

## 1 PURPOSE

1.0.0.1 This Performance Work Statement (PWS) establishes the requirements for the services that the Contractor is to provide to PMW 150 NATO Improved Link Eleven (NILE) Project Management Office (PMO). Specifically, the NILE PMO requires the provision of the services indicated hereafter in order to achieve one of the objectives of the In-Service Support phase of the NILE Project.

## 2 OBJECTIVES

2.0.0.1 New Waveforms (WFs) for the HF FF medium, with higher data capacity and extended range, have been already designed and were proposed by some NILE Nations for implementation in the Link 22 system. The NILE PMO needs to obtain and pursue a solution for the implementation of these new WFs in the *release* (operational) version of the SNC in the best way that minimizes the impact on the existing Link 22 architecture. The solution has to take into account the NILE Nations needs in particular SNC complex protocols like LNE and probing, and Link 22 subsystems interfaces constraints.

A preliminary analysis of new WF's implementation has already been carried out and the outcome of this activity can be found in WP #31. Furthermore a parametric approach for enabling the use of new WFs in the NRS and in the *debug* version of the SNC was accomplished for BC6 through a former Contract and indentified under the title “Media Parameterization”. To achieve the objectives of this PWS, the Contractor may consider the option of re-using code from the “Media Parameterization” task. Description of how this task impacted on the system is reported in the Appendix O to the NRS STM.

## 3 TECHNICAL DIRECTION AND REQUIREMENTS

3.0.0.1 Within the scope of the overarching Contract PWS, and under CLINs 2001/2002, the Contractor **shall** fulfill the requirements of this TDL PWS, detailed as follows. Specifically, in accordance to the task description detailed in PWS Appendix C for Item #11, the Contractor **shall** provide:

- (a) A White Paper (WP), as part of CDRL A006, which provides a detailed analysis of options for the implementation of new WFs within the NILE products. The WP **shall** discuss:
  - (i) Implementation of new WFs in addition to the existing WFs (MSN 1-6).
  - (ii) Implementation of new WFs replacing the existing WFs (MSN 1-6).
  - (iii) A recommended approach based upon a trade-off assessment regarding impacts on the overall Link 22 system and MLST3, and cost effectiveness of implementation.
- (b) The Upgrade of the SNC SW code and a detailed documentation of the actual SW implementation.
- (c) Support to SPCs conformance and interoperability testing for the new HF FF WFs implemented.

3.0.0.2 The Contractor, throughout all the Period of Performance (PoP), **shall** provide following Project Management Services in support of all the tasks introduced in Section 3.0.0.1 and detailed in following Sections 3.1, 3.2 and 3.3:

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- (a) Configuration Management as described in the PWS section 5.1.3.11. Deliverables may include the following documentation (CDRL A006):
  - (i) Change Proposal (CP)
  - (ii) Proposed Change Request (PCR)
  - (iii) Feedback Report (FR).
- (b) Inputs to the Monthly Status Report (MSR) as described in the PWS paragraph 5.1.3.3. Delivery of Monthly Status Reports (CDRL A002) will be tasked under a separate TDL. Efforts under this task shall be limited to inclusion of status information for works specified in this document.
- (c) Quality assurance (QA) as described in the PWS section 5.1.3.13.
- (d) Project Security Management as described in the PWS section 5.1.3.10.

3.0.0.3 No other contractual CDRLs are due during the PoP of this TDL.

### 3.1 White Paper Analyzing Implementation Options

#### 3.1.1 Analysis of the implementation of new WFs in addition to existing WFs

- 3.1.1.1 The Contractor **shall** provide a detailed analysis of the problem and **shall** address the impact of the implementation of new MSNs (WFs) in addition to the existing MSNs on the SNC behavior and existing protocols.
  - (a) The Contractor **shall** analyze a solution that will allow an arbitrary number of WF to be added. The analysis **shall** consider if practical limits on the number of WF implemented exist and identify the factors which impose these limitations.
  - (b) The Contractor **shall** analyze a solution that will allow the number of WFs and their media parameters to be controlled by a Configuration File.
- 3.1.1.2 The Contractor **shall** identify and **shall** propose the necessary changes to the SNC-DLP interface.
- 3.1.1.3 The Contractor **shall** identify and **shall** propose the necessary changes to the interface between SNC and SPC.
- 3.1.1.4 The Contractor **shall** identify, if any, the system and operational planning procedures to be changed and **shall** propose the consequent amendments.
- 3.1.1.5 The Contractor **shall** identify if NILE (and related NATO) documentation requires update as a result of implementing this solution.
  - (a) The Contractor **shall** list affected documents and provide a brief estimate of the scope and scale of changes to each document.
  - (b) NILE documentation **shall** include all documents included within the NILE Block Cycle Releases such as, Guidebook, IRSSs, IDD, SDDs, SSs and STDs
  - (c) NATO documentation **shall** include:
    - (i) ADatP-33
    - (ii) EXTAC 779 and the Link 22 OLM
    - (iii) STANAG 5522
    - (iv) STANAG 5616

- (v) STANAG 5602.

### 3.1.2 Analysis of the implementation of new WFs by replacing existing WFs

- 3.1.2.1 The Contractor **shall** provide a detailed analysis of the problem and **shall** address the impact, on the existing protocols, of the implementation of new MSNs by replacing existing MSNs
  - (a) The Contractor **shall** analyze a solution that will allow the number of WFs and their media parameters to be controlled by a Configuration File.
- 3.1.2.2 The Contractor **shall** identify, if any, the system and operational planning procedures to be changed and **shall** propose the consequent amendments.
- 3.1.2.3 The Contractor **shall** identify and **shall** propose the necessary changes, if any, to the SNC-DLP interface.
- 3.1.2.4 The Contractor **shall** identify and **shall** propose the necessary changes, if any, to the interface between SNC and SPC.
- 3.1.2.5 The Contractor **shall** identify if NILE (and related NATO) documentation requires update as a result of implementing this solution.
  - (a) The Contractor **shall** list affected documents and provide a brief estimate of the scope and scale of changes to each document.
  - (b) NILE documentation **shall** include all documents included within the NILE Block Cycle Releases such as, Guidebook, IRSs, IDDs, SDDs, SSs and STDs
  - (c) NATO documentation **shall** include:
    - (i) ADatP-33
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    - (iii) STANAG 5522
    - (iv) STANAG 5616
    - (v) STANAG 5602.

### 3.1.3 Trade-off assessment

- 3.1.3.1 The Contractor **shall** produce a White Paper (WP) as part of CDRL A006 (see Section 3.0.0.1) that summarizes the outcome of the two analysis performed as per sections 3.1.1 and 3.1.2, and provides an overall trade-off assessment of the impacts of the two different implementations. This WP will include considerations in terms of backward compatibility and, more generally, overall cost-benefit of the two solutions on the entire Link 22 system in order to give the Government all the information necessary to make a meaningful and pondered decision.

## 3.2 Upgrade of the NILE SW Products and related detailed documentation

- 3.2.0.1 Following a Government decision on which solution is preferred, the Contractor **shall** implement the SW changes within a working baseline for the next BC8.
- 3.2.0.2 As necessary, the Contractor **shall** update NILE documentation affected by the implemented SW changes including the Link 22 Guidebook in accordance with the requirements as described in the PWS paragraph 5.1.3.11 (Configuration Management).

- 3.2.0.3 The Contractor **shall** integrate the System Test Description (STD) documents for the SNC and NRS incorporating tests for the new WFs capability.
- 3.2.0.4 The Contractor **shall** conduct Computer Software Unit Testing (CSU), Computer Software Configuration Item (CSCI) Integration Testing and System Integration Testing (dry-run) to ensure the Software modifications perform as expected. This **shall** include regression testing to ensure implementation of Software modifications do not adversely affect other functions for backward compatibility.

The official release and delivery of the updated Software and Documentation, as part of the next BC8, will be a requirement on a future TDL issued subsequent to this one. System Qualification Testing, anticipated by an official TRR, will be accordingly funded and the Contractor should not include any effort for this purpose.

### 3.3 SPC conformance and interoperability testing

- 3.3.0.1 In accordance with the requirements detailed in the PWS paragraph 5.1.2.1.2, the Contractor **shall** develop and deliver test plans/procedures (CDRL A003) with the purpose of assessing the single SPC conformance and also interoperability between the three different vendors SPCs.
- 3.3.0.2 The Contractor **shall** modify test scenarios or develop new ones to be used during the tests. At least one of them must include LNE testing.
- 3.3.0.3 Assuming the availability of updated SPCs, the Contractor, at its facility, **shall** execute three conformance tests, one for each vendor SPC, and provide written report (CDRL A003) after test completion.
- 3.3.0.4 The Contractor **shall** support interoperability tests executed at Government facilities and provide written report (CDRL A003) after tests.

## 4 OTHER CONSIDERATIONS

### 4.0 Travel and Material

Contractor travel or purchased material may be authorized by the Government under this contract in compliance with the requirements reported in the PWS paragraph 5.2. The Contractor **shall** assume the following travel requirements:

- (a) Up to 10 day trips to SPAWAR offices in San Diego for in-progress review meetings;
- (b) Up to 2 international trips to witness new WFs implementation trial or support SPCs testing by a NILE Nation laboratory. The Contractor **shall** assume:
  - (i) Attendance by a single person.
  - (ii) The duration of the Implementation trial or SPC testing **shall** not exceed 5 working days and will be completed within a single week.
  - (iii) The Implementation trial or SPC testing will be conducted within a European NILE nation’s laboratory.

## 5 ORGANIZATIONAL CONFLICT OF INTEREST (OCI)

The Contractor **shall** maintain proprietary data protection agreements with other companies to the extent that their proprietary data is made available to the Contractor.

## **6 PERIOD OF PERFORMANCE (PoP)**

Implementing new WFs must be a unanimous decision by the NILE Nations and is expected no earlier than FY 2015. Assuming the decision to proceed is made, performance of this TDL will begin during the PoP of CLINs 2001/2002. The duration of the PoP will be proposed by the offeror. Should the proposed PoP extend past CLINs 2001/2002, the remainder of the effort will be performed under CLINs 3001/3002 and a new, but consecutively running TDL issued.