



OUTSOURCE DEPARTMENT
ROTARY WING RESEARCH & DESIGN CENTRE
HINDUSTAN AERONAUTICS LIMITED
Post Bag No.1783, Bangalore – 560 017
INDIA



Tender No: SM/OS/RC/8480MIS/39/40/25/2

Date : 28-10-2025

Pre bid Date: 05-11-2025.

Due Date : 19-11-2025, 23:00 Hrs.

Telephone: +91- 80-2232 5357, 22327195

GSTIN: 29AAACH3641R1Z3

E-mail: os.rwrdc@hal-india.co.in

Important Note:

Bidders are requested to submit their proposals (Price bid) online at HAL's e-procurement portal (<http://eproc.hal-india.co.in> or link to e- Procurement through www.hal-india.co.in). Tenders not submitted through e- procurement portal will not be considered and will be rejected (No Hard copies of Technical and Price bid should be submitted). Refer HELP manual for vendor in e-procurement portal for submission of Bids.

MAIN RFQ

SUB: REQUEST FOR QUOTATION (TWO BID SYSTEM) FOR DESIGN AND ANALYSIS OF AIRFRAME FOR IMRH & DBMRH

The Indian Multi Role Helicopter (IMRH) & Deck Based Multi Role Helicopter (DBMRH) are envisaged to meet Qualitative Requirements of Indian Airforce. The Helicopter will have significant improvements in performance over the existing contemporary Multi Role Medium lift helicopters with many features specially designed for Indian conditions.

Towards meeting the time frame of IMRH & DBMRH development and to utilize the indigenous expertise, the activities related to detail design and analysis of Airframe is proposed through private participation within India. HAL seeks response from prospective Engineering Service Providers meeting these technical requirements. Please refer below the table for QUOTATION (TWO BID SYSTEM) FOR DESIGN AND ANALYSIS OF AIRFRAME FOR IMRH & DBMRH.

Sl. No.	Part No	Description	Delivery Schedule (In Months)	Qty
IMRH				
1.	RC/IMRH/STR/TS/001 A M1-1	REQUIREMENT CAPTURING D1	52 months*	1 LOT
2.	RC/IMRH/STR/TS/001 A M2-1	LAYOUT AND ANALYSIS D2&D3		1 LOT
3.	RC/IMRH/STR/TS/001 A M3-1	DETAIL DESIGN AND DWG D4		1 LOT
4.	RC/IMRH/STR/TS/001 A M4-1	ENGINEERING CHANGE MANAGEMENT D5		1 LOT



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DBMRH				
5.	RC/DBMRH/STR/TS/001A M1-1	REQUIREMENT CAPTURING D1	52 months*	1 LOT
6.	RC/DBMRH/STR/TS/001A M2-1	LAYOUT AND ANALYSIS D2&D3		1 LOT
7.	RC/DBMRH/STR/TS/001A M3-1	DETAIL DESIGN AND DWG D4		1 LOT
8.	RC/DBMRH/STR/TS/001A M4-1	ENGINEERING CHANGE MANAGEMENT D5		1 LOT

*Delivery or project time line is 52 months from the date of acceptance of PO. (Refer Para 8 of TECHNICAL REQUIREMENT (RC/IMRH/STR/TS/001 REV A ISSUE III) OF AIRFRAME OF IMRH FOR SL. NO. 1 TO 4 of above table & REFER DESIGN AND ANALYSIS as per TECHNICAL REQUIREMENT (RC/DBMRH/STR/TS/001 REV A ISSUE II) OF AIRFRAME OF DBMRH FOR SL. NO. 5 TO 8 of above table.

Submission of drawing applicability list (DAL) along with other documents as mentioned in technical requirement document to HAL for concurrent manufacturing of GTV in 22 months.

Submission of SOP along with other documents as mentioned in technical requirement document for prototype after incorporating new drawings, changes, modification, design improvements, manufacturing inputs, tooling and assembly feedbacks in 30 months.

PO acceptance is to be given within 02 weeks from the date of release of PO. Vendor has to take necessary clearances as per HAL rules within 2 weeks to start the work from the date of release of PO.

The vendor will execute the work within HAL premises at Bangalore. HAL will provide work station along with necessary software to complete the work package.

Note: This tender is applicable only for Indian Supplier. Any tender submitted by foreign vendors will not be considered for evaluation and will be liable for rejection. Quote should be submitted in INR only.

1.0 VENDOR SCOPE OF WORK: Refer Technical Requirements for providing Engineering Services for Airframe Design and Analysis of IMRH (RC/IMRH/STR/TS/001 REV A ISSUE III) (Enclosure V, 49 pages) for Sl. No. 1 TO 4 of above table & REFER Technical Requirements for providing Engineering Services for Airframe Design and Analysis of DBMRH (RC/DBMRH/STR/TS/001 REV A ISSUE II) (Enclosure VI, 48 pages) for Sl. No. 5 TO 8 of above table.

NOTE: a). The Engineering Service Provider has to take up the structural design definitions from Preliminary Design Phase and carry out Detailed Sizing, Detailed FEM, Stress Analysis, FE Modeling for Dynamic analysis, Mapping the requirements to functional models, Establishing the trace links to verification and validation requests, System Modeling, Detailed Part & assembly drawings by abiding HAL procedures. Complete list of activity is described in the detailed requirement (RC/IMRH/STR/TS/001 Rev. A Issue III) for Sl. No. 1 to 4 and (RC/DBMRH/STR/TS/001 Rev. A Issue II) for Sl. No. 5 to 8 of above table.



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b). Refer para 8 of technical requirement RC/IMRH/STR/TS/001 Rev. A Issue III, for IMRH work package schedule and RC/DBMRH/STR/TS/001 Rev. A Issue II for DBMRH work schedule.

c). Approximate 14000 drawing are expected to be released in total duration of 52 months for each package. However, final figure of drawings may vary. Order would be placed based on work package (D1 to D5) not on the actual release of drawing.

d). Detailed technical requirement will also be shared with vendors who will sign NDA.

e). Technically accepted bids will only be considered for commercial evaluation.

f). Commercial evaluation will be done on package basis. Sl. No.1 to 4 would be considered as one package and Sl. No. 5 to 8 would be considered as other package.

g). Pre-bid conference: Pre-bid conference(s) will be held against this RFQ for clarification and inputs on the tender technical requirements and commercial conditions as mentioned above. All interested bidders to take appointment for pre-bid meeting at least 3 days in advance to make necessary arrangements. Bidder has to forward the names of attendees for the pre bid meeting to the email ID: **os.rwrdc@hal-india.co.in**.

Vendors are encouraged to attend pre-bid meeting in person. Provision will be made to attend meeting through video conferencing as well. The pre-bid meeting will be held at RWRDC, HAL, Bangalore.

All interested Bidders are required to forward particulars of representatives along with details of clarifications required by them, if any through email so as to reach at least 3 working days in advance. Clarifications sought by all the Bidders will be consolidated and HAL's response on all points would be given to all the bidders of pre-bid meeting.

Preferably vendors may sign the NDA on or before the pre-bid meeting day. Vendors are encouraged to sign the NDA at the earliest. (Enclosure X, Format Enclosed). However, **01 week** would be given from the date of Pre-bid meeting to sign the NDA. Detailed technical specification to the interested vendors will be provided after signing of NDA only. The vendors who will not sign the NDA would not be considered for tender evaluation.

h> Please refer NDA clause, EMD clause, Intellectual property rights clause, Integrity pact clause, and PBG clause in commercial compliance statement.

2.0 Schedule of Deliverables: As indicated above.

Note: a).Time period taken for technical clarification and inputs, if any by HAL will not be considered under delivery.

3.0 The warranty comes into effect from the each milestone/final acceptance of the deliverables



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for the workmanship for 12 months. The warranty shall be implemented at the vendor's expense and as HAL chooses according to the company rules.

4.1 Commercial requirements

All prices payable by HAL to be given in the price format enclosed as **Enclosure –IVA & IVB** of this RFQ. It should be complete in all respects. Commercial evaluation will be based on the prices quoted indicated in the price format as per one package for Sr. no. 1 to 4 and other package for Sr. No. 5 to 8. **Reverse auction** will be followed for this tender.

4.2 Compliance to Terms & Conditions and Scope of work

Vendor needs to comply all the terms and conditions as given in the list of enclosures from I to XIII of this RFQ.

5.0 HAL's Rights

5.1 HAL reserves rights to reject any or all the bids received from vendor (s) without assigning any reason what so ever.

5.2 HAL reserves rights to foreclose or terminate the contract/ purchase order finalized based on this RFQ for reasons attributable to non-compliance of any of its terms (if not relaxed in writing) during execution of contract/ purchase order.

5.3 HAL is under no obligation by merely issuing this RFQ to pay any cost incurred in the preparation or submission of any response including technical / commercial proposals from Vendor.

5.4 Any order, resulting from the enquiry, shall be governed by the General Terms and Conditions of Contract of HAL and any party quoting against this enquiry shall be deemed to have read and understood these terms and conditions and to have quoted subject to these terms and conditions.

6.0 Validity of Prices/ Bids

All quoted prices and bids should be kept valid for a minimum period of 180 days from the closing date of tender.

7.0 Guidelines for submission of bids

Vendor should submit proposal in two bid format, (through HAL e-Procurement portal only). Following documents must be submitted as part of the bid:

7.1 Compliance Statements:

Compliance matrix confirming point-by-point compliance to all the points at Enclosure –I to III should be returned. If your quotation doesn't accompany the duly filled, it will be presumed that all the terms & conditions here above have been accepted as whole. Enclosure VII (Vendor Qualification form) & VIII (Service provider detail) also to be submitted by the vendor.

8.0 Non-compliance, if any

Vendor should indicate clearly if any non-compliance is proposed by him. It may please be noted that such non-compliance will be seen critically and may have adverse impact in qualification of the bid.

9.0 Prices as per schedule:

It should be ensured that all prices/ values payable are specified in the **Price Format**. No subsequent addition/ alteration/ claim will be entertained over and above the quote. Offers without complete information and pricing will be treated as incomplete and will not be



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considered for further evaluation. Note: All prices should be filled in the Enclosure –IVA & IVB excel sheet (blue colour cells) downloaded from e- procurement portal and same should be uploaded in the portal. **Prices should not be indicated in any other places.** Disclosure of price in any of the document attachment other than price bid will lead to summarily rejection of the offer. Excel Row height & column width can be modified.

9.1 Applicable taxes and duties, if any

Vendor needs to provide details of GST payable by HAL, if any, over the rate/ price quoted.

10.0 Evaluation process and Acceptance Criteria

10.1 Bid opening: Bid against this RFQ would be opened on same day / next working Day after due date. All interested bidders may witness the tender opening online by logging into HAL e-Procurement portal.

10.2 Commercial Evaluation

Technically accepted bids will be considered for commercial evaluation. It may be noted that the commercial evaluation would be based on the prices quoted indicated in the price format. The purchase order would be placed on the vendor, whose proposal (bid) works out to be the lowest one.

10.3 For determination of comparative prices for commercial evaluation, the following steps would be applied

- The delivery months, quantities and prices filled up in the price bid will be taken as the basis for commercial evaluation.
- Using the discount rate mentioned below, these Future Values will then be discounted to Present Values using standard DCF technique.
- The summation of the Present Values of above prices at EC 2025 level put together will be taken as the total price quoted for comparison of quotes (Not for placement of Order).
- Such prices after levelling will be compared to determine L-1, L-2, etc.

10.4 For comparative price determination as described above, the discounting rate (%) will be derived from State Bank of India's Benchmark Prime Lending Rate at the beginning of the commercial bid opening month. As an illustration, the prevailing SBI Benchmark Prime Lending Rate is 13.75% and accordingly the discounting factor will be derived as 75% of BPLR. This will be equal to 10.3%.

10.5 The prices quoted will be evaluated on RWR & DC, Bangalore basis.

11.0 INTEGRITY PACT (IP):

a. Bidders should submit hard copy of Integrity Pact (either Omnibus IP or Standalone IP), in original, duly signed by authorized signatory and witness, in a sealed envelope. Bidders should submit IP on plain bond Paper. All the pages are to be initialed by the Bidder or its authorized signatory. Formats for both Omnibus IP and Standalone IP are placed at **Enclosure-IX** of this RFQ. In case the Bidder has already signed Omnibus IP with any Division of HAL and the same is still valid, then a copy of the same can be submitted instead of signing fresh Integrity Pact.



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- b. The envelope, which contains the signed IP, should be marked as "Integrity Pact" indicating tender reference and due date and should reach us on or before the tender due date and time.
- c. Entering into IP without deviation from the specified format is preliminary qualification without which the bid is liable to be rejected without evaluation. Bidders who submit IP with deviation might at HAL's discretion be given an opportunity to submit original signed IP without deviation within stipulated time limit as decided by HAL.
- d. In respect of IP and its monitoring, there would be Independent External Monitors (IEM) who will be appointed by the Central Vigilance Commission, a statutory body in India. The present IEMs are:
- Shri Ashok Kumar Tripathy, IAS (Retd.)
E-Mail ID: tripathyak@yahoo.com
 - Shri Sunil Kumar Bansal, IPS (Retd.)
E-mail: sunilku555@gmail.com
 - Shri Chaitanya Kumar Varma, CE&MES (Retd.)
E-Mail ID: ck_varma@yahoo.co.in
- e. The signed IP will form part of the contract/purchase order, in the event of placement of order.
- f. All clarifications/query/status w.r.t tender & validity extension of tender should be forwarded to HAL only and **not to the IEM.**
- g. Query related to IP can be sent to the IEM.
- h. Signed IP in original should be forwarded to HAL only and **not to the IEM.**

12.0 Additional Information

- i) Offers received in the form of Hard copy (courier/post/dropping in tender box) / E-mail / Fax or any other mode (other than submitting online through HAL's e-Procurement portal) will not be considered and will be rejected.
- ii) Vendor should return all the documents and data supplied by HAL (if any) in reference to this RFQ, in case vendor does not want to submit bid.
- iii) HAL would be deducting at source applicable Income Tax as per Government of India Rules applicable at the time of making payments (Generally on the amounts towards Services like training, technical assistance offered by the vendor and license fees). As per the Rules, Income Tax has to be borne by the recipient of the Income and relevant Certificate to this effect will be issued to the vendor on deduction of such amounts, as applicable.
- iv) Proposal should be submitted through HAL's e-procurement portal only on or before due date and time.



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Any clarifications on the tender, you may contact:

CHIEF MANAGER, OUTSOURCING,
ROTARY WING RESEARCH & DESIGN CENTRE, HINDUSTAN
AERONAUTICS LIMITED,
P.B. NO: 1783, VIMANAPURA POST,
BANGALORE – 560 017, INDIA
TEL: 0091-80-22325357
E-mail: os.rwrdc@hal-india.com

- v) Tender Documents: The bidders should download all tender documents directly from HAL e- procurement portal (<http://eproc.hal-india.co.in> or link to e-Procurement through www.hal-india.co.in). No Tender fee is applicable.

Thanking You,

Yourfaithfully,
For Hindustan Aeronautics Ltd,

- S/d-
(Fayaz Rehman PA)

Chief Manager

Note: Bidders are advised to visit the website till the closing date of tender as all future corrigendum with regard to this tender, if any, shall be published only at HAL website / e-procurement portal and not through press advertisement.

List of Enclosure:

1. Enclosure-I: Technical compliance statement of IMRH.
2. Enclosure-II: Technical compliance statement of DBMRH.
3. Enclosure-III: Commercial Compliance statement
4. Enclosure-IVA & IVB: Price Format
5. Enclosure- V: Extract of Technical requirement of IMRH,
6. Enclosure- VI: Extract of Technical requirement of DBMRH,
7. Enclosure- VII: Vendor Qualification Form,
8. Enclosure- VIII: Service provider detail form,
9. Enclosure- IX: Format of Omnibus and standalone IP format,
10. Enclosure- X: NDA Format
11. Enclosure-XI: PBG Format
- 12 Enclosure- XII:Payment Plan
- 13 Enclosure-XIII: Check List

Tender No. SM/OS/RC/8480MIS/39/40/25/2**Engineering Service Provider Details:**

The following details shall be submitted along with RFQ response.

Sl. No.	Details /Documents	Compliance [Yes / No] or Details
1	Name of the Organization:	
	Website	
2	Name of the Contact Person:	
	Address	
	Telephone:	
	E-Mail:	
3	Year of Incorporation	
4	Type of Organization	
	a) Limited/Private Limited/ Partnership/ Proprietary/ Society/ Any other	
	b) Whether 'Foreign Equity Participation (Please give name of foreign participant and percentage thereof)	
	c) Names of Directors of the Board/Proprietors	
	d) Name and address of NRI(s), if any	
5	Category of the firm: Large/Medium/Small scale unit	
6	Address of the Registered Office:	
7	Number of Offices with addresses (Excluding Registered Office):	
	a) India	
	b) Abroad	
8	Profiles of the key resources who would participate in this work package to be furnished.	
9	Working experience from RCMA / DGCA / EASA / FAA or equivalent country specific regulatory authority or any global Aircraft / Helicopter OEM for airframe design.	
10	Under which vertical, if any, Airframe Engineering Services is administratively linked.	

* URL Links should not be provided. Figures are to be keyed in.

Tender No. SM/OS/RC/8480MIS/39/40/25/2
VENDOR QUALIFICATION

The following details shall be submitted along with RFQ response.

Sl. No.	Description of company & details	Desirable / Essential	Compliance and Reference to supporting Documents
NAME OF THE BIDDER:			
	Documentary evidences in support of capabilities of the Engineering Service Provider as per the following details: PLEASE MENTION NUMBER OF DOCUMENTS ATTACHED WITH NUMBER OF PAGE IN BELOW COMPLIANCE AFTER MENTIONING YES/NO		
1	Technical:		
(a)	Engineering Service Provider should have minimum Seven years of experience in Airframe Design and Analysis of Fixed wing or Rotary wing Aircraft with proven examples of capability and projects in Aero-structure – Design, Drafting, MBD, Analysis and Simulations (Stress, Dynamics, F&DT, Thermal, CFD, Loads, and Dynamics etc.)	Essential	
(b)	Experience working with major global Aerospace and Defence customers and Executed the Aircraft/Helicopter Design and Analysis for 2 to 3 development programs Vendor to provide documentary evidence of award of contract and proof of execution of work	Essential	
(c)	Mandates quality models and certifications • AS 9100: Latest QMS for Aerospace & Defence industry	Essential	
2	Commercial:		
(a)	The Bidder shall be a company having an average turnover of Rs.200 Crore for each of the last Three financial years ending on 31st March 2024. (a) Audited Balance sheets. (b) CA Certificate with CA's Registration number/Seal. Indicating required turnover and Profit	Essential	
(b)	Net worth (Positive) as on 31 st Mar 2024	Essential	
(c)	The Bidder shall enclose the following documents: (a) Copy of Company registration certificate issued by statutory authority (duly attested by Notary Public). (b) Copy of Memorandum and Article of Association (duly attested by Notary Public).	Essential	
(d)	Blacklisting Declaration that the bidder has not been banned or delisted by any Govt. of India or Quasi Govt. Agencies or PSUs. If banned / delisted, the fact must be clearly stated. Self-Declaration on company letterhead.	Essential	

Note: 1. Experiences of Airframe Design and Analysis only will be considered. Other projects related to Aircraft interiors, Ducting, Electrical installation and similar type will not be considered.

2. URL Links should not be provided. Figures are to be keyed in.

3. Please refer Annex 4 of Encl 1 and 2 for engineers qualification.



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PP

TENDER REF : SM/OS/RC/8480MIS/39/40/25/2

NAME OF THE BIDDER :								
SAC / HSN Code								
PARTICULARS				Unit Cost (In Rs.)	GST in %	GST Cost	Total Amount in Figures in Rupees	Total Amount in Words in Rupees
PRICE								
Sl No.	PART NUMBER	DESCRIPTION	Qty. (Lot)					
DBMRH								
5	RC/DBMRH/STR/TS/001A M1-1	REQUIREMENT CAPTURING D1	1			-	-	#NAME?
6	RC/DBMRH/STR/TS/001A M2-1	LAYOUT AND ANALYSIS D2 & D3	1			-	-	#NAME?
7	RC/DBMRH/STR/TS/001A M3-1	DETAIL DESIGN AND DWG D4	1			-	-	#NAME?
8	RC/DBMRH/STR/TS/001A M4-1	ENGINEERING CHANGE MANAGEMENT D5	1			-	-	#NAME?
Total Amount						-	-	#NAME?
NOTE : Order will be placed for Design and Analysis of Airframe for DBMRH as per technical document RC/DBMRH/STR/TS/001 Rev. A Issue II.								
1. Bidder is advised to mention their firm's name in blank space provided at right side in the " NAME OF THE BIDDER "- row.								
2. Vendor has to quote under each line item as mentioned above as per Point no. 18.5 & 18.6 of commercial compliance statement(Encl3). For Sl. No. 8, Vendor has to quote mandatory 29% of the total work package cost.								
3. Commercial evaluation will be based on the prices quoted indicated in the price format as per one package for Sr. no. 5 to 8.								
3. GST rate as applicable (can be modified).								



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ENCLOSURE-IVA

TENDER REF : SM/OS/RC/8480MIS/39/40/25/2

NAME OF THE BIDDER :								
SAC / HSN Code								
PARTICULARS								
PRICE								
Sl No.	PART NUMBER	DESCRIPTION	Qty. (Lot)	Unit Cost (In Rs.)	GST in %	GST Cost	Total Amount in Figures in Rupees	Total Amount in Words in Rupees
IMRH								
1	RC/IMRH/STR/TS/001 A M1-1	REQUIREMENT CAPTURING D1	1			-	-	#NAME?
2	RC/IMRH/STR/TS/001 A M2-1	LAYOUT AND ANALYSIS D2 & D3	1			-	-	#NAME?
3	RC/IMRH/STR/TS/001 A M3-1	DETAIL DESIGN AND DWG D4	1			-	-	#NAME?
4	RC/IMRH/STR/TS/001 A M4-1	ENGINEERING CHANGE MANAGEMENT D5	1			-	-	#NAME?
Total Amount						-	-	#NAME?

NOTE : Order will be placed for Design and Analysis of Airframe for IMRH as per technical document RC/IMRH/STR/TS/001 Rev. A Issue III.

1. Bidder is advised to mention their firm's name in blank space provided at right side in the " NAME OF THE BIDDER " - row.
2. Vendor has to quote under each line item as mentioned above as per Point no. 18.5 & 18.6 of commercial compliance statement(Encl3). For Sl. No. 4, Vendor has to quote mandatory 29% of the total work package cost.
3. Commercial evaluation will be based on the prices quoted indicated in the price format as per one package for Sr. no. 1 to 4.
3. GST rate as applicable (can be modified).

**ENGINEERING SERVICES FOR AIRFRAME DESIGN AND ANALYSIS OF IMRH & DBMRH
COMMERCIAL COMPLIANCE STATEMENT: SM/OS/RC/8480MIS/39/40/25/2**

SI No	Description	Vendor Compliance
NAME OF THE BIDDER :		
1	General condition & Procedure:	
1.1	The Broad Technical specification of Engineering services for Design and Analysis of IMRH & DBMRH Airframe shall be as per Enclosure-V & VI respectively. The detailed Technical specifications containing confidential information will be provided to the Bidders after signing a Non-Disclosure Agreement (NDA) with HAL as per format at Enclosure X. If the Bidder does not agree to any clauses in the NDA, alternative formulation of such clauses should be proposed by the Bidder. HAL reserves the right to accept or reject such proposed changes.	
1.2	Vendors are encouraged to attend pre-bid meeting in person. Provision will be made to attend meeting through video conferencing as well. The pre-bid meeting will be held at RWRDC, HAL, Bangalore.	
1.3	In Prebid meeting, HAL will explain in detail the scope of outsourcing, roles and responsibilities of HAL and the vendor, deliverables, schedules, quality standards, etc.	
1.4	Preferably vendors may sign the NDA on or before the pre-bid meeting day. Vendors are encouraged to sign the NDA at the earliest. (Enclosure X, Format Enclosed). However, 01 week would be given from the date of Pre-bid meeting to sign the NDA. Detailed technical specification to the interested vendors will be provided after signing of NDA only. The vendors who will not sign the NDA would not be considered for tender evaluation.	
1.5	Post prebid meeting, 04 weeks will be given to submit both the bids i.e. technical and commercial bids.	
1.6	After the due date, technical bid will be opened. HAL will assess the capabilities, resources and capacities of the vendors for the nature of work involved and shortlist vendors.	
1.7	Commercial bid will be opened only for the vendors who will qualify under the technical bid and vendor qualification criteria by HAL committee.	
2	To be checked while submission:	
2.1	EMD:	
2.1.1	EMD needs to be submitted by the participating bidder for Rs. 2 lac along with the bid. However, PSUs, other entities in the government sector, MSEs exempted by government policy are exempted from EMD. The organisation claiming such exemptions are to submit certified copy of GOI's authority for such exemption in lieu of EMD.	
2.1.2	EMD shall be acceptable in the form of DD/Bankers Cheque/Pay order/Bank Guarantee(including e-Bank Guarantee). DD transfer in favour of HAL-RWRDC /online transfer in Acc no. 39008027200, STATE BANK OF INDIA, IFSC Code SBIN0001114 (Refer RWRDC HAL Bank Mandate Form). If bidder is submitting EMD, as Bank Guarantee, the same is to be submitted in the form of irrevocable Bank Guarantee from the scheduled Banks valid for 28 days beyond the validity of the Bid. The EMD can also be paid through WIRE / SWIFT transfer, the proof of which shall accompany the bidder's offer.	
2.1.3	In case technical bid doesn't contain original instrument towards EMD, offer will be considered unresponsive and rejected.	
2.1.4	EMD will not carry any interest for the period it is retained with HAL. EMD will be forfeited if a tenderer withdraws, impairs, amends, and/or derogates from tender with in validity.	
2.1.5	The bidder should indicate the reference and details of submission of EMD here. EMD in the form of hard copy in original to be sent by post/courier/personal delivery to reach the RWRDC prior to the scheduled closing time of the tender. The copy of such document should attach along with the technical bid of the e-tender. In case, the EMD document doesnt reach tender issuing authority by the time of closing the tender, the offer will not be considered for evaluation.	
2.1.6	The EMD shall be refunded to the unsuccessful bidder within 15 working days in various stage of disqualification of the bid i.e., tender open stage, pre-qualification/ technical evaluation stage and identification of L-1 stage.	
2.1.7	Bank details for return of EMD:Bank details to be entered here such as Bank Name, Account no., and IFSC code. Bank Mandate form to be attached.	
2.1.8	EMD furnished by the successful bidder may be appropriated for Performance Guarantee.	
2.2	While submitting your offer, please ensure that you have responded correctly against each technical/commercial requirement. Your compliance/acceptance to each of our terms should be indicated clearly. Please refer check list (Encl XIII) while quoting.	
2.3	While submitting the quote, Vendor has to submit Vendor Qualification form as attached in Enclosure VII & Engineering service provider detail form as attached in Enclosure VIII.	
2.4	In case, few terms and conditions of HAL are not acceptable, you can propose alternate terms to these clauses. However, HAL shall not be deemed to be governed by such proposed alternate terms and conditions unless written acceptance thereof is given by HAL.	

ENGINEERING SERVICES FOR AIRFRAME DESIGN AND ANALYSIS OF IMRH & DBMRH

2.5	In case techno-commercial clarification is required, it should be obtained before submission of the quotation well in advance. No request for clarification should be included in the quotation or submitted separately after the tender due date. Such requests will not be entertained.																					
3	The Engineering Service Provider has to take up the structural design definitions from Preliminary Design Phase and carry out Detailed Sizing, Detailed FEM, Stress Analysis, FE Modeling for Dynamic analysis, Mapping the requirements to functional models, Establishing the trace links to verification and validation requests, System Modeling, Detailed Part & assembly drawings by abiding HAL procedures. Complete list of activity is described in the detailed specification (RC/IMRH/STR/TS/001 Rev. A Issue III) for Sr. No. 1 to 4 and (RC/DBMRH/STR/TS/001 Rev. A Issue II) for Sr. No.5 to 8 of RFQ.																					
4	Refer para 8 of technical specification RC/IMRH/STR/TS/001 Rev. A Issue III, for IMRH work package schedule and RC/DBMRH/STR/TS/001 Rev. A Issue II for DBMRH work schedule.																					
5	Approximate 14000 drawing are expected to be released in total duration of 52 months under each package. However, final figure of drawings may vary. Order would be placed based on work package not on the actual release of drawing. (D1 to D5).																					
5.1	Submission of drawing applicability list (DAL) along with other documents as mentioned in technical requirement document to HAL for concurrent manufacturing of GTV in 22 months. Submission of SOP along with other documents as mentioned in technical requirement document for prototype after incorporating new drawings, changes, modification, design improvements, manufacturing inputs, tooling and assembly feedbacks in 30 months. Total duration of the project is 52 months from the date of acceptance of PO.																					
6	Manpower to be deputed staggered maximum up to two shifts in a day in line with HAL policy.																					
7	To meet the project timeline vendor has to ensure the deputation of sufficient number of manpower at each stage of the deliverable. Accordingly, the minimum number of manpower required to be deputed for each work package is given below. <table border="1" data-bbox="414 846 1222 1110"> <thead> <tr> <th>IMRH</th> <th>Man power (Min) In nos.</th> <th>DBMRH</th> <th>Man power (Min) In nos.</th> </tr> </thead> <tbody> <tr> <td>D1</td> <td>10</td> <td>D1</td> <td>10</td> </tr> <tr> <td>D2+D3</td> <td>105</td> <td>D2+D3</td> <td>110</td> </tr> <tr> <td>D4</td> <td>60</td> <td>D4</td> <td>60</td> </tr> <tr> <td>D5</td> <td>20</td> <td>D5</td> <td>20</td> </tr> </tbody> </table> Vendor at its discretion needs to increase the manpower to ensure completion of work package as per prescribed milestones and timelines. Milestone payments, indicated as per Enclosure XII mentioned in clause 19 of this enclosure, will be made after the completion of the work package.	IMRH	Man power (Min) In nos.	DBMRH	Man power (Min) In nos.	D1	10	D1	10	D2+D3	105	D2+D3	110	D4	60	D4	60	D5	20	D5	20	
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D1	10	D1	10																			
D2+D3	105	D2+D3	110																			
D4	60	D4	60																			
D5	20	D5	20																			
8	If required, vendor will be asked to submit average man hour rate separately or any other relevant information.																					
9	Delivery or project time line is 52 months from the date of acceptance of PO. PO acceptance is to be given with in 02 weeks from the date of release of PO. Vendor has to take necessary clearances as per HAL rules within 2-3 weeks to start the work from the date of release of PO.																					
10	The vendor shall be permitted to utilize HAL premises, buildings, equipment, hardwares, softwares and other facilities and utilities as necessary to meet the Statement of Work(SOW). No charges shall be applied on the vendor for such utilization of HAL property/assets.																					
11	The vendor should indemnify/compensate HAL for any damage caused by vendor's personnel to HAL property and/or assets and be held accountable to ensure disciplined behavior of its personnel within HAL premises.																					
12	Vendor personnel's entry into HAL premises shall be subject to Security and verification procedures as applicable from time-to-time.																					
13	Vendor is to take out Insurance Policy on its personnel to cover risks of injury/death in connection with their engagement inside HAL premises.																					
14	The bidder shall have their own ESI & EPF Code. The bidder should upload the ESIC & PF Registration Certificate and such registration shall remain valid throughout the period of the Contract signed in relation to tender.																					

ENGINEERING SERVICES FOR AIRFRAME DESIGN AND ANALYSIS OF IMRH & DBMRH

15	The service provider shall provide the services through its uniformed and trained personnel for the performance of its services hereunder and these personnel deployed shall be employees of the service provider only. HAL shall not in any manner be liable and all statutory liabilities (such as ESI & PF etc.) shall be paid for by the Service provider. Service provider should pay salary to its employees as per government norms and contributes towards PF,ESI, insurance policy and any other statutory requirement. Declaration on the same to be given by service provider.																								
16	No request will be considered for change in terms and conditions of this tender during and after finalization of contract, which is resulted out of this tender and its subsequent execution.																								
17	Levies & Taxes: Price quoted should clearly indicate basic price, the rate at which GST and other Government levies chargeable. Claim for GST and other levies will not be entertained later. It would be assumed that rates are inclusive of levies, taxes etc.																								
18	Tender Evaluation:																								
18.1	The tender will be evaluated on package basis for RFQ Sr. no. 1 to 4 together as one package and for Sr. No. 5 to 8 together as other package. Bid with lowest price conforming to the specification/scope of work for individual package will be considered for placement of order.																								
18.2	Conditional discounts will not be considered in evaluation of tender.																								
18.3	Applicability of the Taxes should be explicitly indicated by the bidder in their response either in percentage or in absolute terms. In the absence of this input the offer would be considered all inclusive.																								
18.4	The % of distribution of estimated effort is mentioned below. Vendor has to quote in proportionate to this effort. However, for D5, Vendor has to quote mandatory 29% of the total work package cost.																								
18.5	<table border="1"> <thead> <tr> <th>IMRH</th> <th>% of Effort</th> <th>DBMRH</th> <th>% of Effort</th> </tr> </thead> <tbody> <tr> <td>D1</td> <td>0.9%</td> <td>D1</td> <td>0.9%</td> </tr> <tr> <td>D2</td> <td>11.5%</td> <td>D2</td> <td>12.7%</td> </tr> <tr> <td>D3</td> <td>26.2%</td> <td>D3</td> <td>25.7%</td> </tr> <tr> <td>D4</td> <td>32.8%</td> <td>D4</td> <td>32.2%</td> </tr> <tr> <td>D5</td> <td>28.6%</td> <td>D5</td> <td>28.5%</td> </tr> </tbody> </table>	IMRH	% of Effort	DBMRH	% of Effort	D1	0.9%	D1	0.9%	D2	11.5%	D2	12.7%	D3	26.2%	D3	25.7%	D4	32.8%	D4	32.2%	D5	28.6%	D5	28.5%
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18.6	For determination of comparative prices for commercial evaluation, the following steps would be applied <ul style="list-style-type: none"> The delivery months, quantities and prices filled up in the price bid will be taken as the basis for commercial evaluation. Using the discount rate mentioned below, these Future Values will then be discounted to Present Values using standard DCF technique. The summation of the Present Values of above prices at EC 2025 level put together will be taken as the total price quoted for comparison of quotes (Not for placement of Order). Such prices after levelling will be compared to determine L-1, L-2, etc. 																								
18.7	For comparative price determination as described above, the discounting rate (%) will be derived from State Bank of India's Benchmark Prime Lending Rate at the beginning of the commercial bid opening month. As an illustration, the prevailing SBI Benchmark Prime Lending Rate is 13.75% and accordingly the discounting factor will be derived as 75% of BPLR. This will be equal to 10.3%.																								
19	Payment Terms: The Service Provider shall be eligible to claim payment as per payment plan mentioned in Enclosure XII. All the claims submitted by the Service Provider should be in compliance to the terms and conditions and to be submitted along with requisite documents approved by Project technical monitoring committee(PTMC). Incomplete and non-complying claims shall be liable for rejection. The Consolidated Cleared / certified bills payment will be made only by ECS/ RTGS/any latest mode. Applicable Income Tax and TDS on GST shall be deducted at source while making payment. Tax deduction certificate to this effect will be issued on request.																								
20	Please specify your GSTIN code and enclose copy of documents.																								
21	Please confirm whether your company is registered with NSIC (National Small Industries Corporation)/MSME. If so, a. please enclose the NSIC/MSME registration certificate b. also, please mention supplier type (i) SC/ST/OTHERS (ii) Man/Woman owned. In respect of MSME, Govt. Policy shall be applicable as amended from time to time.																								
22	Others a) Quotation should be free from correction, over-writing, using correcting fluid etc. b) HAL is not bound to accept the lowest or any quotation and reserves the right of accepting the whole or any part of the quotation or part of the quantity offered and bidder must supply the same at the rate quoted.																								

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23	Liquidated Damages / Penalty: In the event that any supply is delivered beyond the agreed schedules, liquidated damages will be payable / deducted from Invoice equal to 0.5% for every week or part thereof on the unexecuted portion of the order subject to a maximum of five percent (5%) of the delayed Supplies & Services. HAL has a right to reject the deliveries and cancel the order without financial implications in case of delay in delivery not matching programmed schedules.	
24	INTEGRITY PACT (IP)	
24.1	Vendors should submit hard copy of Integrity Pact (either Omnibus IP or Standalone IP), in original, duly signed by authorized signatory and witness, in a sealed envelope. Vendors should submit IP on plain bond Paper. All the pages are to be initialed by the Vendor or its authorized signatory. The integrity pact as per HAL format is to be signed and included in the bid document. The Formats for both Omnibus IP and Standalone IP are placed at Enclosure-IX of this RFQ. In case the Vendor has already signed Omnibus IP with any Division of HAL and the same is still valid, then a copy of the same can be submitted instead of signing fresh Integrity Pact.	
24.2	The envelope, which contains the signed IP, should be marked as “Integrity Pact” indicating tender reference and due date and should reach us at the following address on or before the tender due date and time: Deputy General Manager (OS)-RC, Rotary Wing Research & Design Centre, Hindustan Aeronautics Ltd. Vimanapura Post, Bangalore-560017, Ph :+91 80 2232 5357 Or Alternatively the sealed cover with tender reference and due date containing the signed Integrity pact should be dropped in the tender box (Rotary Wing Research and Design Centre) kept at Reception (VIP Gate of RWRDC& Production division) on or before the tender due date and time specified in tender. HAL will not be responsible for any transit/postal delay or delay due to any other reasons in receipt of hard copy of original signed IP. A copy of signed IP should also be scanned and attached with your technical bid, which has to be submitted online through e-Procurement portal.	
24.3	Entering into integrity pact without deviation from the specified format is preliminary qualification without which the bid is liable to be rejected without evaluation. Bidders who submit IP with deviation might at HAL’s discretion be given an opportunity to submit original signed IP without deviation within stipulated time limit as decided by HAL	
24.4	The signed IP will form part of the contract/purchase order, in the event of placement of order	
24.5	All clarifications/query/status w.r.t tender & validity extension of tender should be forwarded to HAL only and not to the IEM except query related to IP	
24.6	Signed IP in original should not be forwarded to the IEM.	
25	Intellectual Property(IP) Rights:	
25.1	Vendor agrees that HAL shall be the sole owner of all Intellectual Property (IP) generated in the performance of this Contract by or on behalf of the Vendor with the aid of either funding and/or technical inputs from HAL (hereinafter referred to as 'Foreground IP'). To the extent that Vendor's sub-contractors perform any part of the Contract, the Vendor shall ensure that any Foreground IP arising from such work shall be assigned to HAL. Vendor shall share with HAL all documentation necessary for HAL to exercise its rights to Foreground IP. If required by HAL, Vendor shall assist HAL in registering the Foreground IP in favour of HAL.	
25.2	Vendor grants to HAL an irrevocable, non-exclusive, world-wide, royalty-free license to sell, offer for sale, use, and distribute HAL Products incorporating the item(s) supplied by the vendor under this Order which item(s) may contain Background IP of the vendor. Background IP shall mean and include all pre-existing inventions and IP necessary for HAL to exercise its rights to Foreground IP.	
25.3	Vendor shall indemnify and protect, at its own cost, HAL in respect of cost/claims/ liabilities (including attorney's fees and associated costs of legal proceedings) arising from any violation of Intellectual Property Rights of any third party with respect to Supplies/Services provided by the vendor. If HAL or HAL's customer/s are unable to put to use the Supplies/Services or a portion thereof as a result of violation of the Intellectual Property of any third party, the vendor shall within reasonable time at vendor's own cost either, (i) Procure for HAL and HAL's Customer/s the right to continue using the Supply/Service or, (ii) Replace or modify the Supplies/Services so that it becomes non-infringing or, (iii) Compensate HAL for the damages suffered by HAL arising due to inability to put to use the supplies/services or a portion thereof.	

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25.4	In case the supplier receives a requirement/ request for supply or repair of deliverables of this contract directly from any third party including HAL's customers, such request shall be forwarded to HAL.	
25.5	Intellectual Property for the purpose of this clause includes inventions, discoveries and improvements; know-how, works of authorship, technical data, drawings, specifications, process information, reports and documented information; and computer software (including without limitation, source code, object code, source code listings and object code listings that would enable the software to be reproduced or recreated), topology of integrated circuits, databases or any other such results of intellectual activity.	
26	Performance Bank Guarantee: The services provided shall be free from any defects/poor designing and analysis and shall be guaranteed for Quality/satisfactory performance for a period of 12 months from date of each milestone/final acceptance by HAL. Any defect or deviations or shortfall against the Technical Specifications of the item Warranty period shall be rectified by the Vendor at its own cost. HAL at its option may insist on the vendor furnishing a Performance Bank Guarantee (PBG) for 10% of the value of the milestone to cover HAL's risks during the Warranty period. Such PBG in HAL's format(Enclosure XI) should be valid till 60 days after the last item is delivered. Post the Warranty period or post the expiry of the PBG as applicable, any rework or rectification to address defects noticed should be undertaken by the vendor on mutually agreed terms.	
27	Firm prices : The contract prices as mutually agreed will be firm and fixed as per contract terms till execution of contract and exclude subsequent claims or price increases of any kind. Tenderers should clearly mention whether the prices hold good when the full quantity of enquiry is not ordered but only a part of it. Unless otherwise mentioned, it would be assumed that the rates hold good even when lesser quantities than those enquired of are ordered. Any increase in prices at a later date for ordering lesser quantities will not be agreed to.	
28	Arbitration: Any dispute/disagreement or question arising out of this contract which cannot be settled in an amicable way between the contracting parties, shall be settled by Arbitration. The Arbitration shall be conducted in accordance with the rules of conciliation and Arbitration of Indian Council of Arbitration. The venue of arbitration shall be BANGALORE, INDIA. The language of arbitration shall be English only.	
29	<u>Work & Payment During Arbitration.</u> Work under the contract shall if reasonably possible continue by mutual agreement during the arbitration proceedings and no payment due to or payable by HAL will be withheld without reasonable cause and merely on account of the pendency of such proceedings.	

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30	<p><u>Agent/Agency Commission:</u></p> <p>The seller confirms and declares to the buyer that the seller is the original manufacturer or authorized distributor/stockist of original manufacturer or Govt. Sponsored/ Designated Export Agencies (applicable in case of countries where domestic laws do not permit direct export by OEMS) of the stores referred to in this offer/contract/Purchase order and has not engaged any individual or firm, whether Indian or Foreign whatsoever, to intercede, facilitate or in any way to recommend to Buyer or any of its functionaries, whether officially or unofficially, to the award of the contract/purchase order to the Seller; nor has any amount been paid, promised or intended to be paid to any such individual or firm in respect of any such intercession, facilitation or recommendation. The Seller agrees that if it is established at any time to the satisfaction of the Buyer that the present declaration is in any way incorrect or if at a later stage it is discovered by the Buyer that the Seller has engaged any such individual/firm, and paid or intended to pay any amount, gift, reward, fees, commission or consideration to such person, party, firm or institution, whether before or after the signing of this contract/purchase order, the Seller will be liable to refund that amount to the Buyer. The Seller will also be debarred from participating in any RFQ/Tender for new projects/program with Buyer for a minimum period of five years. The Buyer will also have a right to consider cancellation of the Contract/ Purchase order either wholly or in part, without any entitlement or compensation to the Seller who shall in such event be liable to refund all payments made by the Buyer in terms of the Contract / Purchase order along with interest at the rate of 2% per annum above LIBOR (London Inter-Bank Offer Rate) (for foreign vendors) and Base Rate of SBI (State Bank of India) plus 2% (for Indian vendors). The Buyer will also have the right to recover any such amount from any contracts/ Purchase order concluded earlier with Buyer.</p>	
31	<p><u>Non Involvement of any agent and Middleman:</u></p> <p>Offers and all correspondence/communications should be addressed directly to HAL.</p> <p>No involvement of agents or Middlemen in India or other countries in any capacity whatsoever is permitted at any stage in relation with this tender and the resultant contract. Vendors should specifically indicate if any of their office or contacts exists in India or abroad providing the details and extent of the activities handled by them and provide the details of the employees, address of the office/location, phone and fax numbers etc.</p> <p>Please note than no agency commission/fee/service charge should be payable to any agent/middleman for promoting this tender. Non-compliance, as of now or in future would entitle HAL to take appropriate action as deemed fit.</p> <p>No Agent/Agents or Third Party/Parties are engaged by HAL in the process of procurement of any materials for HAL. HAL is also not responsible for any person/firm expressing or pretending to express himself/herself/themselves to be the agent or third party representing HAL in the process of procurement of the materials. It is advised to communicate directly with HAL representative who is signatory to this document.</p> <p>Any order, resulting from the enquiry, shall be governed by the General Terms and Conditions of Contract of HAL and any party quoting against this enquiry shall be deemed to have read and understood these terms and conditions and to have quoted subject to these terms and conditions</p> <p>Note: Please note if it is subsequently proved/found that such a commission, fee or service charge has been paid, contrary to the foregoing, HAL shall be entitled to terminate this contract forthwith, recover from vendor an amount equal to the commission, fees or any such charge proved to have been paid not limiting to other actions as deemed fit. If any intent/incidence of agency commission is noticed or made known to HAL during evaluation process of the bids about any vendor, HAL reserves right to disqualify the bid, forfeit all payments and take any other action as deemed fit against the concerned vendor.</p>	
32	<p><u>Immunity to Government of India:</u></p> <p>It is expressly understood and agreed by and between supplier & purchaser that purchaser is entering into this contract solely on its own behalf and not on behalf of any other person or entity. In particular, it is expressly understood and agreed that Government of India is not a party to this contract and has no liabilities, obligations or right hereunder.</p> <p>It is expressly understood and agreed that purchaser is an independent legal entity with power and authority to enter into contracts solely on its own behalf under the applicable laws of India and general principles contract law. Supplier expressly agreed acknowledges and understand that purchaser is not an agent, representative or delegate to the Government of India. It is further agreed and understood that Government of India is not and shall not be liable for any acts, omissions, commissions, breaches or other wrongs arising out of the contract. Accordingly, supplier hereby expressly waives releases and foregoes any and all actions, including counterclaims, impleader claims or counter claims against the Government of India arising out of this contract and covenants as to any manner, claim, cause or action or whatsoever arising out of or under this contract.</p>	
33	<p><u>Confidentiality (in case of entry into RWR&DC):</u></p>	

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	<p>a) Only the authorized persons as nominated by the Vendor (after contract finalization) would have access to enter inside RWRDC-user department/other location where services to be rendered.</p> <p>b) Restriction on Movement : The Engineers deputed by the Vendor should restrict their movement to respective work area only. In case if any Engineer is required to visit other areas/places within RWRDC/Helicopter Complex, he/she should obtain written permission from the competent authority. Any Engineer, if noticed at a place other than work area/canteen would be sent back and would not be henceforth allowed to work at RWRDC.</p> <p>c) Bringing in Data Storage or Transmitting Devices: Engineers deputed by the Vendor are not permitted to bring in any data storage or data transmitting devices including mobile phones. Any Engineer, if noticed not complying to this requirement would be sent back immediately and would not be henceforth allowed to work at RWRDC.</p> <p>d) All security rules/regulations as per HAL policy should be adhered to while carrying out services.</p>	
34	<p><u>Indemnity</u> The Vendor shall at all times indemnify HAL against all claims which may be made in respect of stores/services for infringement of any right protected by patent, registration of design or trade mark and shall take risk of accidents or damage which causes a failure of the supply/services. Vendor should also indemnify HAL against all types of claims from its engineers assigned on work packages.</p>	
35	<p>All persons employed/contractual basis by the contractor shall be engaged by him as his own employees / workers in all respects and all rights and liabilities under the India Factories Act, or the Employees Compensation Act and Employees Provident Fund & Misc. Provisions Act, or any other similar applicable enactments in respect of all such personnel shall exclusively be that of the contractor.</p>	
36	<p>Service Provider is advised to comply with the instruction issued by Government of India, Ministry of Labour and Employment, Chief Labour Commissioner etc. from time to time regarding mode of payment of wages to workers.</p>	
37	<p><u>Injury/Causality:</u> HAL will not be responsible for any injury/causality to your personnel while carrying out related services as part of contract. You should ensure adequate safety precautions and comply with statutory requirements. No claims for compensation will be considered.</p>	
38	<p><u>Loss/Damage to property of HAL & adherence to HAL's rules</u> The liability of compensation to HAL in event of any loss/damage to the property of HAL caused by your personnel while carrying out services rests with Vendor. HAL's decision is final and binding on both the parties in this regard.</p>	
39	<p><u>Short Closure of Contract</u> HAL reserves the right to short close the contract finalized based on this RFQ with one month prior notice to the vendor at any time during the tenure of the contract. The liabilities, if any, shall be mutually discussed and proportionately agreed.</p>	
40	<p><u>Termination of Contract</u> In the event of HAL RWRDC Division not being satisfied with the performance of the Vendor for any reason including breach of contract, or for HAL's own convenience, HAL RWRDC Division shall be entitled to terminate the Order/contract, after giving 30 days' notice in writing to the Vendor by registered post. In case of a termination for convenience of HAL, the compensation payable to the vendor shall be worked out on a fair and equitable basis and then agreed mutually through negotiation. In case the termination is warranted for reasons entirely attributable to the vendor, no compensation shall be payable, but HAL shall be entitled to claim remedies as available under the present order. Further, upon termination, the Vendor shall ensure the following at its own expense and within 30 days after the termination is formally completed.</p>	
40.1	<p>All the materials supplied by HAL, except what is allocable on a pro rata basis to the deliveries completed before the date of receipt of the Notice of Termination, to be returned to HAL.</p>	
40.2	<p>All the other assets supplied by HAL or completed by the vendor using HAL funds to be returned to HAL.</p>	
40.3	<p>All the documents (in soft and hard copies) supplied by HAL to be returned to HAL.</p>	
40.4	<p>All spare copies of documents, soft copies in vendor IT system to be permanently erased/destroyed.</p>	
40.5	<p>For enabling HAL to make alternative arrangements for supply of the items, the vendor shall transfer drawings, documents, process sheets, methodology, etc. to HAL including IP rights (if involved) for use by HAL. In case the termination is for HAL's convenience, the parties will negotiate the terms of such transfer.</p>	
40.6	<p>In case the vendor has sub-contracted a portion of its scope of work, all of the above stipulations to be understood to include the materials, documents, etc. issued to/available with the sub-contractors of the vendor also.</p>	
41	<p><u>Applicable law and interpretation</u> The contract shall be governed by and interpreted in all respects in accordance with the laws of INDIA. The venue of arbitration shall be Bangalore, India.</p>	
42	<p><u>Language:</u></p>	

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	All correspondence between the parties, as well as all documentation, manuals, software listings and other writings, in connection with this Contract shall be in the English language only.	
43	<p>Bribes & Gifts</p> <p>Any bribe, commission, gift or advantage given, promised or offered by or on behalf of the contractor or his parties, agent or servant or any one on his or their behalf to any officer, servant, representative of HAL or any person on his or their behalf in relation to the obtaining or to the execution of this or any other contract with HAL shall in addition to any criminal liability which the contractor may incur, subject the contractor to the cancellation of this and all other contracts with HAL and also to payment of any loss or damage resulting from any such cancellation. Any question or dispute as to the commission of any offence under the present clause shall be settled by HAL in such manner and on such evidence or information as they may think fit and sufficient and their decision shall be final and conclusive.</p>	
44	<p>Relationship of the parties</p> <p>It is understood that each party is an independent entity and that all persons engaged in the work under the contract that are supplied by the either party shall not be employees of the other party in any sense.</p> <p>It is further agreed that neither party shall have the right to act as the agent or legal representative of the other party, or to bind the other party in any respect whatsoever, or to incur any debts or liabilities in the name or on behalf of the other party.</p>	
45	<p>Non Assignment to Third Party:</p> <p>Vendor shall not be entitled without HAL's prior written consent to assign or transfer to a third party all or part of the benefils or obligations of this contract.</p>	
46	<p>Insolvency:</p> <p>If vendor:</p> <p>a) enters into liquidation, whether compulsory or voluntary (otherwise than for amalgamation or re-construction), or</p> <p>b) becomes insolvent, or</p> <p>c) has a Receiver appointed by their respective Governmental law for the whole or parts of its asset,</p> <p>Vendor shall forthwith notify the same to HAL and HAL shall have the right, without prejudice to its other rights or remedies herein, to terminate the unexecuted part of the Contract as per Termination Clause.</p> <p>In such event, HAL shall become entitled forthwith to the refund of the all the advance payments received by vendor for that part of its obligations under the Contract that has not been fulfilled.</p>	
47	<p>Fall Clause:</p> <p>The price quoted shall be in no event exceed the lowest price at which the Vendor sells the stores or offer to sell stores of identical description to any person(s)/organization including the purchaser of any Department of the Govt. of India for any Department of the State Govt. or any statutory undertaking of the Govt. of India/State Govt., as the case may be during the period till the completion of the performance of the order placed and during currency of the order.</p> <p>If at any time during the said period, the Vendor reduces the sales price, sells or offers to sell such stores to any person(s)/organization including the purchaser or any Department of Govt. of India or State Govt. and any statutory undertaking of the Govt. of India/State Govt. as the case may be, at a price lower than the price chargeable in the order, Vendor shall forthwith notify such reduction/sales or offer to sale to HAL, and the price payable in the order for the stores supplies after date of coming into force such reduction or sale or offer to sale shall stand correspondingly reduced.</p>	

ENGINEERING SERVICES FOR AIRFRAME DESIGN AND ANALYSIS OF IMRH & DBMRH

48	<p>Risk Purchase Clause:</p> <p>In case the vendor fails to deliver items as per the specifications, scope, quality or schedules as per the Order, the vendor shall compensate HAL for the additional costs incurred by HAL in arranging for the supplies which are in default. Prior to invoking this clause, HAL will issue a Notice stating its intention to go ahead with alternative arrangements and the obligations of the vendor. In case a resolution to the issue is not proposed by the vendor within 15 days or if that proposal is unacceptable, HAL will initiate action to Short-Close or Terminate the Order and go ahead with making alternative arrangements including prospecting other vendors. In this case, the vendor shall be liable to pay HAL the difference between the price at which such alternate arrangement will be made and the price as per the Order/Contract with the vendor for the items undelivered or delivered with non-compliances. This is in addition to other claims and remedies available to HAL including the imposition of Liquidated Damages.</p>	
49	<p>Exit Clause:</p> <p>I. The contract/order may be terminated under the following circumstances:</p> <p>a. In the event of unsatisfactory performance by the vendor during the contract period, or any of the information provided by the supplier is found to be untrue, or supplier is found to have attempted to influence any person involved with the contract through unethical means, the contract shall be terminated with 3 month's advance notice without any financial implication to HAL. Notwithstanding the foregoing, in cases where it is found that a supplier is engaged in unethical practices, the same shall be barred from participating in the future contracts for a minimum period of 2 years and revocation of banning orders is subject to HAL's discretion.</p> <p>b. If there is change in the Customer requirement, contract shall be terminated with 3 month's advance notice. The liability of HAL in this case will be agreed mutually.</p> <p>c. The supplier is declared bankrupt or becomes insolvent.</p> <p>d. The delivery of material is delayed due to causes of Force Majeure by more than 6 months.</p> <p>e. Based on the decision of the Arbitration Tribunal.</p> <p>II. In the event of termination of contract by either party the supplier shall ensure the following:</p> <p>a. IPRs are transferred to HAL to enable HAL to proceed on the work with other suppliers. Suppliers also will render all assistance till the other suppliers fully take over the balance work.</p> <p>b. Transfer title and deliver all or any part thereof of the supplies, materials, work-in-process, finished Products, Tooling, drawings and data produced or acquired by vendor specifically for the Product being terminated.</p>	
50	<p>Limitation of Liability : Except in cases of criminal negligence or wilful misconduct, the aggregate liability of the Vendor to the HAL, whether under the contract, in tort or otherwise, shall not exceed the total or 100% of the Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Vendor to indemnify the HAL concerning IPR infringement.</p>	
51	<p>HAL is registered on TReDS platform (Trade Receivables Discounting Systems), as being promoted by Gol directive. It is suggested that all the MSME vendors to take note of the same and consider for registering on any TReDS platform and avail the platform services which is being made available as per the Government initiative.</p>	
52	<p>All the above terms are General Terms and Conditions. In case of any ambiguity with reference to terms in the Scope of Work, the terms in the Scope of Work will supersede and will be applicable.</p>	

TECHNICAL COMPLIANCE DESIGN AND ANALYSIS OF DBMRH AIRFRAME**(Tender No. SM/OS/RC/8480MIS/39/40/25/2)**

Note: Vendors must fill up the technical compliance column below, clearly mentioning Yes/No/Remarks, and submit along with the quotation.

Sl. no. of Tech req	Description	Essential/ Desirable	Vendor's compliance
NAME OF THE BIDDER :			
5	Details of Activities by Engineering Service Provider	Essential	
	The Engineering Service Provider is required to carry out the activities mentioned in Para 5.1[D1] to Para 5.5[D5]. Deliverables for each stage are indicated in Para 7 of this document. However, the Engineering Service Provider required to carry out additional activities which arise during detail design stage to achieve complete design and development. Comprehensive Presentation material of global standards for internal reviews, users, certification agencies and CDR Review as required by HAL at all stages of deliverables to be provided.		
5.1	Preliminary Analysis and Methodology Documents (D1)	Essential	
i.	Familiarization of configuration of H/C and interaction with peer design and analysis groups of RWRDC to get information and clarifications on the inputs provided.		
ii.	Methodology of Drawing and Model making.		
iii.	Methodology of FE modelling for stress analysis of full airframe and detailed airframe sub assembly modules.		
iv.	Finite Element Modelling and analysis aspects.		
v.	Estimation methodology for structural component loads from FEM analysis including extraction of loads for sub modelling.		
vi.	Validation and Verification methodology for FEM & FEA.		
vii.	Analytical methods (SOM) for stress calculations		
viii.	Methods (SOM / Hand Calculations).		
ix.	Estimation of structural component loads from FEM analysis		
x.	Static, Fatigue, Crash and Damage Analysis Methodology documentations.		
xi.	Methodology of FE modelling for Dynamic analysis of full airframe and detailed airframe modules.		
xii.	Assessment and acceptance of inputs from peer groups of RWRDC.		
5.2	3D CAD Layout for interference and integration Check (D2)		
i.	Determining the part thickness with inputs from detailed loads, required factor of safety, suitable material and its processes.		
ii.	Material selection and assignment to 3D CAD Models from the standard approved material list provided by HAL.		
iii.	Define the 3D parts considering comprehensive manufacturing and assembly procedures (DFMA) following industry best practices. The 3D modelling methodology to be followed as per manuals provided.		
iv.	Creation of Reference sets for using in different assembly configurations.		
v.	Assembly design has to be done considering tooling (jigs and fixtures) requirements, ease of assembly and access clearances for maintenance personnel.		

vii.	The stress analysis shall cover static, fatigue, crash and damage tolerance requirements specified by DEFSTAN00-970/FAR 29amdt.59/ CS29and associated Advisory Circulars. The simulation results are to be supported by hand calculations / industry standard analytical procedures, as applicable.	
viii.	Prepare stress reports in RWRDC/Global best practices for the detail design phase for CDR. Format will be mutually agreed by RWRDC and Service provider.	
ix.	Prepare reports of FEM for Stress analysis indicating number of elements, Type of elements used, Sectional details and Materials to be mentioned.	
x.	Develop full airframe FE model including the LRUs idealized by lumped masses and inertia at their CG location to carry out dynamic analysis.	
xi.	Develop Detailed FE models (DFEM) of separate airframe modules to carry out dynamic analysis as listed in Anr	
xii.	Engineering service provider should submit the FE model with detailed report of input file for carrying out the Dynamic analysis by HAL subsequently.	
xiii.	Prepare Dynamic FE model reports of the full airframeand for major assemblies/installations in RWRDC format. The reports should include: detail modelling approach, idealisation considered, Material properties of metallic and composite materials, component dimensions and locations, sectional properties, mass, CG and Inertia details of LRUs/components idealized by concentrated masses.	Essential
xiv.	Documentation Support to Test plan for certification.	
xv.	Comprehensive Presentation material of global standards for internal, users, certification agencies and CDR Review	
xvi.	The complexity level of FEM and FEA can be classified as Basic, Intermediate and Advanced. Percentage distribution of these analysis are envisaged in the order of 20% (Basic), 60% (Intermediate) and 20 % (Advanced). However, target should be the completion of entire Airframe Analysis and progress to the next stages of design.	
	All design issues are to be resolved concurrently as the Engineering Service Provider progresses and completes activities listed in D1, D2 and D3. After acceptance of 3D CAD detail design and layout for Interface Arrangement by HAL, the Engineering Service Provider can proceed with generation of detailed 3D CAD Models with MBD, 2D part drawings, DRN, BOM, Loft etc.	
	The 3D CAD Layout for Interface Arrangement to contain the assembled views of ribs or frames along with skins, stringers, access doors, brackets, clips, system interface components with major dimensions embedded in CAD Model itself.	
	The purpose of Interface arrangement 3D CAD Layout is for checking the assembly clearances between a) the parts b) parts and fasteners and c) Airframe and other LRUs.	
	The same layout will be used for planning the Jig Design and subsequent manufacturing activities. Review of this Interface Clearance arrangement Layout is from the start of the project on a weekly basis. This activity should be completed before CDR to facilitate the release of part drawings after CDR.	
	All the stress reports and design documents to be complied to relevant standards (FAR/DEFSTAN etc) in co-ordination with Airworthiness group of RWR&DC.	
5.4	Detailed 3D CAD Models, MBD, Drawing and Associated Attribute forms (D4)	
i.	Updating of CAD/FEM/FEA and all analysis reports based on CDR and configuration freeze.	
ii.	Parametric 3D CAD Models of all structural members considering the form, fit and function in the current NX Software version as that of RWRDCin metric units and in helicopter coordinate system using the seed part from PLM environment.	
iii.	Assigning material to detailed CAD Models and computing the weight and cg data for proper rolling up of data.	

ii.	Check for suppressed feature, unused sketches and unwanted parasolids in the CAD model and remove these features unless it is retained for future use.		
iii.	For each 3D CAD geometry of component, “Model” and “Solid” reference set (containing required bodies only) and for each assembly CAD file “Assembly”, “Model” and “Solid” reference set (containing required components and Parasolid bodies) to be created for ease of assembly.		
iv.	Wherever drawing calls for LH shown, RH opposite, model to be made for both LH & RH part with parameters. There should not be any connectivity (feature wise) between LH & RH part.		
v.	Use of Assembly mirror option for mirror part or mirror body option is not acceptable.		
vi.	Use Analysis-Examine Geometry to check for tiny/misaligned objects, intersections/sheet boundaries/tolerances.		
vii.	Do run the Edit-Feature–Playback Option to know update failure of features of part file.		
viii.	Check for the correct material/Density has been selected for modeling – as per the Material specification.		
ix.	Use of Boolean operations should be avoided as much as possible, except unavoidable.		
5.5	Engineering Change Management (D5)		
	<p>The work package also includes the engineering change management from the Engineering Service Provider to update CAD and FE models, drawings, BOM, DAL resulting due to manufacturing / design issues during component manufacturing and assembly (non – conformity support), New or Change in inputs from Cross functional design groups, Inputs from Jig Fixture Design (to resolve interface issues with tool design team of HAL) ground test (to resolve design issues of component) and flight test (non – conformity support). Preparation of ground test synthesis reports for structural components (refer ANNEXURE-II of technical requirement).</p>		Essential
	<p>During manufacturing and assembly, Design improvement and revisions are expected mainly on 3D models, drawings, and documents. It is to be noted that total number of drawings that undergoes changes depends on the number of Engineering change requests raised on the deliverables of D2 to D4. These are broadly classified as resolution for (i) Design Change Requests (ii) Production Queries (PQ) & Shop Queries (SQ) (iii) Snags (iv) Material Substitution Requests (MSR) etc. The support team should bring in the execution knowledge of the previous milestones and update the Models, Drawings, Analysis and other supporting documents.</p>		
	<p>Additional requirements from users, associated system groups, new design requirements to be considered during this phase. The classification of complexity level of detail CAD models and equivalent drawing sheet size to be considered as mentioned in D4.</p>		
	<p>It is to be noted that sufficient manpower to be accounted for carrying out the activities during this phase for the number of changes that can come over the completed design during the previous milestones. However, based on experience from previous projects, it is assumed that around 40% of peak man-hour requirement during D2 to D4 phase should be deployed during the initial period of D5 phase. It is estimated that an approximate 40% of drawings that is finalised during D4 stage will undergo changes. It includes efforts needed for making 3D Models, drawings and its associated analysis and documentations. Here, It should be noted that, the Design changes, New inputs, PQ's, Snags, testing inputs, synthesis of ground test and design support to fabrication activities are to be considered as part of activities during D5.</p>		
6	Software Tools to be used for Execution: The following software will be provided for the activities mentioned		
Sl. No	Software	Major Activities	
1	Teamcenter 12.4 & above (match with the versions being used by RWRDC)	PLM, System Modelling, Requirement Mapping, Attribute Forms etc.	

2	NX 1926 & above(match with the versions being used by RWRDC)	Modelling with MBD, Drawing, Loft, Sequence, Explosion, Requirement Validation etc.	
3	Hyper-works, MSC Patran	FEA Pre/Post Processor	
4	MSC NASTRAN,HyperWorks (Optistruct), LS-DYNA,Abaqus, MSC Adams.	FEA (Solvers)	
5	HyperWorks (Optistruct),MSC NASTRAN (embedded Fatigue) / FRANC 3D / NASGRO	F&DT Analysis	
6	MS Office 2021 or latest Word, Excel, PowerPoint. Adobe Acrobat Reader, etc.	Documentation	
	Note: Any additional software required apart from above list for completion of work package, will be at the discretion of HAL		
7	Deliverables The Deliverables for work package are as below:		
	Deliverables	Delivery Format	
1	Primary Analysis and Methodology documents as indicated in Para 5.1 (D1)		
i.	Methodology of FE modelling for stress analysis of full airframe and detailed airframe modules.	Word Document in RWRDC template(.docx)	Essential
ii.	Estimation methodology for structural component loads from FEM analysis including extraction of loads for sub modelling.	Word Document in RWRDC template(.docx)	
iii.	Analytical Methods (SOM) for stress Calculations	Word Document in RWRDC template(.docx)	
iv.	Validation and verification Methodology Report for FEM & FEA	Word Document in RWRDC template(.docx)	
v.	Static, Fatigue, Crash and Damage analysis methodology documentations	Word Document in RWRDC template(.docx)	
vi.	FE modelling Methodology for Dynamic analysis	Word Document in RWRDC template(.docx)	
vii.	Technical Report formats (e.g.: Stress reports, Test Reports, Test Orders etc.)	Word Document in RWRDC template(.docx)	
viii.	Presentation material for Reviews	Microsoft Power Point (.pptx)	
2	3D CAD Layout for interference and integration Check as indicated in para 5.2 (D2)		
i.	3D CAD Layout for Interface Arrangement	NX (.prt)	
ii.	Primary Weight Estimation	Excel (.xlsx)	
iii.	Material Stock Size approximation with form classification	Excel (.xlsx)	
iv.	Initial System Model and Physical Mechanical architecture	Teamcenter	
v.	Presentation material for Reviews	Microsoft Power Point (.pptx)	
	Detailed Analysis as indicated in para 5.3 (D3)		
i.	Validation Report for FEM & FEA	Word Document in RWRDC template(.docx)	
ii.	For Stress Analysis:	Hypermesh ,PatranFE Models (*.hm,*.db), Input data in NASTRAN , Optistruct and LS-DYNA format, Abaqus, Nasgro and Franc 3D files (*.DAT /	

	All FEM, FEA and analysis results including full airframe static model and input files towards finalization of detail drawings	*.BDF/*.FEM/*.key,etc) and output data in MSC NASTRAN Optistruct and LS-DYNA format (*.F06, *.PCH, *.OP2, H3D, *.d3plot) etc.	Essential	
iii.	For Dynamic analysis: DFEM / local FE models (Refer Annexure II of technical re Full airframe dynamic model (input files)	Hypermesh FE Models (*.HM), Input data in NASTRAN format (*.DAT / *.BDF) and output data in MSC NASTRAN format (*.F06, *.PCH, *.OP2, H3D).		
iv.	Dynamic and stress FEM reports as per the scope of this work package containing respective assembly / parts / attachments. The FEM should include meshed model with material properties, component dimensions and locations, sectional properties, mass, CG and Inertia details of LRUs.	Soft copy of Word Documents in RWRDC template and 2 sets of printed copy of the report		
v.	Technical Reports as per the scope of this work package containing respective assembly / parts / attachments. (eg: Stress Reports, Test Orders etc.)	Soft copy of Word Documents in RWRDC template and 2 sets of printed copy of the report		
vi.	List of all associated FE reports, stress analysis reports, Dynamic FEM reports and the corresponding FE models and CAD Assembly/parts used.	Word Document in RWRDC template(.docx)		
vii.	Presentation material for Reviews	Microsoft Power Point (.pptx)		
3	Detailed 3D CAD Models, MBD, Drawing and Associated Attribute forms as indicated in para 5.4 (D4)			
i.	3D parametric CAD models of parts in PLM	NX (.prt) / Teamcenter	Essential	
ii.	3D CAD Models of Assemblies with tree structure	NX (.prt) / Teamcenter		
iii.	Model Based Dimensions of each part	NX (.prt)		
iv.	2D Drawings of Parts and Assemblies	NX (.prt)		
v.	Static Snap Shot of 3D Model in Technical Data Package (3D PDF)	NX (.pdf)		
vi.	Static Snap shot of 2D Drawings	NX (.cgm)		
vii.	Light Weight representation of CAD Model with Bounding Box information	NX (.jt)		
viii.	Bill of Material / material schedule as per tree structure in RWRDC Template	Excel (.xlsx) /NX(.prt) / 3D PDF (.pdf)		
ix.	Installation drawings for each system assembly	NX (.prt)		
x.	2D Development of Sheet Metal parts	NX (.prt)		
xi.	Tolerance Stack up Analysis reports	Word Document (.docx) / NX(.prt)		
xii.	Assembly Sequence for all major assemblies	NX (.prt) / Power point (.pptx)		
xiii.	Unit Effectivity as per Drawing Applicability list	Teamcenter form		
xiv.	Part Attributes and Applicability info	Teamcenter form		
xv.	Drawing Release Notice (DRN)	Excel (.xlsx) / Teamcenter		
xvi.	Deviation slip/ Project Slip (PS) / Deviation notes or Equivalent documents as per PLM	Excel (.xlsx), NX(.prt) / Teamcenter		

xvii.	Standard Of Preparation (SOP) for Airframe	Word Document (.docx) / Excel (.xlsx)				
xviii.	Drawing Applicability List (DAL) Document	Word Document (.docx)				
xix.	Weight and C.G. reports with Station wise weight distribution	Word Document (.docx) / Excel (.xlsx)				
xx.	Macros / Automation files / knowledge fusion files	Excel / .exe / NX files / as applicable				
xxi.	Finalised FE model and Stress analysis reports, Test orders and Dynamic FEM reports as per the scope of this work package containing respective assembly / parts / attachments.	FEM in applicable formats, Soft copy of Word Documents in RWRDC template and upto 5 sets of printed copy of the report				
xxii.	Presentation material for Reviews	Microsoft Power Point (.pptx)				
4	Engineerin Change Management (D5)					
i.	Resolutions of PQs, Snags, Deviation Slips and Repair Slips during manufacturing and assembly of prototypes. Updating of drawings, 3D CAD Models, FEM, FEA, Stress Reports etc	FE model, Stress analysis reports, Dynamic FEM reports, NX Models with PMI, and Drawings for affected parts and assemblies in applicable formats, Teamcenter (forms)				Essential
ii.	Based on inputs from design, manufacturing, ground tests, flight tests, user and certification requirementsupdating of drawings, 3D CAD Models, FEM, FEA, Stress Reports etc.	FE model, Stress analysis reports, Dynamic FEM reports, NX Models with PMI, and Drawings for affected parts and assemblies in applicable formats, Teamcenter (forms)				
iii.	Updated Technical Reports as per the scope of this work package containing respective assembly / parts / attachments. (eg: Synthesis Report, Stress Reports, Test Orders etc.)	Soft copy of Word Documents in RWRDC template and 2 sets of printed copy of the report				
iv.	Updated SOP & DAL	Word Document (.docx) / Excel (.xlsx)				
v.	Presentation material for Reviews	Microsoft Power Point (.pptx)				
vi.	All deliverables & communication shall be in English.					
8	Schedule for AirframeWork Package					Essential
	The representative schedule for each module of the Work Package is indicated as below:					
Sl. No	Deliverable\ Module	Milestone 1	Milestone 2	Milestone 3	Milestone 4	
		Requirement Capture and Methodology (Deliverable D1)	Detail Layout and Analysis (Deliverable D2+D3)	Detailed CAD Models + MBD+DWG (Deliverable D4)	Engineering Change Management (Deliverable D5)	
1	Front Fuselage	T0 + 2	T0 + 10	T0+22	T0 + 52	
2	Centre Fuselage	T0 + 2	T0 + 10	T0+22	T0 + 52	
3	Tail Boom & Empennage	T0 + 2	T0 + 10	T0+22	T0 + 52	
4	Weapon Stub Wing	T0 + 2	T0 + 10	T0+22	T0 + 52	
5	Cowlings& Firewalls	T0 + 2	T0 + 10	T0+22	T0 + 52	
	<i>Note: The Numbers indicated in the above table are in months</i>					

	<p>T0 is the placement of PO and signing of contract (Order acknowledgement) with the successful Engineering Service Provider.</p> <p>Engineering Service provider should submit a tentative plan for executing the tasks with intermediate milestones.</p>												
9	<p>Project review & Schedule</p> <p>Reviews like Detail Design Review, Requirement Capture Review, Critical Design Review and Technical Progress Reviews shall be conducted. The support of engineering service provider is envisaged during Ground Tests and Flight Readiness Reviews.</p> <p>Regular Design / Analysis Progress Reviews are mandated between Design co-ordination team and Service provider co-ordination team for all design reviews and clarifications. Project monitoring Team review has to ensure that the activity is progressing satisfactorily and is being performed in required manner. Project reviews & schedules are as shown below.</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Time Period</th> </tr> </thead> <tbody> <tr> <td>1 Design / Analysis Progress reviews</td> <td>Once a Week</td> </tr> <tr> <td>2 Design Technical meeting</td> <td>Need basis</td> </tr> <tr> <td>3 Project Management Review</td> <td>Monthly</td> </tr> <tr> <td>4 Management review</td> <td>Quarterly</td> </tr> </tbody> </table>	Description	Time Period	1 Design / Analysis Progress reviews	Once a Week	2 Design Technical meeting	Need basis	3 Project Management Review	Monthly	4 Management review	Quarterly	Essential	
Description	Time Period												
1 Design / Analysis Progress reviews	Once a Week												
2 Design Technical meeting	Need basis												
3 Project Management Review	Monthly												
4 Management review	Quarterly												
10	<p>Quality of Deliverables:</p> <p>As the timely delivery of reports, drawings and models is critical to the program, the Engineering Service Provider should set up Internal Design quality Check team with Subject Matter Experts for ensuring their correctness and completeness before submitting to HAL for acceptance.</p> <p>Product Quality Targets:</p> <p>In order to reduce iterations and improve the quality of deliverables, it is desirable to meet the following quality targets for First Time Right (FTR) by the Engineering Service Provider:</p> <p>3D Design Layouts(D2): > 85%</p> <p>FE Modeling and Analysis(D3): > 98%</p> <p>Technical content of stress and dynamics reports(D3): > 98%</p> <p>Part and assembly models and drawings(D4): > 95%</p> <p>A Schematic representation of workflow proposed for Layout, Detail Drawing and Analysis that to be followed by Engineering Service Provider before delivering to HAL is shown in technical requirement in Para 10.</p>	Essential											
11	<p>Acceptance of Design</p> <p>Design work is carried out with continuous interactions with Engineering service provider and HAL. Approvals required at various stages of design and it would be mandatory to have acceptance of final design data (Drawings, CAD models, FE Models, Analysis, Reports etc) as mentioned in deliverables for D1 to D5. Design committee nominated by HAL Management will be the approving authority for Design data submitted by Engineering service provider. Following stages would be considered for acceptance of design:</p> <p>a) Confirmation and Acceptance on inputs from various cross functional Design and Analysis groups based on the Helicopter Level PDR.</p> <p>b) Approval of Detail Design Layouts and Analysis by RWRDC for progressing with manufacturing</p> <p>c) Acceptance of Drawings and Analysis reports for release of SOP.</p>	Essential											

	d) Acceptance of mandatory design changes based on feedback from other cross functional teams.		
12	General Conditions on Work place	Essential	
	The Engineering Service Provider should execute this work package in HAL premises. The Engineering Service Provider should also place adequate number of Engineers for Design, Analysis and co-ordination purpose on day-to-day basis at HAL premises. HAL would provide work place and other basic facilities at its premises for the Design and co-ordination team.		
	Engineers of Service Provider placed for Design, Analysis and coordination would have to follow the work timings, rules and regulations of HAL. If Subject matter expert is of foreign origin, it is required to follow the prevailing procedures of HAL for security clearances		
	The Engineering Service Provider is not permitted to bring and use any laptops/ PCs / or any other electronic gadgets inside the HAL work premises. The Service Provider shall not make any attempt directly or through its resources to keep a copy of the Design work being carried out at HAL campus or at Vendor Premises for this work package. Similarly, the Service Provider shall not attempt to transfer / transmit /copy / print / hand sketches or take backup of any file, document or any other type of Design information in to any type of storage device. The Design Intellectual Property of work carried out as part of this work package will be exclusively with HAL only. Refer ANNEXURE-III of technical requirement for expected IT security policies that to be adopted.		
	To execute the work package, the following IT facilities will be provided by RWRDC, HAL for the engineers posted at HAL campus		
	a) Desktop Computers / CAD Workstations with MS Office for individual engineers.		
	b) Design Software Tools / Analysis Software Tools as per para 6 of this document installed in the Desktop		
	c) Scanning /Printing Facility.		
	Engineers who will be assigned to execute the work package should have adequate experience in the relevant fields as defined in Para 4. The Engineers deputed by the Design Partner for this work package need to go through a verification procedure. The Engineering service provider shall submit the Bio-Data of the Engineers to be deployed for verification and approval by HAL after award of CONTRACT. The deputed Engineers would be required to execute the assigned job independently. The Engineers deputed by Engineering Service Provider should possess hands-on experience as no separate training will be provided by HAL.		
	The Engineering service Provider shall have a HR Policy to retain the deputed Engineers for the said CONTRACT period. This is very essential since attrition results in inordinate delays in delivery schedule and lead to uncertainty in contract execution.		
In case, any Employee positioned at site by Engineering service provider are found unsatisfactory with respect to performance and or Interaction/Compliance to HAL requirements/Policies, HAL reserves the right to send back the Employee with suitable replacement by Engineering Service Provider.			
13	Procedure for Review of the Engineering Services	Essential	
	HAL will constitute Project Technical Monitoring Committee (PTMC) for each Work Package as specified in section 5 of this document. This committee will consistS the domain experts from within HAL and other organization at the discretion of HAL Management.		
	The Engineering Service provider is expected to provide the deliverables as specified in section 7 of this document to the single point contact identified by HAL against Work Package in section 7. The PTMC's set up against Work Package will review the deliverables. The recommendations of the PTMC's should be incorporated in the final version of the deliverables.		

	The deliverable is deemed to be complete only after PTMC accepts the same. Payment shall be linked to successful completion of delivery milestones.		
14	Delay in Input/Output	Essential	
	Any delay in providing inputs by HAL because of technical/non-technical reasons beyond a week time and causing the halt of design process to be recorded and duly coordinated by both agencies to review the matter for meeting the time schedules. Delays affecting time schedule, cost and grey areas if any (with respect to non-availability of technical details) will be referred to Project Technical Monitoring Committee (PTMC).		
	Delay in output (deliverables) beyond the reasons mentioned here would be subject to penalty clause as per the commercial contract.		
15	Engagement of Third-party services	Essential	
	The Engineering service provider shall not subcontract this work package in part or full. However, the Engineering service provider can engage the third-party services of consultants or consultancy firms. The Engineering service provider should take prior approval for such engagements and the area of consultancy of third-party services with regard to the work package from HAL.		
16	Program Manager	Essential	
	Engineering Service Provider shall appoint a program manager for managing the overall program. The program manager will be the single point contact for all communications between HAL and Engineering Service Provider. The Program Manager will coordinate all technical disciplines associated with this program and will assure the performance of Supplier tasks in accordance with the program needs according to the statement of work.		
Annx III	IT Security policies	Essential	
	Any requirement of resource allocation / de-allocation, User ID creation / deletion, Application Access, Access Control List, etc should be submitted to HAL for creation, updation and deletion.		
	Police verification should be undertaken for the vendor engineers selected for HAL Project and to be submitted to RWRDC, HAL for issuing ID cards and authorization to work, prior to starting of the work.		
	Highest level of integrity shall be possessed by vendor engineers/staff who are working in HAL project, which belongs to Ministry of Defence, Govt of India and strictly not to disclose any minute details or information or data of the HAL project to outside agencies, family members, friends, relatives, social media, over internet, mails, chats, Land line phone, internet groups, print & visual media etc.		
	While working inside HAL premises, bringing Internet Dongles, USB storage devices, WIFI devices, camera's, smart phones, smart watches, pen drive, external storage devices, SSD devices, microphones, card readers, micro cameras, Go-pro cameras, listeners etc. copying and taking out of manuals, documents, printouts etc., are strictly prohibited.		
	All the vendor staff working for HAL project shall sign the IT security undertaking as per the format provided by HAL.		
	A Non-Disclosure Agreement (NDA) shall be signed by the vendor with HAL as per the format provided by HAL, for keeping the confidentiality of the work being carried-out in HAL premises, by vendor and vendor's engineers/staff/representatives.		
Annx IV	The Engineering Service Provider (Design Partner) is required to depute experienced Engineers as mentioned below to execute the work package at HAL Campus.		

a) Skilled Graduate / Post Graduate Engineers with experience of Design and Analysis of Aircraft/Helicopter airframe. Junior Designer/Analyst shall have minimum 2 years of experience. Middle level Designers/Analyst shall have minimum 5 years of experience. Senior level Designers/Analyst shall have minimum 10 years of experience. Service provider shall maintain a proper employee ratio of junior to middle level (preferably 10:1) and middle level to senior level (preferably 5:1).

b) External Reviewers having minimum work experience of 20 years in Airframe Design, Preferably Retired personnel from HAL/NAL/DRDO or any other private firm which is involved in Aircraft/Helicopter design.

Note: Please refer and comply Encl VII Vendor qualification form for Engineer service provider qualification.

Essential

TECHNICAL COMPLIANCE DESIGN AND ANALYSIS OF IMRH AIRFRAME**(Tender No. SM/OS/RC/8480MIS/39/40/25/2)**

Note: Vendors must fill up the technical compliance column below, clearly mentioning Yes/No/Remarks, and submit along with the quotation.

Sl. no. of Tech req	Description	Essential/ Desirable	Vendor's compliance
NAME OF THE BIDDER :			
5	Details of Activities by Engineering Service Provider	Essential	
	The Engineering Service Provider is required to carry out the activities mentioned in Para 5.1[D1] to Para 5.5[D5]. Deliverables for each stage are indicated in Para 7 of this document. However, the Engineering Service Provider required to carry out additional activities which arise during detail design stage to achieve complete design and development. Comprehensive Presentation material of global standards for internal reviews, users, certification agencies and CDR Review as required by HAL at all stages of deliverables to be provided.		
5.1	Preliminary Analysis and Methodology Documents (D1)	Essential	
i.	Familiarization of configuration of H/C and interaction with peer design and analysis groups of RWRDC to get information and clarifications on the inputs provided.		
ii.	Methodology of Drawing and Model making.		
iii.	Methodology of FE modelling for stress analysis of full airframe and detailed airframe sub assembly modules.		
iv.	Finite Element Modelling and analysis aspects.		
v.	Estimation methodology for structural component loads from FEM analysis including extraction of loads for sub modelling.		
vi.	Validation and Verification methodology for FEM & FEA.		
vii.	Analytical methods (SOM) for stress calculations		
viii.	Methods (SOM / Hand Calculations).		
ix.	Estimation of structural component loads from FEM analysis		
x.	Static, Fatigue, Crash and Damage Analysis Methodology documentations.		
xi.	Methodology of FE modelling for Dynamic analysis of full airframe and detailed airframe modules.		
xii.	Assessment and acceptance of inputs from peer groups of RWRDC.		
5.2	3D CAD Layout for interference and integration Check (D2)		
i.	Determining the part thickness with inputs from detailed loads, required factor of safety, suitable material and its processes.		
ii.	Material selection and assignment to 3D CAD Models from the standard approved material list provided by HAL.		
iii.	Define the 3D parts considering comprehensive manufacturing and assembly procedures (DFMA) following industry best practices. The 3D modelling methodology to be followed as per manuals provided.		
iv.	Creation of Reference sets for using in different assembly configurations.		
v.	Assembly design has to be done considering tooling (jigs and fixtures) requirements, ease of assembly and access clearances for maintenance personnel.		

vi.	Selection of Fasteners from the approved list provided by HAL.	Essential	
vii.	All fasteners are to be cleared for relevant loads. Each fastener hole/axis has to be normal to surface and co-axially aligned with the adjacent parts/assembly as per design standard practice.		
viii.	All fasteners called in the assembly are to be verified for inter-rivet pitch, edge distances, head clearance, head placement (outer or inner), type, material, grip length etc as per the compendium provided by HAL.		
ix.	Creation and Mapping of Derived requirements and Validation requests to CAD Geometry and Creation of Validation reports.		
x.	Creation of System models and Physical Architecture and establishing Trace links to the Requirements and CAD geometry.		
xi.	Preliminary weight estimation and mapping the estimated weight data information in the layout.		
xii.	Detail sizing of metallic and composite parts including skin engineering such as zonal thickness distribution, ply details, weight& stacking sequence for composite parts.		
xiii.	All composite skins to be created using Modeling module of NX for ply wise modelling and creation of ply-book.		
xiv.	Test Data Sheets for composite components of Duty Class I and II.		
xv.	Commonization of Brackets, clips and parts like splice sheets in Joints, etc. in consultation with HAL (variety Reduction concepts).		
xvi.	Assembly and part Numbering assigned in assembly hierarchy as per ATA numbering system provided by HAL.		
xvii.	Wave linking concept to be used for Referenced bodies and it should be excluded from Reference set for reducing the file size loading time of Assemblies.		
xviii.	Master geometry surfaces are not to be edited. In case of any higher issue release, the same will be communicated by HAL.		
xix.	Adjoining system equipment and its parts like cables, tubes etc. are not to be edited. In case of any updates/changes, the same will be communicated by HAL.		
xx.	Rain Water Proofing and Interchangeability concepts for removable panels like Doors, Access panels, Cowlings etc. to be considered from initial phase of design.		
xxi.	The complexity level of CAD Layouts can be classified as Simple Layout, Medium Layouts and Complex Layout. Percentage distribution of these layout are envisaged in the order of 20% (Simple), 60% (Medium) and 20 % (Complex). However, target should be the completion of entire Fuselage Layout for interference check and progress to the next stages of design.		
5.3	Detailed Analysis and Reports (D3)		
i.	Finite Element (FEM) Model (Preliminary, detailed and sub-modeling)		
ii.	FEM is to be verified for its correctness as per global practices.		
iii.	FE Analysis (FEA) of primary structure, components, sub-assemblies and assemblies of H/C structure (Refer Ann		
iv.	Further to the above point, special focus on FEA of hard points and ensures structural integrity.		
v.	Sub modelling and FEA checks as per the best practices for sizing of the components considering various boundary conditions and establish margin of safety.		
vi.	The structure weight targets of parts and assemblies specified during D1 phase to be met. Proposal for further reduction in weight to be submitted. Best optimisation practices to be adopted.		

vii.	The stress analysis shall cover static, fatigue, crash and damage tolerance requirements specified by DEFSTAN00-970/FAR 29amdt.59/ CS29and associated Advisory Circulars. The simulation results are to be supported by hand calculations / industry standard analytical procedures, as applicable.	Essential
viii.	Prepare stress reports in RWRDC/Global best practices for the detail design phase for CDR. Format will be mutually agreed by RWRDC and Service provider.	
ix.	Prepare reports of FEM for Stress analysis indicating number of elements, Type of elements used, Sectional details and Materials to be mentioned.	
x.	Develop full airframe FE model including the LRUs idealized by lumped masses and inertia at their CG location to carry out dynamic analysis.	
xi.	Develop Detailed FE models (DFEM) of separate airframe modules to carry out dynamic analysis as listed in An	
xii.	Engineering service provider should submit the FE model with detailed report of input file for carrying out the Dynamic analysis by HAL subsequently.	
xiii.	Prepare Dynamic FE model reports of the full airframeand for major assemblies/installations in RWRDC format. The reports should include: detail modelling approach, idealisation considered, Material properties of metallic and composite materials, component dimensions and locations, sectional properties, mass, CG and Inertia details of LRUs/components idealized by concentrated masses.	
xiv.	Documentation Support to Test plan for certification.	
xv.	Comprehensive Presentation material of global standards for internal, users, certification agencies and CDR Review	
xvi.	The complexity level of FEM and FEA can be classified as Basic, Intermediate and Advanced. Percentage distribution of these analysis are envisaged in the order of 20% (Basic), 60% (Intermediate) and 20 % (Advanced). However, target should be the completion of entire Airframe Analysis and progress to the next stages of design.	
	All design issues are to be resolved concurrently as the Engineering Service Provider progresses and completes activities listed in D1, D2 and D3. After acceptance of 3D CAD detail design and layout for Interface Arrangement by HAL, the Engineering Service Provider can proceed with generation of detailed 3D CAD Models with MBD, 2D part drawings, DRN, BOM, Loft etc.	
	The 3D CAD Layout for Interface Arrangement to contain the assembled views of ribs or frames along with skins, stringers, access doors, brackets, clips, system interface components with major dimensions embedded in CAD Model itself.	
	The purpose of Interface arrangement 3D CAD Layout is for checking the assembly clearances between a) the parts b) parts and fasteners and c) Airframe and other LRUs.	
	The same layout will be used for planning the Jig Design and subsequent manufacturing activities. Review of this Interface Clearance arrangement Layout is from the start of the project on a weekly basis. This activity should be completed before CDR to facilitate the release of part drawings after CDR.	
	All the stress reports and design documents to be complied to relevant standards (FAR/DEFSTAN etc) in co-ordination with Airworthiness group of RWR&DC.	
5.4	Detailed 3D CAD Models, MBD, Drawing and Associated Attribute forms (D4)	
i.	Updating of CAD/FEM/FEA and all analysis reports based on CDR and configuration freeze.	
ii.	Parametric 3D CAD Models of all structural members considering the form, fit and function in the current NX Software version as that of RWRDCin metric units and in helicopter coordinate system using the seed part from PLM environment.	
iii.	Assigning material to detailed CAD Models and computing the weight and cg data for proper rolling up of data.	

iv.	Creation of Model Based Dimension in the detail design parts and assemblies as per MIL-STD-31000 (Latest Issue).	Essential	
v.	Bill of Material (Material Schedule) in Excel format as well as it should be part of Technical Data Package (3D PDF). It should be created in RWRDC template.		
vi.	Static Snap Shot of 3D Model in Technical Data Package (3D PDF) and 2D Drawings in cgm format.		
vii.	Creation of Light Weight representation of CAD Model (.jt format) with Bounding Box information stored under same dataset.		
viii.	2D drawings in the current version of NX by following the manuals and sample drawings provided. The part and assembly drawings shall cover all dimensions, tolerances, sealant requirements, suitable notes (including material process and finish), part markings, weight, EBOM, curing cycle, Test Data sheet reference etc.		
ix.	Mapping of Derived requirements and Validation requests to Detailed CAD Geometry and Creation of Validation reports and establishing trace links with System Models and Physical architecture models.		
x.	Part numbering as per the ATA scheme provided by HAL.		
xi.	2D Development View (Loft) for sheet metal parts generated using respective NX Module with creation of static snap shot in cgm format.		
xii.	Tolerances stack up analysis report for assemblies.		
xiii.	Creation of Exploded view and Assembly sequence for all major assemblies.		
xiv.	Applying unit effectivity and filling attributes specific to part and applicability in relevant Team center forms.		
xv.	Preparation of Drawing Release Note in RWRDC format and attaching under the item revision as a separate dataset.		
xvi.	Creation of Weight & CG report with station wise weight distribution.		
xvii.	3D part and 2D drawings are to be linked with current NX software version.		
xviii.	Trace linking of all the technical queries with its responses.		
xix.	Deviation notes (if any) with detail description.		
xx.	Changes / new inputs envisaged during this phase will be in the order of 50%. Engineering service provider should cater for amending the deliverables as part of D2 &D3.		
xxi.	Updating CAD / FEM / FEA and Drawings to address the Manufacturing / assembly issues arising before the release of last drawing.		
xxii.	Completion of pending stress analysis and report works if any.		
xxiii.	Modification to Design and Analysis Reports based on the feedback on submitted reports for acceptance of certification agencies.		
xxiv.	Preparation of FEM,FEA and Test orders for ground test of structural components (Refer. Annexure-II of techni		
xxv.	The complexity level of detailed CAD models can be classified as a percentage distribution of equivalent drawing sheet size which is indicative and varies from A4 to A0 as follows. A4 – 20%, A3-30%, A2- 20%, A1- 15% and A0- 15%. However, target should be the completion of entire Airframe detail design formanufacturing, assembly, Integration and testing. The percentage distribution of drawing size will be based on mutual agreement between HAL and Engineering service Provider.		
5.4.1	Standard practices to be adhered		
i.	Sketches used for modeling should be defined in 'fully constrained' condition and Layer settings as that of RWRDC to be followed.		

ii.	Check for suppressed feature, unused sketches and unwanted parasolids in the CAD model and remove these features unless it is retained for future use.		
iii.	For each 3D CAD geometry of component, “Model” and “Solid” reference set (containing required bodies only) and for each assembly CAD file “Assembly”, “Model” and “Solid” reference set (containing required components and Parasolid bodies) to be created for ease of assembly.		
iv.	Wherever drawing calls for LH shown, RH opposite, model to be made for both LH & RH part with parameters. There should not be any connectivity (feature wise) between LH & RH part.		
v.	Use of Assembly mirror option for mirror part or mirror body option is not acceptable.		
vi.	Use Analysis-Examine Geometry to check for tiny/misaligned objects, intersections/sheet boundaries/tolerances.		
vii.	Do run the Edit-Feature–Playback Option to know update failure of features of part file.		
viii.	Check for the correct material/Density has been selected for modeling – as per the Material specification.		
ix.	Use of Boolean operations should be avoided as much as possible, except unavoidable.		
5.5	Engineering Change Management (D5)		
	The work package also includes the engineering change management from the Engineering Service Provider to update CAD and FE models, drawings, BOM, DAL resulting due to manufacturing / design issues during component manufacturing and assembly (non – conformity support), New or Change in inputs from Cross functional design groups, Inputs from Jig Fixture Design (to resolve interface issues with tool design team of HAL) ground test (to resolve design issues of component) and flight test (non – conformity support). Preparation of ground test synthesis reports for structural components (refer ANNEXURE-II of technical requirement).		Essential
	During manufacturing and assembly, Design improvement and revisions are expected mainly on 3D models, drawings, and documents. It is to be noted that total number of drawings that undergoes changes depends on the number of Engineering change requests raised on the deliverables of D2 to D4. These are broadly classified as resolution for (i) Design Change Requests (ii) Production Queries (PQ) & Shop Queries (SQ) (iii) Snags (iv) Material Substitution Requests (MSR) etc. The support team should bring in the execution knowledge of the previous milestones and update the Models, Drawings, Analysis and other supporting documents.		
	Additional requirements from users, associated system groups, new design requirements to be considered during this phase. The classification of complexity level of detail CAD models and equivalent drawing sheet size to be considered as mentioned in D4.		
	It is to be noted that sufficient manpower to be accounted for carrying out the activities during this phase for the number of changes that can come over the completed design during the previous milestones. However, based on experience from previous projects, it is assumed that around 40% of peak man-hour requirement during D2 to D4 phase should be deployed during the initial period of D5 phase. It is estimated that an approximate 40% of drawings that is finalised during D4 stage will undergo changes. It includes efforts needed for making 3D Models, drawings and its associated analysis and documentations. Here, It should be noted that, the Design changes, New inputs, PQ's, Snags, testing inputs, synthesis of ground test and design support to fabrication activities are to be considered as part of activities during D5.		
6	Software Tools to be used for Execution: The following software will be provided for the activities mentioned		
Sl. No	Software	Major Activities	
1	Teamcenter 12.4 & above (match with the versions being used by RWRDC)	PLM, System Modelling, Requirement Mapping, Attribute Forms etc.	

2	NX 1926 & above(match with the versions being used by	Modelling with MBD, Drawing, Loft, Sequence,	
3	Hyper-works, MSC Patran	FEA Pre/Post Processor	
4	MSC NASTRAN,HyperWorks (Optistruct), LS-DYNA,Abaqus, MSC Adams.	FEA (Solvers)	
5	HyperWorks (Optistruct),MSC NASTRAN (embedded Fatigue) / FRANC 3D / NASGRO	F&DT Analysis	
6	MS Office 2021 or latest Word, Excel, PowerPoint. Adobe Acrobat Reader, etc.	Documentation	
	Note: Any additional software required apart from above list for completion of work package, will be at the discretion of HAL		
7	Deliverables The Deliverables for work package are as below:		
	Deliverables	Delivery Format	
1	Primary Analysis and Methodology documents as indicated in Para 5.1 (D1)		
i.	Methodology of FE modelling for stress analysis of full airframe and detailed airframe modules.	Word Document in RWRDC template(.docx)	Essential
ii.	Estimation methodology for structural component loads from FEM analysis including extraction of loads for sub modelling.	Word Document in RWRDC template(.docx)	
iii.	Analytical Methods (SOM) for stress Calculations	Word Document in RWRDC template(.docx)	
iv.	Validation and verification Methodology Report for FEM & FEA	Word Document in RWRDC template(.docx)	
v.	Static, Fatigue, Crash and Damage analysis methodology documentations	Word Document in RWRDC template(.docx)	
vi.	FE modelling Methodology for Dynamic analysis	Word Document in RWRDC template(.docx)	
vii.	Technical Report formats (e.g.: Stress reports, Test Reports, Test Orders etc.)	Word Document in RWRDC template(.docx)	
viii.	Presentation material for Reviews	Microsoft Power Point (.pptx)	
2	3D CAD Layout for interference and integration Check as indicated in para 5.2 (D2)		
i.	3D CAD Layout for Interface Arrangement	NX (.prt)	
ii.	Primary Weight Estimation	Excel (.xlsx)	
iii.	Material Stock Size approximation with form classification	Excel (.xlsx)	
iv.	Initial System Model and Physical Mechanical architecture	Teamcenter	
v.	Presentation material for Reviews	Microsoft Power Point (.pptx)	
	Detailed Analysis as indicated in para 5.3 (D3)		
i.	Validation Report for FEM & FEA	Word Document in RWRDC template(.docx)	
ii.	For Stress Analysis:	Hypermesh ,PatranFE Models (*.hm,*.db), Input data in NASTRAN , Optistruct and LS-DYNA format, Abaqus, Nasgro and Franc 3D files (*.DAT / *.RDF/* FEM/* key etc) and output data in MSC	

	All FEM, FEA and analysis results including full airframe static model and input files towards finalization of detail drawings.	.BDF / *.FEM / *.key, etc) and output data in MSC NASTRAN Optistruct and LS-DYNA format (*.F06, *.PCH, *.OP2, H3D, *.d3plot) etc.	Essential	
iii.	For Dynamic analysis: DFEM / local FE models (Refer Annexure II of technical r Full airframe dynamic model (input files)	Hypermesh FE Models (*.HM), Input data in NASTRAN format (*.DAT / *.BDF) and output data in MSC NASTRAN format (*.F06, *.PCH, *.OP2, H3D).		
iv.	Dynamic and stress FEM reports as per the scope of this work package containing respective assembly / parts / attachments. The FEM should include meshed model with material properties, component dimensions and locations, sectional properties, mass, CG and Inertia details of LRUs.	Soft copy of Word Documents in RWRDC template and 2 sets of printed copy of the report		
v.	Technical Reports as per the scope of this work package containing respective assembly / parts / attachments. (eg: Stress Reports, Test Orders etc.)	Soft copy of Word Documents in RWRDC template and 2 sets of printed copy of the report		
vi.	List of all associated FE reports, stress analysis reports, Dynamic FEM reports and the corresponding FE models and CAD Assembly/parts used.	Word Document in RWRDC template(.docx)		
vii.	Presentation material for Reviews	Microsoft Power Point (.pptx)		
3	Detailed 3D CAD Models, MBD, Drawing and Associated Attribute forms as indicated in para 5.4 (D4)			Essential
i.	3D parametric CAD models of parts in PLM	NX (.prt) / Teamcenter		
ii.	3D CAD Models of Assemblies with tree structure	NX (.prt) / Teamcenter		
iii.	Model Based Dimensions of each part	NX (.prt)		
iv.	2D Drawings of Parts and Assemblies	NX (.prt)		
v.	Static Snap Shot of 3D Model in Technical Data Package (3D PDF)	NX (.pdf)		
vi.	Static Snap shot of 2D Drawings	NX (.cgm)		
vii.	Light Weight representation of CAD Model with Bounding Box information	NX (.jt)		
viii.	Bill of Material / material schedule as per tree structure in RWRDC Template	Excel (.xlsx) / NX(.prt) / 3D PDF (.pdf)		
ix.	Installation drawings for each system assembly	NX (.prt)		
x.	2D Development of Sheet Metal parts	NX (.prt)		
xi.	Tolerance Stack up Analysis reports	Word Document (.docx) / NX(.prt)		
xii.	Assembly Sequence for all major assemblies	NX (.prt) / Power point (.pptx)		
xiii.	Unit Effectivity as per Drawing Applicability list	Teamcenter form		
xiv.	Part Attributes and Applicability info	Teamcenter form		
xv.	Drawing Release Notice (DRN)	Excel (.xlsx) / Teamcenter		
xvi.	Deviation slip/ Project Slip (PS) / Deviation notes or Equivalent documents as per PLM	Excel (.xlsx), NX(.prt) / Teamcenter		

xvii.	Standard Of Preparation (SOP) for Airframe	Word Document (.docx) / Excel (.xlsx)				
xviii.	Drawing Applicability List (DAL) Document	Word Document (.docx)				
xix.	Weight and C.G. reports with Station wise weight distribution	Word Document (.docx) / Excel (.xlsx)				
xx.	Macros / Automation files / knowledge fusion files	Excel / .exe / NX files / as applicable				
xxi.	Finalised FE model and Stress analysis reports, Test orders and Dynamic FEM reports as per the scope of this work package containing respective assembly / parts / attachments.	FEM in applicable formats, Soft copy of Word Documents in RWRDC template and upto 5 sets of printed copy of the report				
xxii.	Presentation material for Reviews	Microsoft Power Point (.pptx)				
4	Engineerin Change Management (D5)					
i.	Resolutions of PQs, Snags, Deviation Slips and Repair Slips during manufacturing and assembly of prototypes. Updating of drawings, 3D CAD Models, FEM, FEA, Stress Reports etc	FE model, Stress analysis reports, Dynamic FEM reports, NX Models with PMI, and Drawings for affected parts and assemblies in applicable formats, Teamcenter (forms)				Essential
ii.	Based on inputs from design, manufacturing, ground tests, flight tests, user and certification requirements updating of drawings, 3D CAD Models, FEM, FEA, Stress Reports etc.	FE model, Stress analysis reports, Dynamic FEM reports, NX Models with PMI, and Drawings for affected parts and assemblies in applicable formats, Teamcenter (forms)				
iii.	Updated Technical Reports as per the scope of this work package containing respective assembly / parts / attachments. (eg: Synthesis Report, Stress Reports, Test Orders etc.)	Soft copy of Word Documents in RWRDC template and 2 sets of printed copy of the report				
iv.	Updated SOP & DAL	Word Document (.docx) / Excel (.xlsx)				
v.	Presentation material for Reviews	Microsoft Power Point (.pptx)				
vi.	All deliverables & communication shall be in English.					
8	Schedule for AirframeWork Package					
	The representative schedule for each module of the Work Package is indicated as below:					
Sl. No	Deliverable\ Module	Milestone 1	Milestone 2	Milestone 3	Milestone 4	Essential
		Requirement Capture and Methodology (Deliverable D1)	Detail Layout and Analysis (Deliverable D2+D3)	Detailed CAD Models + MBD+DWG (Deliverable D4)	Engineering Change Management (Deliverable D5)	
1	Front Fuselage	T0 + 2	T0 + 10	T0+22	T0 + 52	
2	Centre Fuselage	T0 + 2	T0 + 10	T0+22	T0 + 52	
3	Tail Boom & Empennage	T0 + 2	T0 + 10	T0+22	T0 + 52	
4	Weapon Stub Wing	T0 + 2	T0 + 10	T0+22	T0 + 52	
5	Cowlings& Firewalls	T0 + 2	T0 + 10	T0+22	T0 + 52	
	<i>Note: The Numbers indicated in the above table are in months</i>					
	T0 is the placement of PO and signing of contract (Order acknowledgement) with the successful Engineering Service Provider.					

	Engineering Service provider should submit a tentative plan for executing the tasks with intermediate milestones.			
9	Project review & Schedule	Essential		
	Reviews like Detail Design Review, Requirement Capture Review, Critical Design Review and Technical Progress Reviews shall be conducted. The support of engineering service provider is envisaged during Ground Tests and Flight Readiness Reviews.			
	Regular Design / Analysis Progress Reviews are mandated between Design co-ordination team and Service provider co-ordination team for all design reviews and clarifications. Project monitoring Team review has to ensure that the activity is progressing satisfactorily and is being performed in required manner. Project reviews & schedules are as shown below.			
	Description		Time Period	
	1 Design / Analysis Progress reviews		Once a Week	
	2 Design Technical meeting		Need basis	
	3 Project Management Review		Monthly	
4 Management review	Quarterly			
10	Quality of Deliverables:	Essential		
	As the timely delivery of reports, drawings and models is critical to the program, the Engineering Service Provider should set up Internal Design quality Check team with Subject Matter Experts for ensuring their correctness and completeness before submitting to HAL for acceptance.			
	Product Quality Targets:			
	In order to reduce iterations and improve the quality of deliverables, it is desirable to meet the following quality targets for First Time Right (FTR) by the Engineering Service Provider:			
	3D Design Layouts(D2): > 85%			
	FE Modeling and Analysis(D3): > 98%			
	Technical content of stress and dynamics reports(D3): > 98%			
	Part and assembly models and drawings(D4): > 95%			
A Schematic representation of workflow proposed for Layout, Detail Drawing and Analysis that to be followed by Engineering Service Provider before delivering to HAL is shown in technical requirement in Para 10.				
11	Acceptance of Design	Essential		
	Design work is carried out with continuous interactions with Engineering service provider and HAL. Approvals required at various stages of design and it would be mandatory to have acceptance of final design data (Drawings, CAD models, FE Models, Analysis, Reports etc) as mentioned in deliverables for D1 to D5. Design committee nominated by HAL Management will be the approving authority for Design data submitted by Engineering service provider. Following stages would be considered for acceptance of design:			
	a) Confirmation and Acceptance on inputs from various cross functional Design and Analysis groups based on the Helicopter Level PDR.			
	b) Approval of Detail Design Layouts and Analysis by RWRDC for progressing with manufacturing			
	c) Acceptance of Drawings and Analysis reports for release of SOP.			
d) Acceptance of mandatory design changes based on feedback from other cross functional teams.				
12	General Conditions on Work place			

	<p>The Engineering Service Provider should execute this work package in HAL premises. The Engineering Service Provider should also place adequate number of Engineers for Design, Analysis and co-ordination purpose on day-to-day basis at HAL premises. HAL would provide work place and other basic facilities at its premises for the Design and co-ordination team.</p>	
	<p>Engineers of Service Provider placed for Design, Analysis and coordination would have to follow the work timings, rules and regulations of HAL. If Subject matter expert is of foreign origin, it is required to follow the prevailing procedures of HAL for security clearances</p>	
	<p>The Engineering Service Provider is not permitted to bring and use any laptops/ PCs / or any other electronic gadgets inside the HAL work premises. The Service Provider shall not make any attempt directly or through its resources to keep a copy of the Design work being carried out at HAL campus or at Vendor Premises for this work package. Similarly, the Service Provider shall not attempt to transfer / transmit /copy / print / hand sketches or take backup of any file, document or any other type of Design information in to any type of storage device. The Design Intellectual Property of work carried out as part of this work package will be exclusively with HAL only. Refer ANNEXURE-III of technical requirement for expected IT security policies that to be adopted.</p>	
	<p>To execute the work package, the following IT facilities will be provided by RWRDC, HAL for the engineers posted at HAL campus</p>	Essential
	<p>a) Desktop Computers / CAD Workstations with MS Office for individual engineers.</p>	
	<p>b) Design Software Tools / Analysis Software Tools as per para 6 of this document installed in the Desktop</p>	
	<p>c) Scanning /Printing Facility.</p>	
	<p>Engineers who will be assigned to execute the work package should have adequate experience in the relevant fields as defined in Para 4. The Engineers deputed by the Design Partner for this work package need to go through a verification procedure. The Engineering service provider shall submit the Bio-Data of the Engineers to be deployed for verification and approval by HAL after award of CONTRACT. The deputed Engineers would be required to execute the assigned job independently. The Engineers deputed by Engineering Service Provider should possess hands-on experience as no separate training will be provided by HAL.</p>	
	<p>The Engineering service Provider shall have a HR Policy to retain the deputed Engineers for the said CONTRACT period. This is very essential since attrition results in inordinate delays in delivery schedule and lead to uncertainty in contract execution.</p>	
	<p>In case, any Employee positioned at site by Engineering service provider are found unsatisfactory with respect to performance and or Interaction/Compliance to HAL requirements/Policies, HAL reserves the right to send back the Employee with suitable replacement by Engineering Service Provider.</p>	
13	<p>Procedure for Review of the Engineering Services</p>	Essential
	<p>HAL will constitute Project Technical Monitoring Committee (PTMC) for each Work Package as specified in section 5 of this document. This committee will consistS the domain experts from within HAL and other organization at the discretion of HAL Management.</p>	
	<p>The Engineering Service provider is expected to provide the deliverables as specified in section 7 of this document to the single point contact identified by HAL against Work Package in section 7. The PTMC's set up against Work Package will review the deliverables. The recommendations of the PTMC's should be incorporated in the final version of the deliverables.</p>	
	<p>The deliverable is deemed to be complete only after PTMC accepts the same. Payment shall be linked to successful completion of delivery milestones.</p>	
14	<p>Delay in Input/Output</p>	

	<p>Any delay in providing inputs by HAL because of technical/non-technical reasons beyond a week time and causing the halt of design process to be recorded and duly coordinated by both agencies to review the matter for meeting the time schedules. Delays affecting time schedule, cost and grey areas if any (with respect to non-availability of technical details) will be referred to Project Technical Monitoring Committee (PTMC).</p> <p>Delay in output (deliverables) beyond the reasons mentioned here would be subject to penalty clause as per the commercial contract.</p>	Essential	
15	<p>Engagement of Third-party services</p> <p>The Engineering service provider shall not subcontract this work package in part or full. However, the Engineering service provider can engage the third-party services of consultants or consultancy firms. The Engineering service provider should take prior approval for such engagements and the area of consultancy of third-party services with regard to the work package from HAL.</p>	Essential	
16	<p>Program Manager</p> <p>Engineering Service Provider shall appoint a program manager for managing the overall program. The program manager will be the single point contact for all communications between HAL and Engineering Service Provider. The Program Manager will coordinate all technical disciplines associated with this program and will assure the performance of Supplier tasks in accordance with the program needs according to the statement of work.</p>	Essential	
Annx III	<p>IT Security policies</p> <p>Any requirement of resource allocation / de-allocation, User ID creation / deletion, Application Access, Access Control List, etc should be submitted to HAL for creation, updation and deletion.</p> <p>Police verification should be undertaken for the vendor engineers selected for HAL Project and to be submitted to RWRDC, HAL for issuing ID cards and authorization to work, prior to starting of the work.</p> <p>Highest level of integrity shall be possessed by vendor engineers/staff who are working in HAL project, which belongs to Ministry of Defence, Govt of India and strictly not to disclose any minute details or information or data of the HAL project to outside agencies, family members, friends, relatives, social media, over internet, mails, chats, Land line phone, internet groups, print & visual media etc.</p> <p>While working inside HAL premises, bringing Internet Dongles, USB storage devices, WIFI devices, camera's, smart phones, smart watches, pen drive, external storage devices, SSD devices, microphones, card readers, micro cameras, Go-pro cameras, listeners etc. copying and taking out of manuals, documents, printouts etc., are strictly prohibited.</p> <p>All the vendor staff working for HAL project shall sign the IT security undertaking as per the format provided by HAL.</p> <p>A Non-Disclosure Agreement (NDA) shall be signed by the vendor with HAL as per the format provided by HAL, for keeping the confidentiality of the work being carried-out in HAL premises, by vendor and vendor's engineers/staff/representatives.</p>	Essential	
Annx IV	<p>The Engineering Service Provider (Design Partner) is required to depute experienced Engineers as mentioned below to execute the work package at HAL Campus.</p> <p>a) Skilled Graduate / Post Graduate Engineers with experience of Design and Analysis of Aircraft/Helicopter airframe. Junior Designer/Analyst shall have minimum 2 years of experience. Middle level Designers/Analyst shall have minimum 5 years of experience. Senior level Designers/Analyst shall have minimum 10 years of experience. Service provider shall maintain a proper employee ratio of junior to middle level (preferably 10:1) and middle level to senior level (preferably 5:1).</p>	Essential	

b) External Reviewers having minimum work experience of 20 years in Airframe Design, Preferably Retired personnel from HAL/NAL/DRDO or any other private firm which is involved in Aircraft/Helicopter design.

Note: Please refer and comply Encl VII Vendor qualification form for Engineer service provider qualification.