First Flotilla
Blk 213 #03-11
Tanah Merah Coast Road
Singapore 498818

Tel: 6544 5170

DH928/6-4

16 May 2024

HD DO YAU MENG WEE JOSES
Digitally signed by YAU MENG WEE JOSES
DN: cn=YAU MENG WEE JOSES, ou=people, email=Joses_Yau@defence.gov.sg
Date: 2024.05.19 20:58:21 +08'00'

Thru

HD EDB TANG CHEE MENG
Digitally signed by TANG CHEE MENG
Date: 2024.05.19 18:55:32 +08'00'

APPROVAL OF REQUIREMENT SPECIFICATIONS FOR THE IMPLEMENTATION OF CREW MOBILE DIGITAL SERVICES LITE (CMDS-LITE) FOR FIRST FLOTILLA

References:
1. DC962-17/22 dated 4 Mar 2024, "CMDS-Lite for Frigate". Approved by HD OLG, NELD on 16 Mar 2023.

BACKGROUND

1. Quartermasters (QMs) handle a wide spectrum of important tasks from tracking attendance and whereabouts of personnel, contractors, and visitors to flying flags and making announcements to ensuring safety onboard ship, amongst others. Tracking of attendance for a crew of between 70 to 90 is a tedious task, and QMs are also responsible for keeping track of contractors and visitors as they come onboard for works throughout the day. If tracking of attendance for ship crew and visitors can be completely automated, this will free up cognitive workload for the QMs to focus on other tasks that cannot yet be automated (eg. flying of flags). A secure mobile digital platform known as the Crew Mobile Digital Services (CMDS) has previously been implemented on the RSN's Littoral Mission Vessels (LMVs).

AIM

2. This paper seeks HD DO's approval for the requirement specifications for the trial of the CMDS-Lite for two Frigates (FFSes).

SCOPE OF WORK AND CONTRACT VALUE

3. Scope. The scope will include the hardware, software and support required for the Proof of Concept (PoC) trial of the CMDS-Lite on two FFSes.

4. Contract Value. The estimated contract value of this trial will not exceed $124,000 (see the breakdown in Table 1).

Table 1: Cost Breakdown

S/N	Description	Estimated Cost
1	Hardware for 2 FFSes	$36,000
2	Software and Licenses for 2 FFSes	$10,000
3	IT man-effort and Professional Services	$78,000
	Total	$124,000

5. Contract Duration. Contractor has up to 3 months to complete development, supply, installation, after which trial duration is for 30 days. After the trial, the findings will be evaluated through a report within 1 month before relevant RSN stakeholders decide if there is value to expand this to other ships.

6. Option for Scale-Up. The Supplier shall provide an option for proliferation should the PoC be successful in the form of supply and commission of additional ship-sets of CMDS-Lite. The scale up was shaped on a per ship basis with assumption of similar scale. The option shall be valid for 1 year after submission and acceptance of trial report. Each ship's installation shall be completed within 3 months of PO. Maintenance on a per-ship basis shall also be quoted (starting after warranty expiry).

EVALUATION METHODOLOGY

7. Evaluation will be based on the Contractor's ability to comply with the technical requirements stated in the requirement specifications and price reasonableness in comparison with existing market rates and past purchase prices. Quality (including innovation components) is not considered as the evaluation criteria as the nature of these buys is such that the quality is not differentiable and price is the primary consideration.

RECOMMENDATION

8. It is recommended that HD DO approves the requirement specifications and evaluation methodology for the PoC trial of the CMDS-Lite on two FFSes.

NG TENG OOI

Digitally signed by NG TENG OOI
Date: 2024.05.19 14:13:36 +08'00'

ME4 Ng Teng Ooi
Senior Combat System Engineer, RSS Steadfast

Consulted : ME6 Tang Chee Meng, Hd EDB, WARCEN
ME5 Derrick Wong, SCSE, First Flotilla
ME4 Ang Kar Choon, Senior Engineer, WARCEN

Annexes:
A. Requirement Specifications

ANNEX A

REQUIREMENT SPECIFICATIONS FOR THE IMPLEMENTATION OF CREW MOBILE DIGITAL SERVICES LITE (CMDS-LITE) FOR FIRST FLOTILLA

GENERAL REQUIREMENT

1. Functional Requirements. The Supplier shall meet the following functional requirements for the implementation of CMDS-Lite for two FFSes.

a. Proof-of-Concept (PoC) of Logic-Based Gantry System. The PoC shall demonstrate the capability to determine the presence and the direction of movement of personnel through rule-based programming from RFID tag returns from several readers within FFS hangar. The system shall be able to accurately determine which direction the personnel is travelling towards through the computation of detection by respective readers placed at different exit points of the hangar.

b. PoC of Automated Safety Monitoring. The PoC shall demonstrate that when personnel enter the pre-determined out-of-bound compartment, the system notifies the Quartermaster (QM) via the Man-Machine-Interface (MMI) that personnel have entered the compartment[1].

c. Automated Attendance Tracking within Ship. The system shall be able to keep track of all ship crew entering or leaving ship and provide a MMI for ship's QM to monitor the real-time attendance onboard ship at any given time.

d. Digitised Attendance and Visitor Records. The system shall enable QMs to extract the attendance and visitor movement on and off ship over a 24-hour window. The system shall also provide data storage to keep up to 3 months of attendance and visitor records.

e. Other Operation Management Aids. User defined checklists, Duty Roster (including QM, HOTO, Occurrence, Rounds Logs, as well as QM details) and secure content repository shall be available and accessible.

TECHNICAL REQUIREMENTS FOR TRIAL OF CMDS-LITE

[1] Connectivity to this specific compartment if not within immediate vicinity, can be facilitated through power-line modems with RSN identifying a compartment on the same powerline circuit as the hangar

2. Technical Requirements. The Supplier shall meet the following technical requirements:

a. Hardware. The supplier shall supply all hardware required to meet the above functional requirements which includes but is not limited to (1) RFID sensors (and mounting brackets) and tags, (2) cables, (3) servers (in the form of desktop or laptops) for storage of attendance and visitor logs, (4) MMI for QMs to monitor and access data and (5) power-line modems.

b. Software. The Supplier shall supply the software required to run the program algorithm and also a User Interface (UI) for QM to access (1) real-time manpower movement, (2) Attendance and visitor records for up to 3 months and (3) notifications when personnel enters out-of-bound compartment.

3. Scope of PoC.

a. Demonstrate the ability to determine the presence of a personnel onboard ship through rule-based programming. The system shall be able to accurately determine which direction the personnel is travelling towards through the computation of detection by respective sensors placed at different exit points of the hangar.

b. The PoC shall be conducted onboard two Frigates (FFSes). All hardware/infrastructure/software preparation/services costs shall be borne by the potential supplier.

c. Duration. Active trial period of 30 days after which results to be tabulated and verified.

d. The supplier shall verify the accuracy of the presence tracking of personnel with the logic-based gantry system.

4. Security Requirements. The Supplier shall meet the following security requirements:

a. Connectivity. Standalone and “Air-gap” from Internet.

b. Security Clearance. Only personnel cleared by the Authority shall be permitted to come into contact with data.

c. Cyber Security. To abide by same cyber security posture as CMDS

DETAILS OF POST-TRIAL REPORT

5. Measures of Effectiveness for Trial Report. The measures of effectiveness are as follows:

a. PoC of Logic-Based Gantry System. The system shall be able to determine the accuracy of presence whether personnel:
   (1) Is within ship
   (2) have exited the hangar and left the ship or conducting works on the helideck.

b. PoC of Automated Safety Monitoring. The system shall measure accuracy on whether personnel have entered identified hazard area prior to safety measures being taken (i.e. RADHAZ/weapon training enforced and pipe made). Secondly, system shall flag out any personnel who has entered this compartment within 30 secs to the QM via the MMI.

c. Automated Attendance Tracking within Ship. The accuracy of the system in providing attendance at any point of time and the movement of personnel will have to be derived.]

d. Digitised Attendance and Visitor Records. Attendance records shall be saved upon trigger by QM as well as and crew and visitor tracking every minute so that it is possible to track back on personnel who has been onboard ship through the day. This data shall also be available to the Authority at any time.

FAMILIARISATION

6. Prior to the commencement of the trial, the Supplier shall provide a familiarisation session on the operation and usage of the hardware and software for up to 20 participants at the Authority's premises.

PUBLICATIONS

7. The Supplier shall provide the following documents as part of the tender submission:

a. User Manual

b. Handling Instructions

QUALITY, INSPECTION, AND ACCEPTANCE

8. Deliverables. The Supplier shall (1) deliver two fully operational CMDS-Lite systems with the above functional requirements within 3 months to commence active trial of 30 days, and (2) a comprehensive trial report on the PoC (1 month after active trial period) quantifying the system's accuracy and efficiency (based on the time taken to determine the location of a transiting personnel).

WARRANTY

9. The Supplier shall provide a guarantee against any manufacturing defects for the trial period. The Supplier shall repair or replace any above-mentioned defects at no additional cost to the Authority during which the trial will be considered paused. Hardware warranty shall be for 1 year.

OPTION FOR SCALE-UP

10. Option for Scale-Up. The Supplier shall provide an option for proliferation should the PoC be successful in the form of supply and commission of additional ship-sets of CMDS-Lite. The scale up shall be quoted on a per ship basis with assumption of similar scale. The option shall be valid for 1 year after submission and acceptance of trial report. Each ship's installation shall be completed within 3 months of PO. Maintenance on a per-ship basis shall also be quoted.

CLARIFICATIONS

11. For clarifications regarding the Requirement Specifications, please contact the following personnel:

S/N	Rank/Name	Contact Details
1	ME4 Ng Teng Ooi	91527410
2	ME5 Derrick Wong	98226250

NG TENG OOI

Digitally signed by NG TENG OOI
Date: 2024.05.19 14:13:55 +08'00'

ME4 Ng Teng Ooi

Senior Combat System Engineer, RSS *Steadfast*

With Inputs from : ME6 Tang Chee Meng, Hd EDB, WARCEN
ME5 Derrick Wong, SCSE, First Flotilla
ME4 Ang Kar Choon, Senior Engineer, WARCEN