

ANNEXURE-1 A FILE No. LPSC/LVF/2020004910

SCOPE OF WORK

1. Activities

Manpower supplied by service provider will be required to carry out the following:

- Assisting in schematic preparation and PCB layout generation adhering to applicable guidelines.
- Assisting in component selection, schematic generation, preparation of files & components for Wiring of PCBs, preparation of test reports. Testing of wired PCBs, electronic packages, motors, actuators and feedback sensors using checkout systems as per test plan. Electronic components store maintenance and Inventory management.
- Assisting in wiring of PCBs, connectors, winding of electromagnetic components, harnessing of cables and chassis integration for aerospace application, wiring of test consoles and proto type PCBs for design validation

2. Brief Description of Work: -

2.1. Area of Work

Deployed personnel will be required to work for supporting design, realization, and testing of

- Control electronics and Actuators for ongoing and development projects
- Throttling engine control electronics (TECEM) and actuators
- Power processing units(PPU) for high thrust electric propulsion (HEP)
- Control unit for Electric propulsion system(EPS)
- Control electronics and actuators for semi-cryogenic stage

2.2. Nature of Work

2.2.1. Assisting in Schematic preparation and PCB layout generation adhering to applicable guidelines.

- a. Schematic and Layout preparation in PADS adhering to specific design rule and constraints as laid out in ISRO PAX.
- b. Updation and archival of layout designs generated.
- c. Supporting for the quality control activities.
- d. Generation of gerber files for PCB fabrication and other supporting files for procurement planning and production of designed systems.

2.2.2. Assisting in component selection, schematic generation, preparation of files & components for Wiring of PCBs, preparation of test reports. Testing of wired PCBs, electronic packages, motors, actuators and feedback sensors using checkout systems as per test plan. Electronic components store maintenance and Inventory management.

- a. Assisting in schematic generation considering guidelines and preparation of technical documents.
- b. Assisting in Test and evaluation plan development, documentation and execution
- c. Preparation of integration details, verification of harnessing and integration for checkout systems.
- d. Component sorting and assurance of date code and screening validity before wiring, preparation of FIMs and FIM supply to work centre
- e. Preparation of production files required for the wiring and quality control activities for all the PCBs being wired in house and at external work centres and reporting non-conformances.
- f. Test setup preparation and Qualification & acceptance testing of wired PCBs and packages including environmental testing (Thermal, thermo vacuum, EMI, vibration etc...) of packages.
- g. Support Test result compilation, documentation, analysis and reporting of non-conformance for both PCB level and package level tests.
- h. Incoming inspection, vacuum sealing for storage, FCD inspection coordination, inspection report verification, consolidation, NCR verification and its clearance for different types of dc motors fabricated through external industry.
- i. Incoming inspection, co-ordination for screening and clearance of electronic components & feedback sensors, bonding, and issue of components through ElCom software. Packing of components in lots in antistatic covers, mark the date code, manufacturer details, part numbers, bin numbers and storage in temperature and humidity controlled chambers, operation of SMD Tower for component storage and retrieval after verification of barcodes.

2.2.3. Assisting in wiring of PCBs, connectors, winding of electromagnetic components, harnessing of cables and chassis integration for aerospace application, wiring of test consoles and proto type PCBs for design validation

- a. Component tinning, soldering, rework, lead forming, lead bending, connector wiring, hook soldering and lap soldering as per ISRO quality standards.
- b. Harnessing of wires as per guidelines.

- c. Mounting of components, connectors, torquing of components and chassis integration of electronic packages as per aerospace standard
- d. Handling of wiring equipments, tinning pots, specialised tools for the purpose.
- e. Wiring of connectors, jacks and terminations.
- f. Component tinning, soldering, rework, lead forming, lead bending, connector wiring, hook soldering and lap soldering

3. Qualification of personnel for carrying out the activities and Activity list & work units

- Deputed Personnel shall possess sufficient knowledge for coordinating activities as listed in Scope of work
- Working Hours: 08.45 Hrs. to 17.15 Hrs with 5 days per week. If required, work shall be arranged on holidays and beyond normal working hours at the same rate as agreed for the normal working hours
- The service provider needs deploy minimum 11 Diploma personnel, 1 BSc Electronics person and 5 ITI personnel on all the working days, to carry out the tasks specified above.

3.1. BSc Electronics

Qualification requirements

SI No.	Work description	Qualification
1	Assisting in preparation of files and components for Wiring of PCBs, assisting in preparation of test plan documents and test reports, Electronic components store maintenance and Inventory management.	BSc Electronics or equivalent. One year experience in relevant field is preferred.

Work Units requirements

SI No.	Work description	Total work units (for 2 years)
		BSc Electronics
1	Assisting in preparation of files and components for Wiring of PCBs, assisting in preparation of test plan documents and test reports, Electronic components store maintenance and Inventory management	5000

3.2. Diploma Holders

Qualification requirements

SI No.	Work description	Qualification
1	Assisting in schematic preparation and PCB layout generation adhering to applicable guidelines	<p>Diploma in Electronics engineering, Electrical engineering, Electrical and electronics engineering or equivalent.</p> <p>One year experience or one year apprenticeship from any centres of ISRO, or Govt organisations/PSUs in relevant field.</p> <p>Experience in PCB layout and schematic design in any of the ECAD software preferably in PADS from Mentor Graphics is preferred.</p>
2	Assisting in component selection, schematic generation, preparation of files & components for wiring of PCBs, preparation of test reports. Testing of wired PCBs, electronic packages, motors, actuators and feedback sensors using checkout systems as per test plan. Electronic components store maintenance and Inventory management.	<p>Diploma in Electronics engineering, Electrical engineering, Electrical and electronics engineering or equivalent.</p> <p>One year experience or one year apprenticeship from any centres of ISRO, or Govt organisations/PSUs in relevant field.</p> <p>Experience in electronics PCB /package testing and proficient in handling test and measurement equipments preferred.</p>

Work Units requirements

SI No.	Work description	Total work units (for 2 years) Diploma
1	Assisting in schematic preparation and PCB layout generation adhering to applicable guidelines	15000
2	Assisting in preparation of files and components for Wiring of PCBs, assisting in preparation of test plan documents and test reports, Testing of PCBs, electronic packages, motors, actuators and feedback sensors as per test plan. Electronic components store maintenance and Inventory management	40000

3.3. ITI technician

Qualification requirements

SI No.	Work description	Qualification
1	Assisting in wiring of PCBs, connectors, winding of electromagnetic components, harnessing of cables and chassis integration for aerospace application, wiring of test consoles and proto type PCBs for design validation	<p>ITI (NCVT certificate) or equivalent in Electronics mechanic or instrument mechanic with valid certificate in “High reliability interconnection and electronics fabrication techniques for operators” conducted by VSSC.</p> <p>One year experience or one year apprenticeship from any centres of ISRO, or Govt organisations/PSUs in relevant field.</p> <p>Experience in flight quality wiring of PCB is preferred.</p>

Work Units requirements

SI No.	Work description	Total work units (for 2 years) ITI
1	Assisting in wiring of PCBs, connectors, winding of electromagnetic components, harnessing of cables and chassis integration for aerospace application, wiring of test consoles and proto type PCBs for design validation	25000

Work units and computation

For assessment of the quantum of work, one-hour duration of work/person is considered as a “work unit” and the total quantum of work carried out will be computed on monthly basis. The supplier shall be available for work not only during office hours but also during late office hours and on holidays if needed.