

Appendix 'I'

Requirement Document for "Dismantling Two sets of Turret Simulators and Driving Simulators at CVRDE, Avadi and its Installation at 43 AR, Jaisalmer"

Objective

As per Army requirement, CVRDE has upgraded two turret simulators and two driving simulators with OEM which are made in 2010. Army has asked for permanent transfer of these systems to 43AR Jaisalmer for training their Arjun MBT crew. The upgraded systems are now in warranty, CVRDE requested OEM for shifting the systems and extend their technical support at 43AR Jaisalmer with proper maintenance and system training to Army user during the warranty period. The detailed scope of work and list of items need to be transferred from CVRDE to 43AR Jaisalmer are listed as follows:

a) Scope of work

The scope of work mainly covered are

- i. Dismantle two sets of driving simulator items and turret simulator items at CVRDE
- ii. Safe Packing of the systems (Additional care should be taken for the optics, 6 DOF motion platforms, monitors and projectors)
- iii. Transport the packed systems from CVRDE, Chennai to 43 AR, Jaisalmer safely in a container/truck
- iv. Unpack and reassemble the items at 43AR Jaisalmer
- v. Installation, integration and simulator systems functional clearance
- vi. Onsite engineer to provide necessary technical and maintenance support at 43AR Jaisalmer during the warranty period
- vii. Simulator operational and maintenance training to the crew members
- viii. Documents/manuals to be made for Operational & maintenance training

The firm also needs to provide

- a) 10 years technical/maintenance support to Army for continuous running of the simulator systems through CAMC for managing the obsolete / BER items

b) List of items

The list of simulator items that needs to be disassembled, packed, transported and installed at 43AR are tabulated as table - I

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Table – I : List of simulator items to be transferred

| Sr. No | Item Description | Qty |
|---------------|--|------------|
| 1 | <u>Classroom Trainer for Driver</u> | 2 |
| | Each trainer consists of | |
| | Dell Precision 3660: Pre-loaded 64 bit Windows 10 pro, 2*16 GB DDR5 RAM, 12 th Gen Intel i9-12900 processor, 2TB HDD, Graphics card: Nvidia T400 4 GB with Keyboard, mouse, Mini DP to VGA converter and loaded Anti-virus | |
| | 17 "LED monitor | |
| | Epson EB-FH06 Full HD, 3500 lumens LCD Projector. | |
| | Projection screen | |
| | Liebert iton CX1000 1 KVA UPS | |
| | Creative 5.1 channel speakers (1 woofer + 5 mini speakers) | |
| | Partially closed cabin | |
| 2 | <u>Tank simulator:</u> Comprising of Driver Simulator items & Turret simulator items as given in 2(a) & 2(b). | |
| 2(a) | <u>Each Driving simulator consists of</u> | 2 |
| | Driver cocoon: FRP fabricated cocoon. | |
| | Driver cabin: Aluminum fabricated structure with hatch open access and maintenance access. | |
| | Driver station Hardware controls: Seat, cupola with opening mechanism handle, Instrument RH panel, Instrument LH panel, Driver switch board, Gear selector mechanism, Acceleration pedal, Brake pedal, Steering control, Parking Brake, Driver's safety switch, Fuel pump Bilge pump Battery Charger, Fire Suppression System Control Unit panel, Roentgemeter, Central warning Lamp, Voltmeter ,Alarm Cum Flasher panel, Marker Light Control Box panel, Driver's duplicating panel, Emergency gear shift lever, Engine Hour meter, one central and two side periscope, light and fan. | |
| | Visual Cue systems for 5 driver visual channels with system configuration: Windows 10 Enterprises OS, Intel Xenon E-217G CPU @3.70 Ghz, 2 TB HDD, 64 GB RAM, Nvidia GeForce 3080 graphics card with <u>pre-loaded Medallion license</u> | |
| | Optics for driver: 3 Nos. window optics for Periscope | |

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| | Motion Platform: 6 DOF electric motion platform from FCS Moog model E-Cue 624-1800 with Payload 1800kg and motion controller Box | |
| | Speakers: 2.1 channel speakers (1 woofer+ 2 speakers) | |
| | Junction Box items | |
| | +/- 24V DC smps: 1 no | |
| | +/- 12V DC smps: 1 no | |
| | +/- 5V DC smps: 1 no | |
| | +/- 15V DC smps: 1 no | |
| | Relay board: 4 no's | |
| | Signal conditioner card: 2 no's | |
| | Hatch open visual display: Five Sony VPL-PHZ60 6000 lumens projector systems mounted on the motion platform to cover 200 deg FOV (H) and 45 deg FOV (V) to simulate the hatch open condition on FRP screen with proper five edge blend mechanism | |
| | Driver's LH Panel (15" LCD Display) | |
| | LAN hardware for projector control: Netgear Pro safe 24 port gigabyte | |
| | HDMI Splitter | |
| | Surveillance camera – CP plus 5 MP. | |
| 2(b) | <u>Each Turret simulator consist of</u> | 2 |
| | <p>Turret Cabin: Aluminum Fabricated structure with hatch open access and maintenance access.</p> <p>Turret station hardware controls: Gunner and Commander seat, GCB panel, GCDB panel, FCC panel, Turret Traverse Indicator panel, Unity window, GAS FOV panel, CPS FOV panel, Gunner's Intercom unit, GPS, Fire Control Box panel, EFM panel, CCU panel, Smoke grenade Discharge Regulator Box panel, Commander's Intercom unit, Gunner's Control Handle , Commander's Control Handle, Gunner's Manual Hand Pump (AZ),Gunner's Manual Hand Pump (ELV), Fan and light</p> | |
| | Visual cues system for 4 gunner visual channel & 4 commander visual channel with System configuration: Windows 10 Enterprises OS, Intel Xenon E-217G CPU @3.70 Ghz,2 TB HDD,64 GB RAM, Nvidia GeForce 3080 graphics card <u>with pre-loaded Medallion license</u> | |

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| | Optics for Gunner's Day sight and Thermal sight eyepieces, unity window, Gunner's articulated sight optics, Commander's panoramic sight optics, commander's one central and two side episcopes | |
| | Visual simulation display units: | |
| | GMS Day sight (21" LED): 1 no | |
| | GMS Thermal sight (17" LED): 1no | |
| | GAS (21" LED): 1 no | |
| | Unity window (17" LED): 1 no | |
| | CPS (21" LED): 1 no | |
| | Cmdr's Episcopes (17" LED): 3 no's | |
| | Cmdr's TI Repeater (7" LED): 1 no | |
| | Motion Platform: 6 DOF electric motion platform from FCS Moog model E-Cue 624-1800 with Payload 1800kg and motion controller Box | |
| | Junction Box items: | |
| | +/- 24V DC smps: 1 no | |
| | +/- 12V DC smps: 1 no | |
| | +/- 5V DC smps: 1 no | |
| | +/- 15V DC smps: 1 no | |
| | Relay board: 4 no's | |
| | Signal conditioner card: 2 no's | |
| | Surveillance camera – CP plus 5 MP | |
| 3 | <u>Interface Electronics Unit (IEU)</u> | 2 |
| | Single Board Computer with chassis, 1000W SMPS, Pre-loaded 64 bit Windows 10 OS, 6 th Gen Intel core i7-6700 @ 3.40 GHz processor, 256 GB SSD, 500GB HDD, 8 GB RAM (1 No), PIO D144 card with piggyback card (4 Nos.), PIO DA16 card (1 No.), PCI 1202 card (1 No.) & IO Cables and connectors wiring and loaded Anti-virus software | |
| 4 | <u>Instructor Station (IS)</u> | 2 |
| | Dell Precision 3660: Pre-loaded 64-bit Windows 10 pro, 2*16 GB DDR5 RAM, 12 th Gen Intel i9-12900 processor, 2 TB HDD, Graphics card: Nvidia | |

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| | T400 4 GB with Keyboard, mouse, Mini DP to VGA converter. and loaded Anti-virus | |
| | Printer: HP color Laser 150NW. | |
| | Five Monitor display items: | |
| | IOS (21" LED): 1 no | |
| | Driver's Center channel repeater (21" LED): 1 no | |
| | Gunner's DAY& Thermal sight repeater (21" LED): 1 no | |
| | Commander's Panoramic sight & Gunner's Articulated sight repeater (21" LED): 1 no | |
| | Driver's & Turret Surveillance camera display (21" LED): 1 no | |
| | IS console: Steel Structure. | |
| | Monitor stand Dual vertical | |
| | Instructor Chair. | |
| | CCTV recorder – CP plus 4Ch HD Digital Video Recorder with 500GB HDD and 12V 10 Amps SMPS. | |
| | VGA switcher – ATEN VS 291. | |
| | VGA switcher – ATEN VS 491 | |
| 5 | <u>Host PC</u> | 2 |
| | Dell Precision 3660: Pre-loaded 64-bit Windows 10 pro, 2*16 GB DDR5 RAM, 12 th Gen Intel i9-12900 processor, 2 TB HDD, Graphics card: Nvidia T400 4 GB with Keyboard, mouse, Mini DP to VGA converter. and loaded Anti-virus | |
| | Intel pro 1 GB Network card | |
| 6 | <u>Visual Database System</u> | 2 |
| | Intel Xenon E-2176G @ 3.70 GHz CPU, 2TB HDD, RAM 64 GB, Pre-loaded windows 10 Enterprises. OS 64 bit <u>with pre-loaded Medallion license</u> | |
| 7 | <u>MIF system</u> | 2 |
| | Intel Xenon E-2278GE @ 3.70 GHz CPU, 2TB HDD, RAM 128 GB, Pre-loaded windows 10 Enterprises. OS 64 bit <u>with pre-loaded Medallion license</u> | |
| 8 | <u>Network Switch & Cables</u> | 4 |

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| | Make: Netgear 48P GE Smart Managed Pro switch with cables Model: GST 748T-500AJS No of Ports: 48. | |
| 9 | <u>KVM switch</u> | 4 |
| | Make: ATEN 16 Port PS/2-USB KVM switch Model CS1716ADC | |
| | Daisy chain | |
| | VGA, USB mouse and Keyboard adapter | |
| 10 | <u>VGA Splitter</u> | |
| | Make: ATEN 4 port Video Splitter | 8 |
| | Model: VS-134 | |
| | Make: ATEN 2 port Video Splitter | 2 |
| | Model: VS-82 | |
| 11 | <u>Crew Communication</u> | |
| | Amplifiers: HiTONE BOSS 6 stereo Jack Port (MHA 6) | 2 |
| | Crew Headset with microphone. | 8 |
| 12 | <u>PA System</u> | 1 |
| | Amplifiers: EXP pro (CD+320) | |
| | Mini Speakers -03 | |
| | Sound Mixture: Stranger (MM5) | |
| | Microphone: Maxim (MX 390) -02 | |
| 13 | <u>PC mounted Cyber Rack 36U 800*1000 with maintenance Fan and light</u> | 4 |
| 14 | <u>UPS</u> | 2 |
| | Make: Power one | |
| | Model: PTM103Q16 | |
| | Rating: 10KVA | |
| 15 | <u>Battery Bank</u> | 2 |
| | Battery rating: 12V 42 Ah (each set 16 Batteries) | |

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| | Steel rack | |
| 16 | <u>Generator</u> | 2 |
| | Make: Cummins Powerica | |
| | Model: DS 62.5 SL | |
| | Rating: 62.5 KVA | |
| 17 | <u>Fire and Smoke Alarm System</u> | 1 |
| | Smoke Detector: 2 no's of detector for Driver cabin and Turret cabin | |
| | Automatic Alarm System with 2 nos. of 12V 7 AH batteries | |
| | Speaker | |
| 18 | <u>Driver & Turret Aluminum Ladder</u> | 2 |
| List of Software Models | | |
| | <u>Driving Simulator</u> | |
| (a) | Engine model | 2 |
| (b) | Transmission model | 2 |
| (c) | Electrical System model | 2 |
| (d) | Gear System model | 2 |
| (e) | Hydro-Pneumatic Suspension System model | 2 |
| (f) | Vehicle Dynamics Model | 2 |
| | <u>Turret Simulator</u> | |
| (a) | Gun Control System model | 2 |
| (b) | Fire Control System model | 2 |
| (c) | Weapon System model | 2 |
| | Remaining Software modules | |
| (a) | Instructor Station Application | 2 |
| (b) | Trainee Scoring model | 2 |
| (c) | Daily Operational Readiness Test (DORT) utility | 2 |
| (d) | Desert Database (Pokhran) with Driving Obstacles | 2 |

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| (e) | Desert Database (Mahajan) | 2 |
| (f) | Plain Database (Pathankot) | 2 |
| (g) | Visual 3D Object library with MBT Arjun/T90/T72 etc. | 2 |
| (h) | Aural Database & software | 2 |
| (i) | IEU (IO) Linkage Software | 2 |
| (j) | IO Link soft panel software | 2 |
| (k) | GPS Software | 2 |
| (l) | Host – Instructor Station Interface | 2 |
| (m) | Host – Visual Interface | 2 |
| (n) | RTE Win DLL | 2 |
| (o) | Ballistic DLL | 2 |
| (p) | Visual Medallion licenses | 30 |
| (q) | VAPS-SIM SW | 2 |
| (r) | Host – IEU System Interface | 2 |
| (s) | Host – Aural System Interface | 2 |
| (t) | Host – Driver LH Soft Panel Interface | 2 |
| (u) | Host – Motion System Interface | 2 |

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