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APPENDIX-A

SCOPE OF WORK FOR OPERATION & MAINTENANCE OF INTEGRATION EQUIPMENT, CHECK OUT SYSTEM AND LAUNCHERS CONTRACT

1.0 INTRODUCTION

Directorate of ATGMs integration is involved in mechanical and electrical integration of Anti Tank Guided missiles of three projects, i.e PROSPINA, HELINA, MPATGM. It also carries out the various phase check-outs, various tests and rework at different work centers at DRDL and RCI. It has the following equipments/system to be operated and maintained at present.

1. WEIGHT, CG AND MI MEASURING EQUIPMENT
2. SIGN CHECKS EQUIPMENT /DEVICES
3. LAUNCH TUBE GUIDE RAIL ASSEMBLY FIXTURE
4. GROUND RESONANCE TEST EQUIPMENT
5. BATTERY TROLLEY
6. PALLET TRUCK
7. MISSILE CONTAINERS
8. INTEGRATION JIGS AND FIXTURES
9. SEEKER COOLING SYSTEM
10. HIGH PRESSURE SYSTEM, BOOSTER PUMP & AIR COMPRESSOR,
11. TORQUE WRENCH TESTER AND CALIBRATION DEVICE
12. HP MULTI FUNCTIONAL DEVICE (PHOTO COPIER AND PRINTER)
13. ELECTRICAL TEST AND MEASURING EQUIPMENT
14. MISSILE CHECK-OUT SYSTEMS
15. CONSOLES & TEST PANELS
16. ATGMs LAUNCHERS
17. EOT CRANE
18. INVENTORY MAINTENANCE

The activities starts from receiving requirements from projects and end with after integrating the missiles with launch tubes with specified launchers at designated test ranges after getting clearance from MSQAA/RCMA.

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G. Ravinder

(G.RAVINDER)
Scientist'D'

2.0 QUANTUM OF WORK

The above work is to be carried out by positioning skilled personnel of minimum experience of two years in handling the similar equipments at Building no. 0202. Directorate of ATGMs Integration. Vendor has to complete the integration work and quantity as specified in the below table.

Sl. No.	Description of Work	Qty. Nos
1.	- Mechanical Integration of sub-assemblies, Sections, weight , CG and MI measurement, Missile integration, missile handling operations, launch tube guide rail assemblies, torqueing of intersection joints, generation of inspection document, log books, maintenance of jigs and fixtures, calibration of integration tools, preparation wire tunnel, cooling of IR seeker detector, cage assembly, assembly of flap mechanism.	4400
2.	- Electrical integration of inter-stage, power pack, cable loom assembly, insulation checks , carrying out sign checks, testing of test console and phase-III, Phase-IV checks, preparation of hardware for environment testing – vibration, shock, high and low temperature, damp heat test ,	3200
3	- Assembly of missile lock, transportation lock, charging of high pressure bottle, boosting of cooling cylinders, loading of canisters in launcher, integration of launcher to helicopter, integration of canister to launcher , assembly of LIU, FCS, sighting system.	2200


Quantity indicated the minimum work in the year.

3.0 SCOPE OF WORK

The following are the contractor's responsibility.

3.1. WEIGHT, CG AND MI MEASURING EQUIPMENT

- The components are to be prepared for assembling as per drawings.
- Sub assemblies are to be made. The weight of sub assemblies of missile are to be weighed.
- Finally, all sub assemblies are integrated and weighed.
- CG and Mass moment of inertia in three directions are to be measured.



(G.RAVINDER)
Scientist'D'

3.2. SIGN CHECKS EQUIPMENT /DEVICES

- Carry out the sign checks as per document.

3.3. LAUNCH TUBE GUIDE RAIL ASSEMBLY FIXTURE

- Two guide rails are to be kept in launch tube for marking the locations of screws by using assembly fixtures.
- Through holes are to be drilled at marked locations.
- Two guide rails are to be assembled with launch tube.

3.4. GROUND RESONANCE TEST SET UP OF MISSILE

- Preparation of missile and suspension on with low frequency slings.
- Mounting the accelerometers at required locations on the missile.
- Setting up of vibration equipment with missile.
- Carrying out the testing with impulse hammer.
- Plotting the PSD vs frequency.

3.5. BATTERY TROLLEY

- Operating trolley for the movement of flight hardware across technology work centers.
- Daily maintenance of trolley & periodic maintenance of batteries.

3.6. PALLET TRUCK

- Loading and unloading of items by using pallet truck.
- Daily maintenance of trolley and periodic maintenance of batteries.

3.7. MISSILE CONTAINERS


- Packaging of missiles and storing in containers.
- Up keeping of the containers.

3.8. INTEGRATION JIGS AND FIXTURES

- Assembling the components by using the fixtures.
- Assembly and functional trials of Wings and fins.
- Carrying out launch tube trials as per document.

3.9. SEEKER COOLING SYSTEM

- Filling the cylinders with N₂.
- Assembling the components of cooling system as per drawing.
- Testing and Performance evaluation of cooling system.


(G.RAVINDER)
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3.10. HIGH PRESSURE SYSTEM- BOOSTER PUMP & AIR COMPRESSOR

- Operation of Air compressor and Booster pump.
- Maintenance of high pressure compressor.
- Charging of Air bottles.

3.11. MULTIFUNCTIONAL DEVICES (MFD)

- Xeroxing of documents from MFD.
- Printing the documents from MFD.
- Maintenance of MFD.

3.12. TORQUE WRENCH TESTER AND CALIBRATION DEVICE

- Testing & Calibration of Torque Wrenches.

3.13. ELECTRICAL TEST AND MEASURING EQUIPMENT

- Electrical Tests & measuring equipments like safety ohmmeter, missile, pull test machine thermal recorder etc.


3.14. FLIGHT CABLE HARNESS PREPARATION

- Stripping of PTFE insulation.
- Crimping operation.
- Insertion & locking of crimped contacts into connectors.
- End to end electrical continuity checks.
- Insulation checks.
- Application of potting compound on connectors.
- Placement of dust caps/protection caps on connectors.
- Quality inspection and flight cable harness in each stage.
- Pull tests of crimped pins.
- Calibration of tools used.

3.15. INTERSTAGE SECTION

- a. Population and testing of PCB units.
 - Visual inspection, Baking & Components population on PCB.
 - Visual inspection of PCB unit.
 - PCB baking & visual examination after baking.
 - Selection of components for soldering on PCB.
 - Soldering of components on PCB.
 - Electrical checks on diode and connectors.
 - Functional checks.

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- Application of potting compound and conformal coating.
 - Inspection & wiring of thermal batteries.
 - Visual inspection.
 - Squib resistance measurement.
 - Insulation resistance measurement.
 - Soldering of PTFE wires on thermal battery terminals.
 - Low temperature & high temperature tests of PS-PCB & soldered thermal batteries.
- b. Integrated Inter stage.
- Assembly of power pack (inter stage unit).
 - Assembly of thermal batteries on inter stage unit.
 - Crimping, insertion & locking of crimped contacts.
 - Mechanical assembly of PCB and thermal batteries.
 - Cumulative squib resistance measurement.
 - Functional checks of power pack.
 - Electrical isolation checks.
 - Functional checks of the power pack.
 - Random vibration testing of integrated inter stage with onboard power pack at ENTEST.

3.16. MISSILE CHECK-OUT SYSTEMS

- Maintenance of Checkout Systems, NMCV.
- Establishment of Test set-up for Phase Checks.
- Operation of Checkout System.


3.17. CHECK-OUT CONSOLES & TEST PANELS

- Wiring of Checkout Consoles & Test Panels.
- Fabrication of Ground Cable Harnesses.
- Operation of Checkout Consoles & Test Panels.

3.18. EOT CRANE

- Loading and unloading using overhead cranes require special skill on the part of the operator to prevent injuries to personnel and damage to equipments. Do's and Don't's stipulated for crane operation are required to be followed by the contractor's personnel arising due to negligence and non adherence to the laid down safety procedures/norms.
- Operation & maintenance of EOT Crane periodically.




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3.19. INVENTORY MAINTENANCE

- Operation & maintenance of inventories.

4.0 ATGMs LAUNCHERS

4.1. STATIC LAUNCHERS

- Carry out the operational mechanical & electrical checks for missile testing.
- Maintenance of static launchers.

4.2. PORTABLE LAUNCHERS

- Carry out the operational mechanical & electrical checks for missile testing.
- Maintenance of portable launchers.

4.3. TRACK BASED MOBILE LAUNCHERS

- Carry out the operational mechanical & electrical checks for missile testing.
- Maintenance of mobile launchers.

5.0 DRDL SAFETY POLICY


- The contractor's personnel has to follow DRDL's safety policy rules and all person working in the plant should be aware of safety and should follow safety rules.

6.0 WORKING HOURS & DAYS

- The contractor has to depute his team on six working days in a week. In case of urgency in work contractor may need to depute his team on Sundays, holidays, also if required as per schedule given by the co-ordinating scientist from time to time (Maximum working days in a month is limited up to 26 days).
- The personnel employed by the contractor will be deployed at testing areas (out of stations) depending on the requirement

7.0 OWNERSHIP

- The complete ownership of the facility shall be with DRDO, Govt. of India and company shall at no point time have any ownership rights on the facility.
- The tools, equipment and required materials will be provided by DRDL.
- The Contractor shall agree for minor modifications in the scope of work for smooth functioning of the system without any additional cost implications.
- Individual deployed shall be employees of the company and shall not claim to have been employed by DRDL. DRDL has no responsibility towards the company's employee.



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8.0 PERIOD OF CONTRACT

- The contract is valid for three years. However, DRDL holds the right to terminate the contract any time during the contract period with a notice of one month without payment of any compensation in case the work is not progressing according to supply order. The bidder must clearly specify contract charges of one year as well as for three years put together.
- The contract shall be effective from the date of signing and is valid for three years.

9.0 NOTE TO PROSPECTIVE BIDDER

- 9.1 The vendor must visit the work center to discuss and understand the complexity, quantum of work, working environment in view of their personnel safety before quoting. The vendor has to provide quality service meeting technical and schedule requirements of DRDL and has to maintain records of the all individual daily works and report the same to user weekly basis.



(G.RAVINDER)
Scientis'D'

General Terms and Conditions

1. Income tax will be deducted as per rule 194C of Income tax Act 1961 if applicable and as amended from time to time.
2. This contract is effective from the date of signing of this contract by DRDL and will be valid up to three years from that date.
3. DRDL shall reserve the right to terminate this Job contract, in case you fail to carryout services as per the scope of work.
4. The contractor shall quote with the price breakup.
5. For personnel deployed at DRDL, the contractor shall comply with the rules and the regulations of Contract Labour (R &A) Act 1970 and 1971, minimum wages Act and other statutory requirements, as applicable for job contracts and submit documents to DRDL as and when asked.

