

1.0 SCOPE OF WORK

- 1.1 Service provider will be required to carry out tasks related to Quality Assurance Activities pertaining to Earth Storable Engines & Stages for Gaganyaan, Cryo/ Semi-Cryo Engine & Stages, Fluid Control Components & Control Systems and Gaganyaan Orbital Module.

2.0 QUALITY ASSURANCE ACTIVITIES

Service provider has to carryout activities broadly related to:

- 2.1 **Drawings** - Verification for implementation of changes as per configuration control (CC) change proposal, Generation of conformity report w.r.t standard and Maintenance of log book by necessary entries. Also generation of QA comments for deficiencies in drawings.
- 2.2 **Raw material clearance** - Scrutiny of Raw Material Clearance Certificate (RMCC) request for verification of clearance status of raw material & conformance of material to latest drawing and Maintenance of log book by necessary entries.
- 2.3 **Bought out items Lot clearance** - (Fasteners, Springs, Bellows, Filters, 'O'-rings etc) Verification of adequacy of test certificates/Inspection reports w.r.t. Purchase order, Checking conformance to Quality clauses/Specifications, Raising NC reports, if required and Preparation of draft Material Acceptance Certificate (MAC).
- 2.4 **Visual inspection of seating and sliding areas** of non-conforming fabricated parts under microscope as part of LSC actions and submission of assessment report.
- 2.5 **Stage clearance for special processes**- (Passivation, Anodisation, Heat treatment, Sub assy. level welding etc) - Verification of availability of QC clearance certificates of parts and Conformance of process w.r.t. drawings and updation in appropriate register.
- 2.6 **Bonding of fabricated parts** -Verification of conformance to latest Configuration Control (CC) drawings, Verification of availability and conformance to records (inspection reports, NC reports, test certificates for special process, clearance status etc.), Raising conformance/ non-conformance reports, if required and Data entry of bonded parts.
- 2.7 **Functionally Critical Dimension (FCD) clearance related** - Verification of conformance to latest CC drawings, Scrutiny of FCD inspection reports, Reverification sliding clearances comparing with FCD acceptance criteria and Raising non-conformance reports, if required.

- 2.8 Assembly parts list clearance** (fabricated and standard parts) **related** - Ensuring SRQA cleared parts are used for assembly and Identifying suiting pairs, if required.
- 2.9 Analysis of test data related** - Generation of graphs for Flow tests, Response tests etc. Drawing graphs for performance analysis of various components in the ground test/Flight acceptance tests and Generation of test results data base.
- 2.10 Audit of QC documents/Check list verification** - Collection of QC reports from Mechanical/Electrical QC teams, Comparison of QC reports with specification and generation of NC's if required and Compilation of NC's raised by QC teams. Study of various input documents and scrutiny of check list document for conformity with latest applicable drawings and generation of QA comments. Inputs for certification of the revised document after review and changes incorporated. For Engine system, audit of QC documents for completion of processes, inspection data, NC clearance status and generate QA comments.
- 2.11 Providing inputs/support for preparation of PPT presentations** for meetings – Pre-shipment & Pre dispatch Review Committee-Fluid Control Components & Module, (PDRC-FCCM), Non conformance Control Review Board- Sub-Committee (NCRB-SC), Standing Design Review Committee for Earth-Storable, Cryo & Semi-Cryo Stages/Components. (SDRCs & SRCs)
- 2.12 Action points compilation and Data verification** - Component-wise compilation of action points from various meetings and Activities related to identified action closure from various meetings.
- 2.13 QA Clearance of hardware** – Verification of QC documents, RMCC w.r.t latest CC cleared drawings, verification of completion of all processes indicated in the drawings such as passivation, anodization, HT, sub assembly level welding etc. Verification of NCRB recommendation and prepare QA clearance note and entry in the appropriate register for the same.
- 2.14 Providing inputs/support for preparation of Quality documents** - Clearance reports for components, Compilation of FCD, Product Assurance/Quality Assessment reports and PFA reports.
- 2.15 Any other activity that may be called for from time to time as may be felt necessary by LPSC.**

3.0 WORK DETAILS

Following is the work description, annual deliverables and annual man-month estimate requirement to be positioned by the SERVICE PROVIDER for QA activities. This work and deliverables will be more or less uniformly spread over 2 years period.

SI No.	Work description	Total deliverables (nos) For 2 yrs	Total Work Unit for 2 yrs
01	Drawings <ul style="list-style-type: none"> - Verification for implementation of changes as per change proposal - Study for correctness and completeness as per standards. - Generation of conformity report - Entry & maintenance of log book. - Auto CAD conversion 	8374	6700
02	Raw material clearance Scrutiny of RMCC request for: <ul style="list-style-type: none"> - Verification of Clearance status of raw materials - Conformance of material to latest CC drawings - Entry & maintenance of log book. 	11390	7974
03	Bought out items - Lot clearance (Fasteners, Springs, Bellows, Filters, 'O'-rings etc) <ul style="list-style-type: none"> - Verification of adequacy of party test certificates / Inspection reports w.r.t Purchase order - Checking conformance to Quality Clauses / Specifications - Ensure availability of inspection/test reports for the tests carried out by LPSC/VSSC as per sampling plan. - Raising NC reports, if required - Preparation of draft MAC 	3502	7004
04	Visual inspection of seating and sliding areas of non-conforming fabricated parts under microscope as part of LSC/NCRB actions and submission of assessment report.	6500	13,000

SI No.	Work description	Total deliverables (nos) For 2 yrs	Total Work Unit for 2 yrs
05	<p>Stage clearance for special processes (Passivation, Anodization, Heat treatment, Sub assy. level welding etc)</p> <ul style="list-style-type: none"> - Verification of availability of QC clearance certificates of parts. - Conformance of process w.r.t. drawings. - Entry & maintenance of log book. 	12,666	3798
06	<p>Bonding of fabricated parts</p> <ul style="list-style-type: none"> - Verification of conformance to latest CC drawings - Verification of availability and conformance to records (inspection reports, RMCC, NC reports, test certificates for special process, clearance status etc.) - Raising non conformance reports, if required. - Preparation of bonding clearance. - Data entry of bonded parts. 	5600	1680
07	<p>FCD clearance related</p> <ul style="list-style-type: none"> - Verification of conformance to latest CC drawings - Scrutiny of FCD inspection reports - Estimating sliding clearances and comparing with FCD acceptance criteria - Raising non conformance reports, if required 	3600	1800
08	<p>Assembly parts list clearance (fabricated and standard parts) related</p> <ul style="list-style-type: none"> - Re-verification of conformance to latest drawings - Ensuring SRQA cleared parts are identified for assembly - Identifying suiting pairs, if required. 	6200	3720

SI No.	Work description	Total deliverables (nos) For 2 yrs	Total Work Unit for 2 yrs
09	Generation of Inputs for test data analysis <ul style="list-style-type: none"> - Generation of graphs of Flow tests, Response tests, Hot tests etc. - Plotting of graphs for performance analysis of various components in the ground test / Flight acceptance tests - PFA - Generation of test results data base 	9500	9500
10	Audit of QC documents <ul style="list-style-type: none"> - Collection of QC reports from mechanical/electrical teams - Comparison of QC reports with specification and generation of NC's if required. - Compilation of NC's raised by QC teams - Audit of Assembly and integration check list @IPRC, VSSC & SHAR. 	3400	5100
11	Providing inputs/support for preparation of PPT presentations for meetings <ul style="list-style-type: none"> - PDRC-FCCM - NCRB-SC /LSC/NCRB - SDRG-FCCM/DRT - SRC, FAC - CCB Review. 	4300	6450
12	Action points compilation and Data verification <ul style="list-style-type: none"> - Component-wise compilation of action points from various meetings - Activities related to identified action closure from various meetings 	2208	2208
13	Providing inputs/support for preparation of draft Hardware Clearance reports <ul style="list-style-type: none"> - Clearance reports for control components / control system elements - Clearances of Engine and Stage h/w. - Entry in data bank 	11,194	7834
14	Providing inputs/support for preparation of Quality documents <ul style="list-style-type: none"> - Product Assurance reports including Compilation of FCD - Product assurance Report for flight stages. - PFA reports 	404	3232

Total Work unit is 80,000 for 2 yrs.

Minimum diploma personnel required is 16 nos.

Note: LPSC has the right to modify work details & Annual deliverables based on launch schedule, work priority and permanent manpower availability.

4. WORK UNITS & COMPUTATION

One work unit is defined as one hour duration of work per person and the total quantum of work carried out will be computed on monthly basis, based on the completed work unit. The Service provider shall be available for work not only during office hours but also during late office hours and on holidays if needed.

5. PERSONNEL QUALIFICATION:

- a. the personnel deputed shall have minimum qualification of Diploma in Mechanical Engineering with 1 year experience in Quality area (Inspection/Quality Control /Quality Assurance).**
- b. Service provider shall submit the details regarding qualification and experience of the work force being deployed, as and when personnel is positioned/ changed.