2.3. Rationale for the changes being proposed

37.2.4. Illustration of any relevant impact to the performance being rendered including but not limited to those relevant to schedules, technical solutions, requirements and delivery time.

37.2.5. List of contract documents affected by the changes being proposed.

37.2.6. Revised copy of the contract documents in native electronic format edited to incorporate the changes being proposed in a way that changes are immediately identifiable.

37.2.7. Total Firm Fixed Price of the ECP and illustration of cost impacts with respect to the total contract Firm Fixed Price and the single CLINs affected.

37.2.8. A detailed price breakdown of all costs to identify single elements of cost contributing to the total. The cost reduction associated with the ECP (if any) shall take into account the Contractor’s allowable implementation cost.

37.2.9. All labour costs and material quoted as part of any ECP shall be consistent with those stipulated in the Contract.

37.2.10. A revised version of the Contract Schedule of Supplies and Services.

37.3. The Purchaser shall assess the ECP being proposed by the Contractor and, subject to its sole judgment and without recourse by the Contractor, approve or reject the ECP by the mean of written communication to be dispatched solely by the Purchaser’s Contracting Authority.

37.4. Any ECP shall be considered as approved only once the signature pages provided in ANNEX H have been formally signed by the Purchaser's Contracting Authority.

37.5. In case of ECP rejection, the Contractor shall proceed with the performance in accordance with the Contract.

37.6. Formally approved ECPs shall be treated as interim authorization to proceed with the changes proposed strictly and limited to the scope, content and price as specified in the approved ECP.

37.7. The Purchaser shall not be liable for any cost incurred by the Contractor for performance rendered, regardless of the nature or time, associated to ECPs not formally approved by the Purchaser's Contracting Authority.

37.8. All formally approved ECPs will be incorporated in the Contract via the issuance of a formal Contract Amendment at the earliest practical time after their issuance.

37.9. The production of any ECP regardless of its final approval or rejection shall be at no cost for the Purchaser.

38. OPTIMISATION

38.1. The Contractor is encouraged to examine methods and technology that may increase efficient operation and management of the system(s) on which the required services are provided to the Purchaser, thus reducing operating and manpower costs and the overall cost to the Purchaser.

38.2. The Contractor may, at any time during the Period of Performance, introduce Engineering Change Proposals (ECPs) offering innovations and/or technology insertion with a view towards reducing the overall cost to the Purchaser.

38.3. Any such ECP submitted shall cite this Article as the basis of submission and provide the following information:

38.3.1. A detail description of the technical changes proposed, the advantages, both long and short term, and an analysis of the risks of implementation;

38.3.2. A full analysis of the prospective savings to be achieved in both equipment and manpower, including, as appropriate, utility and fuel consumption and NATO manpower, travel, etc;

38.3.3. A full impact statement of changes that the Purchaser would be required to make, if any, to its operational structure and management procedures;

38.3.4. A fully detailed proposal of any capital investment necessary to achieve the savings;

38.3.5. A schedule of how the changes would be implemented with minimal negative impact to on-going performance and operations.

38.4. If the Purchaser, after review and analysis of the ECP, agrees to such proposed change(s), the Contract will be formally amended to include the ECP and the reduced Fixed Price of the Contract, as well as affected Contract Line Items (including options), will be reduced by the total amount of the prospective savings agreed by the Parties.

39. PATENT AND COPYRIGHT INDEMNITY

39.1. Clause 29.3 and 29.4 of the Contract General Provisions is replaced by Clause 39.2 below.

39.2. This indemnity shall not apply under the following circumstances:

39.2.1. Patents or copyright which may be withheld from issue by order of the applicable government whether due to security regulations or otherwise;

39.2.2. An infringement resulting from specific written instructions from the Purchaser under this Contract;

39.2.3. An infringement resulting from changes made to the Work by the Purchaser without the Contractor prior written consent;

39.2.4. An infringement resulting from changes or additions to the Work subsequent to final delivery and Acceptance under this Contract.

40. NOTICE OF AUTHORIZED DISCLOSURE OF INFORMATION FOR MANDATED NATO THIRD PARTY AUDITS BY RESOURCE COMMITTEES

This Clause hereby supplements Clause 28 of the NCIO General Contract Provisions.

(a) Definitions. As used in this clause -

Resource Committees means committees under the North Atlantic Council (NAC) that are responsible, within the broad policy guidance provided by the Resource Policy and Planning Board (RPPB) on matters of resource

allocation, for the implementation of the NATO Security Investment Programme (NSIP) or Budget/Civil budgets.

Mandated Third Party Audits means audits mandated by a resource committee.

Third Party Auditor means an independent, external audit body for NATO such as the International Board of Auditors for NATO (IBAN) or an appointed private contractor (including its experts, technical consultants, subcontractors, and suppliers) providing audit support under a Resource Committee Appointment based on an agreed mandate.

Sensitive information means information of a commercial, financial, technical, proprietary, or privileged nature. The term does not include information that is lawfully, publicly available without restriction.

(b) The Purchaser may disclose to a mandated third party auditor, for the sole purpose of audit support activities, any information, including sensitive information, received -

(1) Within or in connection with a bid, quotation or offer; or

(2) In the performance of or in connection with a contract.

(c) Flowdown. Include the substance of this clause, including this paragraph (c), in all subcontracts, including subcontracts for commercial items.

41. FORCE MAJEURE CLAUSE

41.1. “Force Majeure” means the occurrence of an event or circumstance that prevents a Party (the “Affected Party”) from performing one or more of its contractual obligations under the Contract, provided that: (i) it renders performance impossible; (ii) it is beyond the Affected Party’s reasonable control and without the Affected Party’s cause, fault or negligence; (iii) by its nature it could not have been reasonably foreseen at the time of conclusion of the Contract; and (iv) the effects of it could not reasonably have been avoided or overcome by the Affected Party.

41.2. Examples of Force Majeure, provided conditions (i)-(iv) of paragraph 41.1 are all fulfilled, include:

41.2.1 war (whether declared or not), hostilities, invasion, act of foreign enemies, extensive military mobilisation;

41.2.2 civil war, riot, rebellion and revolution, usurped power, insurrection, act of terrorism, sabotage or piracy;

41.2.3 currency and trade restriction, embargo, sanction;

41.2.4 act of authority whether lawful or unlawful, compliance with any law or governmental order, expropriation, seizure of works, requisition, nationalisation;

41.2.5 plague, epidemic, natural disaster or extreme natural event;

41.2.6 explosion, fire, destruction of equipment, prolonged break-down of transport, telecommunication, information system or energy; and

41.2.7 general labour disturbance such as boycott, strike and lock-out, go-slow, occupation of factories and premises.

41.3. The Affected Party must give the other party to the Contract (the “Other Party”) written notice without delay detailing the occurrence and its expected duration. The Other Party shall within a reasonable time respond, stating whether it accepts or rejects the occurrence as Force Majeure.

41.4. If the Other Party accepts the occurrence as Force Majeure, the Contract shall remain in force but the Parties will be relieved from performance of their obligations (including payment) under Contract, from the date at which the Other Party received written notice, for so long as the effects of Force Majeure continue or for ninety (90) days, whichever is the shorter, provided that:

41.4.1 the Affected Party makes all reasonable efforts to limit the effects of Force Majeure upon performance and to avoid or overcome the effects of Force Majeure;

41.4.2 the suspension of performance is of no greater scope than is necessitated by Force Majeure;

41.4.3 the Affected Party continues to furnish weekly updates by email while the effects of Force Majeure continue detailing reasonable efforts made in accordance with [4.1], and notifies the Other Party immediately when the effects of Force Majeure are avoided or overcome, or cease, and resumes performance immediately thereafter.

41.5. Neither Party shall be in breach of the Contract nor liable for delay in performing, or for failing to perform, its obligations under the Contract, due to Force Majeure.

41.6. Unless otherwise agreed by the Parties, if Force Majeure continues for more than ninety

41.7. (90) days, the Parties may agree: (a) to a revised delivery schedule at no cost; (b) to a reduction of scope terminating part of the contract at no cost; or (c) to terminate the whole of the Contract at no cost.

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ANNEX A. LIST OF ABBREVIATIONS

Abbreviation	Definition
2D	Two Dimensional
3D	Three Dimensional
A1	Air Personnel and Administration
A2	Air Intelligence
A3	Air Operations
A4	Air Logistics
A5	Air Plans and Policy
A6	Air Communications and Information Systems
A7	Air Doctrine and Training
A8	Air Budget and Finance
A9	Air Civilian/Military Affairs
AAP	Allied Administrative Publication
AAR	Air to Air Refuelling
AAWG	Air Assessment Working Group
ABL	Allocated Baseline
ABT	Air Breathing Threat
ABTD	Air Breathing Threat Defence
A/C	Aircraft
ACA	Airspace Control Authority
ACC	Air Component Command
ACC	Air Control Centre (ACCS entity)
ACCS	NATO Air Command and Control System (software and hardware)
ACCS BU2	ACCS Build Upgrade 2
ACCS LOC1	ACCS Level of Capability 1
ACM	Airspace Control Measure
ACMP	Allied Configuration Management Publication
ACN	Aircraft Classification Number
ACO	Allied Command Operation
ACO	Airspace Control Order
ACO	Airspace Coordination Order
ACP	Allied Communication Publication
ACP	Airspace Control Plan
ACROSS	NCIA ACO Resources Optimization Software System (software)
ACS	Airspace Control System
ACT	Allied Command Transformation
ACTWG	Air Coponent Targeting Working Group
AD	Air Defence

Abbreviation	Definition
AD	ACO Directive
ADAMS	Allied Deployment And Movement System
AdatP	Allied Data Publication
ADatP-3	Allied Data Publication Volume 3
ADatP-3 BL 11F	ADatP-3 Baseline 11 Future
ADD	Architecture Description Document
ADDIE	Analysis, Design, Development, Implementation, and Evaluation
ADL	Advanced Distributed Learning
ADL	Allied Disposition List
ADM	AOD Decision Meeting for AOD X+2
ADP	Automatic Data Processing
ADP	Air Defence Plan
AEW	Airborne Early Warning
AFOD	Airfield Operational Database
AFPL	Approved Fielded Product List
AFTN	Aeronautical Fixed Telecommunications Network
AI	Area of Interest
AIFS	NATO Automated Information Flow System (software)
AIP	AirC2IS Information Portal
AIP	Air Operations Information Portal
AirC2IS	Bi-SC AIS Air Command and Control Information Service (software)
AirC2IS-1	AirC2IS Increment 1
AirC2IS-2	AirC2IS Increment 2
AirC2IS-3	AirC2IS Increment 3
AirCC	Air Component Command
AIRINCIREP	Air Incident Report
AIS	Automated Information System
AIS	Automatic Identification System (civilian ships)
AIT	Air Intelligence Team
AJAX	Asynchronous JavaScript and XML
AJP	Allied Joint Publication
ALCC	Airlift Coordination Centre
ALTBMD	Active Layered Theatre Ballistic Missile Defence
AM	ACO Manual
AMMO	Ammunition
AMR	Air Mobility Request
AO	Area of Operations
AOC	Air Operations Centre
AOCC	Air Operations Coordination Centre

Abbreviation	Definition
AOCC (L)	Air Operations Coordination Centre (Land)
AOCC (M)	Air Operations Coordination Centre (Maritime)
AOD	Air Operations Directive
AODT	AOD Team
AOI	Area of Interest
AOM	Air Ops Meeting for AOD X+3 to X+10
AOP	Air Operations Plan
AOPG	Air Operations Planning Group
AOPT	Air Operations Planning Team
AOR	Area of Responsibility
AOR	Area of Operational Responsibility
AOSS	ACO Open Source System
AP	Air Plan
API	Applications Programming Interfaces
APMS	Automated Personnel Management System
APOD	Airport of Debarkation
APOE	Airport of Embarkation
APP	Allied Procedural Publication
APT	Air Planning Team
AQAP	Allied Quality Assurance Publication
ARIS	Architecture of Integrated Information Systems
ARS	Architecture Requirements Specification
ASAS	All-Source Analyst System
ASEP	Architecture Security Engineering Plan
ASIT	Allied Systems Interoperability Test-bed
ASM	Airspace Management
ASMAN	NCIA ICC Airspace Management module (software)
ASOC	Air Support Operation Centre
ASR	Air Support Request
ASRC	Acquisition Support Resource Centre
ASSESSREP	Assessment Report
ASTERIX	All Purpose Structured Eurocontrol Surveillance Information Exchange
AT	Air Transport
ATA	Actual Time of Arrival
ATC	Air Traffic Control
ATD	Actual Time of Departure
ATM	Air Traffic Management
ATO	Air Tasking Order
ATP	Allied Tactical Publication
ATWG	Air Transport Working Group

Abbreviation	Definition
AUP	Airspace Utilization Plan
AWACS	Airborne Warning and Control System
AWCIES	ACCS-Wide Communication Information Exchange System
AWG	Architecture Working Group
BAIP	Bi-SC AIS Implementation Plan
BAPPL	Bi-SC AIS Procurement Product List
BBN	BICES Backbone Network
BDA	Battle Damage Assessment
BDAREP	Battle Damage Assessment Report
BE	Basic Encyclopaedia
BER	Bit Error Rate
BICC	BICES Initial Core Capability
BICES	Battlefield Information Collection and Exploitation System
BIRT	Business Intelligence and Reporting Tools
Bi-SC	Bi-Strategic Command
Bi-SC AIS	Bilateral Strategic Command Automated Information System
Bi-SC AIS PMIC	Bi-SC AIS Programme Management and Integration Capability
BITE	Built-in Test Equipment
BL	Baseline
BM	Ballistic Missile
BMC3	Battle Management Command, Control & Communications
BMC3I	Battle Management Command, Control, Communications & Intelligence
BMD	Ballistic Missile Defence
BMD PO	BMD Programme Office
BOA	Basic Ordering Agreement
BOE	Basis of Estimate
BPD	Boundary Protection Device
BPD	Business Process Design
BPEL	Business Process Execution Language
BPEL4WS	Business Process Execution Language for Web Services
BPS	Boundary Protection Service
Brief	Briefing
BRR	Baselines Requirements Review
BS	Battle Staff
BSO	Battle Staff Object
C2	Command and Control
C2DO	Command and Control Duty Officer

Abbreviation	Definition
C2IEDM	Command and Control Information Exchange Data Model
C2IS	Command and Control Information System
C3	Command, Control and Communication
C4ISR	Command, Control, Communications, Computers Intelligence Surveillance and Reconnaissance
CA	Combat Assessment
CA	Campaign Assessment
CAB	Contracts Award Board
CAL	Critical Asset List
CAOC	Combined Air Operations Centre
CAP	Capability Assessment Plan
CASP	Coordinated Air/Sea Procedures
CAX	Computer Aided Exercise
CBA	Component-Based Architecture
CBRN	Chemical, Biological, Radioactive, Nuclear
CBT	Computer Based Training
CC	Component Command
CC-Air	Air Component Command
CCB	Configuration Control Board
CCF	Conventional Counter-Force
CCHQ	Component Command Headquarters
CCIR	Commanders Critical Information Requirements
CC-Land	Land Component Command
CCLVTC	Component Command Liaison VTC
CC-Mar	Maritime Component Command
CCMM	Common Core Meta-Model
CC-SOF	SOF Component Command
CD	Compact Disk
Cdr	Commander
CDR	Critical Design Review
CDRL	Contract Documentation Requirements list
CEM	Collection Emphasis Messages
CEO	Chief Executive officer
CEOI	Communications-Electronics Operating Instructions
CEP	Circular Error Probable
CET	Central European Time
CDR	Critical Design Review
CFBLNet	Combined Federated Battle Laboratories Network
CFM	Communications Flow Model
CGI	Common Gateway Interface
CGRS	Common Geographical Reference System

Abbreviation	Definition
CGS	Core Geographic Services
CI	Configuration Item
CIA	Component Implementation Architecture
CICOM	CIMIC Coordination Meeting
CIM	Central Information Managers
CIMIC	Civilian and Military Cooperation
CIRC	Computer Incident Response Capability
CIS	Communication Information System
CISREP	CIS Report
CJOC	Combined Joined Operations Centre
CJSOR	Combined Joint Statement of Requirements
CJTF	Combined Joint Task Force
CLC	Combined Logistics Conference
CLI	Combined Language Infrastructure
CLIN	Contract Line Item Number
CM	Configuration Management
CMD	Common Mission Definition
CMDB	Configuration Management Database
CMO	Coverage Mission Order
CMP	Configuration Management Plan
COA	Courses of Action
CO	Contracting Officer
COE	Consequence Of Engagement
COI	Consequence Of Intercept
COI	Communities of Interest
COINS	Communication and Information Systems
COM	Commander
COMMPLAN	Communications Plan
COMMZ	Communications Zone
CONOPS	Concept of Operations
COO	Chief Operating Office
COP	Common Operational Picture
COSI	NCIA ICC CORBA Based ISI (software)
COTS	Commercial off the shelf
CP	Capability Package
CP	Collection Plan
CPX	Command Post Exercise
COVREP	Coverage Report
CR	Change Request
CRAM	Consolidated Route Availability Messages

Abbreviation	Definition
CRC	Control Reporting Centre
CRO	Crisis Response Operations
CRONOS	NATO Secret Wide Area Network (WAN)
CSA	Component Specification Architecture
CSA	Configuration Status Accounting
CSCI	Computer Software Configuration Item
CSD	NCIA MAJIIC Coalition Shared Database (software)
CSDO	Combat Support Duty Officer
CSRS	Community Security Requirements Statement
Csv	Comma separated value
CTL	Collection Tasking List
Ctrl	Control key
CTRL	Control key
CTS	COSMIC TOP SECRET
CUB	Commanders Update Briefing
CurrOps	Current Operations
CVRT	Criticality, Vulnerability, Recuperability & Threat
CWS	Cartographic Work Shop
CY	Calendar Year
D&G	Direction & Guidance
DAC	Defended Area Coverage
DAFIF	Digital Aeronautical Flight Information File
DARB	Daily Assets Reconnaissance Board
DARS	Deployable ACC + RPC + SFP (ACCS entity)
DAV	Distributed Authoring and Versioning
dB	Database
DBA	DataBase Administrator
DBMS	Data Base management System
DCAOC	Deployable CAOC (ACCS entity)
DCIS	Deployable Communication and Information Systems
DCP	Draft Change Proposal
DDD	Detailed Design Document
DDE	Defence Design Enterprise
DDP	Delivery Duty Paid (Incoterms2000)
DDS	Defence Design Services
DEM	Data Exchange Model
DEM	Data Exchange mechanism
DHCP	Dynamic Host Configuration Protocol
DHS	Document Handling Service

Abbreviation	Definition
DHTML	Dynamic HTML
DIF	Difficulty, Importance, and Frequency Analysis
DIS	Distributed Interactive Simulation
DISUM	Daily Intelligence Summary
Div	Division
DJSE	Deployed Joint Staff Element
DJTF	Deployed Joint Task Force
DL	Description Logics
DL	Data Link
DLCP	Data Link Change Proposal
DMPI	Desired Main Point of Impact
DMS	Document Management System
DO	Delivery Order
DOB	Deployed Operating Base
DOORS	Requirements Management for Complex Systems and Software Development: Dynamic Object-Oriented Requirements System
DOS	Days of Supply
Dpi	Dots per inch
DPM	Deputy Project Manager
DR	Deficiency Report
DTED	Digital Terrain Elevation Data
DTG	Data Time Group
DTS	Deployable Training System
DUNS	Data Universal Numbering System
EAD	Extended Air Defence
EAF	Entity Armed Forces
EAPC	Euro-Atlantic Partnership Council
EBAO	Effect Based Approach to Operations
EBO	Effect-Based Operations
EBP	Effects Based Planning
ECMAScript	Ecma International Script
ECP	Engineering Change Proposal
EDC	Effective Date of Contract
EEI	Essential Element of Information
e.g.	For example
E-mail	Electronic mail
EMC	Electro-Magnetic Compatibility
EMCON	Emission Control
EMP	Electromagnetic Pulse

Abbreviation	Definition
EMS	Enterprise Management Services
ENC	Electronic Navigation Chart
EOB	Enemy Order of Battle
EOB	Electronic Order of Battle
EPM	Microsoft Enterprise Project Management
ESB	Enterprise Service Bus
ETA	Estimated Time of Arrival
Etc.	etcetera
ETD	Estimated Time of Departure
ETEE	Education Training Exercise and Evaluation
ETRO	Expected Time to Return to Operations
EUROCONTROL	European Air Traffic Control Agency
EVE	Effective Visible Execution
EW	Electronic Warfare
EW	Early Warning
EWS	Early Warning Sensors
ExO	Exercise Organization
FA	Functional Application
FAC	Forward Air Controller
FAC(A)	Forward Air Controller (Army)
FADR	Fixed Air Defence Radar
FAM	Functional Area Module
FAOR	Fighter Area of Responsibility
FAS	Functional Area Service
FAST	NCIA ICC Flexible, Advanced C2 Services for NATO Time Sensitive Targeting (software)
FAT	Factory Acceptance Test
FA VTC	Functional Area VTC
FBL	Functional Baseline
FCA	Functional Configuration Audit
FFP	Firm Fixed Price
FHA	First Hostile Act
Flash	Adobe Flash (software)
FLOT	Forward Line of Own Troops
FM	Frequency Management
FMC	Full Mission Capable
FOB	Free On Board (incoterms2000)
FOB	Forward Operating Base
FOB	Friendly Order of Battle
FOC	Final Operational Capability

Abbreviation	Definition
FP	Force Protection
FORMETS	NATO Message Text Formatting System
FRAGO	Fragmentary Order
FS	Functional Service
FSA	Final System Acceptance
FSCM	Fire Support Coordination Measure
FSD	Final System Design
FSSL	Fire Support Safety Line
FTE	Full Time Equivalent
GARS	Global Area Reference System
GBAD	Ground Based Air Defence
Geo	Geographical
GEO	Geographical
GEOLOC	Geographic Location
GeoTIFF	Geographical Tagged Image Format
GFE	Government Furnished Equipment
GIF	Graphics Interchange Format
GIS	Geographic Information Service
GML	Geography Mark-up Language
GMT	Greenwich Mean Time
GO	Government Organization
GOF	Gang of Four
GOTS	Government off the shelf
GQA	Government Quality Assurance
GUI	Graphical User Interface
HAS	Hardened Aircraft Shelter
HCI	Human Computer Interfaces
He/his	The terms 'he' and 'his' denote a person and do not imply gender.
HF	High Frequency
HIW	High Intensity Warfighting
HLA	High Level Architecture
HMI	Human Machine Interface
HN	Host Nation
HQ	Headquarters
HRF	High Readiness Forces
HTML	Hypertext Mark-up Language
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol over Secure Socket Layer

Abbreviation	Definition
HUMINT	Human Intelligence
HVA	High Value Asset
HVAC	Heating, Ventilating and Air Conditioning
HVI	High Value Individual
HVT	High Value Target
HW	Hardware
HWCI	Hardware Configuration Item
HWIL	Hardware In The Loop
I&A	Identification and Authentication
I&W	Indications and Warning
IAMD	Integrated Air and Missile Defence
ICA	Initial Central Administrators
ICAO	International Civil Aviation Organization
ICB	International Competitive Bidding
ICC	Integrated Command and Control
ICC	(Patriot) Information Coordination Central
ICC	International Chamber of Commerce
ICD	Interface Control Document
ICO	Icon
ID	Identity
IDE	Integrated Development Environment
IDO	Intelligence Duty officer
i.e.	Includes
IE	Information Exchange
IED	Improvised Explosive Device
IEEE	Institute of Electrical and Electronic Engineers
IEG	Information Exchange Gateway
IER	Information Exchange Requirement
IERD	Information Exchange Requirements Description
IETF	Internet Engineering Task Force
IFB	Invitation For Bid
IFF/SIF	Identification Friend or Foe/Selective Identification Feature
iGeoSIT	NCIA Interim Geo-Spatial Intelligence Tool (software)
IKM	Information and Knowledge Management
ILC	Irrevocable Letter of Credit
ILS	Integrated Logistics Support
ILSP	Integrated Logistics Support Plan
IM	Information Management
IM	Instant Messaging

Abbreviation	Definition
IMART	Imagery Management and Reporting Tool
IMINT	Imagery Intelligence
IMS	International Military Staff
IMSSOP	International Military Staff Standard Operating Procedure
INCOSE	International Council on Systems Engineering
Info	Information
Info Ops	Information Operations
INFOSEC	Information Security
Intel	Intelligence
INTEL	Intelligence
INTEL-FS	Intelligence Functional Services
INTEL-FS IOC	Increment 1 of INTEL-FS Spiral I
INTREP	Intelligence Report
INTSUM	Intelligence Summary
IO	International Organisation
IO	Information Object
IO	Information Operations
IOC	Initial Operational Capability
IOCB	Information Operations Coordination Board
IOT&E	Initial Operational Test and Evaluation
IOWG	Info Ops Working Group
IP	Internet Protocol
IPB	Intelligence Preparation of the Battlespace
IPL	Image Product Library
IPMT	Integrated Project Management Team
IPP	Impact Point Prediction
IPR	Intellectual Property Rights
IPSEC	Internet Protocol Security
IPT	Integrated Project Team
IPv6	Internet Protocol Version 6
IR	Incident Report
IRD	Interface Requirements Document
ISAF	International Security Assistance Force (Afghanistan)
ISI	NCIA ICC Standard Interface Library (software)
ISLA	Initial Service Level Agreement
ISM	Information System Modules
ISO	International Standards Organisation
ISP	Integrated Support Plan
ISP 98	International Standby Practices 98
ISR	Intelligence, Surveillance, Reconnaissance

Abbreviation	Definition
ISTAR	Intelligence, Surveillance, Target Acquisition and Reconnaissance
ISUG	Intelligence Systems Users Group
IT	Information Technology
ITB	Integration Test Bed
ITI	Integration/Interoperability Test Item
ITIL	Information Technology Infrastructure Library
ITS	US Interim Targeting Solution (software)
ITU	International Telecommunication Union
IV&V	Independent Validation and Verification
I&T	Integration and Tests
J (1-9)	Divisional Staffs
J1	Joint Personnel and Administration
J2	Joint Intelligence
J3	Joint Operations
J4	Joint Logistics
J5	Joint Plans and Policy
J6	Joint Computer Information Systems
J7	Joint Doctrine and Training
J8	Joint Budget and Finance
J9	Joint Civilian/Military Affairs
JAAP	Joint Air Allocation Plan
JACC	Joint Airspace Coordination Cell
JADC	Joint Area Air Defence Commander
JADOCS	US Joint Automated Deep Operations Coordination System (software)
JALLC	Joint Analysis and Lessons Learned Centre
JAOP	Joint Air Operations Plan
JASMAD	US Joint Airspace Management and Deconfliction (software)
JC2IS	Bi-SC AIS Joint Command and Control Information System (CP 107)
JC3IEDM	Joint Command Control and Communication Information Exchange Data Model
JCAL	Joint Critical Asset List
JCB	Joint Coordination Board
JCBWG	Joint Coordination Board Working Group
JCHAT	NCIA Joint Tactical Chat (software)
JCO	Joint Coordination Order
JCOP	NCIA Joint COP System (software)
JDAWG	Joint Defended Asset Working Group
JEP	Joint Environmental Picture

Abbreviation	Definition
JFACC	Joint Forces Air Component Command
JFAI	Joint Final Acceptance & Inspection
JFC	Joint Forces Command
JFHQ	Joint Forces Headquarters
JFLCC	Joint Forces Land Component Command
JFM	Joint Frequency Management
JFMCC	Joint Forces Maritime Component Command
JFSCL	Joint Fire Support Coordination Line
JFSOCC	Joint Forces SOF Component Command
JFTC	Joint Forces Training Centre
JHQ	Joint Headquarters
JIM	NCIA JTLS - ICC Interface Module (software)
JIPB	Joint Intelligence Preparation of the Battlespace
JISR	Joint Intelligence Surveillance and Reconnaissance
JLSG	Joint Logistics Support Group
JOA	Joint Operations Area
JOC	Joint Operations Centre
JOCWatch	NCIA Joint Operations Centre Event Management Tool (software)
JOIIS	Joint Operations and Intelligence System
JOPG	Joint Operational Planning Group
JOPLAN	Joint Operational Plan
JOPWG	Joint Operational Planning Working Group
JPCAL	Joint Prioritised Critical Asset List
JPDAL	Joint Prioritized Defended Asset List
JPEG	Joint Photographic Experts Group (format)
jpg	Joint Photographic Experts Group (format)
JPR	Joint Personal Recovery
JPRP	Joint Personal Recovery Plan
JPTL	Joint Prioritised Target List
JRE	Joint Range Extension
JREAP	Joint Range Extension Application Protocol
JREP	Joint Range Extension Protocol
JSR	Java Specification Request
JSTARS	Joint Surveillance and Target Attack Radar System
JTL	Joint Target List
JTLS	NATO Joint Theatre Level Simulation (software)
JTMB	Joint Transportation Movement Board
JTNL	Joint Target Nomination List
JTS	NCIA ICC Joint Targeting System (software)
JTST	Joint Time Sensitive Targeting

Abbreviation	Definition
JTT	US Joint Targeting Toolbox (software)
JTWG	Joint Targeting Working Group
JWC	Joint Warfare Centre
KFOR	Kosovo Force
KOA	Keep-out Altitude
KPI	Key Performance Indicators
L16	Link 16
LAD	Launch Area Denied
LAN	Local Area Network
LC2	Land Command and Control
LC2IS	Land Command and Control Information Service
LCC	Land Component Command
LCN	Load Classification Number
LDAP	Lightweight Directory Access Protocol
LEGAD	Legal Advisor
LEP	Locally-Employed Personnel
LIVEX	Live Exercise
LLNO	Logistics Liaison Officer
LNO	Liaison Officer
LOC	Level Of Capability
LOC	Location
LOCE	Linked Operations-Intelligence Centers Europe
LOG	Logistics
LOGFS	Bi-SC AIS Logistics Functional System
LOGASSESSREP	Logistics Assessment Report
LOGFAS	NCIA Logistics Functional Area Services
LOGREP	Logistics Reporting
LOGSITREP	Logistical Situational Report
LOGUPDATE	Logistics Update Report
LOP	Level of Protection
LOS	Level of Support
LPE	Launch Point Estimate
LRU	Line-Replaceable Unit
LSID	NCIA Link 16 Situational Display (software)
MAAP	Master Air Attack Plan
MAOP	Master Air Operations Plan
MAOP	NCIA ICC MAOP Tool (software)

Abbreviation	Definition
MAP	Master Air Plan
MAPI	Mail Application Programming Interface
Mar	Maritime
MBC	Military Budget Committee
MC	Military Committee
MC	Mission Capable
MCC	Maritime Component Command
MCCIS	Maritime Command and Control Information System
MCDM	Multi-Criteria Decision Making
MD	Missile Defence
MDA	Model Driven Architecture
MEDASSESSREP	Medical Assessment Report
MEDREP	Medical Report
MEDSITREP	Medical Situation Report
MEO	Movement Execution Order
MEZ	Missile Engagement Zone
MGRS	Military Geographic Reference System
MHWPS	Minimum Hardware Procurement Specifications
MIJI	Meaconing, Intrusion, Jamming, and Interference
MIL-STD	Military Standard
MIMI	ICC ICC-ACCS Interface Module (software)
MIMO	Module Information Management Officer
MIP	Multilateral Interoperability Protocol
MISREP	Mission Report
MMI	Man-Machine Interface
MMR	Minimum Military Requirement
MNB	Multinational Brigade
MND	Multi National Division
MOD	Ministry of Defence
MOE	Measures of Effectiveness
MOP	Measures of Performance
MOTS	Military off the shelf
MOU	Memorandum of Understanding
MOVASSESSREP	Movement Assessment Report
MOVSITREP	Movement Situation Report
MPA	Maritime Patrol Aircraft
MRO	Military Response Option
MS	Mission Secret
MS	Microsoft
MS Access	Microsoft Access Database format

Abbreviation	Definition
MTBCF	Mean Time Between Critical Failures
MTBF	Mean Time Between Failures
MTL	Mobile Target List
MTOTE	NCIA ICC Air Mission Monitoring and Management Tool (software)
MTR	Maximum Time to Receive
MTR	Mission Task Request
MTT	Maximum Time to Transmit
MTTR	Mean Time To Repair
MU	Mission Unclassified
MVC	Model View Controller
MWO	Movement Warning Order
NAC	North Atlantic Council
NACMA	NATO ACCS Management Agency
NAEW	NATO Airborne Early Warning
NAF	NATO Architecture Framework
NAMSA	NATO Maintenance and Supply Agency
NATO	North Atlantic Treaty Organisation
NBC	Nuclear Biological Chemical
NCIOA NCI Agency	NATO Communications and Information Agency
NC3B	NATO C3 Board
NCIO	NATO Communications and Information Organisation
NCIOTA	NCI Technical Architecture
NCIRC	NATO Computer Incident Response Capability
NCDM	NATO Corporate Data Model
NCISS	NATO Communications and Information Systems IS School
NCO	Non Commissioned Officer
NCOP	Bi-SC AIS NATO COP System (software)
NCS	NATO Command Structure
NCSA	NATO CIS Support Agency
NECCIS	NATO/NO North European Command and Control Information System (software)
NEDS	NATO-wide Enterprise Directory Services
NEO	Non-combatant Evacuation Operation
NFC	National Force Commitments
NFFI	NATO Friendly Forces Information
NGCS	NATO General Purpose Communication System
NGO	Non Governmental Organisation
NIATC	NATO Information Assurance Technical Centre

Abbreviation	Definition
NICE	NATO IP Cryptographic Equipment
NIMP	NATO Interoperability Management Plan
NIRIS	NCIA Network Interoperable Real-time Information Service (software)
NITC	NCSA INFOSEC Technical Centre
NITF	National Imagery Transmission Format
NLT	Not Later Than
NMC	Not Mission Capable
NMCM	Not Mission Capable Maintenance
NMCRL	NATO Master Cross-Reference List
NMCS	Not Mission Capable Supply
NMS	NATO Messaging Service
NNEC	NATO Network Enabled Capability
NNTCN	Non-NATO Troop Contributing Nation
No	Number
NOTAM	Notice to Air Men
NOTS	NATO Off The Shelf
NOV-2	NATO Operational View
NPC	NATO Programming Centre
NPKI	NATO Public Key Infrastructure
NQAR	National Quality Assurance Representative
NR	NATO Restricted
NRDF	National Rapid Deployment Force
NRF	NATO Response Force
NRT	Non-real time
NS	NATO Secret
NSIP	NATO Security Investment Programme
NSN	NATO Serial Number
NSOV	NATO Service Oriented View
NSR	NATO Staff Requirements
NSV-1	NATO System View
NS WAN	NATO Secret Wide Area Network
NTDI	NATO Target Data Inventory
NTF	NATO Training Federation
NTI	Not to Exceed
NTLM	NT LAN Manager
NU	NATO Unclassified
NUNI	NGCS User Network Interface
NVG	NATO Vector Graphics
O&M	Operations and Maintenance

Abbreviation	Definition
OA	Operating Authority
OASIS	Organization for the Advancement of Structured Information Standards
OB	Order of Battle
OCD	Operational Concept Description
OCR	Optical Character Recognition
ODBC	Open Data Base Connectivity
OEM	Original Equipment Manufacturer
OFS	Open Framework Services
OGC	Open GIS Consortium
OIF	Operational Information Flow
OJT	On the Job Training
OLT	Operational Level Testing
OMG	Object Management Group
OMT	TOPFAS ORBAT Management Tool
OPCOM	Operational Command
OPFOR	Opposing Forces
OPLAN	Operation Plan
OPORD	Operational Order
OPP	Operational Planning Process
OPS	Operations
OPSEC	Operational Security
OPTASK	Operational Tasking
OPTASKLINK	Operational Order for Tactical Data Links
ORBAT	Order of Battle
ORBIT	Order of Battle Intelligence Tool
ORD	Operations Research Division
Org	Organisation
ORRB	Operational Resources Requirement Board
OS	Operating System
OSINT	Open Source Intelligence
OSIS	Open Source Information System
OT	Operational Test
OT&E	Operational Test and Evaluation
OTS	Off-The-Shelf
OUG	Operational User Group
PA	Political Advisor
PBL	Product Baseline
PC	Personal Computer
PCA	Physical Configuration Audit

Abbreviation	Definition
PCN	Pacement Classification Number
PCR	Project Checkpoint Reviews
PCWSF	Pre-Calculated Weapon System Footprint
PD	Passive Defence
Pdf	Portable Document Format
PDR	Preliminary Design Review
PFD	Purchaser Furnished Documents
PFE	Purchaser Furnished Equipment
PHR	Project Highlight Report
PIM	Position of Intended Movement
PIR	Priority Intelligence Requirement
PKI	Public Key Infrastructure
PLANS	Plans
PlaTo	NCIA Planning and Tasking Tool for Extended Air Defence (software)
PM	Project Manger
PMBOK	Project Management Body of Knowledge
PMC	Partial Mission Capable
PMCS	Partial Mission Capable Supply
PMIC	Programme Management and Integration Capability
PMO	Project Management Office
PMP	Project Management Plan
PMR	Project Management Review
PMS	Project Master Schedule
PMTP	Programme Master Test Plan
PNG	Portable Network Graphics
PO	Psychological Operations
POC	Point of Contact
POI	Programme of Instruction
POLAD	Political Advisor
POP	Point Of Presence
POTF	Psychological Operations Task Force
PPBS	Project Product Breakdown Structure
PPLI	Precise Position Location & Identification
PPR	Project Progress Reviews
PR	Personnel Recovery
PR	Problem Report
PRCC	Personnel Recovery Coordination Cell
PREV	Previous
PRINCE2	Projects in Controlled Environments II

Abbreviation	Definition
PRISMA	NCIA Personnel Recovery Information Management (software)
PSA	Partial Site Acceptance
PSD	Performance Start Date
PSO	Peace Support Operation
PSR	Project Status Review
PSRR	Preliminary Systems Requirements Review
Psy Ops	Psychological Operations
PTL	Prioritised Target List
PTL	Primary Target Line (GBAD)
PTR	Problem Trouble Report
PUL	Programme Utilisation List
PWBS	Project Work Breakdown Structure
QA	Quality Assurance
QAP	Quality Assurance Plan
QAR	Quality Assurance Representative
QC	Quality Control
QLR	Quick Look Report
QoS	Quality of Service
RA	Reference Architecture
RACI	Responsible, Accountable, Consulted, and Informed
R&D	Research & Development
RADC	Regional Air Defence Commander
RALCC	Regional Airlift Coordination Cell
RAM	Random Access Memory
RAM	Reliability, Availability & Maintainability
RAP	Recognised Air Picture
RAS	OMG Reusable Asset Specification
RAS	Remote Access Service
RC	Regional Command (ISAF)
RC	Relocation Centre
RDL	Representational Disposition List
RECCE	Reconnaissance
Ref	Reference
REP	Recognised Environmental Picture
Rep	Report
RESALLOC	NCIA ICC Resource Allocation module (software)
REST	Representational State Transfer
RFC	Request for Comments

Abbreviation	Definition
RFC	Request for Change
RFL	Representational Force List
RFD	Request For Deviation
RFBV	Request for Bidders Views
RFI	Request for Information
RFIMS	Request for Information Management System
RFW	Request For Waivers
RGP	Recognised Ground Picture
RIA	Rich Internet Applications
RIC	Reportable Item Code
RLP	Recognised Land Picture
RM	Risk Management
RMP	Recognised Maritime Picture
ROE	Rules Of Engagement
ROZ	Restricted Operating Zone
RPC	RAP Production Centre (ACCS entity)
RPC	Remote Procedure Call
RPOD	Rail Point of Debarkation
RSOM	Reception, Staging, and Onward Movement
RSP	Recognised Surface Picture
RSS	Really Simple Syndication
RT	Real-time
RTF	Rich Text Format
RWY	Runway
SA	Service Architecture
SA	Service Availability
SA	Situational Awareness
SA	Site Acceptance
SAA	Security Accreditation Authority
SACEUR	Supreme Allied Commander (Europe)
SACO	Supreme Allied Command of Operations
SACT	Supreme Allied Command Transformation
SAFE	SIGINT Analyst Functional Environment
SALTO	NCIA ICC Air Mission Planning module (STC's Air Logic Tool) (software)
SAM	Surface to Air Missile
SAN	Storage Area Network
SAT	Site Acceptance Test
SAWREP	Surface to Air Weapon Unit Status and Availability Report
SBAD	Sea Based Air Defence

Abbreviation	Definition
SC	Strategic Command
SCL	Standard Combat Load
SCL	Standard Configuration Load
SCORM	Shareable Content Object Reference Model
SCSI	Small Computer System Interface
SDA	SEWOC Database Application
SDK	Software Development Kit
SDP	System Development Plan
SDP	Service Delivery Plan
SDS	System Design Specification
SE	Systems Engineering
SEAD	Suppression of Enemy Air Defence
SEBOK	Systems Engineering Body of Knowledge
SecOps	Security Operating Procedures
Sect	Section
SEMP	Systems Engineering Management Plan
SEW	Shared Early Warning
SEWOC	SIGINT-Electronic Warfare Operations Centre
SE&I	System Engineering and Integration
SFOR	Stabilisation Force
SFP	Sensor Fusion Post (ACCS entity)
SGML	Standard Generalized Mark-up Language
SHAPE	Supreme Headquarters Allied Powers Europe
SHQ	Standing Headquarters (e.g. JFCN, JFCS etc)
SIDO	Senior Intelligence Duty Officer
SIGINT	Signals Intelligence
SIM	Simulated
SIMPLE	Simulation of Industrial Management Problems with Lots of Equations
SINC	Single Integrated Channel Ground
SIP	Session Initiation Protocol
SIP	System Implementation Plan
SIR	Specific Intelligence Requirements
SISRS	System Interconnection Security Requirements Statements
SIT	System Integration Testing
SITCEN	Situational Centre
SITFOR	Situational Forces
SIVP	Security Implementation Verification Procedures
SLA	Service Level of Agreement
SLC	Standby Letter of Credit
SLP	Standard Language Proficiency

Abbreviation	Definition
SM	Spectrum Management
SM	System Management
SMADEF	Spectrum Management Allied Data Exchange Format
SMART	Specific, Measurable, Attainable, Relevant and Time-bound
SMB	Spectrum Management Branch
SME	Subject Matter Expert
SMP	Security Management Plan
SMS	Short Messaging Service
SNMP	Simple Network Management Protocol
SNTOR	Short and Near-term Operational Requirements
SO	Staff Officer
SOA	Service Oriented Architecture
SOAP	Simple Object Access Protocol
SOCC	SOF Component Command
SO DEF OPS	Senior Officer Defensive Operations
SODO	Senior Offensive Duty Officer
SOF	Special Operations Forces
SOFC2IS	Bi-SC AIS Special Operations Forces Command and Control Information System (CP 107)
SO OFF OPS	Staff Officer Offensive Operations
SOP	Standard Operational Procedures
SOR	Statement of Requirements
SOW	Statement Of Work or Part IV of the Contract
SPA	Service provision Authority
SPINS	Special instructions
SPOD	Sea Ports of Debarkation
SPR	Software Problem Reports
SPT	Support
SQL	Structured Query Language
SQOC	Squadron Operation Centre
SQR	Support/Sustainment Qualification Review
SRA	Security Risk Assessment
SRR	System Requirements Review
SRS	System Requirement Specification
SSL	Secure Socket Layer
SSO	Single Sign-On
SSPP	System Safety Programme Plan
SSR	Site Survey Report
SSRS	System Security Requirements Statements
SSS	Schedule of Supplies and Services
SSTO	SAM SHORAD tactical order

Abbreviation	Definition
ST&E	Security Test & Evaluation
STANAG	Standardization Agreement
STIVF	System Test, Integration and Verification Facility
SUPPLAN	Supporting/Supplementary Plan
SVG	Scalable Vector Graphics
SW	Software
SWDL	SW distribution List
SWIL	Software In The Loop
TA	Target Architecture
TAC	Tactical Air Command
TACAN	Tactical Air Navigation
TACOM	Tactical Command
TACON	Tactical Control
TACP	Tactical Air Control Post
TACS	Theatre Air Control System
TAI	Target Area of Interest
TAI	TMD Amplifying Information
TAP	Test Acceptance Plan
TARE	Telecommunications Automated Relay Equipment
TBCE	Type B Cost Estimate
TBD	To Be Defined
TBM	Theatre Ballistic Missile
TBMD	Theatre Ballistic Missile Defence
TBMCS	US Theatre Battle Management Core System (software)
TBMF	Tactical Battle Management Function
TCP/IP	Transmission Control Protocol/Internet Protocol
TDL	Tactical Data Link
TIM	Technical Interchange Meeting
TL	Target List
TMD	Theatre Missile Defence
TMR	Training Material Review
TNA	Training Needs Analysis
TNL	Target Nomination List
TOGAF	The Open Group Architecture Framework
TOPFAS	Tool for Operational Planning Force Activation and Simulation
TP	Training Plan
TP	Test Plan
TRP	Time of Reporting
TRR	Test Readiness Review

Abbreviation	Definition
TST	Time Sensitive Targeting
TSTL	TST List
TTP	Tactics, Techniques and Procedures
TWY	Taxiway
UAT	User Acceptance Test
UDDI	Universal Description, Discovery and Integration
UHF	Ultra High Frequency
UI	User Interface
UID	Unit Identification Code
UML	Unified Modelling Language
UPS	Uninterruptible Power Supply
URL	Uniform/Universal Resource Locator
UTM	Universal Transverse Mercator
UUID	Universally Unique Identifier
UUP	Updated Airspace Use Plan
VCRI	Verification Cross Reference Index
VESS	Verification Event Summary Sheet
VHF	Very High Frequency
VoIP	Voice over IP
VTC	Video Tele Conference
W3C	World Wide Web Consortium
WAN	Wide Area network
WBS	Work Breakdown Structure
WCS	Web Coverage Service
WCS	Web Catalogue Service
WebDAV	Web-based Distributed Authoring and Versioning
WFS	Web Feature Service
WISE	NATO Web Information Services Environment (software)
WISI	NCIA ICC Webservices Interfaces (software)
WMD	Weapon of Mass Destruction
WMS	Web Map Service
WOC	Wing Operation Centre
WP	Work Package
WP2 PSD	Work Package Two Performance Start Date
WP3 PSD	Work Package Three Performance Start Date
WP4 PSD	Work Package Four Performance Start Date
WP5 PSD	Work Package Five Performance Start Date

Abbreviation	Definition
WP6 PSD	Work Package Six Performance Start Date
WP7 PSD	Work Package Seven Performance Start Date
WP8 PSD	Work Package Eight Performance Start Date
WP9 PSD	Work Package Nine Performance Start Date
WP10 PSD	Work Package Ten Performance Start Date
WP11 PSD	Work Package Eleven Performance Start Date
WP12 PSD	Work Package Twelve Performance Start Date
WP13 PSD	Work Package Thirteen Performance Start Date
WP14 PSD	Work Package Fourteen Performance Start Date
WP15 PSD	Work Package Fifteen Performance Start Date
WRC	World Radio Communication Conference
WRS	Web Registry Service
w.r.t.	With respect to
WS	Workspace
WS	Weaponeering Solution
WS	Weapon System
WSDL	Web Services Description Language
WS-I	Web Services Interoperability Organization
WS-N	OASIS Web Services Notification
WSPS	Windows SharePoint Services
WSRP	Web Services for Remote Portlets
WTS	Web Terrain Service
WYSIWYG	What You See Is What You Get
XLS	Microsoft Excel spreadsheet format
XMI	OMG XML Metadata Interchange
XML	Extensible Mark-up Language
XMPP	Extensible Messaging and Presence Protocol
XSS	Cross-Site Scripting

ANNEX B. NON-DISCLOSURE DECLARATION

To be signed by the Contractor's key personnel designated under Contract IFB-CO-15577-SSSB-UK-GR-NL

I UNDERSTAND:

That I must preserve the security of all information which comes to my knowledge as a result of the Contract with the NCI Agency stated above and that I undertake to comply with all relevant security regulations.

That I must not divulge to any unauthorised person even within my own company, any classified/commercial-in confidence information gained by me as a result of my Contract with NCI Agency, unless prior permission for such disclosure has been granted by the General Manager of the NCI Agency.

That I must not, without the approval of the General Manager of the NCI Agency, publish (in any document, article, book, CD, video, film, play, or other form) any classified /commercial-in-confidence information which I have acquired in the course of my official duties for NCI Agency.

That, at the end of Contract and after performance of all required tasks, I must surrender any official document or material made or acquired by me in the course of my official duties, save such as I have been duly authorised to retain.

That if I violate prescribed security practices either intentionally or accidentally, my Contract shall be immediately terminated.

That the provisions of the above Declaration apply not only during the period of the referred Contract with the Agency, but also after the stated Contract has ceased and that I am liable to prosecution if either by intent or negligence I allow classified/commercial-in-confidence information to pass into unauthorised hands.

That I will be considered as a key personnel as specified in clause 17 of the Special Provisions of Contract IFB-CO-15577-SSSB-UK-GR-NL, and therefore, shall comply with all regulations and restrictions applicable to key personnel.

That I commit to fulfil my obligations for the period of performance mentioned in the Contract Schedules and the Special Provisions of the Contract referred above (including the optional periods) unless major events beyond my reasonable control happen.

That should I decide for personal interest to leave the position, I will do my best effort to fulfil my obligations until the Company that is currently employing me has provided NATO with an acceptable suitable substitute in accordance with clause 17 of the Special Provisions of the aforementioned Contract.

_____Date_____

_____ Full name (in block capitals) Signature

ANNEX C. KEY PERSONNEL

The following personnel shall be subject to the stipulations contained in Clause 17 (KEY PERSONNEL) of Part II.

Position	SOW/Work Package Reference	Name
Project Manager		
ILS Manager		
Technical Lead		
Test Director		

ANNEX D. SCHEDULE OF PAYMENT MILESTONES

Payment Milestone number	Description	Payment amount in Bid Currency	Major Performance Milestones Delivery following successful Acceptance at latest EDC + x weeks	CLINs to be delivered
M1	Site survey reports	10%	EDC+ 18	1 and 2
M2	PDR	5%	EDC +40	3, 4.1 to 4.6, and 6
M3	CDR	10%	EDC+ 52	4.7, 4.8, 8.1, 8.3, 8.4, 8.8, 8.9, 8.13, 8.14, 12.1, 12.2, 14.1 and 14.2
M4.A	FAT – THN1	5%	EDC +84	5 and 7 (corresponding with THN1)
M4.B	FAT – THN2	5%	EDC +88	5 and 7 (corresponding with THN2)
M4.C	FAT – THN3	5%	EDC +92	5 and 7 (corresponding with THN3)
M5.A	Civil Works – THN1	3%	EDC +111	9, 12.6 to 12.8 (corresponding with THN1)
M5.B	Civil Works – THN2	3%	EDC +135	9, 12.6 to 12.8 corresponding with THN2)
M5.C	Civil Works – THN3	3%	EDC +178	9, 12.6 to 12.8 (corresponding with THN3)
M6.A	Installation - THN1	7%	EDC + 126	10 (corresponding with THN1)
M6.B	Installation – THN2	7%	EDC + 169	10 (corresponding with THN2)
M6.C	Installation – THN3	7%	EDC + 212	10 (corresponding with THN3)
M7.A	SAT - THN1	3%	EDC + 139	11, 12.3 to 12.5 and 14.3 (corresponding with THN1)
M7.B	SAT - THN2	3%	EDC + 182	11, 12.3 to 12.5 and 14.3 (corresponding with THN2)
M7.C	SAT - THN3	4%	EDC + 225	11, 12.3 to 12.5 and 14.3 (corresponding with THN3)
M8.A	PSA – THN1	3%	EDC + 147	8.5, 8.10,8.15, 14.4 to 14.6 and 15 (corresponding with THN1)
M8.B	PSA – THN2	3%	EDC + 190	8.5, 8.10,8.15, 14.4 to 14.6 and 15 (corresponding with THN2)
M8.C	PSA – THN3	4%	EDC + 234	8.5, 8.10,8.15, 14.4 to 14.6 and 15 (corresponding with THN3)
M9	FSA	10%	EDC + 260	8.2, 8.6, 8.7, 8.11, 8.12, 8.16, 12.9, 12.10, 13, 16 and 17

ANNEX E. LIST OF SUBCONTRACTORS

Name and Address of Sub-Contractor	DUNS Number[1]	Primary Location of Work	Items/Services to be Provided	Estimated Value of Sub-Contract

[1] Data Universal Numbering System (DUNS). Contractor is requested to provide this data in order to help NCI Agency to correctly identify Subcontractors. If a Subcontractor's DUNS is not known this field may be left blank.

ANNEX F. CONTRACTOR AND SUBCONTRACTOR BACKGROUND IPR

a. The Contractor and SubContractor Background IPR specified in the table below will be used for the purpose of carrying out work pursuant to the prospective Contract.[2]

ITEM	DESCRIPTION/IP OWNERSHIP	INDICATE IF COTS
		NO
		NO
		NO
		NO

b. The Contractor represents that it has and will continue to have, for the duration of this Contract, all necessary rights in and to the IPR specified above necessary to meet the Contractor's obligations under the Contract.

c. The Subcontractor Background IPR stated above complies with the terms specified in Clause 30 of the NCIO General Contract Provisions.

[2] Indicate solely items the provision of which is necessary for the purpose of installing, maintaining and regularly operating the system (i.e. development environment, testing environment etc. items shall not be included)

ANNEX G. THIRD PARTY IPR

a. The Third Party Background IPR specified in the table below will be used for the purpose of carrying out work pursuant to the prospective Contract.[3]

ITEM	DESCRIPTION/IP OWNERSHIP	INDICATE IF COTS

b. The Contractor represents that it has and will continue to have, for the duration of this Contract, all necessary rights in and to the IPR specified above necessary to meet the Contractor's obligations under the Contract.

c. The Third Party Background IPR stated above complies with the terms specified in Clause 30 of the NCIO General Contract Provisions.

[3] Indicate solely items the provision of which is necessary for the purpose of installing, maintaining and regularly operating the system (i.e. development environment, testing environment etc. items shall not be included)

ANNEX H. TEMPLATE OF ECP SIGNATURE PAGE

1. Contract: IFB-CO-15577-SSSB-UK-GR-NL	2. ECP Sequential Number[4]:

3. Requestor[5]:

4. Description and Rationale for changes being proposed
[INDICATE IN DESCRIPTIVE TERM THE REASONS UNDERLINING THE NEED FOR A CHANGE, RESULTING BENEFITS AND/OR RELATED RISKS. *[DESCRIBE IN DETAILED AND BULLETTED FORMAT THE CHANGES BEING PROPOSED]* *[WHERE THE ECP BEING SUBMITTED IS THE RESULT OF AN INVESTIGATIVE ACTION REQUESTED BY THE PURCHASER INDICATE SUCH CIRCUMSTANCE AND ANY RELEVANT RECCOMANDATION ASSOCIATED WITH THE IMPLEMENTATION OF THE ECP]* *[INDICATE SCHEDULE CONSTRAINS ASSOCIATE WITH ECP APPROVAL]*

5. Impact on Project / Contract (other than price)
[INDICATE IN DESCRIPTIVE TERM AND IN DETAIL THE IMPACT IN TERMS OF SCHEDULE OR ACTIVITIES OR IN ANY OTHER PROJECT DOMAIN RESULTING FROM THE IMPLEMENTATION OF THE CHANGES BEING PROPOSED]

[4] ECP sequential numbers shall be unique and continuous regardless of the status of the ECP (pending / approved / rejected)

[5] Indicate requestor in terms of NCI Agency or Purchaser

6. Impact on Contract Price
[INDICATE THE COST IMPACT IN TERMS OF OVERALL INCREMENT OR DECREMENT OF CONTRACT PRICE, IDENTIFY ON WHICH CONTRACT SCHEDULE OF SUPPLIES AND SERVICES CLINs THE CHANGES WILL OCCUR , IN WHICH MEASURE FOR EACH CLIN AND FOR WHICH ACTIVITY IDENTIFIED IN BLOCK 4.]

7. Contract documents to be revised as a result of ECP approval
[LIST CONTRACT DOCUMENTATION TO BE REVISED AS A RESULT OF ECP APPROVAL]

Attachments to ECP (Check as appropriate)

☐ Revised Schedule of Supplies and Services[6]

☐ Complete cost break-down sheets[7]

☐ Revised Statement of Work and/or Annexes[8]

☐ Other documents (Specify _____)[9]

Submitted by

_____ **(Company Name and POC Contact Details)**

_____ **(Signature)**

Purchaser Determination

_____ **(APPROVED / REJECTED)**

_____ **(Signature)**

_____ **(Contracting Officer Name)**

[6] Include document and check if Block 6 of the ECP is to be filled
[7] Include document and check if Block 6 of the ECP is to be filled
[8] Include document and check if Block 7 of the ECP is to be filled
[9] Include document and check if Block 7 of the ECP is to be filled

ANNEX I. LIST OF ACCCEPTABLE BANKS TO ISSUE PERFORMANCE GUARANTEES

#	BANK[10]
1	Bank of America
2	Royal Bank of Canada
3	Scotiabank
4	Bank of Montreal (BMO)
5	HSBC Holdings
6	BNP Paribas
7	Credit Agricole Groupe
8	Citibank Europe
9	Wells Fargo
10	ING Group
11	Rabobank Group
12	Barclays PLC
13	Standard Chartered Plc
14	Danske Bank
15	KBC Group
16	Banco Santander
17	Société Générale
18	BBVA
19	Deutsche Bank
20	Commerzbank AG
21	Intesa
22	UniCredit S.p.A.

[10] These Banks are in NATO-member countries.

IFB-CO-15577-SSSB-AMD3

NATO OTAN

NATO Communications and Information Agency

NCI AGENCY

BOOK II

PART IV – STATEMENT OF WORK

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SECTION 17 ABBREVIATIONS 207

17.1. List of Abbreviations used in this SOW 207

SOW ANNEX A: SYSTEM REQUIREMENT SPECIFICATIONS (SRS) TECHNICAL - UNITED KINGDOM – SEE ATTACHMENT

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

SOW ANNEX D: SYSTEM REQUIREMENT SPECIFICATIONS (SRS) TECHNICAL - NETHERLANDS – SEE ATTACHMENT

SOW ANNEX E: SITE INFORMATION DATA PACKAGE (SIDP) –NETHERLANDS – SEE ATTACHMENT (THE CONTENTS CAN BE FOUND IN THE BIDDERS LIBRARY, SECTION 11)

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

SOW ANNEX G: SYSTEM REQUIREMENT SPECIFICATIONS (SRS) TECHNICAL - GREECE – SEE ATTACHMENT

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

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

SOW ANNEX J: SYSTEM SECURITY REQUIREMENTS (SSR) – SEE ATTACHMENT

SOW ANNEX K: PROJECT SECURITY INSTRUCTIONS (PSI) – SEE ATTACHMENT

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 Contractors 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.

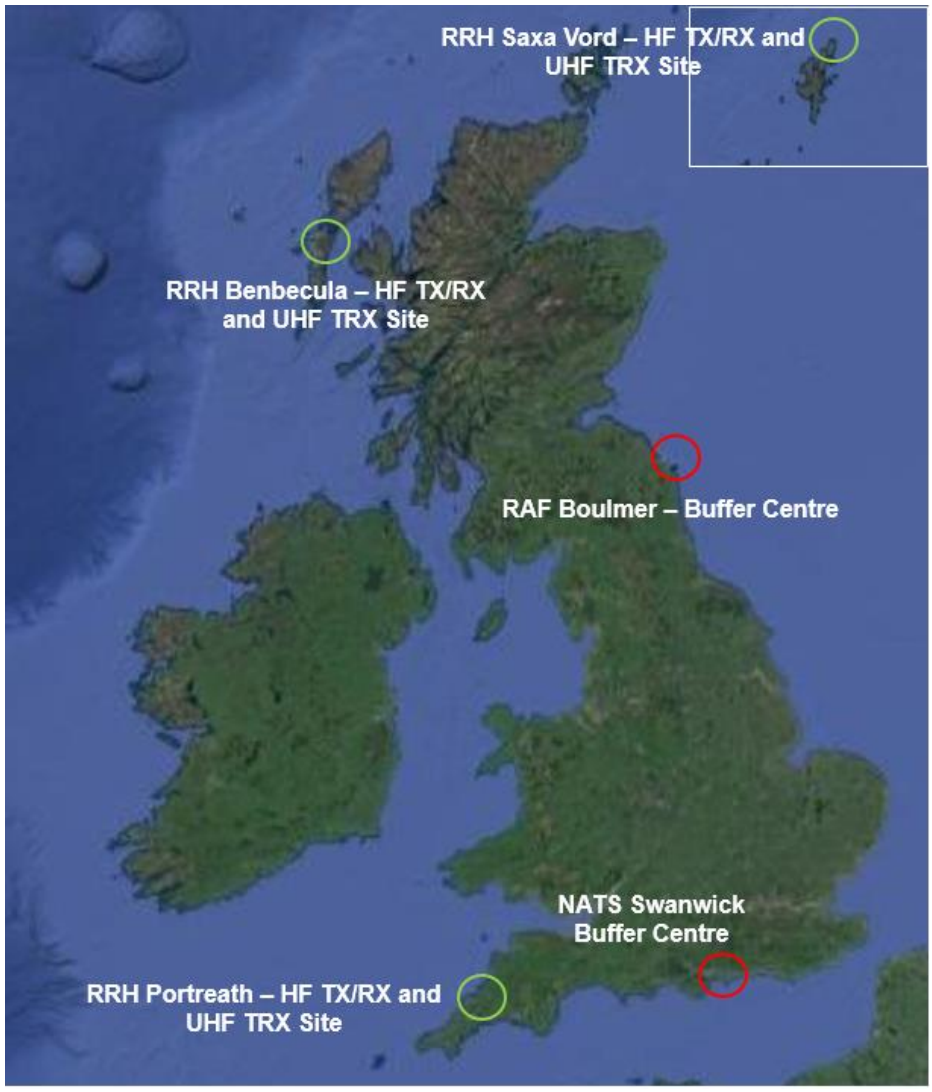

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Figure 1: Site locations (United Kingdom)

Figure 1: Site locations (Greece Less Crete)

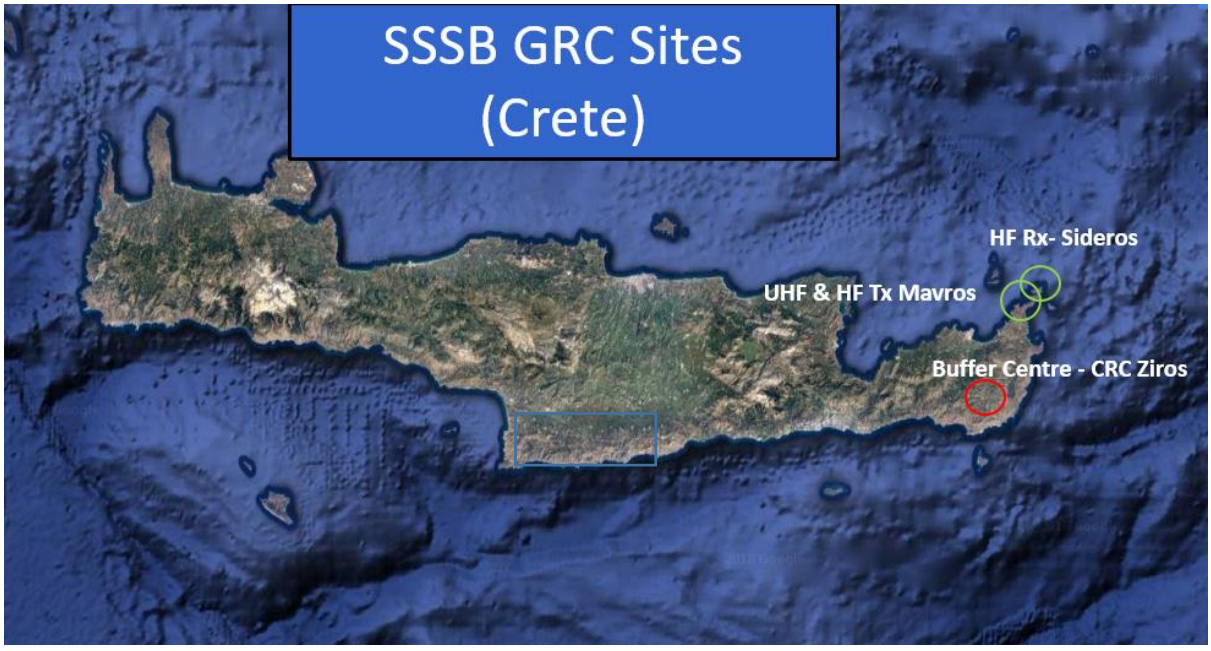

Figure 2: Greece Site locations (Crete)

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. OEM FAT(s) for all major CIS equipment (i.e. Transmitter / Receiver HF and UHF radios) other than the PFEs, will take place at the OEMs Production Facilities.

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;

Note: More detailed information which power lines and other utilities are available at each site, where and how they are terminated, what the existing interfaces are, are provided in SPDP (SITE INFORMATION DATA PACKAGE) Annexes, in CW Annexes and in site specific Appendixes

Note: CW Annexes and site specific Appendixes also describe requirements that the Contractor shall meet in order to integrate the Contractor's provided infrastructure and equipment with existing facilities.

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 whenever such CW-related documentation exists;

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;

Note: More detailed information on PSS and other utilities are available at each site, where and how they are terminated, what the existing interfaces are, are provided in SPDP (SITE INFORMATION DATA PACKAGE) Annexes, in CW Annexes and in site specific Appendixes.

Note: CW Annexes and site specific Appendixes also describe requirements that the Contractor shall meet in order to integrate the Contractor's provided infrastructure and equipment with existing facilities. This means that at some sites the Contractor shall be responsible also for provision and installation of power transformers, MPDBs etc.

f. Provide NB PSS at the thirteen (13) Radio Sites, unless otherwise stated in CW Annexes and site specific Appendixes;

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. 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.;

k. 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, in CW Annexes and in site specific Appendixes.

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 Power Distribution System (with associated power panels, cabling, plugs and other auxiliaries) and integrate it with existing Prime Power Supply (PPS) System. Further requirements are described in CW Annexes and in site specific Appendixes.

3.5.15. The Contractor shall provide and install power generators with fuel tanks, fuel supply system and other auxiliaries. Further requirements are described in CW Annexes and in site specific Appendixes

3.5.16. The Contractor shall provide and install UPS with batteries. Further requirements are described in CW Annexes and in site specific Appendixes

3.5.17. The Contractor shall provide, install and build other infrastructure and equipment as stipulated in CW Annexes and in site specific Appendixes.

3.5.18. 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.

3.5.19. When applicable, the Contractor shall take into consideration the location of all underground/overhead, on surface installed and concealed in any manner 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 bespoken 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. Site orientation presentation

b. Restricted access areas

c. Hazards and risks on the site

d. 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 aswell 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 20120) – 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 SECRET[3] 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 rational 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 CMDB.

7.7.3. The Contractor, through the Configuration Management Database (CMDB), 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.

Support Level	***ALDT for Sites***
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 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:

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 (manc). 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

Field	***Description***
Height	Item packed height
Quantity	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 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
Failure Rate	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. Assumption measurement intervals: 1,000,000 hours
Failure Rate Data Source	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.

Part Logistics Category	is a support classification that defines the role of a hardware or software part as designed in the context of product support.
	• End Item
	• System Subsystem
	• Hardware Maintenance Significant Items (MSI) to be split into the following categories:
	  ○ 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:
	  ○ 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
	  ○ 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	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:

Field	*Description*
	• 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:

a. No less than 30 days after submission of the RSPL and RCIL and all relevant documentation including the full range of drawings

b. 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 302nshall 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 addresses 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	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 buiness days	Replenishment received within 20 Business Days from the written 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 buiness 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
		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

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.

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 buiness days	Replenishment received within 20 Business Days from the written 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 buiness 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

		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

h	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**	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 SC0 0-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 SC0 0-SS02 activated)	Per occurrence

		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 Contractor 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 buiness days	Replenishment received within 20 Business Days from the written 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 buiness 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

		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 SC0 0-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 SC0 0-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 SC0 0-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 SC0 0-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 SC0 0-SS02	With activation of SC00

				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 SC0 0-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 SC0 0-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.

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

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 buiness days	Replenishment received within 20 Business Days from the written 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 buiness 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

		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)

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. For GBR and NLD, integration and FAT will be performed at Contractor's facility. For GRC, integration and FAT will be performed at the designated Hellenic Navy's Facility located at Athens Greece.

a. All the major CIS equipment and PFE equipment will then be shipped directly to Hellenic Navy's Warehousing Facilities in Athens / Skaramanga/ Greece.

b. Integration CIS FAT will be hosted by Greece in Hellenic Navy's facilities in Attika / Skaramanga / Greece.

c. No testing equipment (spectrum analyzers, network testers etc) will be required from Hellenic Navy, since the Contractor will bring in its own (trusted / calibrated equipment). Limited Engineering Support in terms of Hand tools and Ad Hoc general technical support may be provided upon request.

d. No telecommunication simulators will be provided by Hellenic Navy w.r.t to delay, jitter, packet loss etc.

e. Microwave links and network equipment (routers, switches) will be interconnected back to back during the FAT to "emulate" interconnections at the Radio Sites.

f. Total Endeavor / FAT Duration is expected to be 2 working weeks i.e. 10 working days. Access to the facilities during the weekends will not be possible. An extension for a third week will be granted upon timely request. Beyond that period a formal discussion and reporting will be required during the Project Management meetings.

g. Force Majeure for the equipment stored in Hellenic Navy's facilities applies. As an example, **ATTIKA** region is seismogenic.

h. The climate is generally mild (temperate zone). However, during summer months (July and August) Heat Waves with ten days duration are not uncommon. Temperature averages for July and August are below 35 Celsius and the Facilities are close to the Sea and in the Country side. The Hellenic Navy's industrial warehouse facilities are not air conditioned. Since however no High Power Testing will take place (kW of Radio Power Transmission), the Warehouses have high ceilings and large openings, hence natural ventilation should be adequate.

i. As a general description Hellenic Navy's Central Warehouse facilities are Modern Installations/ Facilities, with Open Space of 100's square meters, Heavy Duty Industrial Floors, with strict physical security and with access to transportation networks. The offices available inside the warehouses and also the Administration building are air conditioned. The contractor will have access and make use of dedicated office space. Please advice on requirements for Internet Access (considered feasible).

j. Since the Contractor will provide UPS equipment and these equipment will also have to be FAT tested, we strongly recommend that these are brought in for the integration test in Greece. Utility power for the FAT will be provided by Hellenic Navy but Uninterrupted Power is not going to be available. UPS systems will also provide protection against unforeseen sags, surges, spikes, voltage dips.

12.5.2. A representative scaled down system shall be assembled and installed at thefacilities as described in paragraph 12.5.2 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. Full power (5kW and 10kW) testing of the HF Transmitter modules will not be performed at the FAT. 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.

12.5.3. 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).

12.5.4. 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.

12.5.5. 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).

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[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 utiltiies. 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. Removal and disposal of any material containing Asbestos is:

a) For SSSB UK sites – THN UK responsibility;
b) For SSSB NLD sites – up to and including 4.0 m^3 (in summary for all of the NLD SSSB sites) of material contaminated with asbestos is the contractor's responsibility;
c) For SSSB GRC sites – up to and including 20.0 m^3 (in summary for all of the GRC SSSB sites) of material contaminated with asbestos is the contractor's responsibility

14.12.2. Removal and disposal of fuel, fuel sludge, equipment and soil contaminated with fuel and fuel sludge at various sites in SSSB GRC is the Contractor's responsibility. Further requirements are stipulated in SSSB GRC site specific Appendixes. 3.4.5.

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 locationswhere 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 (LS0H-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.

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

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

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:

a. For all documents unless otherwise instructed: an electronic copy to the Purchaser's Project Manager,

b. For contractual documents: in addition to one hard copy and an electronic copy to the Purchaser's Contracting Officer

c. 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, theirs 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 is to 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:

Training Types	***Student Groups***
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):

Description	***Draft Type***	***Printed Qty***	***Electronic Qty***
Instructor guide	Electronic	Printed (each Instructor)	Electronic (each Instructor)
Student handbook and Quick Reference Cards	Electronic	Printed (each student)	Electronic (each student)

Description	***Draft Type***	***Printed Qty***	***Electronic Qty***
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:

a. Course designator.

b. Course start date.

c. Course Completion date.

d. Names of attending students.

e. Student attendance and performance record.

f. Individual test results.

g. Student course critique.

h. Actions taken or recommended.

i. 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 personal 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

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

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

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

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

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

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

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	

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

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	

IFB-CO-15577-SSSB-AMD3

BOOK II

PART IV – STATEMENT OF WORK

SOW - ANNEX A

SYSTEM REQUIREMENT SPECIFICATIONS (SRS) UNITED KINGDOM - TECHNICAL

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Introduction

1.1 Overview

1.1.1 The Ship-Shore-Ship-Buffer (SSSB) system is a real-time digital link buffer system supporting the exchange of tactical information between the NATO Air Defence Ground Environment (NADGE) system, Airborne Early Warning (AEW) systems and Naval Forces through the use of NATO data Link-1, Link 11, Link 11B and Link 22. This is illustrated in Figure 1:

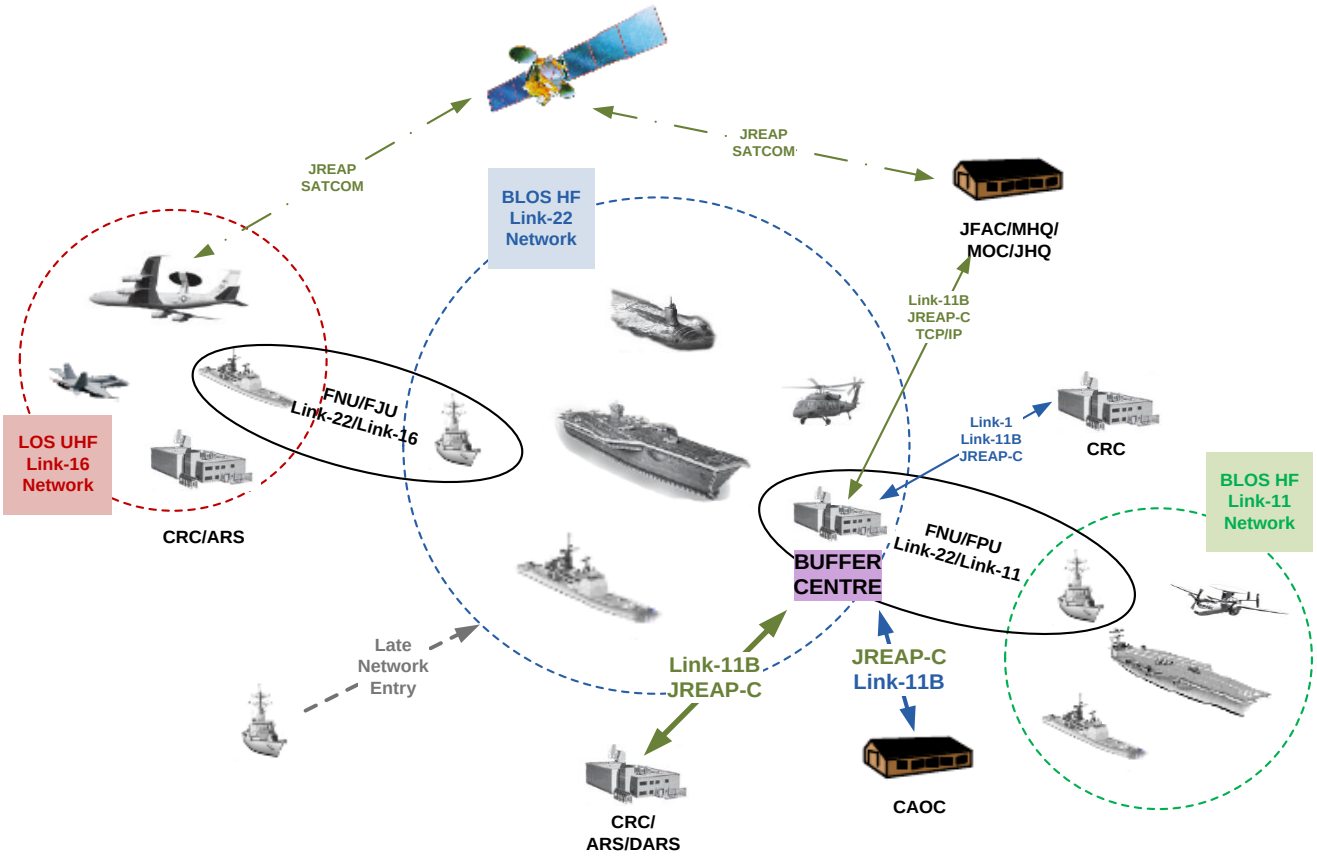

Figure 1: Tactical data exchange layout.

1.1.2 The SSSB system is organised in three sub-systems, see Figure 2:

1.1.3 Radio Network Communication: Provided by several radio sites.

1.1.4 Command and Control:

a. Tactical Data Link Processing and Presentation, provided at the main and

remote SSSB Control Centre.

b. Distributed Radio Control and Management of the communication equipment, provided at all sites.

Signals Transport: Transport of digital and analogue signals:

a. Co-located Radio Sites, where HF TX, HF RX and UHF components are located within the same compound.

b. Non-Colocated Radio Sites, where HF TX, HF RX and UHF components are separated, but located in the same area. The distances between the components can vary.

c. RRH-Office (Saxa Vord Radio Management Office). This SSSB COMMS control component at Saxa Vord will be provided by the purchaser.

1.2 Purpose

1.2.1 The purpose of the SSSB system is to provide communication between Maritime and Airborne Early Warning (AEW) units and their Command and Control Centre, located at the Buffer Centres.

1.2.2 The SSSB-UK-GR-NL project aims at providing the Territorial Host Nation of the United Kingdom (THN UK) with a SSSB system that is planned to upgrade the existing SSSB system within the United Kingdom.

1.2.3 The purpose of this document is to specify the system requirements for the SSSB-UK-GR-NL System as depicted by Figure 2, and consisting of:

a. Three SSSB Radio Sites, HF-TX/RX/UHF Sites at RRH Benbecula, RRH Portreath and RRH Saxa Vord connected to Buffer Centres at RAF Boulmer and Swanwick Resilience Entity (SWK RE), shall be implemented by the Contractor (see Figure 3 to Figure 6). The distances between the SSSB sites are shown in Figure 7.

b. The UK National Defence Network (NDN) for the transport of the signals between the Buffer Centres at RAF Boulmer and the Swanwick Resilience Entity (SWK RE) and the three Radios Sites at RRH Benbecula, RRH Portreath and RRH Saxa Vord. The National Defense Network (NDN) will be provided by the Host Nation.

1.2.4 Radio Sites

a. The Radio Sites at RRH Portreath and RRH Saxa Vord are already existing SSSB COMMS Sites, which have to be upgraded/renewed. The existing operational functionality has to be retained until the SSSB Final System Acceptance to ensure operational continuity.

b. The Radio Site at RRH Benbecula is a military site without any existing SSSB functionality. This site will become a new SSSB COMMS site.

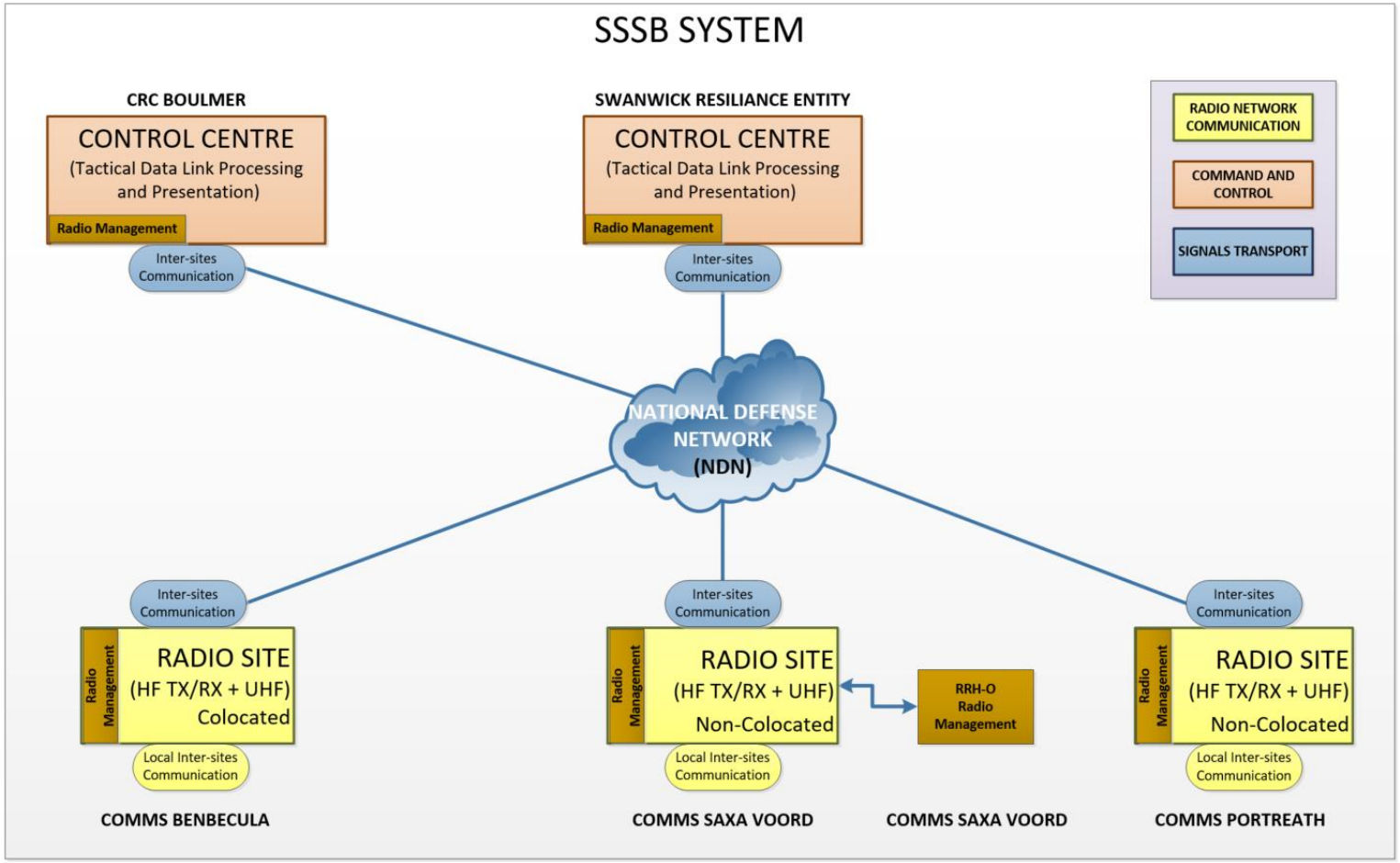

Figure 2: SSSB System, block diagram.

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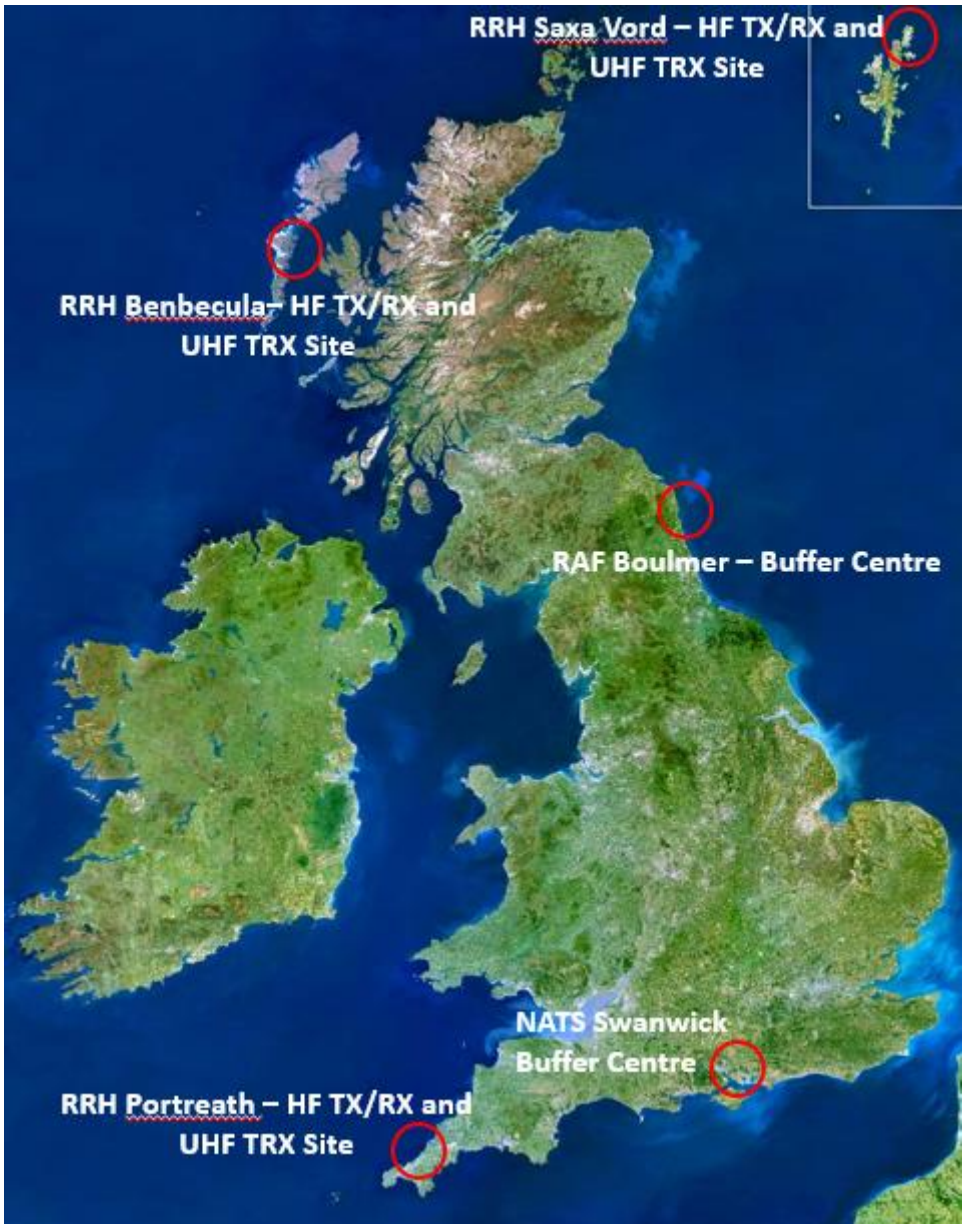

Figure 3: UK Buffer Centres and TX/RX/UHF COMMS locations.

Figure 4: SSSB Site location RRH Benbecula.

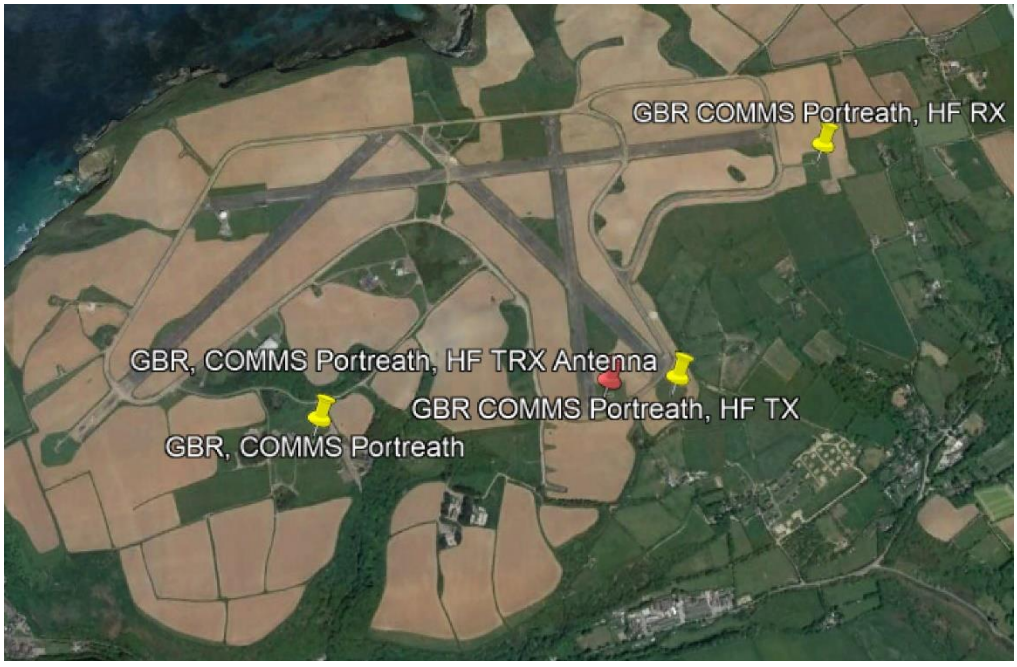

Figure 5: SSSB Site location RRH Portreath.

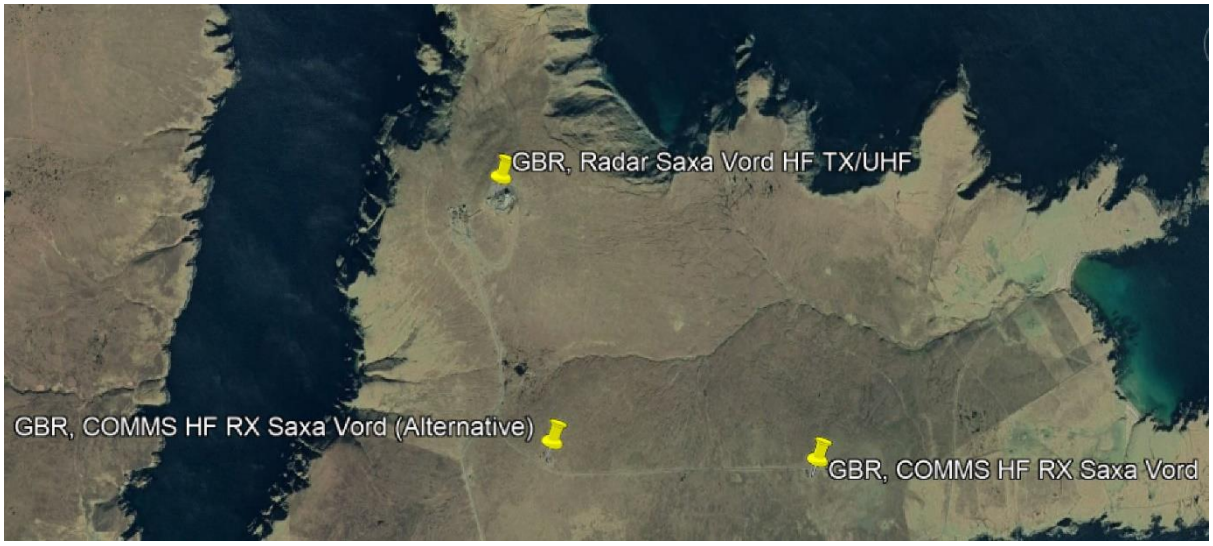

Figure 6: SSSB Site location RRH Saxa Vord

LOS Distances Km Elev (m)			1	2	3	4	5
			RRH Benbecula	RRH Saxa Vord	RRH Portreath	RAF Boulmer	Swanwick RE
1	110	RRH Benbecula	X	520	830	434	848
2	280	RRH Saxa Vord	520	X	1207	605	1106
3	57	RRH Portreath	830	1207	X	622	290
4	40	RAF Boulmer	434	605	622	X	503
5	10	Swanwick RE	848	1106	290	503	X

Figure 7: Distances between SSSB Site locations (*Km*), Site elevations (*m*).

1.2.5 Radio Sites will consist of:

a. Site Monitoring System (SMS), providing the site status/alerts and equipment alerts.

b. Radio Communication Equipment. To be installed at the Radio Site and dedicated to the Ship-Shore-Ship communication in HF (BLOS) and in UHF (LOS) in the Link 11 and Link 22 mode for the Tactical Data exchange and in Voice mode for the operators' coordination; see Figure 8 to Figure 13.

1.2.6 Radio Management (local) Equipment. Equipment consisting of computers and interface concentrators to provide control of communication devices as follows:

a. The Radio Sites include one Low-Level Controller computer (LLC), one

serial line concentrator (multi-serial), one network switch and one network router; see Figure 8 to Figure 13.

b. The HF-TX/UHF Site includes also a Radio-Over-IP (RoIP) converter (Narrow-Band/Wide-Band Gateway) for secure and non-secure Voice Coordination functions; see Figure 8, Figure 9, Figure 11 and Figure 12.

1.2.7 Data Link Equipment. Equipment consisting of Data Terminal Set (DTS) / Signal Processing Controller (SPC), Remote Versatile Link Interface (VLI/R) to provide Link 11 signal interface; see Figure 8 to Figure 13.

1.2.8 Automatic Identification System (AIS) receiver and a dedicated antenna for the reception of information. The AIS receivers in general are placed where HF-TX capability is provided. Final decisions on site placement will follow the best LOS position for the AIS receiver.

1.2.9 Inter-site Communication:

Distributed system dedicated to the connection between the Radio sites and between the Radio sites and the Buffer Centres.

1.2.10 The Buffer Centres are dedicated to the three RRH Radio Sites for:

a. Translation of the Link 11 and Link 22 protocols into Link-1, Link 11B and JREAP-C in accordance with STANAG 5511, STANAG 5522, STANAG 5601, STANAG 5616, STANAG 5518 (latest revisions). Presentation of the Air, Surface and Subsurface tactical picture. Processing of the Automatic Identification System (AIS) Receive-Only information.

b. Radio Management (remote).

c. Management of the VOICE Co-ordination of the Link 11/Link 22 data links.

d. Providing secure data encryption of Link 11 (COMSEC).

e. Providing secure data encryption of Link 22 (COMSEC).

f. Providing secure voice encryption for HF (COMSEC).

g. Providing secure voice encryption for UHF (COMSEC).

h. Providing Link 22 ECM-resistant (EPM) capability.

i. Providing ECM-resistant communications for UHF Voice (EPM Functionality - SATURN).

j. Monitoring of the status operations of infrastructure and equipment.

1.2.11 The overall responsibility of the implementation of the SSSB-UK system lays with the NCI Agency (the Purchaser), while the implementation of the three sub-systems is delegated to:

a. The Contractor for the implementation of the three Radio Sites. DLOS microwave inter-site communication is not foreseen.

b. The THN UK for the provision of the inter-connection land lines between the Buffer Centres and the Radio Sites (via the NDN).

c. The NCI Agency for the implementation of the SSSB Buffer Control Centre (BCC) at RAF Boulmer and the Swanwick Resilience Entity (SWK RE).

1.3 Scope

1.3.1 The overall SSSB project consists of the following phases:

1.3.2 Phase 1:

1.3.3 General Civil Works, by the HN Contractor, for the three Radio Sites, including buildings (including new build at RRH Portreath), electrical power supplies, HVAC, etc.

1.3.4 Phase 2:

a. A - Radio Communications and inter-sites communications, including associated equipment and civil works, by the Contractor, within scope of this Contract

b. B - Land Inter-sites Communications, by the THN UK

c. C - Command and Control system at the SSSB Buffer Centres by the NCI Agency

1.3.5 Phase 1: The Contractor shall implement the Civil Works portion of the SSSB UK project HF-TX/RX/UHF Sites at RRH Benbecula, RRH Portreath and RRH Saxa Vord.

1.3.6 Phase's 2.A, 2.B and 2.C: Execution shall be coordinated, between the Contractor, the THN UK and the Purchaser, respectively NCI Agency.

1.3.7 The Contractor shall implement the Radio Communications portion of the SSSB UK project with the installation of HF-TX/RX/UHF Sites at RRH Benbecula, RRH Portreath and RRH Saxa Vord, within Phase 2.A.

1.3.8 In addition, the Contractor shall provide technical support to the THN and the Purchaser for phases 2.B and 2.C.

1.3.9 The technical support, to be provided by the Contractor is to consist of, but not be limited to, the following:

a. Assisting the THN and the Purchaser in the final identification of the number and characteristics of signals to be transported between the Sites;

b. Assisting the THN and the Purchaser in the integration and testing phases by generating the signals to be transported between the Sites;

c. Assisting the THN and the Purchaser in the overall system integration and testing phases. In the operation of the Radio Management System (RMS) from the Buffer Centres, local sites and verification of the correct transport of the signals between the sites and Buffer Centres.

1.4 Purchaser Furnished Equipment (PFE)

1.4.1 To allow the Contractor to complete the implementation of the Radio Sites a number of equipment is provided as PFE.

1.4.2 The PFE equipment/system provided for the technical integration of the SSSB is:

a. Radio Management Equipment, (See Para 1.4.4)

b. Versatile Link Interface, (See Para 1.4.8)

c. Narrowband/ Wideband Voice over IP Gateway, (See Para 1.4.9)

d. Advanced Link Analysis Module (ALAM), (See Para 1.4.10)

e. Time of Day (TOD), (See Para 1.4.11)

PFE Specifications

1.4.3 The PFE specifications and characteristics are described below.

1.4.4 Radio Management:

a. Radio Management Console (RMC) - based on the SSSB Open System Communication Control (OSCC) Low Level Controller (LLC)

1.4.5 The RMC is the operator's interface to the Radio Management Sub-System (RMSS) and is part of the RMSS.

a. Provided to the Contractor as PFE

1.4.6 Operational requirements:

a. The RMC is implemented at all Radio Sites and the Buffer Centres.

b. The RMC is mainly operated from the Buffer Centres, but can also be operated locally at the radio sites to allow COMMS management, maintenance and site monitoring of all modalities including Link 11/Link 22 Data.

1.4.7 Operational functions:

a. Local and remote control of the installed equipment for:

i. Power up/down

ii. Mode selection

iii. Frequency selection

b. Power level selection, where applicable

c. BITE

d. Status monitor

e. Services – Equipment allocation

f. Access to the Local and Long Haul Networks for telephone communication between the Sites and the Buffer Centres.

g. PSTN (Public Switching Telephone Network) access

h. And other functionalities not listed here that may be THN specific.

i. For all COMMS equipment, which needs to be controlled by the RMC, the NCI Agency will develop new drivers/modules. The contractor shall provide the ICDs for all devices to NCI Agency having a control interface.

1.4.8 The Versatile Link Interface is a media converted between NTDS/ATDS interfaces to IP interface in accordance with:

a. MIL-STD-1397

b. ISO-8877

1.4.9 Narrowband/ Wideband Voice over IP Gateway provided to the Contractor as PFE is as follows:

a. The NB/WB Gateway provides signaling information transport for unsecured voice via IP between the SSSB Radio sites and the Buffer Centres SSSB Operator position.

[A] The NB/WB Gateway: can:

a. Transport analog Unsecure Voice via IP (bi-directional)

b. Transport radio PTT signal via IP

c. Handle digital signals

d. Handle VoIP streams

e. Provide standard serial interface for radios

1.4.10 The Advanced Link Analysis Module (ALAM) analyses Link 11 and Link 22 audio signals and quantifies their quality.

1.4.11 Time of Day (TOD)

a. TOD-HQ, GPS, military grade, SAASM, incusive the. antenna

SECTION 2 SSSB System Requirements

2.1 Operational Dependence

2.1.1 The SSSB System is operationally dependent on the Buffer Centres at RAF Boulmer and the Swanwick Resilience Entity (SRE).

2.2 Connectivity

2.2.1 The inter-site connections between the Buffer Centres and the three Radio Sites shall be implemented via the UK National Defence Network (NDN).

2.2.2 There shall be a main connection between the Buffer Centres and the radio sites via the NDN.

2.2.3 There shall be fallback (backup) connection between all SSSB sites.

2.3 Standardisation

2.3.1 In order to allow interoperability of the HF/UHF radio elements the Contractor shall respect the technical prescriptions contained in the following, (but not limited to) NATO and Military Standards:

a. STANAG 5511 TACTICAL DATA EXCHANGE – LINK 11/11B, Ed. 9, January 2016, NATO UNCLASSIFIED

b. STANAG 5501, Tactical Data Exchange – Link 1 (Point-to-Point), Ed. 7, NATO UNCLASSIFIED

c. STANAG 5601, “Standards for Interface of NATO Data – Links 1, 11, 11B and 14 Through a Buffer”, edition 7, January 2014, NATO UNCLASSIFIED

d. STANAG 5501, Tactical Data Exchange – Link 1 (Point-to-Point), Ed. 7

e. MIL-STD-1397C(SH), ”INPUT / OUTPUT INTERFACES, STANDARD DIGITAL DATA,NAW SYSTEMS”, 1 June 1995, UNCLASSIFIED.

f. STANAG 5522 NATO IMPROVED LINK ELEVEN (NILE) - LINK 22, Ed. 5, January 2016, NATO UNCLASSIFIED.

g. NG-278-A011-LLCIRS, Interface Requirements Specification (IRS) for the Link-Level COMSEC (LLC) segment of the Link 22 (NILE) System, NILE PMO, 28 July 2016.

h. NG-278-A011-SPCSS, Segment Specification for the Signal Processor Controller (SPC) of the Link 22 (NILE) System, NILE PMO, 28 July 2016.

i. STANAG 5518, JOINT RANGE EXTENSION APPLICATION PROTOCOL (JREAP. Ed, 4,26-Apr-2019, NATO UNCLASSIFIED.

j. STANAG 4372 Ed 3
SATURN – A fast frequency hopping ECCM mode for UHF radio

k. ITU-R M.1371-4, Technical characteristic for an Automatic identification system using time-division multiple access in the VHF maritime mobile band, 04/2010

l. NMEA 0183, Standard for Interfacing Marine Electronic Devices.

m. RFC 2833 RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals (VoIP)

n. RFC 3261 Session Initialization Protocol (SIP) (VoIP)

o. RFC 3350 Real Time Protocol (RTP) (VoIP)

p. RFC 3351 Real Time Protocol (RTP) (VoIP)

q. EUROCAE ED 137 (RoIP)

r. MIL-STD-188-203A, Interoperability and Performance Standards for Tactical Digital Information Link (TADIL) A, 8 January 1988.

2.3.2 The Contractor shall implement the Radio Communications System (RCS) and associated equipment and Civil Works in compliance with the governing THN electrical standards.

2.3.3 The Contractor shall implement the RCS and associated equipment and Civil Works in compliance with the Low Voltage Directive 2006/95/EC and/or THN equivalent.

2.4 Design requirements

2.4.1 In order to remove the impact of long haul lines delay in the Link 11 “DTS Split” configuration, the Contractor shall implement Link 11 using “Local DTS” configuration at the Radio Site (RS) and the NATO Versatile Link Interface (VLI) architecture between the Buffer Centres and the Radio Site (RRS) (see paragraph 5.1).

2.4.2 The Contractor shall dimension the system to allow implementation of the Tactical Data Link 22 service. The Link 22 service will use the existing Link 22 radios via the Link 22 modem (SPC).

2.4.3 The Contractor is to design the system in order to allow remote control of operational commands and manual control of maintenance commands. In the design and implementation of the automation and the remote control systems the following criteria shall be used:

a. The TX/RX/UHF Radio Site RRH Benbecula will not be manned.

b. The TX/RX/UHF Radio Site RRH Saxa Vord will not be manned.

c. The TX/RX/UHF Radio Site RRH Portreath will not be manned

2.4.4 For the PFE sub-system for control and management of the communication equipment the Contractor shall provide the technical documentation and support to the purchaser in the configuration and customisation of the sub-system in relation to the communication equipment delivered by the Contractor.

2.4.5 The PFE will be delivered six (6) weeks before the Factory Acceptance Test (FAT). The FAT is the last stage before commencing the on-site implementation activities. The handover of the PFE will allow the Contractor to be autonomous

and independent in the implementation and the implementation verification of the three Radio Sites.

2.4.6 At the FAT the contractor shall provide all fully equipped and fully integrated racks for the RRH sites (including PFE, radio and COMMS equipment and full applied wiring).

2.4.7 The FAT shall cover Voice and Data signal verification, equipment test, wiring test and SSSB functional test of the all RRH sites systems. The interconnection wiring between the racks shall represent a one-to-one wiring replication as integrated at the RRH sites.

2.4.8 Local and remote COMMS control capability verification shall be part of the FAT, where the RMSS shall be used to prove the remote control capability. Local control capability shall be proven using the individual device control user interfaces.

2.4.9 A functional test of the Site Monitoring System (SMS) shall be included in the FAT.

2.4.10 It is the Contractor's responsibility to test the integration of the Contractor-provided equipment with relevant equipment, elements and systems provided as PFE and demonstrate that both the Contractor's equipment and PFE are compatible and function correctly as stipulated SOW Section 3 and described in the enclosed document references.

2.4.11 The Contractor is also required to provide all the necessary support to the Purchaser and the THN for system integration and testing.

2.5 Operational Requirements

2.5.1 The fundamental requirement of the SSSB system is to implement a data exchange for:

a. Network Link 11 – TADIL A without degradation of the information content, as specified in Para 2.3.1 Ref. a, r.

b. Network Link 22 – NILE without degradation of the information content as specified in Para 2.3.1 Ref. f, g, h.

2.5.2 The integration of the Radio Sites with the SSSB BCC (at the Buffer Centres) shall allow air and naval surveillance of the North Atlantic: in the HF frequency range with data Link 11/Link 22 mode and VOICE mode, up to 300 NM[1], and in the UHF spectrum up to 28 NM Ground-to-Ground and 150 NM Ground-to-Air. Monitoring and control of communication resources will be delegated to the Buffer Centres.

2.6 Configuration of the SSSB System

2.6.1 The principle SSSB UK system sites are:

a. The Buffer Centres, located at RAF Boulmer and RAF Swanwick, which will be implemented by NATO NCI Agency.

[1] LINK-22 will also be supporting the Long Range waveform for distances up to 1000 NM.

b. HF-TX/RX/UHF Sites at RRH Benbecula, RRH Portreath and RRH Saxa Vord, shall be implemented by the Contractor.

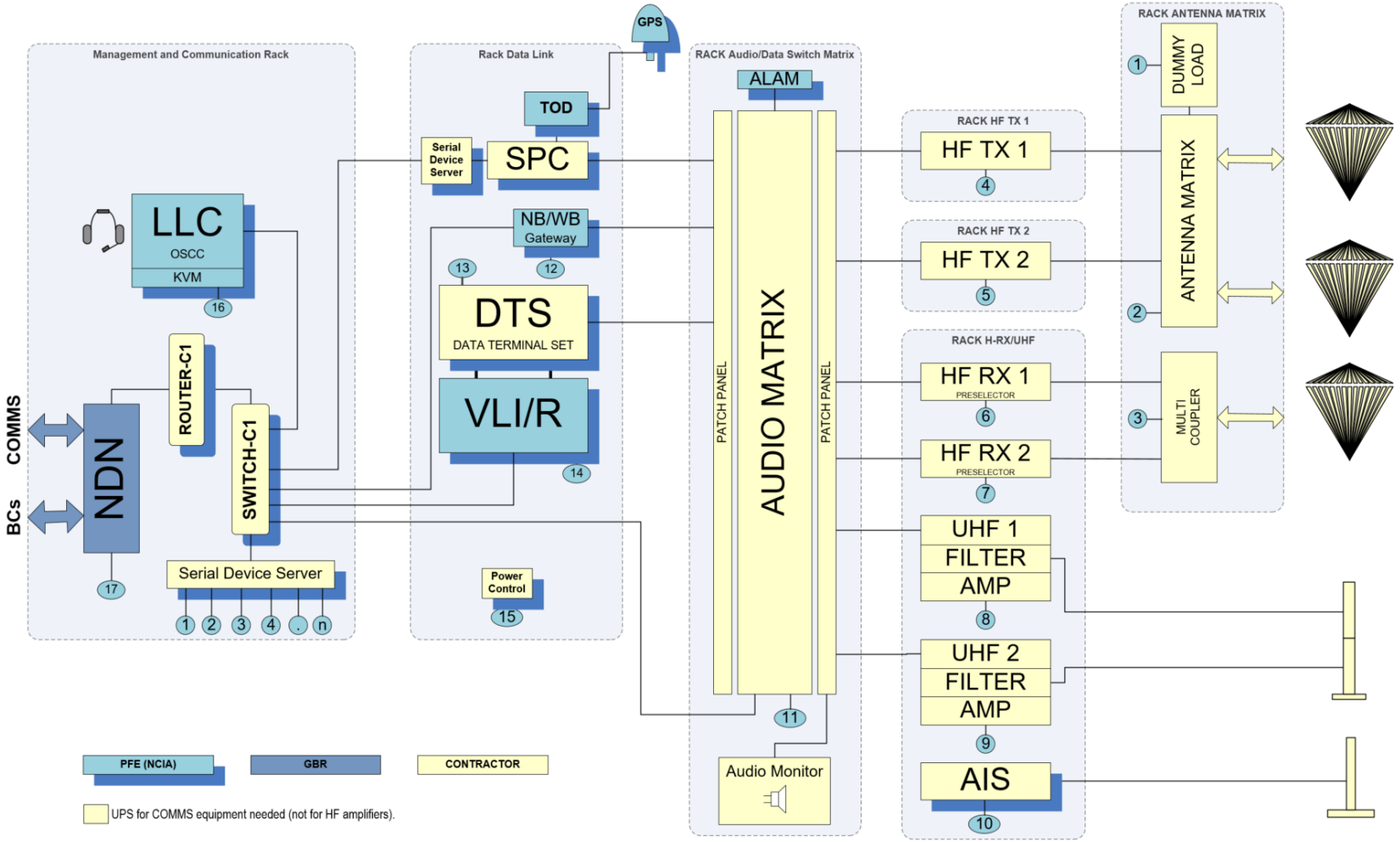

Figure 8: RRH Benbecula - HF-TX/RX/UHF Radio site block diagram

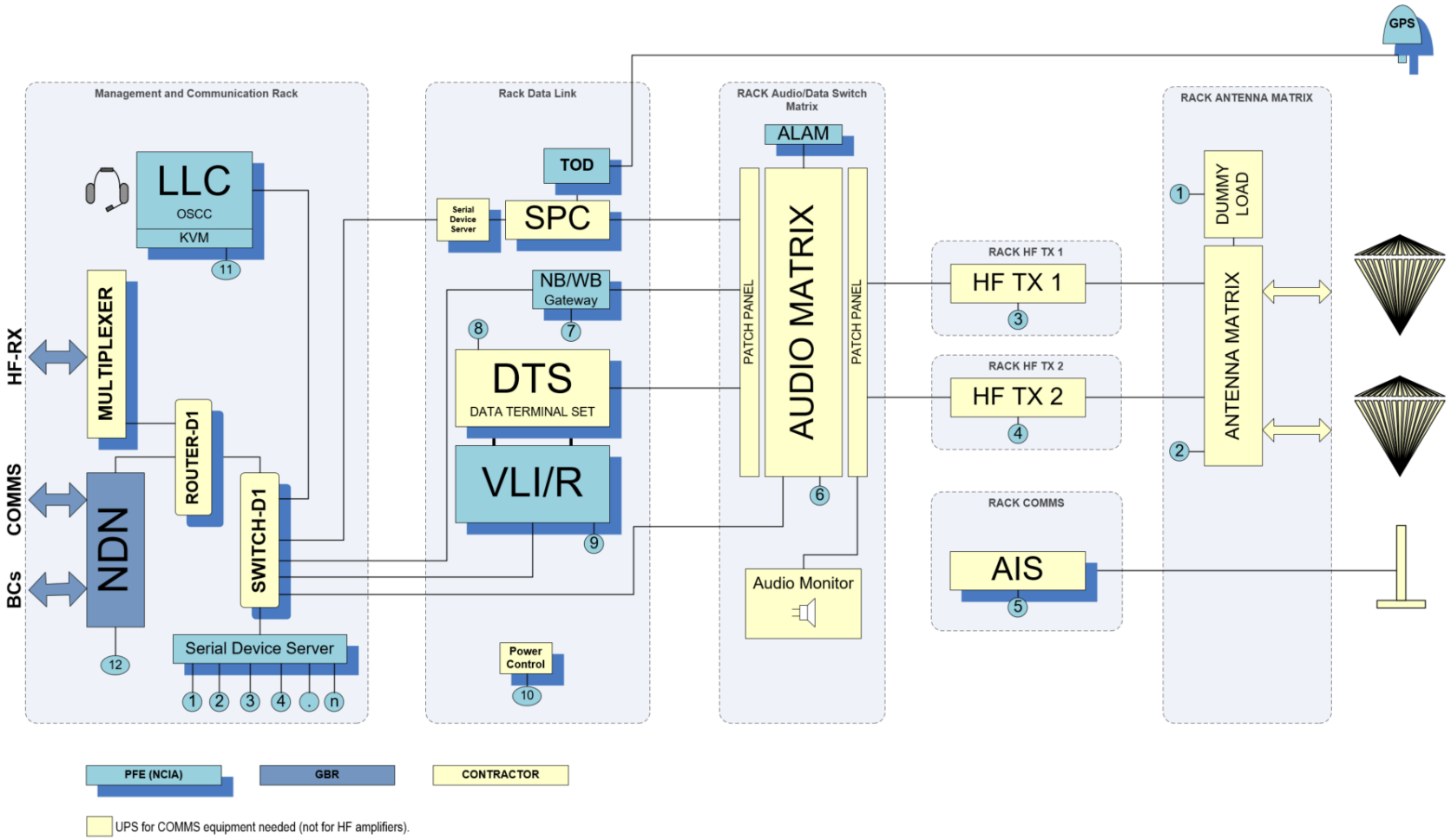

Figure 9: RRH Saxa Vord - HF-TX Radio site block diagram

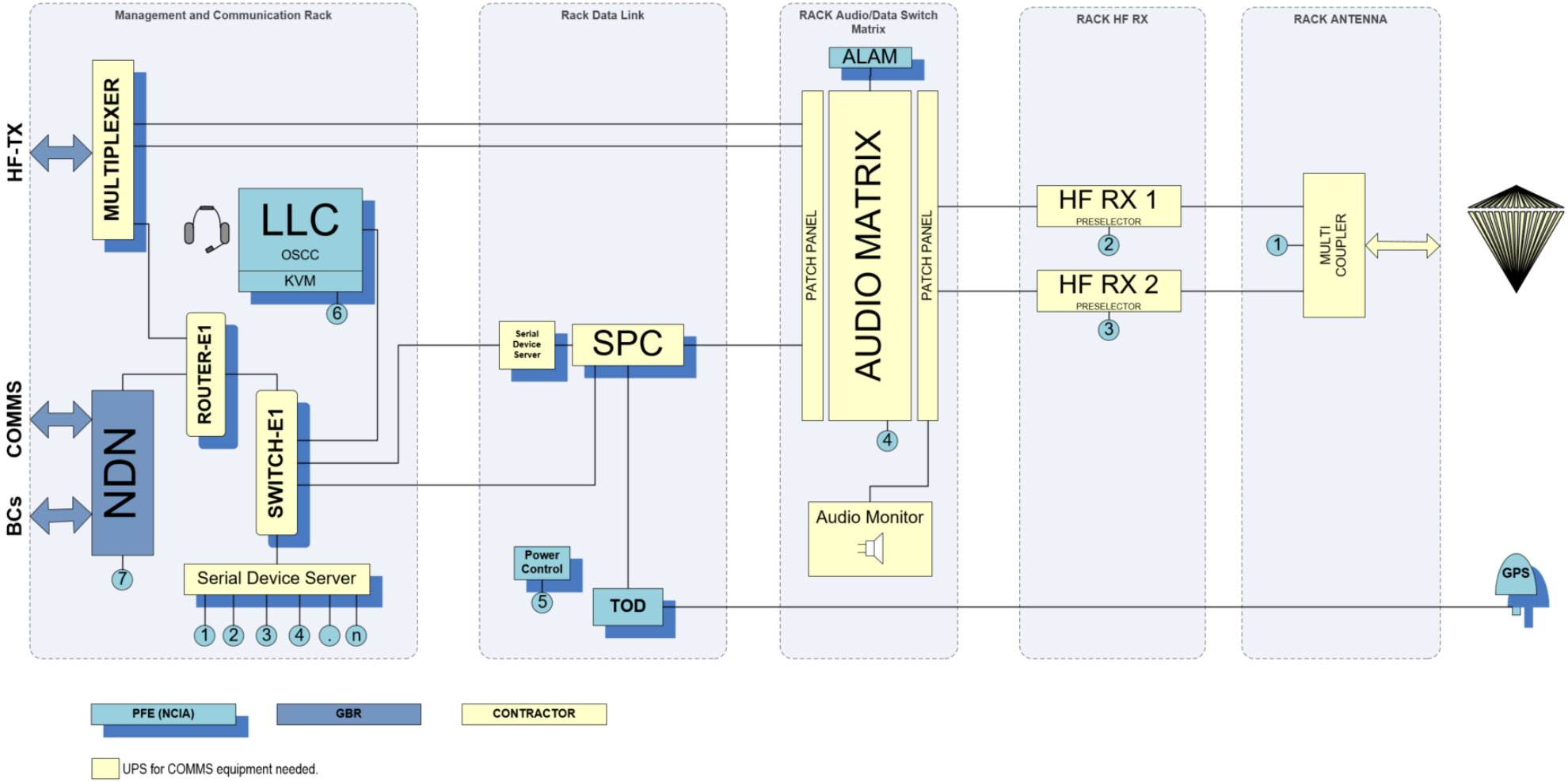

Figure 10: RRH Saxa Vord - HF-RX Radio site block diagram

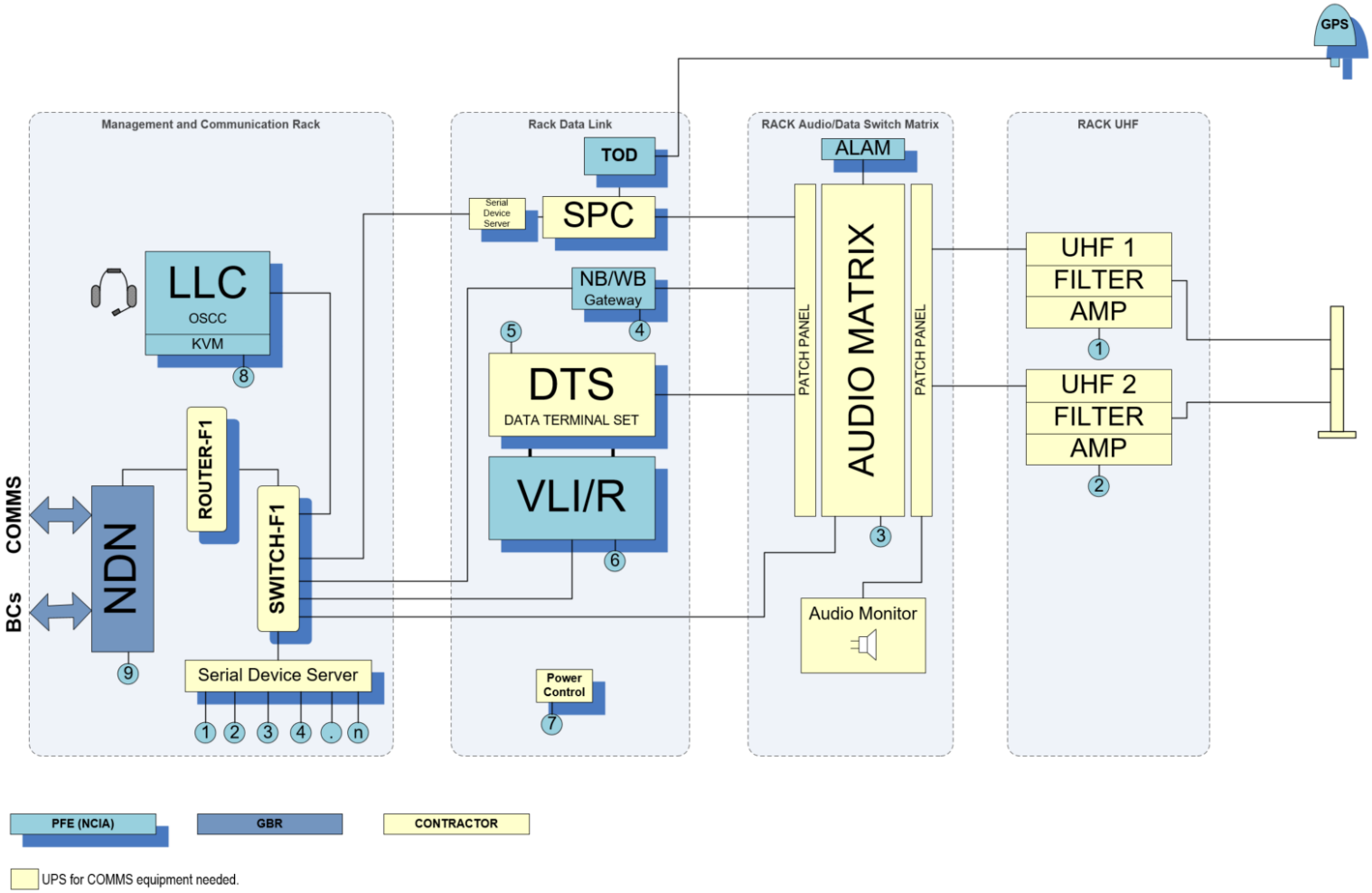

Figure 11: RRH Saxa Vord - UHF Radio site block diagram

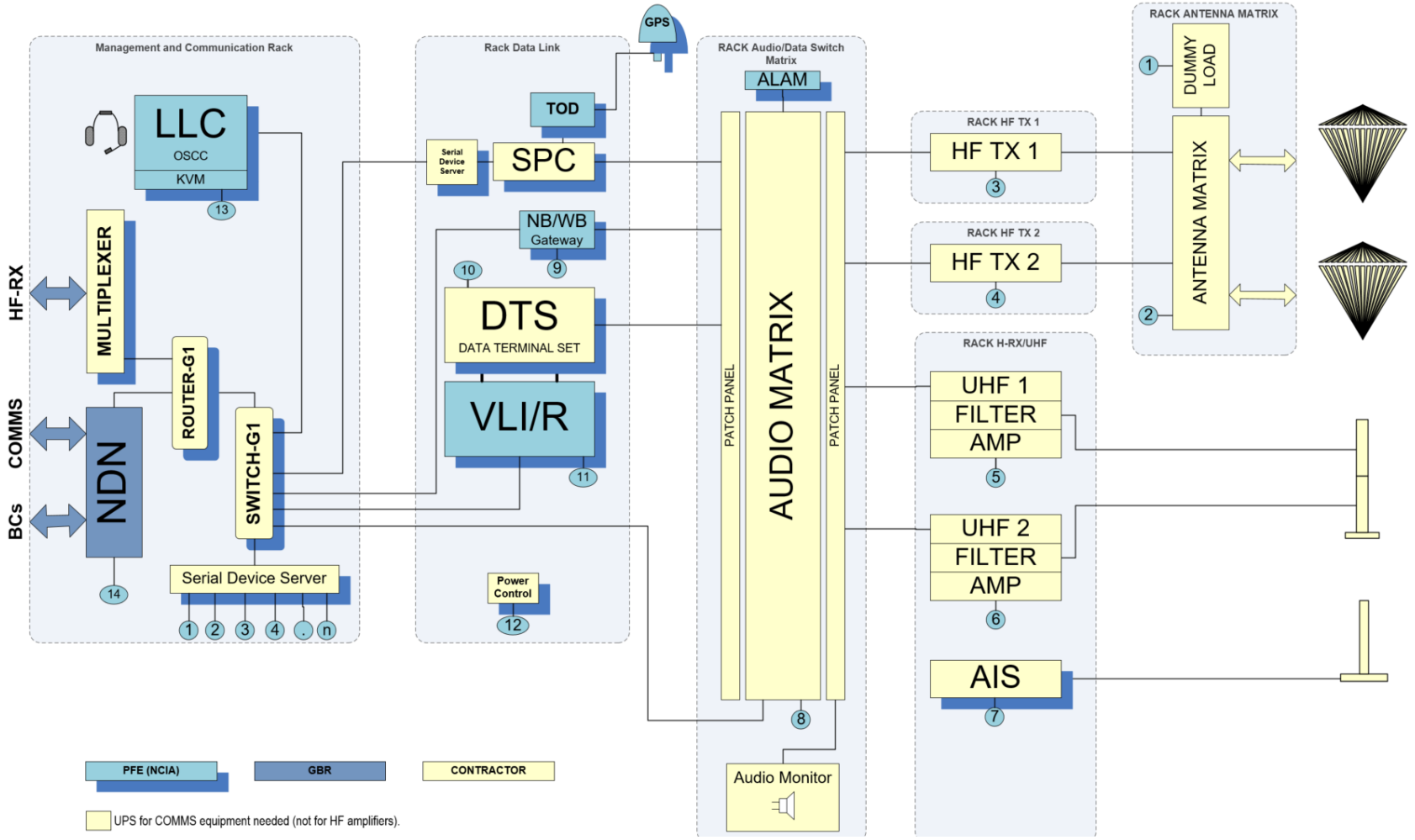

Figure 12: RRH Portreath - HF-TX/UHF Radio site block diagram

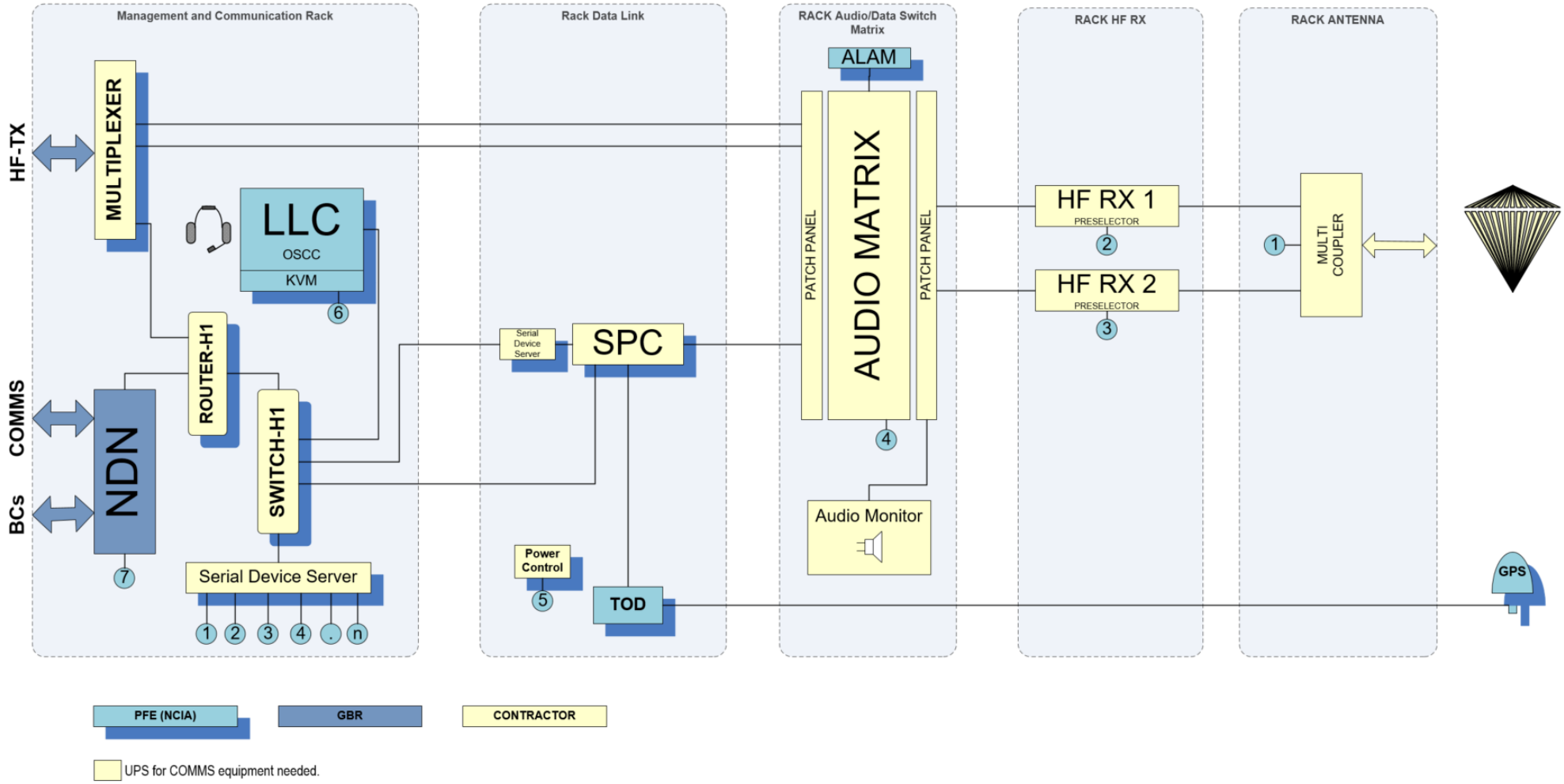

Figure 13: RRH Portreath - HF-RX Radio site block diagram

2.7 MASW/CPT and Geotechnical Assessment Analysis

2.7.1 For each COMMS site the contractor shall provide a study/analysis covering the following topics, but not limited to, depending on the individual situation of each COMMS site:

a. Fulfilment of project requirements

b. Interference/distortion with other internal or external systems are existing:

i. HF, UHF and DLOS

ii. RX and TX

iii. Selected antennae

iv. Towers

c. Antenna Field and placement of SSSB Antennas

d. Interference with on-site installed Radars

2.7.2 For RX in addition:

a. Radiation from lightning discharges (atmospheric noise due to lightning)

b. Unintended radiation from electrical machinery, electrical and electronic equipment, power transmission lines, or from internal combustion engine ignition (man-made noise)

c. Emissions from atmospheric gases and hydrometeors

d. The ground or other obstructions within the antenna beam

e. Radiation from celestial radio sources

2.7.3 Soil Examination:

a. Multichannel analysis of surface waves (MASW) as conventional seismic approach for near surface investigation including seismic anomaly detection.

b. Cone Penetration Test (CPT) for detection of geotechnical properties of existing soils.

c. Detailed MASW/CPT analysis result and Geotechnical assessment result

d. Type and sizing of the selected foundations

2.8 Radio Communication Sub-system RRH Benbecula

2.8.1 This site is a collocated site with centralised HF TX, HF-RX and UHF-TRX location.

2.8.2 The Contractor shall:

a. Install and integrate CIS and the PFE equipment at the radio sites, including supporting sub-systems (e.g. UPS, SMS, etc.)

b. Implement necessary Civil Works related directly to CIS equipment provided by the Contractor and any additional necessary Civil Works outside the main Civil Works, which were already contracted by the HN under a separate Contract.

c. Test, monitor and control the needed equipment including Aerials, Antennae, Radio equipment, etc.

2.8.3 Block diagrams showing the components related to the Radio Communication sites are described in Figure 8. The Contractor shall provide the “yellow” colored components and integrate the others, under the scope of this Contract.

2.8.4 HF-TX/RX/UHF Components:

a. HF-TX radio component

b. HF-RX radio component

c. UHF radio component

d. Radio management, Link 11 DTS, Link 22 SPC, TOD and VLI/R

e. AIS reception component

f. Routers, Switches and Serial Converters

g. Long distance comms land line to the Buffer Centre at RAF Boulmer and the Swanwick Resilience Entity and to the other SSSB COMMS sites.

2.8.5 HF-TX/RX/UHF Equipment.

[A] The Contractor is to provide, but not limited to, the following equipment for the radio components, less any equipment listed as PFE:

a. HF-TX Antenna field

i. Qty 2 Wide band monocone antennas, vertical polarization for SSSB,

ii. RF cabling (incl. trenching)

b. HF-RX Antenna fields

i. Qty 1 Wide band antenna, vertical polarization for SSSB, 2 channels

ii. RF cabling

c. UHF Antennas

i. Qty 1 Co-linear antenna with two channels

ii. RF cabling (incl. trenching)

d. HF Transmitters, UHF RX/TX component

i. Qty 2 HF Solid State Radio Transmitters 5 kW for SSSB (Link 11, Link 22 and Voice) with cooling/ventilation systems

ii. Qty 1 Antenna matrix for HF-TX antennas

iii. Qty 1 Dummy load 5 kW

iv. Qty 2 100 W UHF radio transceivers upgradable to support Link 22 EPM and Voice SATURN and Have Quick II.
The UHF radios shall be upgradeable latest at Site Acceptance Test (SAT)

The Link 22 EPM is an Upgrade Capability.

The upgrade shall be performed via SW upgrade (HW interface already present).

The L22 EPM SW upgrade shall EXIST latest at time of the COMMS Radio Site Acceptance Test (RSAT) - meaning:

- The UHF Radio Manufacturer shall provide a written statement containing:
  - The L22 EPM SW Upgrade Part Number
  - L22 EPM NSN
  - A statement about how the upgrade is integrated
- Capability demonstration:

  A. Can be performed at COMMS site by Software upgrade by HN COMMS experts:
  - Delivery lead time (arrival at the purchaser) not exceeding four (4) weeks after a L22 EPM purchase request submitted by the purchaser to the equipment manufacturer - for the radios under this contract.
- B. Must be performed at Manufactures Premises:
  - Shipment of L22 EPM upgraded equipment from the manufacturer premises to the purchaser not later than four (4) weeks after equipment delivery at manufacturer premises - for the radios under this contract.
- UHF radio transceivers upgradable to support Link 22 EPM.

v. Qty 1 AIS receiver with antenna

vi. Qty 1 Audio data/voice switch matrix, also capable of witching Link 22 discrete signals, with patch panels

vii. Qty 1 Audio Monitor

viii. Qty 1 ALAM (PFE)

ix. Qty 1 TOD-HQ, GPS, military grade, SAASM, incl. antenna (PFE)

x. Qty 1 DTS

xi. Qty 1 SPC

xii. Qty 1 VLI/R (PFE)

xiii. Qty 1 Radio Management Equipment Set (PFE)

xiv. Qty 1 Narrow-Band/Wide-Band Gateway (secure and unsecure voice) (PFE)

xv. Qty 1 Network Router

xvi. Qty 1 Network Switch

xvii. Qty 2 Serial Device Servers, RS-232/RS-422

xviii. Power switch (multi) socket based unit with IP connectivity, allowing the individual Power-Down/Power-UP for a connected device with remote control capability..

xix. All racks with accessories, internal and cabling

xx. UPS for COMMS equipment, except for HF TX amplifiers.

e. HF Receivers component

i. Qty 2 HF Receivers for SSSB with pre-selectors

ii. Qty 1 HF multi-coupler

iii. Power switch (multi) socket based unit with IP connectivity, allowing the individual Power-Down/Power-UP for a connected device with remote control capability.

iv. All racks with accessories, internal and cabling

2.8.6 The civil works to be implemented by the Contractor shall include but not limited to the implementation of Antenna fields including RF cables and ducting.

2.8.7 Other CW requirements that are Contractor responsibility are specified in SOW Section 14 and the UK specific SRS (CW) Annex C.

2.9 Radio Communication Sub-system RRH Saxa Vord

2.9.1 This site is a non-collocated site with three separated HF-TX, HF-RX and UHF-TRX locations.

2.9.2 The Contractor shall:

a. Install and integrate CIS and the PFE equipment at the radio sites, including supporting sub-systems (e.g. UPS, SMS, etc.).

b. Implement necessary Civil Works related directly to CIS equipment provided by the Contractor and any additional necessary Civil Works outside

the main Civil Works, which were already contracted by the HN under a separate Contract.

c. Test, monitor and control the needed equipment including Aerials, Antennae, Radio equipment, etc.

2.9.3 Block diagrams showing the components related to the Radio Communication sites are described in Figure 9 to Figure 11. The Contractor shall provide the “yellow” colored components and integrate the others, under the scope of this Contract.

2.9.4 HF-TX/RX/UHF Components:

a. HF-TX radio component

b. HF-RX radio component

c. UHF radio component

d. Radio management, Link 11 DTS, Link 22 SPC, TOD and VLI/R

e. AIS reception component

f. Routers, Switches and Serial Converters

g. Long distance comms land line to the Buffer Centre at RAF Boulmer and the Swanwick Resilience Entity (SRE) and to the other SSSB COMMS sites.

[A] HF-TX/RX/UHF Equipment. The Contractor is to provide, but not limited to, the following equipment for the radio components, less any equipment listed as PFE:

a. HF-TX Antenna field

i. Qty 2 Wide band monocone antennas, vertical polarization for SSSB,

ii. RF cabling (incl. trenching)

b. HF-RX Antenna fields

i. Qty 1 Wide band antenna, vertical polarization for SSSB, 2 channels

ii. RF cabling

c. UHF Antennas

i. Qty 1 Co-linear antenna with two channels

ii. RF cabling (incl. trenching)

d. HF Transmitters, UHF RX/TX component

i. Qty 2 HF Solid State Radio Transmitters 5 kW for SSSB (Link 11, Link 22 and Voice), inclusive cooling/ventilation systems

ii. Qty 1 Antenna matrix for HF-TX antennas

iii. Qty 1 Dummy load 5 kW

iv. Qty 2 100 W UHF radio transceivers upgradable to support Link 22 EPM and Voice SATURN and Have Quick II.

The UHF radios shall be upgradeable latest at Site Acceptance Test (SAT)

The Link 22 EPM is an Upgrade Capability.

The upgrade shall be performed via SW upgrade (HW interface already present).

The L22 EPM SW upgrade shall EXIST latest at time of the COMMS Radio Site Acceptance Test (RSAT) - meaning:

- The UHF Radio Manufacturer shall provide a written statement containing:
  - The L22 EPM SW Upgrade Part Number
  - L22 EPM NSN
  - A statement about how the upgrade is integrated
- Capability demonstration:

  A. Can be performed at COMMS site by Software upgrade by HN COMMS experts:
  - Delivery lead time (arrival at the purchaser) not exceeding four (4) weeks after a L22 EPM purchase request submitted by the purchaser to the equipment manufacturer - for the radios under this contract.
- B. Must be performed at Manufactures Premises:
  - Shipment of L22 EPM upgraded equipment from the manufacturer premises to the purchaser not later than four (4) weeks after equipment delivery at manufacturer premises - for the radios under this contract.
- UHF radio transceivers upgradable to support Link 22 EPM.

v. Qty 1 AIS receiver with antenna

vi. Qty 3 Audio data/voice switch matrix, also capable of witching Link 22 discrete signals, with patch panels

vii. Qty 3 Audio Monitor

viii. Qty 3 ALAM (PFE)

ix. Qty 3 TOD-HQ, GPS, military grade, SAASM, incl. antenna (PFE)

x. Qty 2 DTS

xi. Qty 3 SPC

xii. Qty 2 VLI/R (PFE)

xiii. Qty 3 Radio Management Equipment Set (PFE)

xiv. Qty 2 Narrow-Band/Wide-Band Gateway (secure and unsecure voice)

(PFE)

xv. Qty 3 Network Router

xvi. Qty 3 Network Switches

xvii. Qty 2 Multiplexers

xviii. Qty 6 Serial Device Servers, RS-232/RS-422

xix. Power switch (multi) socket based unit with IP connectivity, allowing the individual Power-Down/Power-UP for a connected device with remote control capability.

xx. All racks with accessories, internal and cabling

xxi. UPS for COMMS equipment, except for HF TX amplifiers.

e. HF Receivers component

i. Qty 2 HF Receivers for SSSB with pre-selectors

ii. Qty 1 HF multi-coupler

iii. Power switch (multi) socket based unit with IP connectivity, allowing the individual Power-Down/Power-UP for a connected device with remote control capability.

iv. All racks with accessories, internal and cabling

2.9.5 The civil works to be implemented by the Contractor shall include but not limited to the implementation of Antenna fields including RF cables and ducting.

2.9.6 Other CW requirements that are Contractor responsibility are specified in SOW Section 14 and the SRS (CW) Annex.

2.10 Radio Communication Sub-system RRH Portreath

2.10.1 This site is a non-collocated site with two separated HF-TX/UHF-TRX and HF-RX locations.

2.10.2 The Contractor shall:

a. Install and integrate CIS and the PFE equipment at the radio sites, including supporting sub-systems (e.g. UPS, SMS, etc.)

b. Implement necessary Civil Works related directly to CIS equipment provided by the Contractor and any additional necessary Civil Works outside the main Civil Works, which were already contracted by the HN under a separate Contract.

c. Test, monitor and control the needed equipment including Aerials, Antennae, Radio equipment, etc.

2.10.3 Block diagrams showing the components related to the Radio Communication sites are described in Figure 12 and Figure 13. The Contractor shall provide the

"yellow" colored components and integrate the others, under the scope of this Contract.

2.10.4 HF-TX/RX/UHF Components:

a. HF-TX radio component

b. HF-RX radio component

c. UHF radio component

d. Radio management, Link 11 DTS, Link 22 SPC, TOD and VLI/R

e. AIS reception component

f. Routers, Switches and Serial Converters

g. Long distance comms land line to the Buffer Centre at RAF Boulmer and the Swanwick Resilience Entity (SRE) and to the other SSSB COMMS sites.

[A] HF-TX/RX/UHF Equipment. The Contractor is to provide, but not limited to, the following equipment for the radio components, less any equipment listed as PFE:

a. HF-TX Antenna field

i. Qty 2 HF Solid State Radio Transmitters 5 kW for SSSB (Link 11, Link 22 and Voice)

ii. RF cabling (incl. trenching)

b. HF-RX Antenna fields

i. Qty 1 Wide band antenna, vertical polarization for SSSB, 2 channels

ii. RF cabling

c. UHF Antennas

i. Qty 1 Co-linear antenna with two channels

ii. RF cabling (incl. trenching)

d. HF Transmitters, UHF RX/TX component

i. Qty 2 HF Solid State Radio Transmitters 5 kW for SSSB, including cooling/ventilation systems

ii. Qty 1 Antenna matrix for HF-TX antennas

iii. Qty 1 Dummy load 5 kW

Qty 2 100 W UHF radio transceivers upgradable to support Link 22 EPM and Voice SATURN and Have Quick II.
The UHF radios shall be upgradeable latest at Site Acceptance Test (SAT)

The Link 22 EPM is an Upgrade Capability.

The upgrade shall be performed via SW upgrade (HW interface already

present).

The L22 EPM SW upgrade shall EXIST latest at time of the COMMS Radio Site Acceptance Test (RSAT) - meaning:

- The UHF Radio Manufacturer shall provide a written statement containing:
  - The L22 EPM SW Upgrade Part Number
  - L22 EPM NSN
  - A statement about how the upgrade is integrated
- Capability demonstration:

  A. Can be performed at COMMS site by Software upgrade by HN COMMS experts:
  - Delivery lead time (arrival at the purchaser) not exceeding four (4) weeks after a L22 EPM purchase request submitted by the purchaser to the equipment manufacturer - for the radios under this contract.
- B. Must be performed at Manufactures Premises:
  - Shipment of L22 EPM upgraded equipment from the manufacturer premises to the purchaser not later than four (4) weeks after equipment delivery at manufacturer premises - for the radios under this contract.
- UHF radio transceivers upgradable to support Link 22 EPM.

iv. Qty 1 AIS receiver with antenna

v. Qty 2 Audio data/voice switch matrix, also capable of witching Link 22 discrete signals, with patch panels

vi. Qty 2 Audio Monitor

vii. Qty 2 ALAM (PFE)

viii. Qty 2 TOD-HQ, GPS, military grade, SAASM, incl. antenna (PFE)

ix. Qty 1 DTS

x. Qty 2 SPC

xi. Qty 1 VLI/R (PFE)

xii. Qty 2 Radio Management Equipment Set (PFE)

xiii. Qty 1 Narrow-Band/Wide-Band Gateway (secure and unsecure voice) (PFE)

xiv. Qty 2 Network Router

xv. Qty 2 Network Switches

xvi. Qty 2 Multiplexers

xvii. Qty 4 Serial Device Servers, RS-232/RS-422

xviii. Power switch (multi) socket based unit with IP connectivity, allowing the individual Power-Down/Power-UP for a connected device with remote control capability.

xix. All racks with accessories, internal and cabling

xx. UPS for COMMS equipment, except for HF TX amplifiers.

e. HF Receivers component

a. Qty 2 HF Receivers for SSSB with pre-selectors

b. Qty 1 HF multi-coupler

c. Power switch (multi) socket based unit with IP connectivity, allowing the individual Power-Down/Power-UP for a connected device with remote control capability.

d. All racks with accessories, internal and cabling

2.10.5 The civil works to be implemented by the Contractor shall include but not limited to the implementation of Antenna fields including RF cables and ducting.

2.10.6 Other CW requirements that are Contractor responsibility are specified in SOW Section 14.

2.11 Inter/Intra-Sites Communication Sub-system

2.11.1 The inter-sites Communication, provided by the THN via the NDN network, will provide all the necessary channels to allow the exchange of data, voice and control signals between the Buffer Centres and the Radio Sites. THN will also provide a backup communication line between the Radio Sites. The contractor is responsible for the intra-site communication, which will be needed at RRH Saxa Vord and RRH Portreath between the local sub sites. The following list enumerates the type and minimum number of required channels:

a. Radio Sites to/from a Buffer Centre

v. Qty 1 IP line with a constant minimum no less than 4 Mbps (better 10 Mbps) for the following:

a) Qty 1 Link 11 monitoring, VoIP, total 64 kb/s

b) Qty 1 Link 22 monitoring, VoIP, total 64 kb/s

c) Qty 1 Link 11 VOICE line, RoIP, total 64 kb/s

d) Qty 1 Link 22 VOICE line, RoIP, total 64 kb/s

e) Qty 2 UHF Voice (NB and WB) lines, RoIP, total 128 kb/s

f) Qty 4 intercom line, RoIP, total 128 kb/s

g) Qty 1 Link 11 Data Line, IP, total 128 kb/s

h) Qty 4 Link 22 Data Lines, IP, total 256 kb/s

i) Qty 4 AIS Data Lines, IP, total 256 kb/s

j) Qty 1 Control & Monitoring, IP, total 2048 kb/s

2.11.2 The Contractor shall provide support to the THN and the Purchaser in the integration and testing of the inter-sites/intra-sites communication sub-systems.

2.11.3 The delay, jitter, throughput of the inter-sites/intra-sites communication sub-systems have to fulfill the requirements for Link 11, Link 22, voice and network specifications.

2.12 Radio Management and Command and Control Sub-system

2.12.1 The SSSB Command and Control system is a product consisting of hardware and software elements developed by the NCI Agency SSSB Section. The Command and Control Centre/Buffer Centres in combination with the SSSB Radio Sites will be integrated and tested by the Purchaser, while the contractor will provide engineering support at the Radio Sites.

2.12.2 The radio management system, delivered as PFE, is a product consisting of hardware and software elements developed by the NCI Agency SSSB Section. Before delivery the product has to be configured and customized by the purchaser in order to operate with the communication equipment used at the radio sites. The integration of the SSSB Radio Sites is based on ICDs.

2.12.3 Technical characteristics, documentation and technical support, related to the control of the communication equipment, is to be provided by the Contractor to the purchaser with the system design at PDR and CDR in accordance with SOW Section 4.7.

2.12.4 The technical integration documentation is to be provided, beside other technical documents, as Interface Control Documents (ICDs) format describing the format of the control messages and the protocol.

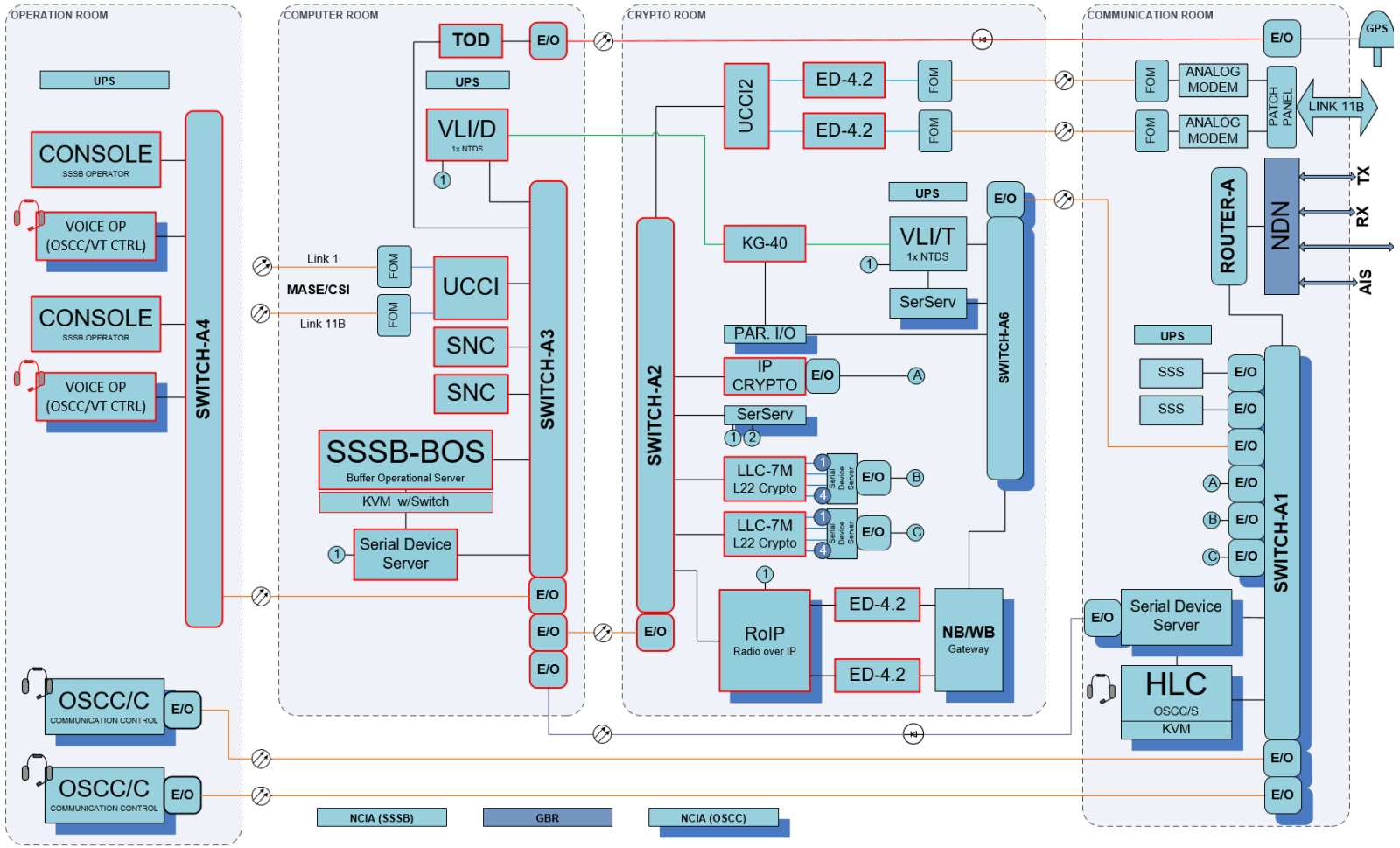

Figure 14: SSSB BC at RAF Boulmer block diagram

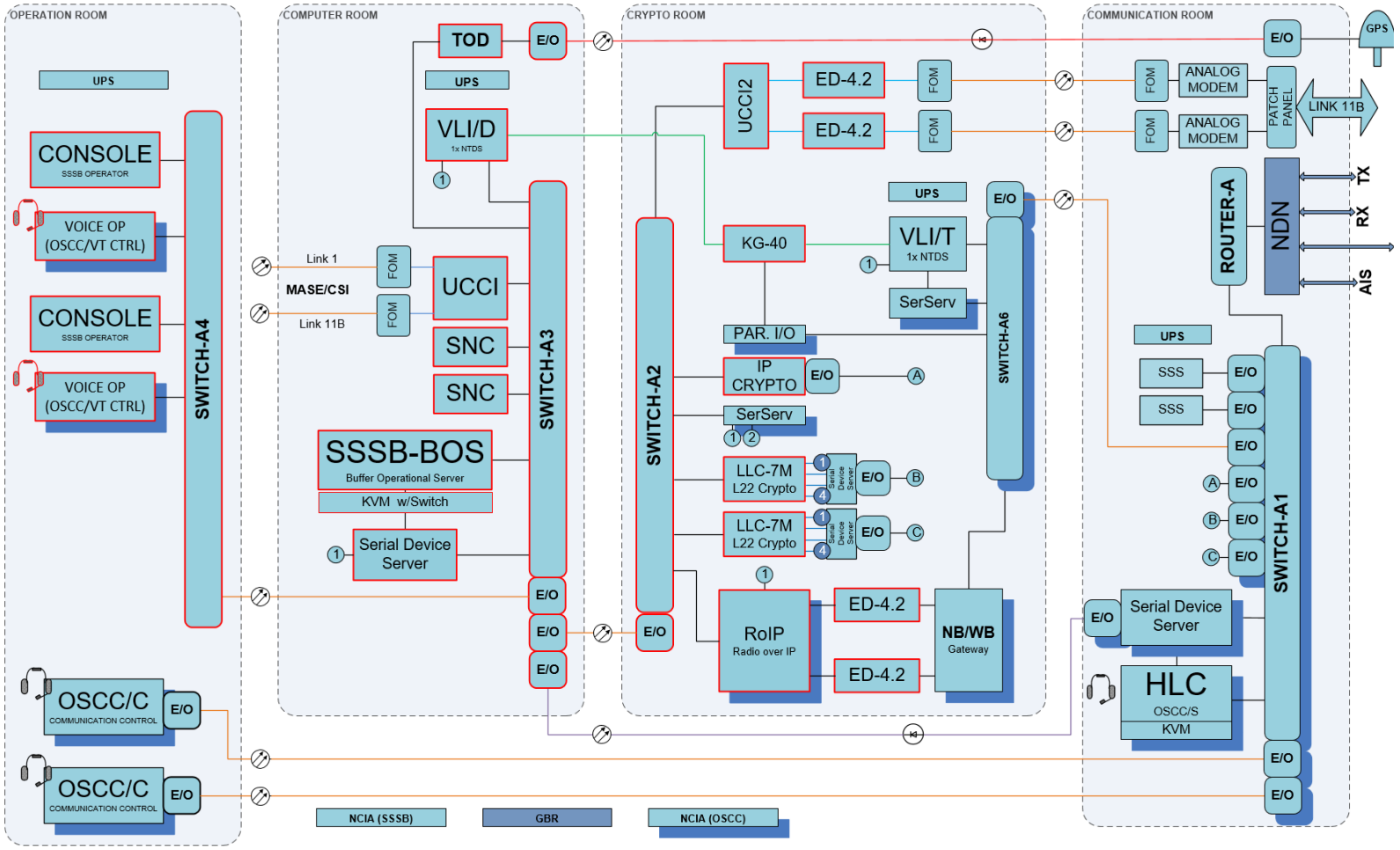

Figure 15: SSSB BC at SWK RE Swanwick block diagram

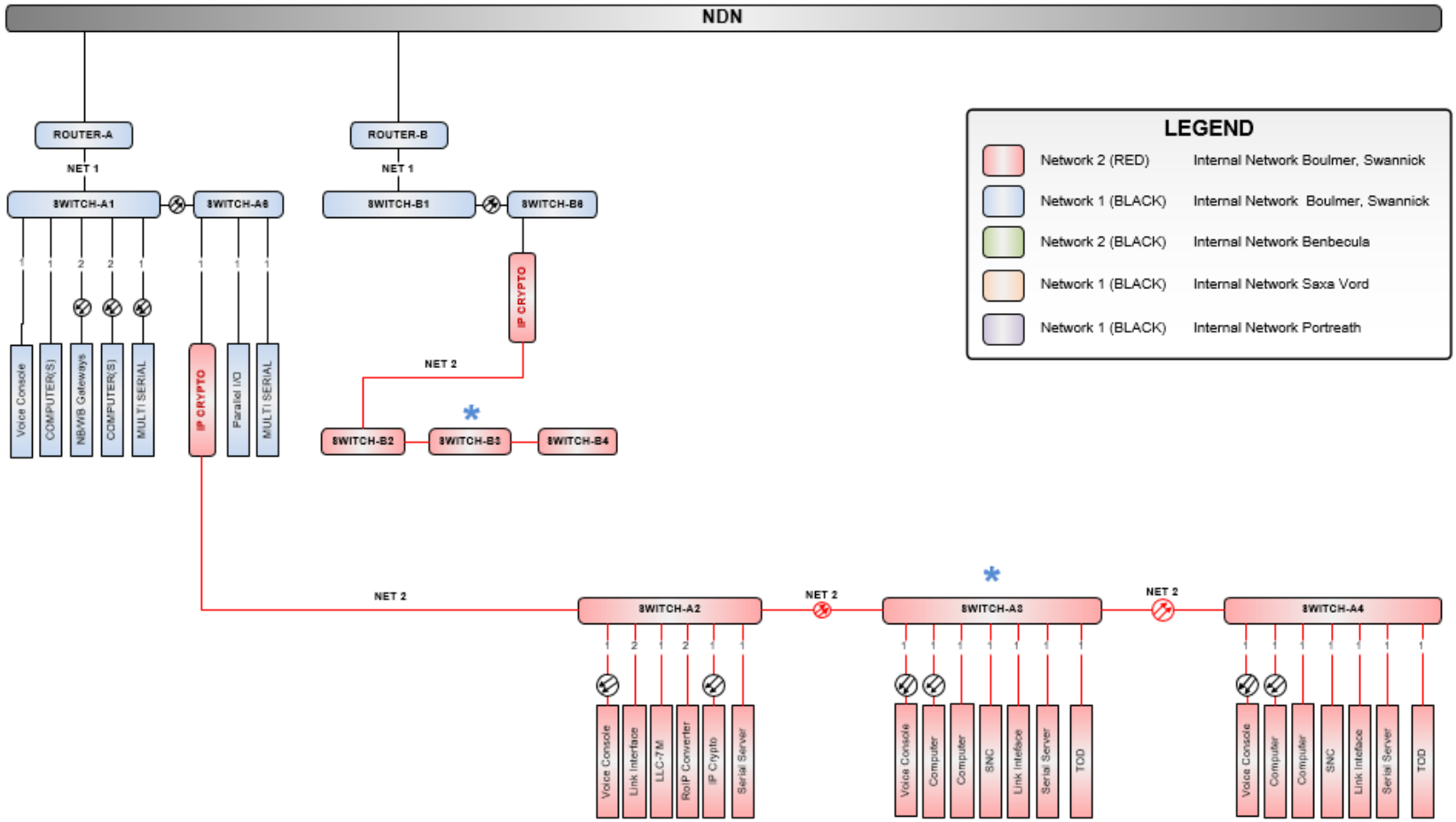

Figure 16: SSSB Brief Network Overview 1/2

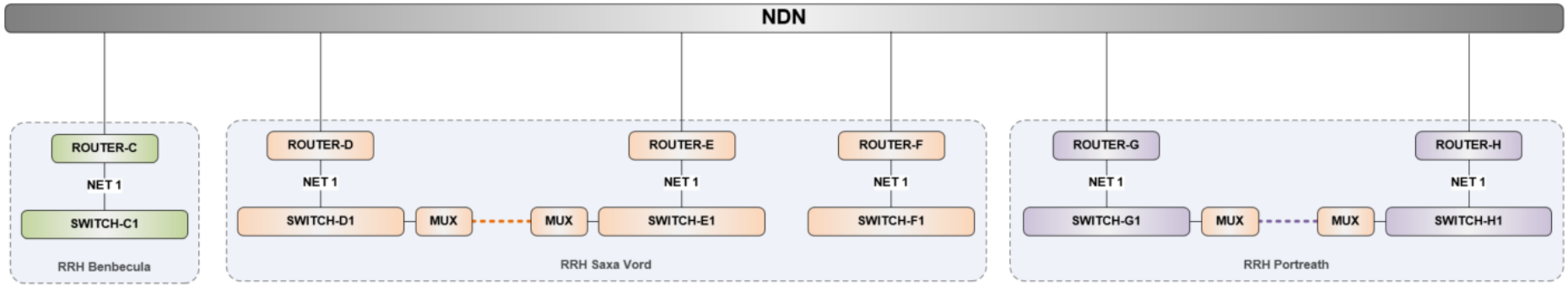

Figure 17: SSSB Brief Network Overview 2/2

2.13 System Integration and Testing

2.13.1 The Contractor shall be responsible to perform the testing activities as specified in SOW Section 10.

2.14 Summary of Responsibilities

2.14.1 This paragraph provides a summary of the areas of responsibilities of the Contractor, as illustrated in Figure 18:

2.14.2 The Contractor shall be responsible for the:

a. Implementation of the 3 (three) Radio Sites, including integration of the PFE elements.

b. RRH Benbecula is a collocated site.

c. RRH Saxa Vord is a non-collocated site.

i. Separate COMMS HF-TX.

ii. Separate COMMS HF-RX.

iii. Separate COMMS UHF.

d. RRH Portreath is a non-collocated site.

i. Separate COMMS HF-TX/UHF.

ii. Separate COMMS HF-RX.

e. Implementation of DLOS microwave inter-site communication is currently not foreseen, but might be considered upon contractor recommendation.

f. Delivery of racks for inter-site/intra-site communication equipped with power distribution and accessories including racks for NDN equipment.

g. Support to Purchaser/THN for Radio Sites and Buffer Centres for integration and testing of inter-site communication.

The Intersite Communication Test, per SSSB Buffer Centre, will have a minimum duration of:

i. Preparation: 1 week

ii. Site Acceptance Test: 1 week

iii. Contractor engineering manning at the COMMS Sites during activities: To be calculated by the contractor.

h. Provision of the required information to the Purchaser in the customization and configuration of the radio management PFE elements.

i. Support to Purchaser for overall integration and testing of the complete SSSB system.

2.14.3 The Purchaser (NCI Agency) will be responsible for the:

a. Implementation of the Buffer Centres.

b. Delivery of the PFE elements to the Contractor for radio site installation, integration and testing.

c. Overall authority over the integration and testing of the SSSB system as a whole.

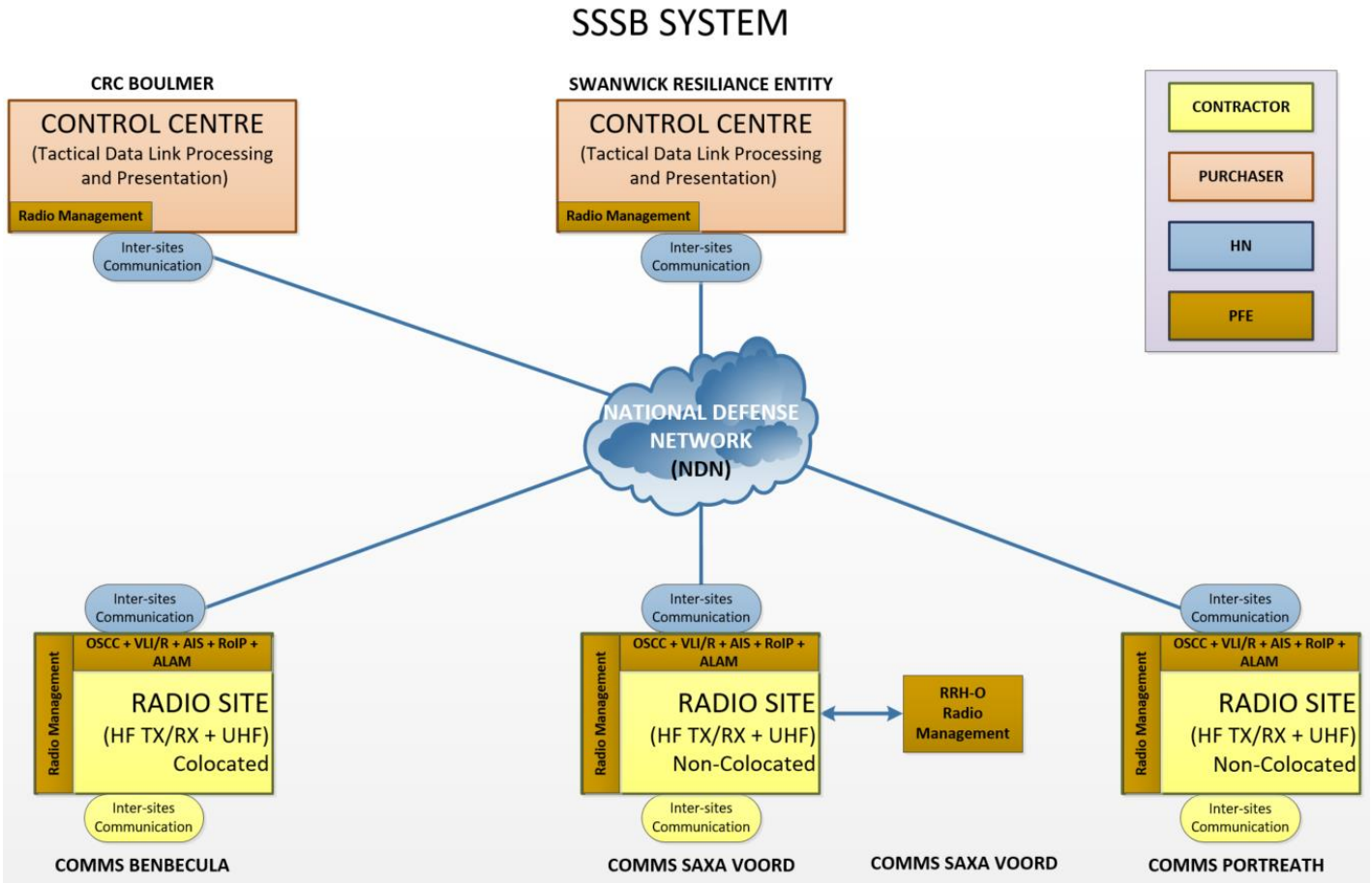

Figure 18: Areas of responsibilities among Contractor, Purchaser and HN.

SECTION 3 Technical Requirements: Equipment and Antennas

3.1 Requirements

3.1.1 The following specifications are to be understood as minimal project requirements and NATO MMR criteria for the SSSB HW equipment.

3.2 General requirements

3.2.1 In accordance with NATO requirements, the Contractor is to assemble the site equipment with racks of standard dimensions, 19 inch standard, in order to achieve:

a. Uniform implementation in terms of colour, height, depth and accessories.

b. Simplified assembly and acceptance.

c. Simplified installation.

3.2.2 The Contractor shall provide a 20% of growth capacity in terms of space in the racks, power and power socket requirements.

3.2.3 Installation of Equipment:

a. The Contractor shall install equipment racks, miscellaneous devices and antennas, inclusive of materials, cables and all the necessary accessories until finalisation and acceptance by the Purchaser.

b. Any additional minor equipment or communications devices (e.g. modems), not encompassed in the present or following sections, shall be delivered and installed by the Contractor at the sites in case they are required for the proper functioning of the system.

3.2.4 Furniture (Also refer to THN specific SRS (CW) Annexes):

a. The Contractor shall provide the necessary furniture for each site - meaning each working position at each site/sub-site e.g. tables, cabinets, office

chairs (office chairs: highest EU/THN Standard required), trolleys, office furniture and workbench).

b. A list of the furniture shall be proposed by the Contractor in the bidding offer.

3.3 Site Monitor System (SMS)

3.3.1 The Contractor shall supply one Site Monitor System at each site. This shall be compatible with any monitoring system already installed by the THN.

3.3.2 Function:

a. The function of the SMS is to reveal the status of operation of the respective SSSB Radio Site.

3.3.3 The SMS shall provide the vital site states and alarms via an interface to the site operator.

3.3.4 The SMS shall convey the monitored data to the SSSB Open System Communication Control (OSCC HLC/LLC) in time using a software interface:

a. States and Alerts triggering sub-alerts shall be changeable/selectable.

b. On request, the SMS log file contents shall be provided to the OSCC.

c. The contractor shall provide an SMS ICD for OSCC implementation to the purchaser.

3.3.5 Architecture:

a. The data to be monitored shall be available at the local and remote SMSs.

b. The SMS system shall have a redundance capability.

c. The data to be monitored shall be conveyed to the other SMS at remote sites.

d. The SMS will relay to the remote monitoring station at the other site and the control centre via Local Area Network (LAN) and Long Haul Network (LHN).

e. The contractor shall implement the software interface to the OSCC using SNMP V. 3.x where also ‘get’ and ‘set’ functionality shall be included

f. The contactor shall install a SMS Alert Panel at one of the COMMS racks at the front side:

i. The SMS Alert panel shall represent the status of the local site.

g. The contractor shall install a desk mountable SMS Alert Panel at the location requested by the THN (in general 1 unit, but if needed 2units - e.g. 2nd unit is to be installed at Saxa Vord RRH-O):

i. The desk mountable SMS Alert Panel shall represent the status of all logical combined SSSB sites, e.g. for the RRH Saxa Vord COMMS site:

a) COMMS HF TX.

b) COMMS HF RX.

c) COMMS UHF.

h. SMS Alert Panels shall:

i. Indicate the individual states/alerts by an LED.

ii. Have an Alert Buzzer.

iii. Have an ACKNOWLEDGE button to acknowledge any alert and switch off the Alert Buzzer.

iv. Have a LED/Buzzer Test Button:

i. The contractor shall provide a “SMS ALERT PANEL- RESPONSE PROCEDURE” which describes in detail:

i. The error detection and correction measures necessary, to identify the displayed fault.

ii. To recover the operational state, if possible.

iii. To secure the related equipment and its surrounding environment - up to the level of human and building safety.

iv. A list of Alerts and triggering Sub-Alerts as well as the detailed description of each alert - added as an appendix.

v. A procedure how to change the triggering sub-alert(s)

vi. NOTE: This document and its procedures shall be part of the COMMS training to be provided by the contractor.

3.3.6 Monitored data:

a. Radio Receivers, HF and UHF.

b. Radio Transmitters, HF and UHF.

c. Low Tension power network.

d. Low Tension UPS.

e. Electric system.

f. Air conditioning system.

g. Equipment air cooling system.

h. Fire Alarms.

i. Anti-intrusion system.

3.3.7 Any other SMS integration recommendation from the contractor in relation to the installed devices shall be detailed in his bidding proposal.

3.3.8 The final SMS Alert Panel Status/Alert list and their triggering sub-states and sub-alerts will be defined and agreed on before the CDR – where the THN holds the final decision.

3.3.9 Any other SMS integration recommendation from the contractor in relation to the installed devices shall be detailed in his bidding proposal.

3.4 Rack Transmitter HF/SSB – 5 kW

3.4.1 The Contractor shall supply, integrate and test HF transmitter equipment of "Solid State" technology.

3.4.2 A typical configuration of the transmitter rack 5 kW, which has the dimension of a standard rack, includes the control circuits, low level RF, power amplifier and power supply.

3.4.3 The Contractor shall supply, integrate and test rack transmitter in accordance with the typical configuration as stated before and shall provide forced air circuit cooling system for the HF Tx, or in case equipment cooling use room ambient air and the available A/C is not adequate, then the Contractor shall upgrade or improve the A/C system to the needed level.

Modern state of the art liquid cooled high power transmitters, compliant to the listed requirements, are also acceptable.

3.4.4 The equipment of the rack transmitter component shall meet the following minimum requirements:

a. Frequency range: 2 ÷ 29.9999 MHz.

b. Frequency tuning steps: 10 Hz.

c. Tuning time (max): 10 s.

d. Frequency stability (max):

   i. ± 1 part in 107 after 30 minute warm up period.

   ii. ± 1 part in 108 for any period of 24 hours after a warm up period of 4 hours under any combination of specified service conditions.

e. RF output power: 5 kW nominal PEP and mean, into a 50 ohm impedance unbalanced to ground and with VSWR up to 1.3:12.

f. Power steps: 1/1, 1/2, 1/4 and 1/8 of maximum output power. Other values of power steps are acceptable as long as they will be within 25% range from the required ones.

g. Modes of operation:

[2] Above VWSR 1.3:1 the transmitter should de-rate the output power according to MIL-STD 188-141C.

i. AM (A3E, R3E, H3E and J3E classes of emission3) including Upper Sideband (USB) and Lower Sideband (LSB) simultaneously or independently[4].

ii. CW (A1A class of emission5)

iii. Link 11 and Link 22

h. Duty cycle: 100 % under all applicable service conditions.

i. Audio inputs 28: 0 ± 3 dBm and 10.3 dB PEP/avg on balanced ungrounded lines with 600 ohm terminations.

j. PTT input.

k. Sidetone: to be provided at the HF audio outputs (both USB and LSB).

l. Time delay (max): 3.5 ms (for any single frequency over the range 500 ÷ 3.050 Hz) (design objective 2.5 ms).

m. Group (or differential) delay (max): 500 μs (within the frequency range 815 ÷ 3.050 Hz).

n. Frequency response: 2.5 dB passband fc +415 ÷ fc +3.050 Hz for the USB and fc -415 ÷ fc -3.050 Hz for the LSB (max); 3 dB at 300 Hz (max with respect to the peak response between 450 ÷ 3.050 Hz); 60 dB at fc +5.000 and fc -1.500 Hz for the USB; 60 dB at fc -5.000 and fc +1.500 Hz for the LSB.

o. Phase jitter (max): 2.5 degrees (rms value) and the probability of a shift greater than 30 degrees shall be 0.01 % when measured at the signal output terminals6.

p. Sideband attenuation: 60 dB below PEP.

q. Carrier suppression (where applicable): 50 dB below PEP.

r. Harmonic attenuation: 45 dB below PEP.

s. Spurious attenuation: 45 dBc.

t. In-band intermodulation distortion (IMD): 35 dB below PEP (with reference to IMD products generated by two equal level in-band audio tones spaced 440 Hz).

u. In-band noise: 50 dB below PEP (in each sideband when measured in a 3

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[3] Respectively: double-sideband, single-sideband reduced (or variable) level carrier, single-sideband full carrier and single-sideband suppressed carrier for single channel analogue telephony (see ITU “Radio regulations – Appendices”).

[4] Independent Side Band (ISB).

[5] Double-sideband without the use of a modulating sub-carrier for single channel keyed telegraphy.

[6] Measurements shall be performed over a sufficient number of adjacent frame pairs to establish the specified probability with a confidence of 95%; measured values shall be the average phase in an averaging time of 9, 09 ms or 18.18 ms for frame lengths of 13,3 ms or 22 ms, respectively.

kHz bandwidth).

v. Out-of-band noise (max):

  i. 10 µV (at any frequency between 2 ÷ 24 MHz, with the exception of fc ±15 % and HFoscillator frequency, when measured in a 3 kHz bandwidth using a two-tone test signal input).

  ii. 2 µV (at any frequency between 2 ÷ 24 MHz, with the exception of fc ±15 % and HF oscillator frequency, when measured in a 3 kHz bandwidth with the audio signal inputs terminated in 600 ohm dummy loads).

  iii. 10 µV (at any frequency between 2 ÷ 24 MHz, within fc ±15 % but with the exception of fc ±3 kHz, when measured in a 3 kHz bandwidth with the audio signal inputs terminated in 600 ohm dummy loads).

  iv. 1 µV (with the transmitter in the off keyed condition, at any frequency between 2 ÷ 24 MHz when measured in a 3 kHz bandwidth).

w. Attack-time delay (max): 7 ms (to reach 90 % of rated power output).

x. Release-time delay (max): 10 ms.

y. Built-In Test Equipment (BITE): embedded.

z. Programmed channels: 99.

aa. Monitor: hours of operation, number of failures, tuning numbers, forward and reflected power.

bb. Remote control: frequency, mode, power level, BITE.

cc. Remote control interfaces: EIA RS 232 (or, equivalently, 422 or 485) and/or 10Base-T IEEE 802.3 (Ethernet).

dd. Power supply: 400 Vac ± 10 % three phases @ 45 ÷ 65 Hz.

ee. Power consumption (max): 20 kW.

ff. Size (max): 1200 x 900 x 2100 mm (W x D x H).

gg. Weight (max): 750 kg.

hh. Operating temperature: 0 ÷ +40 °C.

ii. Relative humidity: 90 % at +40 °C without condensation.

jj. Cooling`/ventilation system: forced air.

kk. In the event of a power outage, the status of the transmitter is to be kept to avoid reconfiguring the exciter portion when the power comes back This shall be obtained by hardware capacity through the transmitter rack itself (e.g. through non-volatile memory) or by the use of a small-size UPS circuit dedicated to the HF transmitter assembly except the amplifier portion.

ll. Transmission exchange time: conforming Link 11 DATA mode

From MIL-STD 188-203 1A:

5.1.7 Switching time. A time period shall be allocated to allow for the switching between the transmit state and receive states. This switching shall be automatic and shall conform to the timing diagram illustrated in FIGURE 5.

a. Receive-to-transmit switching occurs when the picket recognizes its address code, the DNCS recognizes a picket stop code, or the DNCS detects loss of signal presence. When switching from the receive state to transmit state, a silent period of 10 milliseconds shall be required during which the audio output from the DTS to the transmitter shall be inhibited. The audio composite signal shall be applied to the transmitter by the DTS within three frame intervals of the beginning of the silent period. The DTS shall apply the radio keyline a minimum of 7 milliseconds and a maximum of one frame interval prior to the application of the audio composite signal. After application of the audio composite signal and radio set keyline, the transmitter RF output shall reach at least 90 percent of its rated power within 7.0 milliseconds.

b. Transmit-to-receive switching occurs at the end of the transmission, that is, the picket stop code or address code. When switching from the transmit to receive state, the transmitter RF output shall be reduced to the quiescent noise level of 0.1 microvolt (µV) or less in a 6 kHz bandwidth centered on the nominal carrier frequency, and the receiver shall be capable of maximum receive sensitivity within 23 milliseconds or less after reset of the radio set keyline.

3.5 UHF Transceivers Assembly

3.5.1 Rack mountable UHF transceiver compliant to Link 11, Link 22 and SSSB Voice standards and equipped with RF filter automatic tuning and amplifier. UHF transceiver have to be upgradeable for Link 22 EPM, voice HAVE QUICK II and SATURN capability. Minimum requirements will be:

a. Frequency range: 225 ÷ 400 MHz.

b. Frequency tuning steps: 25 kHz.

c. Tuning time (max): 7.5 ms.

d. Frequency stability (max):

i. ± 0.0005% of the selected fc after 5 minutes warm up period.

ii. ± 5 parts in 106 for any period of 6 months after a warm up period of 30 minutes under any combination of specified service conditions.

e. Modes of operation:

i. FM (F3E class of emission) inclusive of Link 11 data as per STANAG 5511.

ii. AM (A3E, classes of emission7).

f. IF selectivity: 6 dB bandwidth of at least 50 kHz (with a peak-to-peak ripple over 90 % of the bandwidth not exceeding 3 dB) and 60 dB bandwidth of maximum 200 kHz.

g. Audio inputs8: nominal 0 ± 3 dBm and 10.3 dB PEP/avg on balanced ungrounded lines with 600 ohm terminations.

h. Audio outputs: nominal 0 ± 3 dBm (adjustable) and 10.3 dB PEP/avg on balanced ungrounded lines with 600 ohm terminations.

i. PTT/Mute input.

j. Phase jitter (max): 2.5 degrees (rms value) and the probability of a shift greater than 30 degrees shall be 0.01 % when measured at the signal output terminals of the transmitter or receiver9.

k. Time delay (max): 3.5 ms (for any single frequency over the range 500 ÷ 3.050 Hz) (design objective 2.5 ms).

l. Group (or differential) delay (max): 500 µs (within the frequency range 815 ÷ 3.050 Hz).

m. BITE: embedded.

n. Programmed channels: 99.

o. Remote control: frequency, mode, power level, BITE.

p. Remote control interfaces: EIA RS 232 (or, equivalently, 422 or 485) and/or 10Base-T IEEE 802.3 (Ethernet).

q. Power supply: 230 Vac ± 10 % single phase @ 45 ÷ 65 Hz.

r. Power consumption (max): 700 W.

s. Rack mountable with size (max): 19”

The size and weight shall be compliant to the Human Engineering Standard MIL-STD-1472G.

t. Weight (max): 35 kg - See above.

u. Operating temperature: 0 ÷ +40 °C.

v. Relative humidity: 90% at +40 °C without condensation.

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[7] Respectively: double-sideband, single-sideband reduced (or variable) level carrier, single-sideband full carrier and single-sideband suppressed carrier for single channel analogue telephony

[8] Inclusive of keyline simplex method.

[9] Measurements shall be performed over a sufficient number of adjacent frame pairs to establish the specified probability with a confidence of 95%; measured values shall be the average phase in an averaging time of 9.09 ms and 18.18 ms for frame lengths of 13.3 ms and 22 ms, respectively.

w. Transmitter section.

x. RF output power: nominal 100 W PEP and 25 W carrier at m = 100% into a 50 ohm impedance unbalanced to ground and with VSWR not exceeding 3:1 over the defined frequency range.

y. Power steps: 1/1, 1/2 and 1/4 of maximum output power. Other values of power steps are acceptable as long as they will be within 25% range from the required ones.

z. Duty cycle: 100% under all applicable service conditions.

aa. Attack-time delay (max): 7 ms (within ±1 dB of its steady state output from the receipt of a keying signal).

bb. Sidetone: to be provided at the UHF receiver audio output.

cc. Frequency modulation deviation: ±20 kHz when produced by a +10 dBm signal at the audio input.

dd. Frequency response (max): 2 dB between 450 ÷ 3.050 Hz and 3 dB at 300 Hz.

ee. Harmonic attenuation: 70 dBc.

ff. Spurious attenuation: 70 dBc at fc ±10 MHz.

gg. In-band IMD: 35 dB below a two-tone test level (935 and 1.045 Hz) for a frequency deviation of ±20 kHz (measurements to be performed on the demodulated transmitter output).

hh. In-band noise: the audio output detected in a nominal 50 Hz audio bandwidth by a test receiver shall be at least 50 dB below the audio output detected when a carrier at the same RF power level deviated ±20 kHz at a 1 kHz rate is applied to the test receiver RF input (with the transmitter at full rated RF power output and with the audio input terminated with a 600-ohm resistor).

3.5.2 Receiver section:

a. RF input: 50 ohm impedance unbalanced to ground.

b. Audio frequency response (max at the receiver output and relative to the peak response between 450 ÷ 3.050 Hz): 2 dB between 450 ÷ 3.050 Hz and 3 dB at 300 Hz for a reference RF input signal level of -73 dBm with peak deviation of 20 kHz applied to the receiver input terminals.

c. Frequency modulation deviation: an input of ±20 kHz deviation and -67 dBm shall produce a signal output of +10 dBm.

d. Input signal protection:

e. The receiver shall not be damaged by the continuous application of a +35 dBm RF signal

f. The receiver shall be protected when the transmitter is at full power and the electrical isolation between the transmitter and receiver antenna terminals

is as low as 26 dB; the protection circuit shall activate within 150 ms time interval used by the transmitter to go from the carrier “on” to the carrier “off” condition; provision shall be made to override the protection circuitry to the extent required to monitor the transmitter at full power; the override feature shall provide the required receiver output when the electrical isolation between the transmitter antenna terminal and receiver antenna terminals is in the range 26 dB to 36 dB.

g. Image frequency rejection: 80 dB.

h. IF rejection: 80 dB.

i. Spurious frequency rejection: 80 dB.

j. In-band IMD: 30 dB below a two-tone test level (935 and 1.045 Hz) for a frequency deviation of ±20 kHz.

3.5.3 UHF pre-post selector filter.

3.5.4 Tunable RF filter to improve the selectivity performances of the UHF Link 11 transceiver assembly. The component shall be mounted within the same rack of the UHF transceiver. Minimum requirements:

a. Control from the associated UHF transceiver

b. Frequency range: 225 – 400 MHz

c. RF power rating: 100 W FM modulation

d. Selectivity: 50 dB bandwidth: ±8 MHz

e. Input/output impedance: 50 ohm unbalanced

f. Insertion loss: 2 dB max

3.6 Audio/Data Matrix

3.6.1 The Audio/Data Matrix is a switching equipment to commute audio, data (including sidetone) and keyline signals between local consoles, remote consoles, communication equipment and radio transceivers to be provided for all the involved sites.

3.6.2 Audio/Data Switch Matrix to be integrated by the Contractor shall meet the following requirements:

3.6.3 Switching the system from Link 11 to Link 11 HF and UHF, audio and key lines

3.6.4 Switching the system from Link 22 to Link 22 HF and UHF, audio and key lines

3.6.5 Connecting the audio and control signals, VOICE, Link 11 DATA and Link 22 DATA, to the radio equipment HF and/or UHF for all operational modes of SSSB Voice, Link 11 and Link 22.

3.6.6 Extra lines for expansion of two additional services and two additional equipment’s:

a. Technology: solid state switching, non-blocking

b. Audio inputs/outputs: 600 ohm balanced

c. Management of input/output PTTs/Mutes/Keylines

d. Audio channels isolation: Providing a maximum decoupling/isolation between signal lines for the Link 22 MSN 1-18 and MWF modulations (MSN), to avoid Crosstalk.

e. The matrix (including the setting of all nodes) shall be reprogrammable/configurable successfully via the remote control interface in less than 5s.

f. Rack mountable: 19”

g. Matrix capacity two times the minimum needed

3.6.7 The Audio/Data Matrix shall be integrated with the “Matrix Bypass” patch panels meeting the following minimum requirements:

a. Passive unit

i. Individual monitor of all the input and output matrix ports

ii. Monitoring shall be possible during normal usage and during patching (must be possible at any time)

3.6.8 Individual manual bypass of all matrix ports with disconnection of service and/or equipment from the matrix:

a. Every patch connector named according provided service

b. Provided with a sufficient number of bypass patch cables

3.6.9 The Audio/Data Matrix shall be integrated with the “Audio Monitor” Unit, with the following minimum capabilities:

a. Audio monitor channel 1 for VOICE

b. Audio monitor channel 2 for Link DATA

c. The Audio Monitor Unit (AMU) shall be operated in auto mode when the two channels are connected to the Audio/Data Matrix. The AMU shall be operated in Manual mode using the patch cables from the audio monitor channel port at the patch panel to the patch panel port of the signal to be monitored.

3.6.10 Analog and Discrete signals:

a. Analog Signals Narrow Band (NB)

i. 600 Ohm, 0 +/- 3 dBm for Link 11 and +9 dBm for Link 22, 300 to 3400 Hz

b. Analog Signals Wide Band – NRZ

i. 600 Ohm, +/- 4V TX and +/- 5V RX for Link 22, 16 to 24 kHz

c. PTT/KEYLINE Open Collector

i. Transmit: 0 +/- 0.25V DC (sink 10mA)

ii. Receive: Open

d. PTT/KEYLINE +6V
   i. Transmit: +6.0 + 1.0, -0.25 V DC (source 2mA)
   ii. Receive: 0.0 + 0.75, -0.25 V DC (sink 10mA)

e. PPT/KEYLINE V.28
   i. Transmit: positive voltage max +12V
   ii. Reception: negative voltage max -12V
   iii. NOTE: PTT / Keyline - It should be possible to configure any type of input with any type of output
   iv. Remote control interfaces Serial RS-232 unbalanced / RS-422 balanced and optional 10Base-T IEEE 802.3 (Ethernet).
      a) Serial: From 4800 to 11520 b/s

f. Discrete Signals – Used in Secure Voice UHF Wide Band (WB)

g. PT/CT
   i. Vmin -0.3 V
   ii. Vmax +31V,
   iii. Output: Open drain to +28V
   iv. Imax 5mA
   v. Rj ~1kOhm

h. CGC
   i. Vmin -0.3V
   ii. Vmax +5.5V
   iii. Internal pullup (10 kOhm) to +5V
   iv. Input: Schmitt-trigger
   v. Vt- 0.9..1.8V
   vi. Uh >0.25V

i. DPPT
   i. Vmin -0.3 V
   ii. Vmax +31V (7V)
   iii. Output: Open drain with internal pull-up (47 kOhm) to +28V
   iv. Imax 25mA
   v. Rj ~230 Ohm
   vi. DPPT: contact to GND short circuit proof up to 7V

j. BB/~DP

i. Vmin -32 V

ii. Vmax +0.3V

iii. Output: Open drain

iv. Imax 3.5mA

v. Rj > 2.5 kOhm

vi. Base-Band/Diphase
Contact (open drain) to GND; Open (>100kOhm) when unit is not powered. Controls the base-band/diphase operation.

a) NOTE: Discrete Signals – Minimal input/output delay, as it can affect the correct functioning of the ciphering.

k. Gain: 0 ±0,5 dB

l. Frequency response (max): NB: ±2 dB between 20 and 3.400 Hz

m. Frequency response (max): WB: ±2 dB between 20 and 26/48 kHz

n. Switching time (max): 10 ms

o. Local control: keyboard and LCD display

3.7 Rack HF Antenna Matrix

3.7.1 Coaxial switching systems intended to be used for the connection of every transmitter to each antenna at the Rozewie HF-TX/UHF site. The minimum requirements are:

a. Automatic/manual and 4 rows by 4 columns type with interlock protection and remote indication matrix status

b. Frequency range: 2 ÷ 29.9999 MHz

c. Input and output impedance: 50 ohm

d. Power rating: 10 kW PEP and mean

e. Insertion loss (max): 0.1 dB

f. VSWR (max): 1.1:1 (into 50 ohm and in all the specified frequency range)

g. RF channels isolation: 70 dB (over the specified frequency range)

h. Remote control interfaces: EIA RS 232 (or, equivalently, 422 or 485) and/or 10Base-T IEEE 802.3 (Ethernet)

i. Power supply: 230 Vac ± 10% single phase @ 45 ÷ 65 Hz

j. Power consumption (max): 3 kW

k. Size (max): 1.000 mm x 1.000 mm x 42 U (W x D x H)

l. Weight (max): 500 kg (including HF dummy load)

m. Operating temperature: 0 ÷ +40 °C

n. Relative humidity: 90% at +40 °C without condensation

3.8 Dummy Load

3.8.1 The minimum requirements are:

a. HF dummy load capable of continuous power dissipation of 5 kW compliant with the following minimum requirements:

b. Frequency range: 2 ÷ 29.9999 MHz

c. Direct connection into 50 ohm coaxial line

d. Power dissipation capability: continuous 5 kW

e. VSWR (max): 1.1:1

f. Optional remote control interfaces: EIA RS 232 (or, equivalently, 422 or 485) and/or 10Base-T IEEE 802.3 (Ethernet)

g. Power supply: 230 Vac ± 10 % single phase @ 45 ÷ 65 Hz

h. Power consumption (max): 2 kW

i. Operating temperature: 0 ÷ +40 °C

j. Relative humidity: 90% at +40 °C without condensation

k. Cooling system: forced air

l. Interlock protection

3.9 HF Transmitter Antenna

3.9.1 The design, production and installation of the antenna masts shall comply with the following standards:

a. EN ISO 1461 – Hot dip galvanized coatings on fabricated iron and steel articles;

b. EN 10204 Metallic materials. Types of inspection documents;

c. EN 10025 – Hot rolled products of structural steels. General technical delivery conditions;

d. EN ISO 14 713 (Part 1, 2 and 3) – Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron and steel in structures;

e. EN 10210-1 – Hot finished structural hollow sections of non-alloy and fine grain steels;

f. ISO 898 (part 1, 2 and 5) – Mechanical properties of fasteners made of carbon steel and alloy steel;

g. ISO 5817 – Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections;

h. ISO 6520-1 – Welding and allied processes - Classification of geometric imperfections in metallic materials - Part 1: Fusion welding.

3.9.2 The expected lifetime of the antenna mast shall be at least 15 years without the need for substantial maintenance.

3.9.3 Antenna requirements:

a. Due to possible future expansions and limited space at the TX site, a combination of Monocone and Multi-feed antennas with similar performance characteristics should be considered.

   HF antenna with vertical polarization, omnidirectional azimuth radiation pattern and high efficiency and high gain at low take-off angle in order to sustain ground wave propagation over all the interested spectrum compliant with the following minimum requirements:

b. Type: monocone (inverted cone)

c. Frequency range: 2 ÷ 30 MHz

d. Polarization: vertical

e. Input impedance: 50 ohm

f. Azimuth plane pattern: omnidirectional (within ± 1 dB)

g. Elevation plane pattern: high gain at low take-off angles (nominal 5 dBi @ 2 MHz)

h. VSWR (max):

i. 2,0:1 into 50 ohm and in all the specified frequency range (transmitting)

j. 2,0:1 into 50 ohm and, at least, in the frequency range 2 ÷ 30 MHz (receiving)

k. Power handling capability (transmission): Based on the HF transmitter power

l. Dimensions (max):
   The maximum dimensions of the HF Antenna shall be based on the limited ground available at the TX site, taking into account that in the future an additional antenna for Link 22 (skywave) might be placed at this location.

m. Diameter (maximum dimensions, guy to guy with ground screen included):

   i. 80 m (transmitting), see also paragraph 3.9.3 (l)

   ii. 80 m (receiving)

n. Height: maximum height in line with THN regulations

o. The antenna sub-systems mounted on the antenna masts, as well as the antenna masts themselves shall be capable of withstanding following environmental conditions without suffering degradation of system performance (gain, pattern type, sensitivity) and without suffering permanent mechanical damages:

   i. Local weather conditions pertaining temperature, snow load and ice

accumulation (glaze ice – 0.9 g/cm³), as per STANAG 4370. The region is defined as conditions A3 Intermediate and C0 Mild Cold (according to STANAG 4370) for the purpose of this Contract;

ii. High Temperature: Norm: + 65° C for operation;

iii. Low Temperature: Norm: - 50° C for operation;

iv. Minimum 44 - 61 m/s ±10% wind at RRH Benbecula

v. Minimum 44 - 61 m/s ±10% wind at RRH Saxa Vord

vi. Minimum 44 - 61 m/s ±10% wind AT RRH Portreath

vii. It will be the Contractors responsibility to retrieve local wind speed data, including exceptional wind speed data, for each local COMMS site from the THN authorities and plan and install appropriate antennas accordingly to meet the local climatic conditions.

viii. Hailstones of up to 25 mm diameter, 0.9 g/cm3 density and 58 m/s terminal velocity;

ix. Sand and dust concentrations up to 1 g/m³, with particle size down to 20 µm at an air speed up to 20 m/s;

x. The fundamental resonance frequency of the mast with equipment shall be greater than 3 Hz;

xi. The design of the antenna masts shall take into account seismic conditions of HN.

p. The antenna shall be provided with grounding/earthing and air obstacle light kits; each light kit shall include a double toroid transformer to be connected to light power supply at the base of the related antenna; the installations of air obstacle lights shall be implemented in accordance to ICAO Annex 14, Volume 1, Chapter 6, “Visual aids for denoting obstacles”, latest edition. The antenna and the support structure shall be treated so as to withstand installation in proximity of the sea.

q. Further details on mast specifications and requirements can be found in the Section 25 of SRS (CW) Annex C.

3.10 UHF Antenna

3.10.1 Collinear UHF antenna with two dipoles with omnidirectional azimuth radiation pattern compliant with the following minimum requirements:

a. Type: 2-channel collinear dipoles antenna

b. Frequency range: 225 ÷ 400 MHz

c. Polarization: vertical

d. Omnidirectional azimuth radiation pattern

e. Input impedance: 50 ohm

f. Directivity gain: nominal 2 dBi

g. VSWR (max): 2.5:1 (into 50 ohm and in all the specified frequency range)

h. Isolation between channels: 25 dB

i. Power capability: 400 W

j. Dimensions (max):

k. Diameter: 0.35 m

l. Height: 3 m

m. Weight (max): 35 kg

n. Environmental operation:

   i. Minimum 44 - 61 m/s ±10% wind in Benbecula

   ii. Minimum 44 - 61 m/s ±10% wind in Saxa Vord

   iii. Minimum 44 - 61 m/s ±10% wind in Portreath

   iv. It will be the Contractors responsibility to retrieve local wind speed data, including exceptional wind speed data, for each local COMMS site from the THN authorities and plan and install appropriate antennas accordingly to meet the local climatic conditions.

o. Omnidirectional

3.11 Receiver HF/SSB

3.11.1 Rack mountable HF receiver compliant to Link 11, Link 22 and SSSB Voice standards compliant to the following minimum requirements:

a. Frequency range: 2 ÷ 29.9999 MHz

b. Frequency tuning steps: 10 Hz

c. Tuning time (max): 10 s 10

d. Frequency stability (max):

e. ± 1 part in 107 after 30 minute warm up period

f. ± 1 part in 108 for any period of 24 hours after a warm up period of 4 hours under any combination of specified service conditions

g. RF input: 50 ohm impedance unbalanced to ground with an input VSWR not exceeding 2,5:1 over the operating frequency range

h. Modes of operation:

   i. AM including USB, LSB and ISB in compliance with STANAG 5511 and STANAG 5522

   ii. CW

[10] When the radio is operated with an external automatic antenna multi-coupler, the coupler tuning time should not exceed 60 s.

i. Audio outputs: 0 ± 3 dBm (adjustable) and 10,3 dB PEP/avg on balanced ungrounded lines with 600 ohm terminations

j. Mute input

k. Time delay (max): 3.5 ms (for any single frequency over the range 500 ÷ 3.050 Hz) (design objective 2.5 ms).

l. Group (or differential) delay (max): 500 μs (within the frequency range 815 ÷ 3.050 Hz)

m. Audio frequency response (max): 2 dB passband 450 ÷ 3.050 Hz at the receiver output; response down by 2.5 dB between 415 and 450 Hz; response down by 3 dB at 300 Hz; response down by 60 dB at -400 and 4400 Hz; gain for each sideband adjustable to within 1/2 dB of nominal output

n. Phase jitter (max stability): 2.5 degrees (rms value) and the probability of a shift greater than 30 degrees shall be 0.01 % when measured at the signal output terminals11

o. Sensitivity: -110 dBm producing a S+N/N of 10 dB (in both USB and LSB over the specified frequency range)

p. De-sensitisation dynamic range: with the receiver in a SSB mode of operation (with the passband setting providing a nominal 3 kHz bandwidth) and tuning centered on a sinusoidal input test signal which level is adjusted to produce an output SINAD of 10 dB, a single interfering sinusoidal signal equal to or less than 90 dB above the test signal level and offset from this latter by fc ±5 % shall not degrade the output SINAD by more than 1 dB.

q. Linearity: with the receiver operating at maximum sensitivity and with a reference input signal that produces an output SINAD of 10 dB, the output SINAD shall increase monotonically and linearly within +1.5 dB for a linear increase in input signal level until the output SINAD is equal to 30 dB; when saturation occurs, the output SINAD may vary +3 dB for additional increase in signal level.

r. Input signal protection: the receiver (with primary power on or off) shall not be damaged by the application of any input RF signal up to +53 dBm (open circuit peak value) applied to the receiver input terminals for a duration of 1 minute.

s. Internally generated spurious outputs (max): -112 dBm for 99 % of the available 3 kHz channel; -100 dBm for 0.8 % of the available 3 kHz channel; for 0.2 % of the available 3 kHz channel, spurious signals may exceed these levels.

[11] Measurements shall be performed over a sufficient number of adjacent frame pairs to establish the specified probability with a confidence of 95%; measured values shall be the average phase in an averaging time of 9,09 ms and 18.18 ms for frame lengths of 13,3 ms and 22 ms, respectively.

t. Image frequency rejection: 70 dB

u. IF rejection: 70 dB

v. Other signals spurious: 55 dB for frequencies from fc ±2.5 % to fc ±30 % and 70 dB for frequencies beyond fc ±30 %.

w. Audio frequency Total Harmonic Distortion (THD): with the receiver at rated output level, 35 dB below a reference tone level that is a RF test signal (producing a frequency within 300 ÷ 3050 Hz) 35 dB above the receiver noise threshold.

x. In-band IMD: with reference to two input signals of -53 dBm each spaced 110 Hz apart at frequencies selected to produce audio outputs in the 450 ÷ 3050 Hz range, 35 dB below the output level of either audio tone.

y. Out-of-band IMD: for a two-tone equal-amplitude input signals with each tone at -36 dBm or greater (with the closest signal spaced 30 kHz from the operating frequency), second order (and higher-order) responses shall produce an output SINAD equivalent to a single 110 dBm tone.

z. Automatic Gain Control (AGC):

i. Attack time delay (max): 12 ms (from no signal to a two-tone +19 dBm signal).

ii. Decay (or release delay) time (max): 20 ms (from a 16 tone +19 dBm signal to a two-tone -81 dBm signal, in the data mode).

iii. Recycle period: capability of repeating the above operations every 100 ms (with a period between data signals higher than 10 ms).

iv. Dynamic range: the AGC shall maintain the receiver output level at 0 ± 3 dBm when the input signal level is in the range -87 ÷ +13 dBm.

aa. BITE: embedded

bb. Local and remote (BITE) controls

cc. Remote control interfaces: EIA RS 232 (or, equivalently, 422 or 485) and/or 10Base-T IEEE 802.3 (Ethernet)

dd. Power supply: 230 Vac ± 10 % single phase @ 45 ÷ 65 Hz

ee. Power consumption (max): 350 W

ff. Rack mountable with size (max): 19”

The size and weight shall be compliant to the Human Engineering Standard MIL-STD-1472G.

gg. Weight (max): 20 Kg - See above.

hh. Operating temperature: 0 ÷ +40 °C

ii. Relative humidity: 90 % at +40 °C without condensation

jj. Time delay (max): 3.5 ms (for any single frequency over the range 500 ÷

3.050 Hz) (design objective 2.5 ms).

3.12 HF-RX Pre-Selector

3.12.1 Rack mountable HF-RX pre-selector to allow the use of the receiver with strong input signals (improved receiver input selectivity). Each pre-selector shall meet the following minimum requirements:

a. Automatic/manual and fast tuning type (less than 10 ms) with RF input signal protection

b. Frequency range: 2 ÷ 29.9999 MHz

c. Selectivity: 3 dB at 2% off the operating frequency and 50 dB at fc ±10 %

d. Gain: 0 ±3 dB

e. Noise Figure (max): 20 dB

f. IMD: 35 dB

g. Power supply: 230 Vac ± 10 % single phase @ 45 ÷ 65 Hz

h. Power consumption (max): 100 W

kk. Rack mountable with size (max): 19”

The size and weight shall be compliant to the Human Engineering Standard MIL-STD-1472G.

i. Weight (max): 20 Kg - See above.

j. Operating temperature: 0 ÷ +40 °C

k. Relative humidity: 90 % at +40 °C without condensation

l. Intermodulation distortion: better than 35 dB

3.13 HF-RX Multi-coupler

3.13.1 Rack mountable HF-RX multi-coupler in order to allow the use of one HF antenna with two (2) HF receivers. The following minimum characteristics for multi-coupler shall be met:

a. Low noise and high linearity, operative also in presence of strong signals minimizing distortion and intermodulation

b. Frequency range: 2 ÷ 29.9999 MHz

c. Input pass band filter: 2 ÷ 29.9999 MHz, high rejection of out-of-band signals

d. Input and output impedance: 50 ohm

e. Number of inputs (antenna): The input/output of the Multi Couplers shall be in relation to the number of radios and antennas, as listed in the respective THNs figures (block diagrams). The contractor shall calculate the correct number of Multi Coupler I/O lines.

f. Number of outputs (receivers): See above.

g. VSWR input/output (max): 1.5: 1

h. Isolation between RF outputs: 30 dB

ll. Rack mountable with size (max): 19”

The size and weight shall be compliant to the Human Engineering Standard MIL-STD-1472G.

i. Weight (max): 70 kg - See above.

j. Operating temperature: 0 ÷ +40 °C

k. Relative humidity: 90 % at +40 °C without condensation

3.14 HF Receiver Antenna

The physical and environmental requirements of this antenna and supporting structure are the same as for the HF Transmitter antenna specified in section 3.9.

3.15 RF Cabling

3.15.1 Different type of coaxial cabling to be provided for all the involved sites with the aim to connect transceivers and antennas to be compliant to the following minimum requirements:

a. Standard RG-213/U coaxial cable attenuation (max):

i. 10 dB/100m @ 225 MHz;

ii. 15 dB/100m @ 400 MHz

b. Standard 7/8” coaxial cable attenuation (max):

i. 0.2 dB/100m @ 2÷4 MHz

ii. 0.3 dB/100m @ 6 MHz

iii. 0.4 dB/100m @ 10 MHz

iv. 0.7 dB/100m @ 30 MHz

v. 1.8 dB/100m @ 225 MHz

vi. 2.5 dB/100m @ 400 MHz

c. Standard 1-5/8” coaxial cabling attenuation (max):

i. 0.1 dB/100m @ 2÷4 MHz

ii. 0.2 dB/100m @ 6 MHz

iii. 0.3 dB/100m @ 10 MHz

iv. 0.4 dB/100m @ 30 MHz

3.15.2 The RF cabling shall be equipped with the proper connectors and cannot be directly connected to the transmitters; they shall pass from a suitable panel to be provided and installed at the entrance of the barrack/building; this latter panel shall be provided and equipped with suitable surge dischargers.

3.16 19” Standard Rack Cabinets

3.16.1 19” standard rack cabinets, having the dimensions indicated in this document, in the drawings and, in any case, able to support the installation of the envisaged devices:

a. Ground connection kit for each frame part

b. Two supply ribbons for the active parts, cabled on the back post, composed by at least 12 VDE (C15) type sockets

c. Suitable number of covering blank panels

d. A proportionate magneto-thermal differential breaker and a warning light

e. Front service socket set

f. Proportionate cooling set for equipment heat removal in the worst case

g. Ventilation slits to allow for forced cooling

h. Service drawer, minimum 2U height, placed to be easily accessible by a standing person. One every three racks.

i. Suitable protections against dust for the cables inputs and ventilation slits

j. External label in order to identify the rack in accordance with ANSI/TIA/EIA–606 o ISO/IEC 14763-1 Standards. The label shall be placed either on the front or on the rear of the rack

k. External not removable label in metallic material, reporting the following data:

i. Inventory number and contract date (contract nr. Contract number of mm.dd.yyyy Inventory)

ii. Purchaser

iii. Contractor (contracting Company name)

iv. Use destination

3.16.2 The rack/frame protection level shall be at least IP 20 and the supply shall include the supports and those elements required to install cable bundling and blocking.

3.16.3 The rack shall be compliant to IEC 60297 or THN standard and shall be suitable for structured cablings having TIA/EIA 568-C or THN standards or similar. The rack shall be able to contain a 19” Units number equal to how much indicated in the design and in the related estimate. The frame shall allow a correct installation and cablings management (e.g., the cables shall be installed in the observance of minimum bend radius).

3.16.4 The power will be based on the UK three pin power socket format as opposed to the majority of the devices which will be standard European socket format. Therefore the Contractor shall surplus rack power sockets that shall be of European standard sockets format with an additional two (2) UK standard

socket formats per rack.

3.17 Multiplexer

3.17.1 The Multiplexer shall transport Audio signals/services and discrete signals between the HF TX sites and the HF RX site. The selection of Multiplexers shall be performed in close coordination with the purchaser and the THN. The final decision on the selected multiplexer type is with the purchaser.

3.18 Network/Router/Switches

3.18.1 Every SSSB COMMS site will constitute a local area network within the boundaries of the SSSB COMMS system.
A COMMS site is connected to the Buffer Centre via the THN National Defense Network (NDN) with the SSSB Buffer Centre.
Between the Buffer Centre and other NATO units, data (SSSB Data, JCHAT, Tactical Data, etc.) will be exchanged via the NATO NGCS network.

3.18.2 The selection of Routers shall be performed in close coordination with the purchaser and the THN. The final decision on the selected Router type is with the THN.

3.18.3 For Network connections between the COMMS racks and to the router, F/O is preferred.

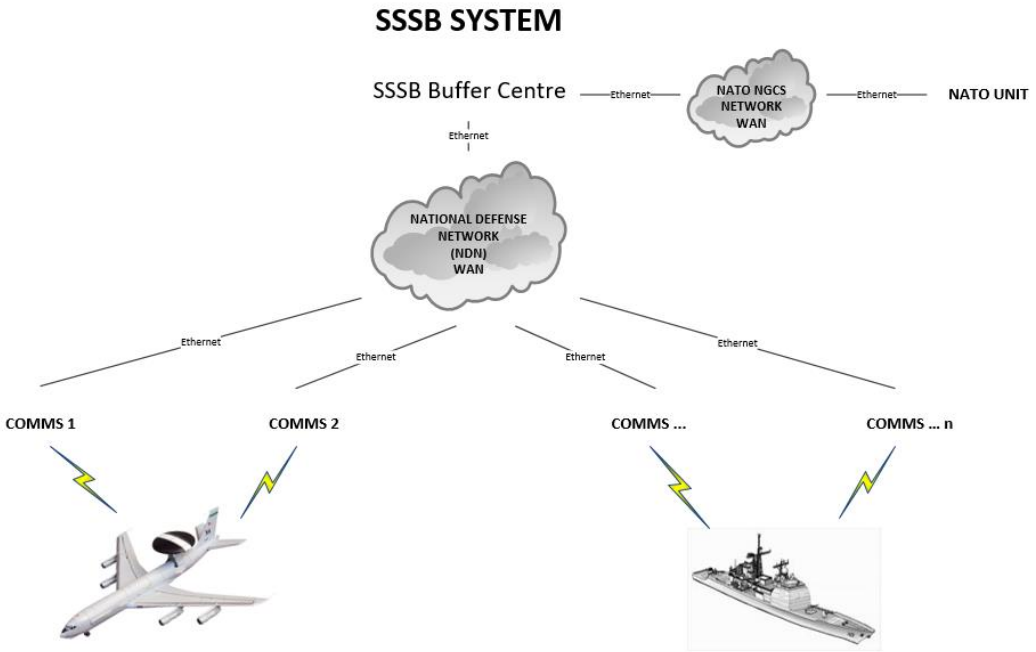

Figure 19: SSSB Network Overview

3.19 Time of Day Server (TOD)

3.19.1 A Military Grade Time of Day (TOD) HQ/SATURN GPS server with Selective Availability Anti-spoofing Module (SAASM) shall be used as time reference.

3.19.2 Time Reference for SPC, Frequency Synchronisation for UHF radios and Time Reference for applicable equipment.

3.19.3 The TOD shall fulfil the following requirements:

a. DTS Conforming standards:
   i. STANAG 4430 NRS IDD
   ii. MIL Grade GPS SAASM
b. SPC supports the following control Interface:
   i. Serial RS-232 unbalanced (and/or) 10Base-T IEEE 802.3 (Ethernet).
c. GPS Antenna included
d. Have Quick (HQ) Time Code output
e. Low Phase Noise Sine Wave Output 10MHz
f. Provides NTP, PTP
g. Supports the number of devices to be connected.

3.20 Link 22 Signal Processing Controller (SPC)

3.20.1 The purpose of the SPC is to provide the modem functions and control of the Link 22 network in radio communication HF-UHF.

3.20.2 SPC Conforming standards:

a. NILE Interface Requirements Specification and NILE Communication Media Segment Specification
   i. NG 278-A018-LLCIRS/B4
   ii. NG 278-A018-SPCSS/B4
   iii. NG 278-A018-SPCSS/B4, Appendix A, HF FF Media
   iv. NG 278-A018-SPCSS/B4, Appendix B, UHF FF Media
   v. NG 278-A018-SPCSS/B4, Appendix D, UHF FF Media
b. STANAG 4205
c. STANAG 4372
d. STANAG 4539 Annex D

3.20.3 The SPC is intended to support the following configurations:

a. LOCAL
b. SPC Serial Splitter (SSS)
c. Standard, Long Range, High Throughput Link 22 Waveforms and

Maintenance Waveform are implemented in the SPC (MSN 1-18, MFW).

3.20.4 SPC supports the following control Interface:

a. Serial RS-232 unbalanced (and/or) 10Base-T IEEE 802.3 (Ethernet).

3.21 Link 11 Data Terminal Set (DTS)

[A] The purpose of the DTS is to provide the modem functions and control of the TADIL-A/Link 11 network in radio communication HF-UHF-SATLINK.

3.21.2 Link-11 modem is defined in MIL-STD-188-203A - Interoperability and Performance Standards for Tactical Digital Information Link (TADIL) A.

3.21.3 The Modem shall fulfil the following requirements:

a. DTS Conforming standards:

i. MIL-STD-188-203A,

ii. SPAWAR-S-850,

iii. MIL-STD-1397,

iv. STANAG 5511,

v. EIA RS-232-C

b. Single Tone (SLEW) and Multi Tone (CLEW) Link 11 Waveforms are implemented in the DTS

c. DTS supports the following Input/Output data interface:

i. Naval Tactical Data System (NTDS).

d. DTS supports the following control Interface:

i. Serial RS-232 unbalanced (and/or) 10Base-T IEEE 802.3 (Ethernet).