Request for Quotation for Tender No. F/DGM(IMM)/CAP/924/1 dated 27/08/2026

FOUNDRY AND FORGE DIVISION , HAL(BC)

Integrated Materials Management (IMM)

DUE DATE: 30.10.2026 at 12:30 Hrs IST.

Design, Manufacture, Supply, Installation, Commissioning and Proving out of 10000 Ton Hydraulic forging Press as per attached Technical Specifications at Annexure-A.

Quantity: 1 No &

Design, Manufacture, Supply, Installation, Commissioning and Proving out of 20 Ton Counter Blow Hammer as per attached Technical Specifications at Annexure-B

Quantity - 01 No

Ref: Tender No F/DGM(IMM)/CAP/924/1 Date: 27/08/2026

Sub: Request for Quotation for Tender No. F/D GM(IMM)/CAP/924/1 – Due date 30.10.2026 1230 Hrs IST.

Foundry & Forge Division (F&F) of Bangalore Complex manufacture s and supplies Forgings in Steel, Aluminum, and Titanium & Nickel alloys for various programs of all the complexes of HAL. Apart from HAL projects, division also supplies Forgings to External and Export customers such as Rolls Royce, GE, Collins, DRDO, ISRO etc.

2. F&F Division has also taken up the task of development of forgings for various new programs. Additionally, opportunity exists for indigenized development of critical components for various projects, which are currently being imported and can result in significant cost savings for HAL.

3. Forging requirements for upcoming programs necessitate a higher capacity press & Counter blow hammer. Accordingly, the requirement of 10000 Ton Hydraulic forging Press & 20 Ton Counter Blow Hammer are envisaged.

4. The Tender for Design, Manufacture, Supply, Installation, Commissioning and Proving out of 10000 Ton Hydraulic forging Press as per attached Technical Specifications at Annexure-A. Quantity: 1 No & Design, Manufacture, Supply, Installation, Commissioning and Proving out of 20 Ton Counter Blow hammer as per the technical specifications attached at Annexure-B. Quantity: 1 No by Foundry and Forge Division is released. Quotations are invited from interested Bidders. The scope of work of tender, terms and conditions, Omnibus NDA are elaborated and enclosed.

5. For this tender Bidder has to submit **EMD of Rs.10,00,000/- (INR)** or in case of foreign bidder equivalent amount in free convertible currency along with technical bid. For MSME bidders classified as Manufacturer in Udyam Certification, Other bidders exempted from submission of EMD as per Government of India directives must submit certified copy of Govt. of India authority for such exemption in lieu of EMD. Offers not accompanied with EMD or EMD not submitted in the specified form in original shall be summarily rejected.

6. Earnest Money Deposit for foreign bidders:

6.1 EMD to be submitted in any freely convertible currency of amount equivalent to the above EMD value (Rs.10,00,000/- INR).

6.2 Whenever EMD is submitted by bidder in Foreign Currency, received amount in the same currency shall be returned to the unsuccessful bidder.

6.3 EMD remittance document, either in Indian Currency or any other convertible currency of the specified amount Rs. 10,00,000, can be arranged by the Indian Subsidiary / branch in India of a foreign bidder which shall be submitted along with the certificate confirming the relation ship of subsidiary / branch office in the bidder's offer.

7. Tender has to be submitted two bid system only. Bidders may submit their quote either by post / courier to F&F Division HAL. Bidders may also submit the quote by hand at our tender box in Foundry and Forge Division reception.

8. Bidder can download documents through any one of the following portals CPPP Portal/hal-india.co.in Website/MoD portal/GeM CPPP Tenders Portal.

9. TWO Bid System Procedure (By Post /Courier /by hand/ Drop Box):

9.1 The format of technical bid and price bid are enclosed. Bidder has to submit bid in the same format only. Quotes received in other formats will be summarily rejected. Technical bid should be signed and sealed on all the pages. Bids without Signature of authorized signatory will be rejected.

9.2 Technical bid should be filled and signed with seal and stamp of the organization. EMD of Rs.10,00,000/- in form of Demand Draft from any nationalized bank or in case of foreign bidder equivalent amount in free convertible currency has to be enclosed along with technical bid. MSME Bidders are exempted for EMD. Bidder can also wire transfer EMD to HAL Account. (Mandate form is enclosed). However, MSME Bidders have to be submit a copy of their MSME/NSIC/SSI/UAN certificate along with technical bid. A copy of the same has to reach in email (nk.ramanamurthy@hal-india.co.in) on or before due date of tender positively. Technical bids without EMD/MSME/NSIC/SSI/UAN will not be further considered for tender evaluation and their price bids will not be opened. Omnibus / Standalone Integrity Pact and Non-Disclosure Agreement should be a part of the technical bid.

9.3 Technical bid should be sealed in cover and on the sealed cover Tender No. and "Technical Bid" should be mentioned. The following documents should be a part of the technical bid essentially

9.3.1 Earnest Money Deposit
9.3.2 Integrity Pact
9.3.3 Non-Disclosure Agreement
9.3.4 Duly filled Check Lists
9.3.5 Duly filled Technical Bid / Bid(s)
9.3.6 Duly filled Commercial Compliance Statement
9.3.7 Declaration for Open Tender
9.3.8 Application for registration as vendor
9.3.9 Bank Mandate forms
9.3.10 GST & PAN (for Applicable Bidders)

9.3.11 DUNS Number (for Applicable Bidders)
9.3.12 Declaration by Foreign Bidders (Sl No17,18,19 of Commercial check list)

9.4 Price bid should be filled and signed with seal and stamp. The filled price bid should be sealed in cover and on the sealed cover Tender No. and "Price Bid" should be mentioned. Bids without Signature of authorized signatory will be rejected. Vendor has to clearly mention the quoted prices along with applicable currency in the price bid. Vendor can use their price bid format and submit the same in the Price Bid Cover only".

9.5 Technical Bid should be sealed as one packet, Price Bid should be Sealed as one packet. Bothe sealed technical and Price Bids should be enclosed in one single main cover and the main cover should be sealed. On the sealed main cover Tender No. should be mentioned.

10. In case of Post / Courier the address for sending the quote is (Cover should bear tender name, due date and bidder address).

Deputy General Manager (IMM)
Foundry and Forge Division
Hindustan Aeronautics Limited
Post Bag No. 1791
Vimanapura Post,
Bangalore – 560 017
Karnataka,
India.

11. Bidders who opt for submission by hand may drop the sealed tenders in the tender box placed at our reception in Foundry and Forge Division.

12. DUE DATE: 30.10.2026 at 12: 30 Hrs IST.

13. Tenders received post due date are not considered for further processing and shall be regarded as late tender. These Late Tenders will not be opened and shall be sent back to the respective Bidders.

14. Bids received in single bid system i.e., if technical bid is having pricing details or if price bid is not sealed separately those bids of such Bidders shall not be considered for further processing.

15. For any queries, please feel free to contact us at +91-80-22322418 / 9686678119/ nk.ramanamurthy@hal-india.co.in.

16. Detailed Terms and Conditions, eligibility criteria for submission of the tender are provided in the Terms and Conditions of Contract. Tender will be evaluated on Line-item basis. It is not mandatory that bidders should quote for both the items.

17. **INTEGRITY PACT:**

17.1 Integrity Pact (IP) as per HAL format enclosed shall be duly signed by the bidder along with the witnesses. Failure to sign Integrity Pact as per HAL's standard format may lead to rejection of offer. The hard copy of original singed IP should reach HAL by post before the due date of tender. The submission of Integrity Pact without deviation is a mandatory requirement.

17.2 Two IP formats are attached with the RFQ, Omnibus IP & Standalone IP formats. The Bidder can choose to sign either Omnibus or Standalone format. In case the Bidder has already signed Omnibus IP with any Divisions of HAL and the same is valid then please enclose a copy of the same against this tender, by providing the details such as date of signing, validity, Division, etc. Failure to sign Integrity Pact as per HAL's standard enclosed format may lead to rejection of offer.

17.3 It is requested to forward the Original signed Integrity Pact in duplicate (as per HAL format enclosed) duly initialed on each page to following contact person and address:

Deputy General Manager (IMM)
Foundry and Forge Division
Hindustan Aeronautics Limited
Post Bag No. 1791
Vimanapura Post,
Bangalore – 560 017
Karnataka. India

17.4 In respect of IP and its monitoring authority i.e., the Independent External Monitor (IEM), who is appointed by HAL, in line with the communication received from Central Vigilance Commission (CVC). The present IEMs are:

Shri Sunil Kumar Bansal, IPS (Retd.) Email id: sunilku555@gmail.com
Shri Chaitanya Kumar Varma, CE&MES (Retd.) Email id: ck_varma@yahoo.co.in
Shri Ashok Kumar Tripathy, IAS (Retd.) Email id: tripathyak@yahoo.com

17.5 The Bidder may approach the IEM nominated only for IP related issues. Any other specific clarifications/query/status with reference to tender and request for validity, extension of the tender etc., should be forwarded to concerned tender issuing HAL Officer.

17.6 Signed IP in original should be forwarded to the Division along with the offer and not to IEM.

18. Tenders shall be opened on the due date indicated above or the next working day of the due date in the presence of the intending Bidders and that Bidder or his authorized representative may attend the Tender opening with valid authorization letter and Identity

Proof. A formal intimation will be provided to all the bidders to attend for tender opening with the date and time of tender opening

19 Note:

19.1 HAL will not be responsible for the loss or delay in receipt of tender documents/ sample/ tender in transit. HAL reserves the right to reject Late/ incomplete tenders.

19.2 Bid submitted by the Bidder's authorized dealer/ distributor/ channel partner should accompany with scanned copy of signed authorization letter/ email of the bidder to whom the tender was originally issued. In the absence of such authorization letter/ email, the bids submitted shall be considered as unsolicited.

20. HAL reserves the right to cancel this RFQ in partial or in whole, without assigning any reasons thereof.

21. This RFQ does not oblige HAL to pay any cost incurred in the preparation or submission of any response including technical/ commercial proposals from Bidder. HAL reserves the right to reject any and/ or all responses received to this RFQ without assigning any reasons.

22. Please acknowledge the RFQ read in any of the medium from your end by E-mail, as soon as it is read. Any clarifications may please be addressed to the Point of Contact mentioned at para 15.

23. For all the RFQ Conditions, HAL Management's decision would be final in awarding the contracts based on technical and commercial evaluation recommendations.

24. Special and Important Note: Suppliers to comply all the Indian Government Guidelines / Circulars / Office Memorandums etc., issued and updated by any Ministry or Department at any point of time regarding import of Goods.

25. HAL Shall not be responsible if any restrictions are imposed by Government of India regarding Procurement of Goods from any part of the Foreign Countries / Sources during the execution of contracts. All the prevailing Government directives issued from time to time during the complete process of tendering till finalization of Contract have to adhered.

26. Please mention a SPOC from Bidder end and the escalation matrix with contact number and email of the personnel for correspondence.

27. Land Border Clause:

27.1 Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey

projects) only if the bidder is registered with the Competent Authority. Further, any bidder (including bidder from India) having specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India, shall also require to be registered with the same competent authority.

27.2 "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

27.3 "Bidder (or entity) from a country which shares a land border with India" for the purpose of this Order means:

(a) An entity incorporated, established or registered in such a country; or

(b) A subsidiary of an entity incorporated, established or registered in such a country; or

(c) An entity substantially controlled through entities incorporated, established or registered in such a country; or

(d) An entity whose beneficial owner is situated in such a country; or

(e) An Indian (or other) agent of such an entity; or

(f) A natural person who is a citizen of such a country; or

(g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

27.4 The beneficial owner for the purpose of above will be as under:

(1) In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;

b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

(2) In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

(3) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who,

whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

(4) Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

(5) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

27.5 An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

27.6 The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

27.7 The registration shall be valid at the time of submission of bid and at the time of acceptance of bid.

27.8 If the bidder was validly registered at the time of acceptance/ placement of order, registration shall not be a relevant consideration during contract execution

27.9 An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

27.10 The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

27.11 The registration shall be valid at the time of submission of bid and at the time of acceptance of bid.

27.12 If the bidder was validly registered at the time of acceptance/ placement of order, registration shall not be a relevant consideration during contract execution, work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

27.13 Model additional certificate by Bidders in the cases of specified ToT:
"I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder does not have any ToT arrangement requiring registration with the competent authority."
OR
"I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder has valid registration to participate in this procurement."

28. Looking forward for your valuable bid.

With Regards
For **HINDUSTAN AERONAUTICS LIMITED**
FOUNDRY AND FORGE DIVISION

N Krishna Ramana Murthy
Deputy General Manager (IMM)

Encl:

i. Request for Quotation
ii. Check List – Compiled
iii. Check List – Technical – 1
iv. Check List – Technical – 2
v. Check List – Commercial
vi. Technical Bid – 1
vii. Technical Bid – 2
viii. Technical Bid Compliance Matrix – 1
ix. Technical Bid Compliance Matrix – 2
x. Commercial Terms and Conditions of the Contract
xi. Commercial terms and conditions compliance statement
xii. Price Bid
xiii. HAL Bank Mandate Form
xiv. Format of Bank Guarantee for Security Deposit
xv. Format of Performance Bank Guarantee
xvi. Format of Bank Guarantee towards Earnest Money
xvii. Format of Insurance Surety Bond for Security Deposit
xviii. Format of Insurance Surety Bond for Warranty Coverage
xix. Format of Standalone Integrity Pact
xx. Format of Omnibus Integrity Pact
xxi. Non-Disclosure Agreement Format
xxii. Public Procurement Policy
xxiii. Declaration by the bidder for open tender
xxiv. Application Form for Registration as Approved Vendor (Foreign Vendor - Manufacturer)

xxv. Check List of Documents to be Submitted along with the Application for Foreign Vendor – Manufacturer

xxvi. Application Form for Registration as Approved Vendor (for Vendors based in India)

xxvii. Check List of Documents to be Submitted along with the Vendor Registration Application Form (for Vendors based in India)

xxviii. Application Form for Registration as Approved Vendor (Foreign Vendor - Stockist/Distributor)

xxix. Check List of Documents to be Submitted along with the Application for Foreign Vendor - Stockist/ Distributor

Technical specifications of 10000 Ton Hydraulic Press **Annexure-A**

1	**Introduction**	
a	Foundry & Forge Division (F&F), Bengaluru, a Division of Hindustan Aeronautics Limited (HAL), is engaged in the development and manufacturing of forgings and castings in various alloys for aeronautical and other engineering applications. In line with the Division's ongoing capacity augmentation and technology up gradation initiatives, F&F Division is planning to establish a Hydraulic forging Press of 10000 Ton Capacity in its new forging hangar. The proposed 10000 Ton forging press will be utilized for manufacturing of critical forging components such as landing gears, hubs, gear forgings, shafts, aero-engine discs, blisks, and other forgings required for various HAL programs and global aero-engine OEMs. The establishment of the new facility is aimed to enhance HAL's capability to manufacture high-integrity aerospace forgings, especially for aero-engines with improved process control, dimensional accuracy, and repeatability.	
b	1.This press shall be capable of carrying out forging operations in the following modes and the typical production utilization will be as follows. a. Closed die forging (~60%) : Primarily intended for the production of aircraft structural forgings, including landing gear components, hubs, and other critical aluminium alloy closed die forgings b. Open die forging (~10%) : Primarily intended for preforming/gathering operations prior to closed die forging, upsetting operations, and other intermediate forging operations as required. c. Near Isothermal forging (~30%) : Primarily intended for the manufacture of aero-engine disc forgings and other critical rotating components in Titanium (Ti) and Nickel(Ni) based super alloys under near isothermal forging conditions 2. Further, the press shall also perform coining operation (Cold compression/warpage removal) of forgings. 3. Materials and typical Forging temperatures to be forged: Aluminium Alloys: 385°C to 460°C, Alloy Steels: 1000°C to 1180°C, Titanium alloys : 700°C to 1000°C, Nickel super alloys : 950°C to 1160°C	
2	**Scope of Work:**	
	Vendor shall carryout Design , manufacture , supply, installation, commissioning, training, documentation and prove out of a brand new 10,000 Ton forging press along with near isothermal forging facility and integrated robotic manipulator for handling forgings on turnkey basis as per specifications given below. Typical forgings planned to be produced utilizing the new 10000 Ton hydraulic [ress is attached in the Annexure-1 with details of type of the material and approx. dimensions. The machine is planned to be installed in the new production hangar which is currently under construction. The new forging press will be positioned within the marked section of layout enclosed at Annexure-2.In case any minor modification to the proposed layout of the press facility is required, the same shall be indicated in the technical bid document. The vendor's scope shall also include obtaining all necessary export licenses and regulatory approvals from the concerned government authorities in the country of origin for the supply and establishment of the facility at HAL-F&F.	
3	**Technical Description of Press**	
3.1	**TECHNICAL SPECIFICATION OF THE PRESS**	
3.1.1	**Press Capacity:**	
a	Rated Press Capacity (minimum)	**10000 Ton** (additional 20% booster load capacity : Up to 12000 Ton)
b	Press type	Four Column Push down
c	Number of main ram cylinders	3 Nos
d	Cylinders capacity at rated load of 10000 Ton	Center Cylinder : **5000 Ton** ; Two side cylinders : **2500 Ton each**
e	Cylinders capacity at booster load of 12000 Ton	Center Cylinder : **6000 Ton** ; Two side cylinders : **3000 Ton each**
f	Cylinders orientation	Left to right (Inline with moving bolster direction)
g	Number of retraction ram cylinders	4 Nos
3.1.2	**Cross Slide:**	
a	Vertical stroke of the Slide shall be within the range of	3000 mm to 3500 mm
b	Eccentricity (minimum)	200 mm
c	Eccentric moment Load (left to right) (Minimum)	20,000 kNm
d	Eccentric moment Load (front to back) (Minimum)	20,000 kNm
3.1.3	**Day light details**	
a	Daylight at Top Dead Center (TDC)	4000 mm to 5000 mm
b	Daylight at Bottom Dead Center (BDC)	1000mm to 1500 mm
c	Top and bottom Bolster size (width x breadth) (minimum)	2500 x 2500 mm
d	Minimum distance between the column and die bolster	350 mm each on each side

Technical specifications of 10000 Ton Hydraulic Press Annexure-A

3.1.4	**Press Speed (For Open die and Closed die operations):**	
a	Rapid approach speed (variable)	1 mm/s to 250 mm/s
b	Rapid retraction speed (variable)	1 mm/s to 250 mm/s
3.1.5	**Forging Speeds for rated press capacity (10000 Ton)**	
a	Speed at loads up to 50% of maximum press capacity	1 mm/s to 40 mm/s
b	Speed at the maximum press capacity	1 mm/s to 20 mm/s
3.1.6	**Forging Speeds for booster press capacity (12000 Ton)**	
a	Velocity at 12000 Ton (variable)	1 mm/s to 10 mm/s
3.1.7	**Press Speed (For near Isothermal mode)**	
a	Rapid approach speed (variable)	1 mm/s to 100 mm/s
b	Rapid retraction speed (variable)	1 mm/s to 100 mm/s
c	During the isothermal operations minimum operating speed at rated load capacity	0.04 ± 0.01 mm/s
3.1.8	**Moving bottom bolster**	
a	Stroke	4500-5000 mm
b	Force (Minimum)	100 Ton
c	Direction of travel	From the center of the press to the left side when viewed from operator desk
d	Speed (Variable)	1mm/s to 200 mm/sec
3.1.9	**Ejectors (Top and Bottom)**	
a	Stroke (minimum)	600 mm
b	Force (minimum)	200 Ton
c	Speed (Both Ejection and Retraction) (variable)	1 mm/s to 100 mm/s
3.1.10	**Connected Load**	
a	Total connected load - Maximum. (Includes press, Isothermal attachment, manipulator, and all other accessories)	5500 KVA
b	Input Power Supply	415V ± 10%, 50Hz ± 3%. Motors shall be selected for voltages working up to 415Volts only. Operating voltage beyond 3 phase, 415V ± 10% is not allowed.
3.1.11	**Press Dimensions**	
a	Max height of the press above floor level including the pre fill tank	15000 mm
b	Bottom bolster height above floor level (typical)	400 mm
3.1.12	**Booster load capacity up to 12000 Ton**	20% of daily machine operating time (on need basis)
3.2	Major components of the press are as follows and their description is detailed in the below sections.	
a	• Press Frame (Consisting of Upper beam, Tie rods and Lower beam) • Moving cross slide • Moving cross Slide Guiding system • Cross Slide connection to main cylinder • Parallelism monitoring and control system • Main Cylinders and retraction cylinders • Hydraulic Ejectors • Moving Lower Bolster with guiding mechanism • Tool clamping	
b	Standard for Design and construction of main structural parts of the press shall comply with DIN EN 14673: 2006 + A1: 2010. All critical load-bearing structural forgings, including tie rods, columns, main cylinders shall be subjected to 100% ultrasonic testing (UT) in accordance with ASTM A388/A388M or an internationally recognized equivalent standard. Necessary reports shall be shared to HAL during fabrication stage of the press.	
3.2.1	**Press Frame**	
	The press frame shall consist of a press bed, four columns, and a press crown forming a rigid closed-frame structure. The frame shall be designed and optimized using Finite Element Method (FEM) analysis to ensure adequate strength and minimal deflection of press frame, cross slide and columns under loads. The frame components shall be of cast or welded steel construction, duly thermo-stress relieved. Necessary FEM design calculations shall be shared to HAL during the phase of press design. The crown and bed shall be rigidly connected by four columns with hydraulically pre-stressed tie rods, ensuring high structural rigidity and preventing joint separation under full load conditions. Each column shall be made of casting / welded structure & designed as hollow rectangle section. The four columns shall be enclosing the tie rods. Together with upper and lower beam, the columns constitute the pre-stressed frame.	

3.2.2	**Moving cross slide** The moving cross slide shall be manufactured from torsion-resistant steel castings/welded structure, designed to withstand high loads. Slide tilting under off-center loading conditions shall be minimized through an optimized guidance ratio and precisely adjustable slide guiding elements. The slide shall function as a rigid pressing member. The clamping surface shall be provided with T-slots for mounting the upper die as per HAL's requirement. A slide locking system shall be provided to prevent the slide movement during the maintenance time. The slide shall be mechanically locked at the top dead center (TDC) position by means of a locking bar operated by a hydraulic cylinder. The end positions of the locking bar shall be electrically monitored through PLC. The locking shall be controlled by the operator from the operator control panel.
3.2.3	**SLIDE GUIDING SYSTEM** Robust guide brackets with large-area flat guide surfaces surrounding the columns shall be provided to effectively withstand eccentric loads. The guide clearance shall be adjustable easily and precisely by means of wedge arrangements, ensuring accurate alignment and smooth, stable operation of the ram. Preferably vendor may provide five number (5 No) adjustable flat guide surfaces per column. Hardened and tempered guide flats with bronze linings shall be provided on the columns to achieve superior guiding performance. An automatic grease lubrication system shall be installed to ensure continuous lubrication of all guide surfaces. Shoes shall be fixed to the moving crosshead, the slide-ways shall be fixed to the press frame columns.
3.2.4	**SLIDE CONNECTION TO MAIN CYLINDER** The press shall be equipped with double spherical bearing (double ball-joint) connections between the moving slide (ram) and the main hydraulic cylinders to effectively accommodate angular misalignment and eccentric loading during forging operations. Main cylinder connection to Cross slide shall be made with double spherical joint, and retraction cylinders shall be connected with moving cross slide by single spherical joint. The bearing arrangement shall ensure that torque and bending moments acting on the slide due to eccentric loading are isolated from the cylinder pistons, thereby minimizing side loading on the hydraulic cylinders. The design shall reduce wear of cylinder bushings and seals, enhance the service life of cylinder components to improve the overall reliability and operational life of the press.
3.2.5	**Ram Parallelism monitoring and Control mechanism of the press** The press frame shall incorporate vertical tie rods connecting the upper beam (crown), columns, and lower beam to form a rigid structural assembly. The vertical tie rods shall be hydraulically pre-tensioned to impart the required initial pre-stress to the press frame, ensuring structural rigidity, dimensional stability, eccentricity and uniform load distribution during all forging operations. The press shall be equipped with a real-time parallelism monitoring system to continuously monitor and control the parallelism of the moving ram with respect to the press bed in both the left-right and front-back directions. The system shall provide continuous feedback to the control system to maintain ram parallelism within the specified tolerance throughout the forging stroke. The values shall be displayed in the main control panel. Hydraulic jacks used for pre stressing the tie rods shall be supplied along with the press.
3.2.6	**Main Cylinders and Retraction Cylinders** The main hydraulic cylinders and retraction cylinders shall be of heavy-duty construction and shall be completely assembled, pressure tested, and performance tested at the manufacturer's works prior to installation on the press. The cylinders shall be designed to withstand the specified forging loads and duty cycle with adequate factor of safety and shall ensure reliable long-term operation. The main hydraulic cylinders and retraction cylinders shall be of single-acting design and shall incorporate high-quality sealing systems, wear-resistant guide elements, and guiding arrangements to minimize internal and external leakage, reduce wear, and ensure smooth operation throughout the service life. The pistons shall be manufactured from high-quality forged or cast steel, suitably heat-treated and machined for heavy-duty forging applications. Adequate guide rings and seals shall be housed within the cylinder assembly and shall be readily accessible for inspection and replacement to facilitate maintenance and minimize equipment downtime. Fixtures and jigs are to be provided for replacement of seals of Ram Cylinders.
3.2.7	**Hydraulic Ejectors** Vendor shall provide total 2 Nos of part Ejectors- 1No for Bottom bolster and 1No for Top bolster. The press shall be provided with a hydraulically actuated ejector cylinder installed in the press bed for automatic ejection of forged components from the die after completion of the forging operation. The ejector shall be designed with adequate force and stroke to ensure reliable removal of the forged part under all specified operating conditions. The ejectors shall normally remain in its home position and shall be automatically actuated through the press control system based on the programmed forging sequence. The ejectors shall operate only when all prescribed interlocks, including the correct position of the moving bolster (where applicable), are satisfied. After reaching the programmed upper end position and ejecting the forged component, the ejectors shall remain at the end position for an adjustable dwell time before automatically returning to its home position, thereby enabling the subsequent forging cycle.

3.2.8	**Bottom Moving Bolster** The press shall be provided with a heavy-duty hydraulically operated moving bolster designed to facilitate rapid and safe die change operations. The supplier shall design the moving bolster to withstand the maximum forging loads, including severe impact and eccentric loading encountered during rough forging operations, without permanent deformation or loss of alignment. The moving bolster shall be actuated by hydraulic cylinders (preferably single acting type) and shall provide smooth, accurate, and repeatable movement into and out of the press. Mechanical end stops and cushioning arrangements shall be provided to ensure precise positioning and controlled deceleration at the end of travel. The bolster shall be supported on full-length low-friction, wear-resistant sliding surfaces and shall incorporate lateral guide elements and anti-lift retaining arrangements to maintain accurate alignment during operation. The moving bolster shall be manufactured from high-strength forged steel and shall be provided with suitable clamping arrangements for secure mounting of the lower die/tooling. The design shall be capable of carrying the complete lower die assembly during die change operations. The position of the moving bolster shall be continuously monitored by two independent displacement measuring systems to ensure precise positioning and safe operation. The sliding surfaces shall incorporate an automatic lubrication system with lubrication grooves or equivalent arrangements to ensure continuous lubrication throughout the travel. The slideway and hydraulic drive system shall be rigidly integrated with the press structure to eliminate relative movement and maintain positioning accuracy. The complete slide track shall be protected by robust steel drag plates or equivalent protective covers to prevent ingress of scale, dirt, and other contaminants, thereby ensuring reliable operation and extended service life. To perform tool change by over head crane, Lower bolster shall be shifted out of the shadow of the press/movable cross head. The outward direction of the moving bolster shall be designed towards left side of the press when it is viewed from operator desk. The vendor shall supply one bottom moving bolster (thickness ~ 400 mm) for mounting the bottom die. One side of the bottom bolster shall be securely fastened to the bottom platen, the other side shall be machined dovetail keyways for mounting HAL's dies. The vendor shall also supply all die locking keys required for securing the bolster and the dies . The bolster shall be manufactured from Tool Steel DIN 1.2714 or an internationally recognized equivalent grade with equivalent or superior mechanical properties.
3.2.9	**Top Bolster** A thermal insulation plate shall be provided between top bolster and cross slide. The plate shall be designed to minimize heat transfer from the dies to the press structure, thereby maintaining die temperature and improving process stability. The insulation plates shall be manufactured from a high-strength, low thermal conductivity material suitable for repeated high-temperature forging operations. The thermal plate shall ensure uniform die temperature distribution, minimize thermal distortion of the press structure, and facilitate reliable long-term operation. The top bolster shall be manufactured from high-strength forged steel and shall be provided with suitable clamping arrangements for secure mounting of the upper die/tooling to the cross slide. The design shall be capable of carrying the complete top die assembly during die change operations. The vendor shall supply one top bolster (Thickness ~ 400 mm) for mounting the top die. One side of the top bolster shall be securely fastened to the cross slide , while the other side shall be machined dovetail keyways for mounting HAL's dies. The vendor shall also supply all die locking keys required for securing the bolster and the dies .The bolster shall be manufactured from Tool Steel DIN 1.2714 or an internationally recognized equivalent grade with equivalent or superior mechanical properties.
3.2.10	**Die Locking Mechanism** The top and bottom dies used for open-die forging and closed-die forging shall be secured to the press by means of a dovetail locking mechanism, using locking keys on two parallel sides perpendicular to the die-shifting axis. The dovetail dimensions of the HAL designed dies is specified in Annexure-4**.** The top and bottom bolsters shall also be designed to permit mounting of the die keys parallel to the die-shifting axis by rotating the bolsters by 90° . The press design shall provide adequate clearance and accessibility for fixing and removing the locking keys of both the top and bottom dies using a rammer suspended from the overhead crane. The arrangement shall ensure that the key-ramming operation is not obstructed in either locking direction. Provision for key installation and removal in both directions shall be incorporated in the design. Detailed drawings demonstrating the key-fixing arrangement, clearances, and accessibility shall be submitted along with the technical quotation. Additionally, the vendor shall supply top and bottom adaptor plates of minimum dimensions 2000 mm × 2000 mm (L × W). One side of each adaptor plate shall be machined with a dovetail arrangement for mounting the dies, while the other side shall be machined for secure locking to the respective bolsters. The vendor shall supply all additional locking keys required for securing the adaptor plates and dies .
3.2.11	**Cover Plate** The vendor shall provide heavy-duty steel cover plates to form a continuous operating platform at shop floor level for safe movement of operators, forging manipulators, and associated handling equipment during loading and unloading of forgings/tools. The cover plates shall completely cover the entire press foundation area, including the lower bolster cylinder pit and the full travel span of the moving bolster and associated hydraulic cylinders. During all operating conditions, no open cavities, gaps, or exposed foundation pits shall remain within the operating area to ensure personnel safety. The cover plates shall be designed and structurally verified to withstand a uniformly distributed and concentrated load corresponding to a minimum load capacity of 40 tones, including the weight of the forging manipulator, tooling, and any other operational loads, without permanent deformation. The plates shall be securely supported and fixed to prevent movement during operation. The operating platform shall be provided with gradual sloping transitions on all accessible sides to facilitate smooth and safe movement of the forging manipulator and other material handling equipment. The surface of the cover plates shall be anti-skid and suitable for continuous operation in a hot forging environment.
3.2.12	**Mechanical Stopper**
	Vendor shall provide a positive stroke limitation stopper to the columns in order to prevent the cross slide beyond Bottom Dead Centre. This mechanical stopper shall act as fail safe protection to the movement of Cross slide. Vendor shall design mechanical stoppers with welded steel structure, assemble and integrate to the columns. These mechanical stoppers shall be designed with detachable provisions for easy assembly and removal. It shall adequately to withstand the dead weight of the cross slide and cylinders.

3.2.13	**Working Platform**
	Vendor shall design a maintenance platform made of Steel and adequately fastened and fixed over the top frame and to the parked position of the moving cross head to carryout maintenance activities/inspection. The platform shall have approach ladder with safety cage. Approach ladder shall have intermediate resting platform of suitable size at parked position of the cross slide. The approach shall be designed with suitable rails for full body harness.The entry door for top of the press shall have safety latche interlocked with PLC .
3.2.14	**Layout drawing**
	The supplier shall submit, along with the technical offer, a detailed three-dimensional (3D) layout/model of the proposed hydraulic forging press clearly identifying all major components, including but not limited to the press frame, hydraulic cylinders, moving bolster, ejector system, manipulator , isothermal attachment, hydraulic power unit, piping, platforms, cover plates, and other associated equipment.
3.3	**Hydraulic System and Piping's**
a	Press shall be designed to have a complete, fully integrated hydraulic direct drive system and shall be designed in accordance with ISO 4413.
b	**Main components of hydraulic drive system are :** • Hydraulic Direct Drive • Proportional Pre-Fill Valve system • Hydraulic Tank and pre-fill tank • Main control and Return cylinder manifolds • Pressure Monitoring System • Oil filtration system • Automatic Force Control • Oil-Water Cooling system
3.3.1	**Hydraulic Direct Drive**
	The press shall be equipped with a heavy-duty hydraulic direct drive system designed to provide precise, smooth, and energy-efficient operation under all specified forging conditions. The hydraulic drive shall comprise multiple high-efficiency axial/radial piston pumps, electric motors, flexible couplings, pump mounting bases, hydraulic tank, filtration and cooling systems, and all associated control and safety devices. The hydraulic system shall be designed for a maximum operating pressure of 350 bar for open and closed die forging at rated and booster load. For isothermal forging, vendor may select suitable high pressure pumps beyond 350 bar of radial /Axial type for achieving desired speed/ Strain rate. Vendor shall provide 2 Nos of standby pumps in addition to the main pumps of the hydraulic system. The hydraulic control system shall be of modular manifold construction to minimize external piping, reduce leakage points, and ensure smooth, shock-free operation without pressure surges. The hydraulic direct drive system shall provide accurate control of ram position, speed, force, acceleration, and deceleration throughout the forging cycle. The supplier shall clearly identify and indicate the makes and models of all major hydraulic drive components in the technical offer. The details of availability of the boost force during the stroke shall be indicated in the technical offer and the boost force shall be available over a minimum length of the last 50 mm of the working stroke or for a maximum of 10% of all strokes whichever is less .
3.3.2	**Proportional Pre-Fill Valve system**
	The press shall be equipped with a high response proportional pre-fill valve system for the main slide cylinders. The pre-fill valve shall be capable of independent operation regardless of the pressure existing in the main cylinder and shall support continuous programmable intermediate positions, controlled opening and closing ramps, and precise pressure regulation through the press control system. The pre-fill valve system shall provide rapid controlled pressure relief and decompression of the main cylinder, with a minimum decompression time shall not be more than 2 Sec.The decompression function shall be achieved directly through the proportional pre-fill valve without the requirement of a separate pre-decompression circuit. Vendor shall provide a variable decompression time programmable from 2 sec to 10 Sec. The system shall be designed to minimize cycle time, reduce hydraulic shock and pressure fluctuations, improve forging repeatability, and enhance the overall reliability, energy efficiency, and service life of the hydraulic system.
3.3.3	**Hydraulic Tank**
	The hydraulic reservoir shall be of compartmentalized construction with multiple chambers to provide effective deaeration, sedimentation of contaminants, and stabilization of the hydraulic fluid during continuous press operation. The design shall ensure adequate settle down time for the hydraulic fluid to minimize turbulence, foaming, and air entrapment before recirculation. The hydraulic reservoir shall be equipped with a continuous visual and digital hydraulic oil level monitoring system. The oil level shall be continuously displayed on the operator interface and appropriate visual and audible alarms shall be provided for low and high oil level conditions. The hydraulic reservoir shall also be provided with suitable inspection openings, drain arrangements, breather filters, and access provisions to facilitate inspection, cleaning, and maintenance. The level fluctuation within the tank during the operation creates an air circulation, which shall be exchanged by built-in air filters. A sensor in the air breather, oil filters shall monitor the degree of soiling, which shall be communicated to the press control via electrical signal. In case of soiling level exceeding set parameters, related error shall be displayed on screen. Hydraulic tank and pre-fill tank shall have adequate number of pressure, level, temperature and contamination monitoring sensors and communicate to the press PLC.

3.3.4	**Main control and Return cylinder manifolds** The press shall be provided with dedicated hydraulic manifolds for the main cylinder and return cylinder circuits. The manifolds shall be of modular block construction and shall incorporate all necessary directional, proportional, servo, logical cartridge valves, pressure control, flow control, safety, oil filters and isolation valves required for precise control of the respective hydraulic functions. The manifolds shall be designed to minimize external piping, pressure losses, and potential leakage points while ensuring smooth, accurate, and repeatable operation of the main and return cylinders. This design shall facilitate rapid response, controlled acceleration and deceleration, synchronized cylinder movement, and stable pressure regulation throughout the forging cycle. The manifold blocks shall be manufactured from high-strength forged steel. The manifold arrangement shall provide easy access for inspection, maintenance, and replacement of components without requiring major dismantling of the hydraulic system. A system of pressure checkpoints/inspection points is required to facilitate identification of correctness of function of the hydraulic-system through sufficient number of hydraulic connector ports.
3.3.5	**Pressure Monitoring of the Hydraulic system** The hydraulic system shall be equipped with high-accuracy pressure transducers for continuous monitoring of all critical hydraulic circuits. The pressure transducers shall incorporate fail-safe diagnostics and shall be designed to detect wire breakage, short circuits, sensor failures, and other electrical faults. Any such fault shall immediately generate a visual and audible alarm on the control panel and shall initiate appropriate protective actions to ensure safe operation of the press. The measured pressure values shall be continuously displayed, recorded, and made available to the press control system for process monitoring, diagnostics, and interlocking. The pressure sensors shall have local digital display on the sensor unit.
3.3.6	**OIL FILTRATION SYSTEM** The hydraulic system shall be provided with an additional OFFLINE oil filtration unit along with ONLINE filtration system. OFFLINE filtration System: Unit shall have filtration capability of 3 µm or finer for continuous conditioning of the hydraulic oil during press operation. The filtration unit shall continuously monitor the condition of the filter element, and upon reaching the predetermined contamination level, the press control system shall automatically generate visual and audible alarms on the press control panel, providing timely indication to the operator for filter replacement or maintenance. Vendor shall supply suitable Cellulose filter insert based oil filtering unit with contamination and moisture monitoring probes with display and printer. (Make of the filtering unit: C C JENSEN)
3.3.7	**AUTOMATIC FORCE CONTROL** The press shall be equipped with an automatic hydraulic cylinder management system for the main slide cylinders. The system shall enable automatic and dynamic activation/deactivation of individual cylinder areas during the forging cycle based on the required forming force, ram position, and process parameters, without any intervention by the operator. The hydraulic control system shall automatically distribute the available hydraulic oil flow from the main drives to the appropriate cylinder areas through high-response servo/proportional hydraulic controls to optimize ram speed, force, and energy utilization throughout the working stroke. The transition between different cylinder configurations shall be smooth and automatic, without pressure shocks or interruption of the forging process. The complete cylinder management system shall operate fully automatically under PLC/CNC control and shall optimize press performance by achieving the best combination of forming capacity, ram speed, and energy efficiency during the entire forging cycle. No manual selection or operator action shall be required during normal operation.
3.3.8	**Accumulator Station** The accumulator station shall consist of an accumulator with downstream Nitrogen bottles. This station shall be coupled with safety and shut-off valves to the return cylinder manifold. It Shall not be used for main pressing operation.
3.3.9	**Pressure hold Pump Unit** This unit shall be a source of regulated flow and pressure for auxiliary functions It shall further preform the function of maintaining pressure in accumulator station. Note: The motors involved in this operation shall be independent from main pump motors
3.3.10	**Piping, Fitting and Fastening Structures** The control manifolds, working cylinders of the press and tanks to be interconnected with pressure and return piping. The piping system to be supplied of shut-off valves with electric check of function, where necessary. The piping shall also comprise of check valves, high-quality fastening elements and steel structures for supporting the piping to fastening to the concrete foundation. This assembly also incorporates packing sheets, foundation bolts and other anchor material intended for installation of individual sub-assemblies on the foundation on site. All pipes lines shall be appropriately clamped wherever necessary to avoid vibration and overhang. The high pressure hoses used should be designed adequately (with proper clamping) to withstand maximum pressures .
3.3.11	**-Provision for Stick Slip free Movement of Moving Cross Head** Provision for stick slip free movement of moving cross head shall be made for press operations at slow speeds.
3.3.12	**Lubrication System:** Automatic lubrication is required for an accurate and maintenance-free guidance of all the moving parts. The lubrication system shall be fully controlled by electrical control system .The lubrication system shall have sensors to ensure it's effectiveness during application. Centralized control from control panel to all the lubrication units with provision of error messages in corresponding areas to be provided. The lubrication system shall be of Bijur/Lincoln make. The press shall be designed with independent grease lubrication systems for moving bolster- 1 Set, Ram spherical joints and Ram guiding system- 1Set. A standby pumping system shall be provided in addition to the main grease pumping system with local display and control along with PLC interface of control desk. Standby pumping system shall be able to be used for any of the two pumping systems during failure if any.

3.3.13	**Oil-Water Cooling heat exchanger**	
	The hydraulic system shall be provided with a thermostatically controlled hydraulic oil cooling system incorporating high-efficiency counter-flow heat exchangers. The cooling system shall automatically regulate the hydraulic oil temperature within the specified operating range under all operating conditions . The cooling system shall be complete with temperature sensors, flow control valve, circulation pumps (where applicable), and all associated piping, instrumentation, and controls.	
a.	The Cooling unit shall be provided for the main oil tank/ any other required oil tanks. This unit shall be of make Hydac/Alfa Laval. It shall draw oil from the Return Oil chamber, filters, passes oil through heat exchanger and fills into the clean chamber. This shall ensure conditioning of the circulating oil with regard to cleanliness and constant temperature for a proper press operation.	
b.	During press operation ,the heat absorbed by the hydraulic oil must be removed by cooling via oil-water heat-exchanger so that it's operating viscosity can be maintained. Cooling water quantity to be regulated depending on oil temperature. The oil temperature in the main tank to be measured with temperature detectors. The proper sensors and detection system shall be provided and linked to PLC for alarms in case of temperature is too high. Interlocking with press operation shall be provided for the same.	
c.	Furthermore, collected dirt particles and wear debris to be filtered with the appropriate fineness of ONLINE filtration in order to reach the required class of oil purity. The filter soiling degree to be monitored by electrical soiling indication and monitored at the control desk. The system shall maintain the appropriate NAS level (approx. NAS 6) of oil that is required for most optimum working of the hydraulic system.	
d.	The type of pumps used shall guarantee a constant quantity of oil, independent from the contamination level of the filters. The arrangement and the location of the filters shall enable an easy access for maintenance and service activities. Fluid contamination monitoring device (online) with alarm to be connected to operator control. Pilot pressure system also shall have inline filtration and continuous circulation filtration loop.	
e.	Note: Complete hydraulic system shall have to be accommodated in hydraulic room shown in Annexure-2	
	Oil volume for hydraulic system.	(*)To be provided by vendor with technical quote
	Oil to be used in the hydraulic system	HLP 46 Hydraulic oil with high viscous index
	Heat dissipation from power pack in hydraulic room （approx.）	(*)To be provided by vendor with technical quote
3.3.14	**Water Chiller Unit for Hydraulic Oil**	
a.	The press shall be designed and equipped with a complete cooling system for the hydraulic system, Near-Isothermal Forging System, manipulator and all other systems requiring cooling. The cooling arrangement may consist of a single integrated chiller system or multiple dedicated chiller/cooling units for individual equipment or subsystems, as required to ensure optimum performance, reliability, maintainability, and energy efficiency. The cooling system shall be adequately sized to meet the total heat load of the complete installation and shall ensure continuous operation of the press under all specified operating conditions. The scope shall include chillers, pumps, heat exchangers, cooling circuits, piping, valves, evaporator cooling tower, instrumentation, controls, insulation, and all other accessories required for a complete and reliable cooling system. The vendor shall clearly indicate the proposed cooling methodology, cooling capacities, equipment served by each cooling system, and the location of all chiller units in the technical proposal. A detailed layout drawing showing the location of the chiller unit(s), cooling piping network, and interfaces with the press and associated equipment shall be submitted as part of the technical offer. Vendor shall provide one working and one standby chiller of equal capacity to ensure uninterrupted cooling needs of the facility.Vendor shall provide water chiller of at least 150 TR capacity for each of the working chiller and standby chiller	
b.	The Chiller have following features: 1. Screw type compressors for chiller. 2. Water cooled/Air cooled condenser 3. Environmental friendly refrigerant 4. All working pumps shall have one standby pump. 5. Chilled water tank with insulation 6. Cooling tower with temperature controller 7. Micro controller based cooling water management and control system. 8. Automatic switchover between standby and working chiller with help of control system. 9. A separate PLC based SCADA control system for Operation. The alarms and operation shall be interfaced with Press PLC and Operation of ON/OFF, timer control shall be carried out from the Operator Desk. 10. SCADA system shall have Flow rate, compressor status, temperature of water Inlet and outlet, pressure of water and refrigerant. Adequate solenoid valves shall be provided for chiller selection management of chilled water management 11. Piping, Instrumentation and Insulation wherever applicable for the chilled water pipelines. 12. Make: Voltas/Daikin/Bluestar	

4	**ELECTRIC EQUIPMENT**
	The electric equipment shall mainly consist of the complete power and automation control of the forging press equipment.
4.1	**Control and Operation** The press shall be equipped with a Industrial PC (IPC)-based control system housed in control cabinet of the control room and provided with a Full HD (FHD) industrial-grade operator monitor. Operator Interface application shall provide a graphical process visualization system with intuitive, user-friendly screens for operation, monitoring, diagnostics, alarms, trends, and maintenance functions. The Operator Interface application shall display real-time process parameters, machine status, fault diagnostics, hydraulic system status, production data, and historical event logs. The press control system shall be based on a Siemens TIA Portal PLC with programming conforming to IEC 61131 standards. Motion control and high-speed machine automation may be implemented using Beckhoff Twin CAT or an equivalent industrial automation platform. Communication between the PLC, PC, drives, sensors, and field devices shall be through PROFINET and Ether CAT industrial communication protocols or equivalent. The safety control system shall be implemented using a dedicated Safety PLC integrated with the main control system and shall comply with the latest international safety standards. The control system shall incorporate comprehensive machine interlocks, emergency stop functions, safety monitoring, fault diagnostics, and safe operating modes to ensure safe and reliable operation of the press under all operating conditions.
4.2	**Slide Control and Monitoring** The press control system shall provide a dedicated Operator Interface application screen for slide (ram) control with a clear and intuitive interface for setting, monitoring, and modifying all relevant operating parameters. The operator shall be able to program slide capacity, ram speed, stroke length, and slide position switching points through the Operator Interface application. The slide capacity and ram speed shall be continuously adjustable over the operating range specified by the supplier. The SCADA application shall provide real-time digital display of ram position, hydraulic pressure, forging force/capacity, ram speed, and operating status. The system shall incorporate a teach-in function for programming and storing all slide position switching points for different forging recipes. The ram position shall be continuously measured using high-resolution absolute encoders, while the hydraulic pressure shall be continuously monitored using high-accuracy electronic pressure transducers. The slide return sequence shall be programmable based on ram position (stroke-dependent) and, where applicable, hydraulic pressure (pressure-dependent). All process parameters shall be continuously monitored, recorded, and made available for diagnostics, process optimization, and production data logging
4.3	**Ram Parallelism Monitoring System** The press shall be equipped with a high-accuracy digital ram parallelism monitoring system to continuously measure and evaluate the parallelism between the moving ram (slide) and the moving bolster/press bed throughout the entire forging stroke. The system shall continuously monitor the left-right and front-back parallelism and provide real-time feedback to the press control system to ensure accurate ram alignment and protection against excessive eccentric loading. The current parallelism deviation shall be continuously displayed on the Operator Interface application in real time, enabling the operator to monitor the alignment and optimize the forging process. The system shall generate visual and audible alarms whenever the preset parallelism limits are approached. If the permissible parallelism deviation exceeds the preset safety limit, the press control system shall automatically stop the forging operation in a safe manner to protect the press structure, dies, and hydraulic components from damage. All parallelism deviations, alarms, trips, and related events shall be automatically recorded in the press event/error log with date and time stamps for diagnostics, maintenance, and process analysis.
4.4	**Visualization** The press shall be provided with a modern SCADA featuring graphical process visualization for efficient monitoring and control of all metal forming operations. The SCADA shall incorporate ergonomically designed control elements, intuitive navigation, and user-friendly graphical displays to facilitate operation, process monitoring, diagnostics, maintenance, and troubleshooting. The visualization system shall provide comprehensive real-time information on machine status, process parameters, alarms, trends, and production data. The operator interface screen shall be logically organized into multiple functional sections to ensure quick access to all relevant information and controls. As a minimum, the display shall include: **Machine Status and Process Overview:** Display of press operating mode, machine status, ram position, forging force, hydraulic pressures, temperatures, alarms, and active process sequence. **Operation and Control Panel:** Operator controls for machine operation, recipe selection, parameter setting, manual/automatic modes, diagnostics, and maintenance functions. **Alarm, Event, and Diagnostic Window:** Real-time display of warnings, faults, interlocks, safety messages, and event history with date and time stamps. **Navigation and System Information:** Menu navigation, user login/access levels, production statistics, trend displays, maintenance information, and system health monitoring. The SCADA shall support recipe management, process data logging, historical trending, multilingual operation, user access control, and remote diagnostics. The complete visualization system shall be integrated with the PLC and safety control system to provide comprehensive monitoring and control of all press functions.

5	**Modes of Operation of the Press:**
	The hydraulic forging press shall be designed and equipped to operate in **Open Die Forging, Closed Die Forging, and Near-Isothermal Forging modes**. The press control system shall support **Manual, Semi-Automatic, and Fully Automatic modes** of operation. The operator shall be able to select the desired forging mode and operating mode through the Operator Interface application, with all associated process parameters, interlocks, ram motion profiles, die heating/cooling functions, and hydraulic control sequences being automatically configured. The control system shall permit storage and retrieval of forging recipes for each operating mode to ensure repeatability, process consistency, and ease of operation.
5.1	**Open die forging mode:** The press shall be capable of operating in Open Die Forging Mode for the manufacture of forgings of various sizes and geometries. In this mode, the press control system shall permit independent programming and control of ram position, stroke length, ram speed, forging force, dwell time, and return stroke to suit different forging operations such as preforming/gathering operations prior to closed die forging, upsetting operations, and other intermediate forging. The control system shall support manual and automatic operation in Open Die Forging Mode. The operator shall be able to create, modify, store, and recall forging recipes through the SCADA, with programmable switching points, forging sequences, and process parameters. The system shall continuously monitor , control and display ram position, forging force, hydraulic pressure, and parallelism throughout the forging cycle and shall automatically protect the press against overloads, excessive eccentric loading, and abnormal operating conditions.
5.2	**Closed die forging mode:** The press shall be capable of operating in Closed Die Forging Mode for the production of precision forged components using single-impression and multi-impression closed dies. The control system shall provide precise control of ram position, forging force, ram speed, stroke length, dwell time, and return stroke to ensure repeatable die filling, dimensional accuracy, and optimum material flow. The press shall support Manual , semi automatic and Automatic operation in Closed Die Forging Mode. The control system shall permit creation, storage, and retrieval of forging recipes with programmable process parameters, including ram motion profiles, force limits, speed profiles, strain rates , dwell times. Automatic execution of the complete forging cycle shall be possible through a single command after loading the appropriate recipe. The press shall continuously monitor , control and display forging force, ram position, hydraulic pressure, die parallelism, and other critical process parameters throughout the forging cycle. The control system shall provide automatic overload protection, eccentric load monitoring, and process interlocks to safeguard the press, dies, and tooling. The system shall ensure high repeatability, consistent product quality, reduced cycle time, and safe operation during closed die forging.
5.2.1	**Die Heating System for closed die forging mode:** The press shall be provided with a dedicated die heating system capable of heating the upper and lower forging dies at temperatures up to 450°C during closed die forging operations. As the die sizes and geometries will vary depending on the forging component, the supplier shall provide a MOBILE external die heating system (Preferably electric heating system) suitable for heating a wide range of die dimensions. The dies will be preheated externally using the die heating furnaces available at HAL to the required temperature before installation/fixing in the press. After fixing of the dies to the bolsters, the die heating system shall carry out heating of the dies. The die heating methodology proposed for the closed-die forging mode shall be clearly indicated in the technical bid using appropriate pictorial/illustrative representations.
5.3	**Near Isothermal Forging Mode:**
5.3.1	The press shall be designed and equipped to perform Near-Isothermal Forging of aerospace-grade alloys, including nickel-based and titanium alloys, at process temperatures up to 950°C under inert gas atmosphere like Argon. The complete system shall ensure controlled and uniform temperature distribution of the billet and dies throughout the forging cycle to achieve optimum material flow, dimensional accuracy, and metallurgical properties. The supplier shall provide a fully integrated near-isothermal forging system comprising Electrical resistance chamber furnace, thermal insulation system, bolster, ram extension, hydraulic and electrical interfaces, control system, and all associated accessories required for fully automatic operation. The Die/Die stack shall be maintained at 950 Deg C using the resistance furnace chamber heaters. Suitable thermocouples are to be provided for measurement of die and furnace temperatures The portable chamber furnace shall be installed between the press cross slide (ram) and the press bed and shall be designed as a heavy-duty chamber furnace integrated with the hydraulic press. Induction heating is not allowed for die stack/billet. The system shall be designed and supplied with bottom die and upper die ejector systems for near isothermal forging mode also.
5.3.2	**Proposed sequence of Near Isothermal Forging operation:** 1. The billets shall be heated separately in preheating furnaces to the required forging temperature, typically in the range of 900°C to 1150°C, depending on the material and forging process requirements. 2. After achieving the specified soaking time and temperature, the billets shall be transferred using a robotic manipulator and positioned inside the near-isothermal chamber furnace, where the die assembly is maintained at 950°C. 3. The forging operation shall be carried out in accordance with the programmed process parameters, including forging force, ram speed, stroke, dwell time, and other specified process settings. 4. Upon completion of the forging cycle, the forged component shall be automatically ejected using the integrated upper and lower die ejector systems. 5. The forged component shall then be removed from the near-isothermal chamber furnace using the robotic manipulator and transferred to the designated unloading station for subsequent processing.

5.3.3	The Chamber Furnace shall have two operating positions: **Parking Position:** The chamber furnace shall be provided with a parking position located outside the press and away from the moving bolster to facilitate die preparation, tool change, loading and unloading of dies/tools, inspection, maintenance, and other preparatory activities for near-isothermal forging operations. After completion of tool installation and preparation, the chamber furnace shall be capable of preheating the dies and tooling to the specified operating temperature while in the parking position. This arrangement is intended to minimize the heating time and overall setup time after the furnace is moved to the working position. Suitable provisions for electrical power supply, argon gas supply, hydraulic and/or pneumatic connections, and all necessary control interfaces shall also be provided at the parking position. **Working Position:** The working position shall be the forging position located at the center of the press, where the chamber furnace, moving bolster, ram extension, and die assembly are accurately positioned, aligned, and automatically locked prior to commencement of the near-isothermal forging cycle. The positioning and locking arrangement shall ensure precise alignment, repeatability, and safe operation throughout the forging process. The ram extension shall be securely clamped to the press ram during near-isothermal forging operations.
5.3.4	**Proposed Working Sequence of the Near-Isothermal Chamber Attachment:** 1. The dies, tool holders, and associated tooling shall be installed inside the near-isothermal chamber furnace. 2. The chamber furnace shall be energized to heat the dies and tooling to the specified set temperature. Argon gas purging shall be carried out, whenever required, to establish and maintain the specified inert atmosphere. 3. Upon attaining the required temperature, the complete chamber furnace assembly shall be transferred from the parking position to the press using a transfer car or other suitable transfer mechanism. The furnace assembly shall then be positioned on the moving bolster, accurately aligned with the press centerline, and securely locked in position. Prior to transportation, electrical power, hydraulic/pneumatic and control connections at the parking position shall be safely disconnected. 4. The moving bolster, together with the chamber furnace assembly, shall then be moved to the forging position inside the press. The ram extension shall be accurately aligned and securely locked to the press ram. The electrical power, argon gas, cooling, hydraulic/pneumatic, and control connections provided at the press shall then be connected to enable near-isothermal forging operations. 5. Upon completion of the forging operation, the electrical power, argon gas, cooling, hydraulic/pneumatic, and control connections shall be disconnected. The chamber furnace assembly shall then be withdrawn from the press and transferred back to the designated parking position using the transfer mechanism.
5.3.5	The complete system shall be capable of heating the die assembly, tool holders, and associated tooling from ambient temperature to 950°C within a maximum period of 24 hours. The design shall be suitable for heating of tooling assemblies having a total mass of up to 15,000 kg including tool holders manufactured from nickel-based alloys or equivalent high-temperature materials. The furnace shall be provided with front and back side doors with vertical operation door on the front side door. Back side door shall be used for die and tools handling and maintenance. The front and back doors shall be of hinged type operated by hydraulic/pneumatic system interlocked with PLC and Press operation. Small vertical door shall facilitate Robotic manipulator for loading and unloading of the forgings without opening of the complete furnace.
5.3.6	The press control system shall provide dedicated Near-Isothermal Forging Mode with automatic control of furnace temperature, slide movement, forging force, ram speed, dwell time, moving bolster positioning, furnace door operation, safety interlocks, and process sequencing. All operating parameters shall be programmable through the Operator control desk, and complete forging recipes shall be capable of being created, stored, modified, and recalled for repeatable production. The supplier shall ensure complete integration of the furnace, bolster, press hydraulics, manipulator interface, and automation system to achieve reliable, safe, and repeatable near-isothermal forging operations.
5.3.7	The Near-Isothermal Forging System shall be provided with a comprehensive process temperature monitoring system for continuous measurement of the temperatures of both the work piece (billet/forging) and the dies (upper and lower die assemblies) throughout the forging cycle. The temperatures of the work piece and the dies shall be continuously displayed in real time on the main operator control desk and shall also be available for recording, trending, and storage in the press data acquisition system. The system shall provide programmable high- and low-temperature alarms, and all temperature data shall be linked to the forging recipe and archived for complete process traceability. The supplier shall provide a high-temperature industrial camera system to enable continuous visual monitoring of the forging process preferable inside the near-isothermal heating chamber (or) the camera shall be fitted outside the shell of the furnace through a glass pane view port . The live video feed shall be displayed in real time on the operator's control desk and shall also be capable of being recorded for process analysis, diagnostics, and quality traceability.
5.3.8	The Near-Isothermal Forging System shall be designed with inert gas (Argon) purging of the furnace chamber to enable processing under an inert atmosphere. This argon purging will be carried out on need basis during isothermal forging requirement. The system shall include all necessary provisions such as gas inlet and outlet connections, sealing arrangements, piping interfaces, instrumentation, control logic, and safety interlocks to facilitate integration of argon gas supply system. The design shall ensure effective purging of the furnace chamber and maintenance of the specified atmosphere during forging operations. Vendor shall provide suitable Argon gas manifold system for working and standby gas cylinders. Supply of Argon gas cylinders is HAL's scope. Vendor shall design Argon gas bank requirement for continuous working of 24 hours. The complete changeover between conventional forging mode and near-isothermal forging mode, including the installation/removal of the chamber furnace assembly, moving bolster, ram extension, associated tooling, and all mechanical, hydraulic, pneumatic, electrical, cooling, gas, and control interfaces, shall be completed within 2 hours under normal working conditions by trained operating personnel.
5.3.9	The Near-Isothermal Forging System shall be provided with an integrated hydraulic ejection system capable of safely and reliably ejecting the forged component from the lower die after completion of the forging cycle. The ejection system shall be designed to operate under near-isothermal conditions and shall be fully integrated with the press control system. The ejection sequence shall be automatic, programmable, and interlocked with the ram position, moving bolster position, and furnace operation to ensure safe and reliable operation. The moving bolster and furnace arrangement shall be designed to permit the forging manipulator to safely load the preheated billet into the furnace chamber and remove the forged component from the lower die after ejection without interference with the furnace structure or press components. The furnace chamber, access door, moving bolster, and tooling arrangement shall provide adequate access and clearance for manipulator operation throughout the loading and unloading cycle.

5.3.10	The Near-Isothermal Forging Attachment shall be transferred from the parking position to the working position using a transfer car or an equivalent suitable transfer mechanism. The transfer mechanism shall accurately position the chamber furnace assembly on the moving bolster and ensure precise alignment with the press centerline prior to commencement of the forging cycle. The vendor shall provide a detailed description/ animation of Near-Isothermal Forging System and its operating mechanism as part of the technical offer. This shall include illustrative drawings/schematics/ 3D representations clearly explaining the complete operational sequence, including the chamber furnace transfer mechanism, alignment and locking arrangement, utility connections (electrical, hydraulic/pneumatic, cooling, control, and argon gas), and the complete changeover procedure between conventional forging mode and near-isothermal forging mode. The vendor shall clearly indicate the changeover methodology, sequence of operations, special tools/fixtures (if any), and the estimated time required for each activity in the technical bid.	
5.3.11	The complete die design and manufacturing of the dies for near isothermal forging operations, including die impression/profile, die blocks, inserts will be under the scope of HAL. Prior to manufacture die-interface components by HAL, the vendor shall submit the following drawings/documents to HAL : a. Die-stack interface with the chamber furnace. b. Die loading/unloading arrangement. c. Furnace working envelope d.Temperature measurement/thermocouple arrangement.	
5.3.12	**Billet dimensions for Isothermal Forging Operations**	
a.	Max. billet diameter in heating furnace	300 mm
b.	Max. billet height in heating furnace	800 mm
c.	Max. diameter of forged part	800 mm
d.	Max. Weight of billet	500 kg
5.3.13	**Electrical resistance Chamber Furnace for Isothermal Forging**	
a.	Type	Electrical resistance
b.	Working Space (W X D X H)	2200x2400x2800 mm (Approx.)
c.	Front and Back service doors (W X H) - 2Nos	2000 X 2000 mm (Approx.)
d.	Operation door (W X H)	1500 X 1000 mm (Approx.)
e.	Stroke of Operation door (typical)	1300 mm
f.	Furnace Power	400 KW (Approx.)
g.	Temperature of the furnace(Minimum)	1100 Deg C
h.	Insulation Material	Suitable ceramic board/Fiber modules
i.	Insulation thickness	250mm minimum
j.	Heating Elements	Kanthal ROB with Fibrothol vacuum formed insulation or suitable heaters with insulation
k.	Outer wall temperature	Less than 60 Deg C.
l.	Data Logger	Eurotherm make Digital recorder
m.	Temperature control system	Eurotherm make temperature controllers for main and safety thermocouples
n.	Power control	MCCB→Contactor→Thyristor→Heating Elements
o.	Furnace Accuracy	±10 Deg C in the range of 650 Deg C to Maximum temperature of furnace
q.	Furnace shell	Furnace shell be made of MS plates/GI steel frame.
r.	Cladding for the furnace shell	Powder coated panels shall be provided for aesthetic looking.

6	**Robotic Manipulator**	
a.	Vendor shall supply Robotic Manipulator and integrate with press and furnaces of HAL. The Robotic manipulator shall be capable of loading and unloading work pieces between the heating furnaces, press, loading and unloading station. The manipulator shall facilitate loading of billets into the furnaces, the transfer of heated work pieces from the furnaces to the forging area and, upon completion of the forging operation, transfer the forged components to the designated unloading location. The manipulator shall be of hydraulic type. Vendor shall carry out design, supply, installation, commissioning , integration with Press and furnaces and prove out of the following: 1. Robotic manipulator for handling of hot parts (billets/performs/finished forgings) to and from furnaces and press. 2. The robotic manipulator should be rail bound and should function in fully automatic mode, semi automatic, manual mode. 3. Automatic loading of billets into the furnace shall be carried out using a robotic manipulator. The billets shall preferably be positioned vertically for the forging operation, while semi-finished forgings shall preferably be positioned horizontally. 4. Integration of Robotic Manipulator with 4 Nos furnaces and also provide scope for addition of 4 Nos of furnaces. 5. One unloading station with metal pallets for stacking of parts after unloading from press . Layout consisting of press and with indicative positions of furnaces is attached at Annexure-2 for reference.	
b.	The manipulator shall be designed with suitable interchangeable grippers for handling forgings of various shapes, sizes, and profiles during all specified forging operations. The vendor shall design and supply multiple grippers to suit the different forging components and operations. The grippers shall be designed for quick replacement with minimum changeover time. The final design, quantity (minimum 4 no's) , and configuration of the grippers shall be finalized after placement of the Purchase Order in consultation with HAL, based on the forging components and operational requirements.	
	Technical specifications of Robotic manipulator	
6.1	**Part Details:**	
6.1.1	Max. part weight	1500 kg
6.1.2	Min. part weight	20 kg
6.1.3	Max. diameter after Forging/upsetting	1500 mm
6.1.4	Min. Diameter	100 mm
6.1.5	Max. billet height	1200 mm
6.1.6	Min. billet height	100 mm
6.1.7	Travel distance required as per site conditions(Approximate)	20,000mm
6.1.8	Positioning Accuracy (High speed mode)	±5mm
6.1.9	Transfer time allowed from furnace door opening to placing part on press (Max)	35 Sec
6.1.10	Additional Transfer time allowed for precision mode (Maximum)	5 Sec
6.2	**Working envelope:**	
6.2.1	Vertical stroke (Minimum)	1200mm
6.2.2	Min height from floor	600mm
6.2.3	Max height from floor (More is preferable)	1800mm
6.2.4	Linear(horizontal) stroke (minimum)	4200 mm
6.2.5	Slew Axis (minimum)	270 Degrees
6.2.6	Tong Tilt up (minimum)	5°
6.2.7	Tong Tilt Down (minimum)	15°
6.2.8	Tong rotation Axis	360°
6.3	**Speeds**	
6.3.1	Slew (Minimum)	0-50 Degrees/sec
6.3.2	Vertical (Minimum)	0.4 m/s
6.3.3	Horizontal (Minimum)	1.5 m/s
6.3.4	Tong rotation (Minimum)	60°/s
6.3.5	Repeatability (Minimum)	+/- 5 mm

6.4	**Integration with Furnaces of HAL**
6.4.1	Supplier shall carryout the integration of robotic manipulator with furnaces of HAL(as per the layout proposed in the Annexure - 2) The indicative dimensions of the furnaces are as follows: **High temperature Box type chamber Furnaces: 2 Nos** Size: 1800mm W X 1800mm Depth X 900mm Height : Bed height from Floor: 900-1200mm, Temperature range: 650 Deg C - 1180 Deg C **High temperature Box type Chamber furnaces: 2 Nos** Size: 2500mm W X 2500mm Depth X 900mm Height : Bed height from Floor: 900-1200mm, Temperature range: 650 Deg C - 1180 Deg C **Low temperature Box type furnaces: 2 Nos** 1800mm W X 1800mm Depth X 900mm Height: Bed height from Floor: 900-1200mm, Temperature range: 150 Deg C - 650 Deg C **Low temperature Box type furnaces: 2 Nos** Size: 2500mm W X 2500mm Depth X 900mm Height : Bed height from Floor: 900-1200mm, Temperature range: 150 Deg C - 650 Deg C Supplier shall design tongs such a way that maximum number of billets and forgings can be loading and unloading is possible in coordination with HAL after PO placement. The above dimensions of the furnaces are indicative, actual dimensions of the furnaces will be provided after PO placement. The manipulator control system shall be interfaced with PLC of furnaces of HAL for door declamping/clamping and Opening and closing for transfer of parts.
6.4.2	Manipulator shall be rail bound and rails shall be grouted in flush with floor level. Vendor shall provide a suitable high temperature camera at suitable location on the Manipulator for visualization during operations. This shall be integrated to main control desk of the press. Power supply for loading manipulator shall be taken through a drag chain placed in side ground with suitable guide channel, Heavy duty drage channel shall be provided by the vendor. Make: Igus/equivalent A suitable Operator cabin with controls shall be provided on the manipulator for manual operation/Maintenance activities
6.4.3	Vendor shall provide recipe management for manipulator operations. There should be facility to perform test run for operations in auto mode and semi auto mode. Vendor shall provide a separate HMI/Industry PC in the press control room & shall be integrated with press & furnace. Automatic / Semi - automatic / manual operation shall also be available from the remote control panel installed in the press control room. In semi automatic mode , manipulator shall move to a desired position upon selection.
6.4.4	The vendor shall provide a detailed description/ animation of Robotic Manipulator and its operating mechanism as part of the technical offer. This shall include illustrative drawings/ schematics/ 3D representations clearly explaining the complete operational sequence.
6.5	**Manipulator Performance Requirement**
	The forging manipulator and its control system shall be designed to enable completion of the forging cycle for a representative closed die forging component within 240 seconds, measured from unloading of the heated billet from the pre heating furnace into the press until completion of the forging operation and removal of the forged component and moving to the unloading station. The manipulator shall ensure smooth, precise, and repeatable handling of the work piece without adversely affecting the forging sequence or process quality. The vendor shall demonstrate compliance with this requirement during the Factory Acceptance Test (FAT) with simulated robot motions and Site Acceptance Test (SAT) using a mutually agreed representative forging component and process sequence. The complete forging cycle time, including billet handling, positioning, forging manipulations, and part removal, shall be recorded and submitted as part of the acceptance documentation.
7.0	**Die Lubrication System**
	The Die lubrication unit shall be designed for storing , stirring and dispensing the lubricant at the desired pressure and flow through a hand held spray gun. This die lubrication shall be made available through out the operating cycle of the press during forging operations. The main components of the die lubricant system is described below:
7.1	**Die lubrication storage tank:**
	The lubricant tank shall made of Stainless steel material and having a capacity of approximately 100 liters. The compressed air regulator ,filter and diaphragm pump shall be installed over the tank. The tank shall have provision for filling/top up of the die lubricant. And the tank shall be provided with level indicator , gate valve and drain valve. The tank shall be mounted over a movable skid with hand rails.
7.2	**Pressure Compensating Unit**
	The tank shall be provided with a pressure compensation unit to maintain the pressure of the die lubricant and dispenses same through handheld spray gun. Pressure compensation bellows shall be provided with solenoid valves and pressure sensors/gauges. The system shall draw power and logic controls through a panel fitted on the tank
7.3	**Pneumatic motor stirrer**
	The lubrication tank shall be assembled with a pneumatic motor stirrer to homogenously mix the stored die lubrication . The pneumatic motor operated stirrer shall be mounted over top of the tank.
7.4	**Hand Spray Gun for applicant of lubricant**
	Hand held spray gun (Qty: 2 no's) shall be designed and supplied for spraying of graphite based lubricant during forging operations. The graphite lubricant will be supplied by HAL. Vendor shall design the system based on the details of the graphite lubricant provided by HAL. Apart from hand held spray, the system shall have provision for spray lance and nozzles with solenoid valves controlled through control desk operations.

8	**Electrical Main Data**
	Names of all equipment and devices which consume electrical power, its power rating shall be provided by vendor with technical bid. Total (approx.) power consumption shall also be provided.
8.1	**Electric and Electronic Control** The electric equipment shall mainly consist of the complete power and automation control of the Press
8.1.1	**Switch Cabinets**
a.	The main switch cabinet shall consist of :
b.	Main supply by the means of three-pole Main switch
c.	Design of switch cabinet in channel wiring
d.	Design for ambient temperatures up to 40°C with cabinet cooling by air conditioning
e.	Lighting to the cabinet
f.	Power switchgear with overload protection of all electric components, power and auxiliary contactors
g.	Separate power circuits for the individual machinery groups
h.	Emergency stop push buttons
i.	Vendor shall provide minimum TWO different electrical panels to distribute Power to the electrical systems. Maximum connected load to each panel shall not be more than 2500 KVA.
j.	A separate electrical panel is to be provided for isothermal chamber furnace
k.	There shall be a minimum 200 mm gap between Power cables and control cables in the trench. Vendor shall accordingly provide cable trays. All the cables shall be properly routed through cable trays.
8.1.2	**Control Cabinets**
a.	Switch cabinets to house the PLC-systems and to generate the control voltage shall consist of:
b.	Overload protection
c.	Suitable air conditioning inside the panel to maintain panel temperature within operating range.
d.	Transformers for the generation of control voltage
e.	Power packs for the generation of control voltage
f.	Relays and auxiliary contactors
g.	Programmable Logic Control (PLC) unit consisting of: •CPU •Digital input and output components •Analog input and output components •Module for interfacing with the Ethernet for remote trouble shooting. •Port for remote data transmission to the programming unit
8.1.3	**Local Control Panels / Remote Control Cabinets**
a.	Local control panels / remote control cabinets/remote PLC I/O modules to operate the individual machines /equipment in the operation / maintenance modes shall comprise of :
b.	Control and signalling devices to start and stop the individual assemblies
c.	Emergency stop push button
8.1.4	**Control Desk**
a.	All the operations of press shall be controlled from control desk using push buttons, joy sticks and potentiometers/Encoders. The control desk shall have following :
b.	Desk top
c.	The desk top shall essentially comprise of the following hardware :
d.	Industrial PC with IPC847E or latest + 24 inch monitors (2 Nos).
e.	One DELL commercial computer + 40 inch monitor for advanced press monitoring, machine action and CCTV camera view installed in hydraulic room.
f.	Full HD colour monitor, keyboard, optical mouse or trackball
g.	User Licenses shall be provided by the vendor for: •Windows operating system - Windows 11 or latest, SCADA or any other software •Visualization •Recipe management •Any other application software •All above software's shall be configured ready for connection, including documentation

8.1.5	**Machine Visualization**
a.	Graphic representation(MIMIC display) of machinery and plant sections(both static and dynamic visualization) which is showing the different working modes (ram movement, cross slide lock, Hydraulic circuit schematic with cylinders, Hydraulic tank, Accumulators, all Valves, Position Sensors, limit switches, shutoff valves, filters, pumps, motors, temperature indicators, flow transmitters, etc. and PLC input and Output of Analog and Digital)
b.	Numeric display of measured operating values of individual assemblies on the basis of set values
c.	Additional detail information (e.g. Identification of all electrical devices, pressure, temperature and distance sensors, servo valves and their working parameters)
8.1.6	**Process Visualization**
	Visualization of the process in the Press, numeric and graphic display(MIMIC) of the process parameters. During submission of technical quote, Vendor shall explain process visualization using actual screen shots as examples.
8.1.7	**Recipe/Programme Input**
a.	A recipe/programme is a group of production-related set input values for the Press.
b.	Input values shall be checked by Press inbuilt system shall ensure a safe operation of the Press.
c.	Loading, Storage, deleting of recipes for individual parts in a data logging and retrieving system. Batch wise part data to be captured.
8.1.8	**Alarm Management**
a.	Alarm list including faults with time stamp of message and acknowledgement
b.	Diagnosis of faults: By a click of button on fault message or code, one can reach to graphical / visual display or a link to check in manual showing the fault location in the machine. This shall be accompanied with details of the fault .
c.	Tabular and/or graphical/visual display (with green, yellow/grey and red colours or in any other format or colour codes)of the states of various assemblies.
d.	Access to the operating and maintenance manuals and to the circuit diagrams of Electrical and Hydraulic systems. During submission of technical quote, vendor shall explain alarm management system using screen shots as examples.
8.1.9	**Sensors shall be provided for the measurement of the following**
a.	Pressure transmitters: with display for the individual hydraulic pressure systems
b.	Position transducers: For Measurement of the movements of the various assemblies of press
c.	Position sensors: Proximity/Limit switches for position sensing.
d.	Flow Meters: For measurement of Hydraulic oil and water flow in the circuit
e.	Level Sensor: Hydraulic Oil level in the tanks
f.	Temperature Sensors: Hydraulic oil and water temperature
g.	Any other type of sensor for safe operation of Press.
8.1.10	**Safety Control**
a.	The pre set safety circuit shall be monitored by the PLC. Any operation and machine related problem shall be displayed in clear text on operator screen indicating location of the failure.
b.	In event of any process or machine related problem during operation, the safety circuit shall override the processing controls and it shall bring the press to rest position safely.
c.	In addition, Emergency stop push buttons at minimum 3 locations shall be provided. 1 on the press side , 1 on the PLC panel, 1 on the control desk. Features such as 2 hand control for movement shall be incorporated. On activation of emergency buttons, press shall be brought safely to rest position.
d.	Different password levels(for operators, engineers, manager, maintenance staff) with the disabling of individual inputs and functions.
e.	Tool Change Mode: For tool change on upper or lower dies, none of the press components other than those used in the tool change shall be functional .
f.	The emergency stop should comply with ISO 13850 standards.
8.1.11	**Networks**
a.	Communication connection (Ethernet) of the PLC controls and the PC visualization systems to exchange the process data
b.	OPC UA communication shall be available for data exchange with other Server/MES/ERP Systems.
c.	Industrial managed Ethernet switches shall be provided for automation networks with support for PROFINET/Ethernet communication, VLAN, diagnostics, SNMP.
d.	Switches shall be industrial grade and suitable for continuous operation in harsh industrial environments.

8.1.12	**Data Acquisition, Handling and Management System**	
8.1.12.1	**Function:**	
	Storage and display of process data as a time function for diagnosis and optimization purposes	
8.1.12.2	**Application:**	
a	Selection of individual machine and process parameters to represent the trend - Hydraulic pressures, no of parts, Velocity Electrical Energy, Current, voltage, oil and water temperatures.	
b	Graphic representation as online and historical trending for measured parameters - Energy, Hydraulic pressures, position, force and temperature	
c	-Axis scaling freely selectable, zoom function where applicable	
d	-Export / import function for archived files	
e	-Screen print-out	
f	-Language -English	
g	-Alarm logger/History	
h	All alarms for past 2 years shall be recorded including the date and time of their occurrence; they can be called up any time later.	
i	-Data acquisition /Trends	
g	After forging operation, all machine and process related data shall be displayed on the screen to facilitate optimization for optimization of next batch/part	
8.1.12.3	**-Product programs**	
a	-Creating a product library	
b	-Storage (data back-up)	
c	-Overview of the programs stored on the hard disc	
8.1.12.4	**Remote/Online Support**	
a	Vendor shall offer remote diagnosis and support system for the press.	
b	The Vendor shall have online access to the press (including PLC, visualization PC etc.) whenever required by HAL.	
c	This is to enable immediate support in case of defects and also software corrections can be made. **Remark:** Vendor shall provide free online support during warranty period.	
9.0	**Electric Design and specifications**	
a	Electric power supply available	415 V +/-10%, 50 Hz +/-3%, 3 phase, 4 wire, A.C. system
b	Type of net	TN -S network
c	Neutral conductor	Unloaded
d	Control voltage	230 V AC/ 24 V DC
e	Press-operator and Control Room (containing PLC+Visualisation PC) temperature switch cabinet / control room	Min. 15 up to max. 25 °C
f	Ambient temperature outside of air-conditioned switch cabinet rooms	up to max 45 °C
g	Design specifications (excluding single core marking)	VDE / UVV / EN / IEC
9.1	**Switchgear assemblies / system technology**	
a	Type of protection for panels inside cabinet rooms	IP20
b	Type of protection outside cabinet rooms	IP54
c	Switch cabinets inside cabinet rooms	with doors and suitable air conditioning to be provided by vendor
d	PLC design	Remote I/O
e	Network	Industrial Ethernet (TCP/ IP)
f	Protocol	Profinet/Ethernet
9.2	**All pumps of the hydraulic system**	
a	Thermistor protection for motors	For >= 45 Kw motors
b	Surge protection	Required
c	Digital Energy meter in the switch cabinets	Required
d	Cable entry	Bottom Entry
e	PC – operating systems:	MS Windows
f	Reserve expansion space inside of switch cabinets	minimum 15%
g	Reserve space provided in PLC (without hardware):	minimum 20%
h	Reserve space provided in PLC (with hardware):	minimum 20%

9.3	**Brand specifications : Electrical and Electronic systems:**	
a	Switch cabinets / control boxes	RITTAL/SIEMENS/SCHNEIDER
b	Desks	RITTAL/SIEMENS/SCHNEIDER
c	Main switches	SIEMENS/MOELLER Eaton /SCHNEIDER/ABB/GE/L&T/CG
d	Switchgear	SIEMENS/MOELLER Eaton /SCHNEIDER/ABB/GE/L&T/CG
e	Soft start devices	SIEMENS/SCHNEIDER/ABB/GE
f	Servo converter	SIEMENS/SCHNEIDER/ABB/GE
g	Motors	Siemens/ABB/L&T/Schneider/Crompton Greaves/GE/CG
h	Servo motors	SIEMENS/BALDOR/LENZ/BECKHOFF
i	PLC system	SIEMENS
j	Remote PLC	SIEMENS
k	Safety control	PILZ/Sick/Siemens
l	Visualization (SCADA)	SIMATIC /IN TOUCH WONDERWARE/OEM of the Press
m	PC system	BECKHOFF/SIEMENS
n	Monitor size (Minimum)	24“ Full HD
o	Energy Meter	Schneider/Siemens/ABB
p	Control and signalling devices:	SIEMENS/MOELLER/SCHNEIDER/ABB/GE
q	Network components:	Suitable to PLC system
r	Control Cables	LAPP
s	Programming device:	Siemens Field PG
t	UPS for PC system with 20 minutes backup	APC/POWERWARE/RITTAL/EATON
u	AC for panels	Rittal/Dai-chi/Werner Finley
v	Cables	All shall be copper cables with ground wire
w	Distance Transducers	Balluf/ASM/SICK/MTS/Tempesonics
9.4	**Brand specifications : Hydraulic System**	
a	Pump	Bosch Rexroth/Eaton/Parker/Wepuko
b	Valves(Direction, check, relief/logic and cartridges)	Bosch Rexroth/Eaton/Parker
c	Proportional/Servo	Moog/Rexroth
d	Hydraulic cylinder Seals	Trelleborg/Freudenberg/Hunfer DFE/SKF
e	Pressure sensors	IFM/WIKA
f	Decompression valve	Bosch Rexroth/Parker/ Hoerbiger/OEM of the Press
g	Hydraulic Filters	Hydac/Mahle/Parker
h	Hydraulic Hoses	Parker/Gates/Eaton/ Contitec/OEM of the Press
i	Temperature Sensors for Hydraulic	IFM/WIKA/Danfoss
j	Heat Exchanger	Alfa laval/OEM Specific
k	Accumulators	Hydac/Bosch Rexroth/Olaer
l	Manifold/Blocks	Bosch Rexroth/ OEM of the Press
10	**Control-modes, Transitions and Process Tolerances forging operations**	
	The press visualization system shall provide the capability to display and monitor all control modes, mode transitions, and process tolerances during operation. It shall also display the set (reference) versus actual process curves followed by the work piece throughout the forging cycle. The required control modes, process parameters, and permissible tolerance limits are specified in Annexure-3. The press shall be capable of achieving and maintaining all specified parameter tolerance limits throughout the forging process.	

11	**Mandatory Accessories :**	
11.1	**Forging Temperature Monitoring System**	
	A non-contact temperature measurement system using infrared pyrometers shall be provided to continuously measure the temperature of the billet/forging during the forging process where billets are positioned. The system shall be capable of accurately monitoring the forging temperature throughout the forging cycle without interfering with the forging operation. The measured temperature shall be displayed in real time at the press control desk as well as on a dedicated display screen located in the forging shop/hangar. The system be integrated with the press control and data acquisition system for monitoring, recording, and traceability of the forging process. The temperature measurement system shall be suitable for operation in the forging environment and shall provide reliable measurements under high-temperature conditions, taking into account scale, emissivity variations, and radiant heat. The vendor shall specify the measurement range, accuracy, response time, and method adopted for emissivity compensation. The proposed system shall be of proven industrial design and shall have been successfully implemented in heavy forging and/or automotive forging industries for online forging temperature monitoring. The vendor shall supply valid calibration certificates of the pyrometers.	
11.2	**Industrial Video Monitoring System**	
	The vendor shall supply, install and commission an industrial-grade CCTV camera system for real-time visualization of press and shop floor activities from the operator cabin. A minimum of 06 nos. industrial-grade IP CCTV cameras shall be provided at suitable locations to clearly cover the press working area, die area, manipulator/material handling area, and surrounding shop floor movement area. The CCTV system shall meet the following minimum requirements: Cameras shall be minimum 5 MP resolution IP cameras, suitable for continuous industrial operation. For critical viewing locations such as press working area and job handling area, 8 MP / 4K cameras are preferred for enhanced clarity. Cameras shall be suitable for forge shop environment and shall have protection against dust, heat, vibration, scale particles and shop floor contamination. Cameras installed near the press area shall be provided with suitable protective housings, heat shields and robust mounting arrangements. Cameras shall have day/night vision capability, wide dynamic range and good low-light performance for clear visibility under varying shop lighting conditions. Live video feed from all cameras shall be displayed on a dedicated monitor inside the operator cabin. The system shall include NVR/DVR with minimum 30 days recording capacity, with provision for retrieval, backup and playback of recorded footage. All cameras, cables, network switches, power supply, mounting brackets, conduits, protective housings, accessories and software required for complete installation shall be included in the vendor's scope. The CCTV system shall be installed operator in the operator cabin and shall not obstruct machine operation, maintenance access or shop floor movement. Final camera locations shall be decided during detailed design/manufacturing of press in consultation with HAL. 40 inch monitor for CCTV camera view which shall be installed in operator control room.	
12	**Mandatory Critical spare Components/tools**	
	1. Vendor shall supply the following critical spares along with the equipment: a. Seal kits/Wear strips for each of Main cylinders, retraction cylinders, Moving bolster cylinders including jigs, fixtures and special tools required for replacement. b. One set of Pre-fill valve/decompression valve, Proportional and Servo valves c. One set of Robotic manipulator cylinders and motors d. One set of Mobile Oil contamination monitoring kit with printer I. One set of Hydraulic Oil filters/Breathers f. One set of Distance transducers g. One set of Heating elements for Chamber Furnace h. One set of Pressure, distance, level transducers and flow meters. I. One set Tool kit with trolley for machine operation and maintenance	
13	**Spares After Warranty:**	
	Along with the technical quotation of press, vendors shall provide a complete list of spare parts for press mechanics / electrics / hydraulics for two years normal operation after warranty period. The quotation for spares shall be separate from quotation of the press and should be valid for a period of 2 years from the date of completion of warranty. The price of Post Warranty Spares shall not be part of commercial evaluation of tender.	
13.1	This list shall contain the following:	
a	Name of equipment	
b	Name of spare parts	
c	Specifications	
d	Quantity	
e	Price	
f	Priority (VITAL/ESSENTIAL/DESIRABLE)	

14	**Warranty :**	
14.1	**Warranty period:** Two years from the date of signing the final acceptance letter. In case of any failure noticed in the parts during warranty period , the vendor should give free replacement .	
14.2	Any replacement job in above warranty periods shall be executed by vendor by deputing it's service engineer at HAL. Travel cost, hotel charges and local transport cost of the service engineer has to be borne by the vendor .	
14.3	Vendor to ensure minimum uptime of 90% of the machine during warranty period In case of 95% uptime not met for a certain period of time during warranty, then warranty period shall extend by that extent. Working hours shall be counted at 90 hrs. per week (@ 15 hrs. per day, 6 days a week). The downtime of machine shall be considered from the breakdown of machine to its restoration to normal.	
15	**Annual Maintenance Contract (AMC):**	
	Vendor shall provide a separate budgetary quotation for the Annual Maintenance Contract (AMC) for five years , which will be applicable after the expiry of the warranty clause. The AMC cost is requested solely for ensuring the machine supplier commitment to support the equipment and also for the budgetary purpose and shall not be part of commercial evaluation of tender. This AMC quote shall include online support on need basis, service engineer visit on half yearly basis to trouble shoot and service of the press.	
16	**Painting and Colour Coding for equipment and Pipelines**	
16.1	Hydraulic Press and other accessories	The Press shall be painted with rust proof primer followed by two coats of enamel painting in accordance with ISO 12944. Painting shall enormously improve the aesthetic look of equipment . Preferred colour for the press structure is RAL 6018
16.2	Pipe lines	All hydraulic , lubrication , cooling water , compressed air and utility pipe lines shall be permanently identified in accordance with IS 2379 , ISO 20560-1. Identification shall include colour coding , flow direction arrows , service description , wherever applicable.
17	**Civil Foundation Details:**	
17.1	After Purchase Order placement , vendor shall share all necessary foundation drawings of Press and manipulator with HAL within 3 months so that foundation works can be started.	
17.2	During foundation work, HAL will call vendor specialists to inspect the actual foundation details so that corrections if any can be carried out immediately. The Specialist's air travel cost , hotel fare, local transport to and from HAL shall be at vendor's cost. Vendor can specify most appropriate time for it's specialists visit , frequency of visit. Vendor shall plan for his visit based on the progress of the foundation at one or more times.	
17.3	Vendor shall supply Foundation bolts & nuts, levelling pads, embedded plates required for Civil foundation and erection of the press	
18	**Delivery Schedule:**	
	The 10000 Ton Press along with all associated equipment and auxiliaries to be delivered (which includes supply, installation, commissioning and final acceptance) within 30 months from the date of acceptance of the order by the vendor. Site readiness for installation of the equipment is scheduled by June 2028. The vendor shall submit a detailed project execution schedule indicating all major milestones and timelines with the technical offer and shall ensure compliance with the stipulated project completion period. Delivery Term: DPU (Delivery at Place Unloaded) INCOTERMS 2020. Delivery Place: Foundry and Forge Division, Hindustan Aeronautics Limited, Bangalore, India. Complete scope of logistics including movements to the installation location is in the scope of vendor.	
19	**Pre Dispatch Inspection(PDI)**	
	Before shipment of the consignment, a Pre Dispatch Inspection shall be carried out by HAL representatives at vendor's site. Vendor has to successfully demonstrate all sub assemblies, material certificates, electrical and PLC panels, SCADA System, hydraulic systems and OEM certificates for bought out parts(brands shall meet the requirement of tender). 1. Dimensional verification of press structures, assemblies, sub assemblies and other systems. 2. Salient features of the press 3. Isothermal Forging attachment 4. Robotic Manipulator 5. Hydraulic System including tanks, filtering system, Servo system, pipes and fittings 6. Main cylinders and retraction cylinders 7. Manifolds, Pumps and Motors 8. Instrumentation and Control systems 9. Lubrication system 10. Main control Desk 11. Tools/Dies 12. Electrical Panels 13. Data Acquisition and storage SCADA system 14. Bought out items and OEM certificates 15. Electrical, Mechanical and Hydraulic drawings and documentation There will not be any separate cost towards PDI activities and same shall be borne by the vendor. However, HAL reserves the right to waive the Pre dispatch inspection(PDI), either partially or in full, if deemed necessary.	

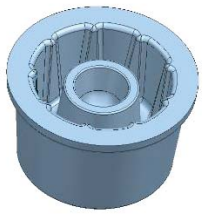
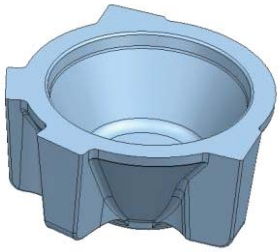
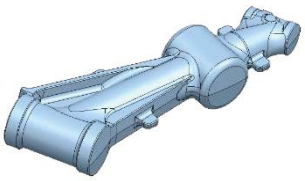
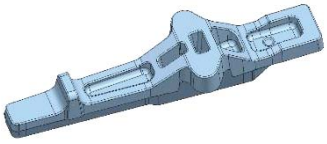
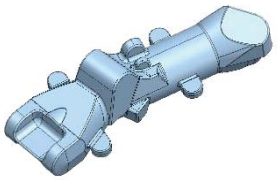
20	**Erection , Installation, Commissioning, Acceptance and Training:**
20.1	**Erection & Installation:**
	Erection and Installation of the press will solely be vendor's responsibility. Subsequent to this , vendor shall carry out erection work using it's own people, using it's own loading/unloading and lifting cranes and erection tools and equipment. Vendor shall also supply heavy duty cable conduits, cable trays, vibration pads for erection of the press.
20.2	**Commissioning**
	Commissioning involving the dry run with all electrical, electronic, mechanical and hydraulic functions shall be carried out . This shall be solely vendor's responsibility. After erection and commissioning , an acceptance test will be performed. As a part of commissioning , vendor shall Provide First fill of Hydraulic oil, Grease, Refrigerant, Oil lubrication required for press equipment.
20.3	**Acceptance Test Method**
20.3.1	HAL will carryout an extensive acceptance test process for TWO months period after vendor declares that press facility is ready for hot trails under full range of loads and for all operations. Vendor shall demonstrate maximum press load capacity of 10000T (max. 12000T boost capacity) by means of calibrated Pressure gauge with respect to cylinder dimensions. HAL reserves the right to check press capacity independently during acceptance test. During the acceptance test process, all the required features expected from the Press for Open die, closed die and Isothermal forging in all modes of operation including robotic manipulator integration and functions shall be checked. Along with this all the Control modes, transitions and process tolerances of the press shall be checked. The equipment shall perform without any problems in the complete acceptance trial period. In case of any problem arising in the machine in this period that is attributed to the vendor, the trial period gets extended to that extent.
20.3.2	**Site Acceptance Test (SAT) for Open and Closed die forging :** A representative Open die and Closed die forging operations shall be carried out during SAT to demonstrate the functionality of the press as per defined parameters . The vendor shall also demonstrate seamless integration and synchronized operation of the manipulator with the press for automatic loading, unloading, and handling of the workpiece throughout the complete forging cycle. Dies/tools required for the SAT is in HAL's scope. **Site Acceptance Test (SAT) for near Isothermal forging** : A representative near-isothermal forging operation shall be carried out during SAT to demonstrate the functionality of the near-isothermal forging system supplied by vendor. The vendor shall also demonstrate seamless integration and synchronized operation of the manipulator with the press and near-isothermal system for automatic loading, unloading, and handling of the workpiece throughout the complete forging cycle. Dies/tools required for the SAT is in HAL's scope.
20.4	**TRAINING**
	After successful completion of acceptance test, vendor specialists shall train HAL's operation's and service personnel for 15 working days. After successful commissioning and prove out of the press at HAL, Vendor has to depute his Engineers at HAL for a period of ONE month for monitoring and troubleshooting of the equipment.
21.0	**HAL Scope of Supply**
21.1	**CIVIL ENGINEERING**
	Foundations and grouting for all equipment (press and manipulator) and auxiliaries as per vendor drawing.
	Parts concreted in the foundation for reinforcement
	Trenches for cables, pipe lines, drainage lines for fluids/emulsions
	Painting/coating of foundations and civil works if required.
	Operator room with air-conditioning, telephone, illumination, furniture etc.
	Main Hangar with illumination, 2 over head lifting cranes with capacity 10T and 50T respectively.
	Hydraulic and electrical room with illumination, over head lifting crane with capacity 5T .
21.2	**ELECTRICAL ENGINEERING**
	External wiring/energy supply between the transformer and the Electrical panels to 2nos of Main switch cabinets and Switch cabinet of Chamber Furnace. All other power supply for any additional panels and internal cabling is in vendors scope only.
	Transformers & HT/LT switchgears
	Site lighting
	Electrical/electronic earthing of the complete equipment
21.3	**SPARES, CONSUMABLES**
	Storage space for consumables, spare and wear parts
	Raw material of sufficient quantity for commissioning, acceptance test
21.4	**Air and Water Supply**
	Supply of compressed air Water at Room temperature
	Sump and drainage pumps.

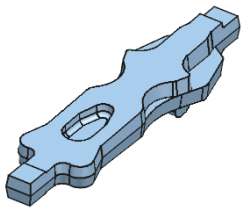
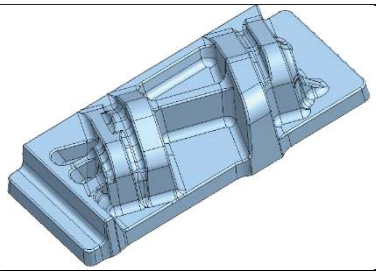
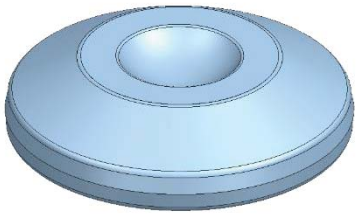
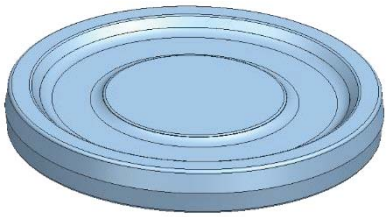
22	**Qualification Criteria:**
22.1	**Past Experience:**
	The proposed 10000 Ton will be utilized for the manufacture of critical aircraft & aero-engine forgings for the programs of HAL and therefore OEMs. The forged components produced on this press are to meet the stringent dimensional, quality and process requirements of HAL & global aero-engine OEMs. Indian Airworthiness agencies & OEMs carry out process audits and qualification of the forging equipment before approving the facility for forging manufacturing. Therefore, the vendor shall have proven experience in supplying of hydraulic presses to the standards of global industry. Vendor shall have past experience of supplying similar forging equipment to forging industries and the supplied equipment should have met the operational and quality requirements . Following are the experience requirements: a) The Vendor / OEM shall have successfully designed, manufactured, supplied, installed and commissioned at least Five (05) Hydraulic Forging Presses and out of which at least two (02) Hydraulic Forging Presses shall have a rated capacity 10,000 Tons or above. b) The Vendor / OEM shall have successfully designed, manufactured, supplied, installed and commissioned at least two (02) Near-Isothermal / Isothermal Forging Presses capable of Forging of Titanium / Nickel-based alloys. c) At least one of the above presses should have been supplied more than ten (10) years prior to the date of bid submission. The vendor shall submit documentary evidence in support of the above experience (a), (b) &(c) in the form of customer purchase orders/completion certificates/commissioning certificates/ performance certificates .HAL's technical Evaluation Committee will evaluate such evidences and in case any additional proof is required, same will be asked by HAL. **Failure to submit the required documentary evidence shall render the bid liable for rejection.**
22.2	**Financial Standing:**
	Average financial turnover of the bidder during the last three completed financial years shall be atleast INR 240.00 Crs.In case the bidder participates in both the line-items (i.e., 10000 Ton Hydraulic Press and 20 Ton counter blow hammer together) the average financial turnover shall be atleast INR 290 crores. The bidder shall submit the audited financial statements/reports (relevant portions) for the last three completed financial years as a proof of evidence in support of the above requirement. **Failure to submit the required documentary evidence shall render the bid liable for rejection.**
22.3	Bids submitted by bidders quoting as authorized representative of the same or other principal manufacturer shall also be considered for qualification provided: a) their principal manufacturer meets all the qualification criteria without exemption, and b) the principal manufacturer furnishes a legally enforceable tender-specific authorization in the prescribed form assuring full guarantee and warranty obligations as per the general and special conditions of contract; and c) the bidder himself should have been associated, as authorized representative of the same or other Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service as the case may be) for same or similar Product ((i.e., hydraulic forging press / forging hammer as the case may be) for past three years ending on the Relevant Date (i.e, date of bid submission).
23	**Documentation to be provided by Vendor after Purchase Order Placement:**
a	All documentation shall be provided in the English language and delivered in three (3) hard-copy sets. In addition, a soft copy of all documents shall be supplied on a USB flash drive (pen drive) . Unit of measurement shall be in metric (SI).
b	Operation and Maintenance manual.
c	All Drawings shall be submitted a soft copy as well a hard copy. Drawings shall be submitted by E-Mail or USB flash drive (pen drive).
d	The Documentation shall mainly consists of following:
23.1	**Mechanics**
a	Technical specifications of press
b	General assembly drawing of forging press
c	Plan arrangement and elevations of the forging press
d	Erection drawing of framework
e	Component erection drawings
f	Erection drawing of fixing device of top die
g	The maximum weight of installed single unit and maximum dimension of installed single unit
h	Maintenance manuals of the press

23.2	**HYDRAULICS**
a	Plan arrangement and elevations of the high-pressure pump station
b	P & I diagram of the hydraulic system
c	Arrangement plan of the hydraulic pump station (including elevations)
d	Hydraulic equipment and piping erection drawings
e	Erection drawings of various parts of the hydraulic system (including, main pump and motor, oil tank, cooler, filters, valve stands)
f	Centralized lubrication system diagram
g	Arrangement drawings catalogue of the main parts of the hydraulic system (including valve blocks of various functions, oil tanks, special valves, special pipeline fittings such as special connections, piping connectors, etc.)
h	Test run instructions for the hydraulic system
i	Operation, maintenance and troubleshooting instructions for the hydraulic system
j	Catalogues, operation manuals, technical specifications, qualification certificates of the all components and parts of the hydraulic system
k	List of hydraulic equipment for valve, pump, motor and various auxiliary equipment including name, type, manufacture, position No. in drawing, quantity.
23.3	**ELECTRICS**
a	Schematic diagram of the electric control system (VDE or EN)
b	Motor List with the following information (type, power, protection class, voltage, cooling mode, quantity, location)
c	Arrangement drawing of the operation rooms and the electric control rooms
d	Erection drawings of all electrical equipment
e	Panel apparatus arrangements of control cabinet and operator desk
f	Terminal wiring diagram of the electrical control system
g	List for motor, power and control/communication cable, sensor, switch, PLC etc. including name, type, manufacturer, position No. in drawing, quantity
h	List of Grounding standard documents (VDE or EN)
i	Operation manual
j	Catalogues, operation manual, technical specifications of the components and parts
23.4	**CIVIL ENGINEERING**
a	Arrangement plan and elevations of the foundation of the forging press / high-pressure pump station indicating the net dimensions of the pit, and showing equipment erection elevation and foundation elevation (secondary grouting requirements)
b	Basic drawings of civil engineering and ventilation including dimension of the cable trench and cable tunnels, for electric room and control room
c	Foundation loading diagram (indicating loading points and directions of dynamic and static loads, maximum and minimum loads; loading points and directions of the foundation vibrating loads (Preliminary and /or Final if applicable)
d	Arrangement plan of pits, holes and openings on the foundation, indicating the net dimensions of them.
e	Arrangement plans of embedded parts at the foundation of the hydraulic forging machine and at the foundation of the high pressure pump station, indicating the ID numbers., dimensions, loading directions and loads (dynamic loads and static loads) of the embedded parts
f	Information on drawings of the embedded parts of the hydraulic forging machine and of the high pressure pump station
g	Arrangements and details of steel coverings around the foundation of the hydraulic forging machine and around the foundation of the high pressure pump station
h	Arrangements and details of the bracing for steel coverings around the foundation of the hydraulic forging machine and around the foundation of the high pressure pump station
i	Any other foundation related details required by HAL during design of foundation
24	**Annexures**
	All requirements as per below annexures need to be accepted by vendors during submission of technical quotes.
	Annexure-1 : Typical forgings planned to be produced utilizing the new 10000 Ton hydraulic Press
	Annexure 2 : Plan of the hangar with press , manipulator , hydraulic room and other accessories location
	Annexure 3 : Control-modes, Transitions and Process Tolerances forging operations
	Annexure 4 : Dovetail size of Dies
	Notes: Control-modes, Transitions and Process Tolerances forging operations
	Vendor may be called for Technical Clarification during Technical Evaluation stage if HAL desires.
	Special Notes:
	All the above mentioned requirements/parameters are Essential , unless otherwise it is explicity specified.

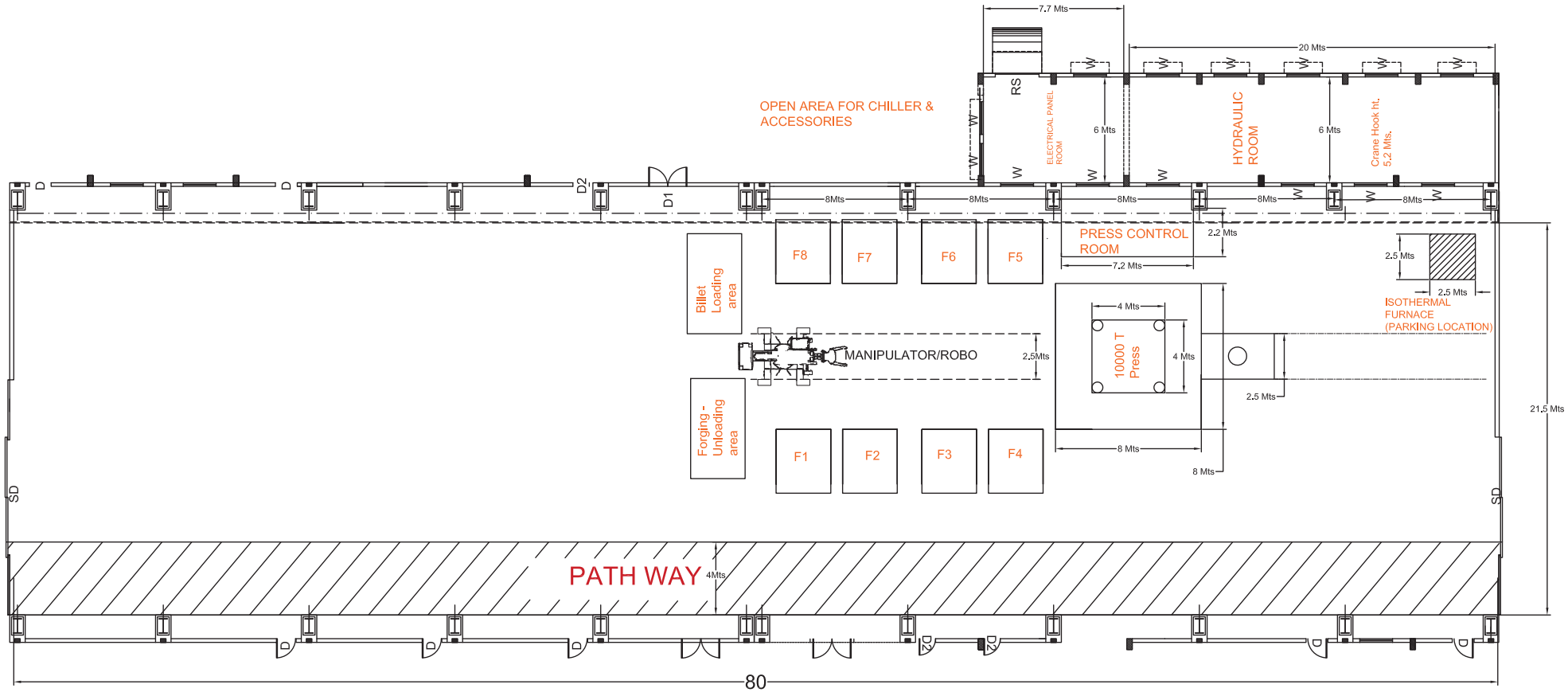
Annexure-1

Typical Forgings planned to be produced utilizing 10000 Ton hydraulic Press are listed below:

SL No	Forging Details	Approx. Forging Weight (Kgs)	Approx . Dimensions (in mm)	Pictorial Representation
1	Aluminium alloy forgings – Hub	116	Ø 590 * 350 H	
2	Aluminium alloy forgings – Conical Housing	53	Ø 470 * 240 H	
3	Aluminium alloy forgings – Landing Gear	100	850 L * 280 B * 160 H	
4	Aluminium alloy forgings – Root Rib	59	1230 L * 250 B * 160 H	
5	Aluminium alloy forgings – Leg	40	830L * 210 B * 200 H	

SL No	Forging Details	Approx. Forging Weight (Kgs)	Approx . Dimensions (in mm)	Pictorial Representation
6	Aluminium alloy forgings – Elevon Support bracket	40	1030 L * 250 B * 210 H	
7	Aluminium alloy forgings – Base Plate	65	835 L * 340 B * 205 H	
8	Nickel Alloy forgings – Disc	122.5	Ø 450 * 120 H	
9	Titanium Alloy forgings – Disc	55	Ø 550 * 65 H	

Annexure-2 : LAYOUT



NOTES :

All dimensions in Mtrs

Distance between Columns : 8

F : Furnace

Height of crane hook path : 15

Annexure 3

Control-modes, transitions and process tolerances for Open and closed die forgings

Abbreviations:

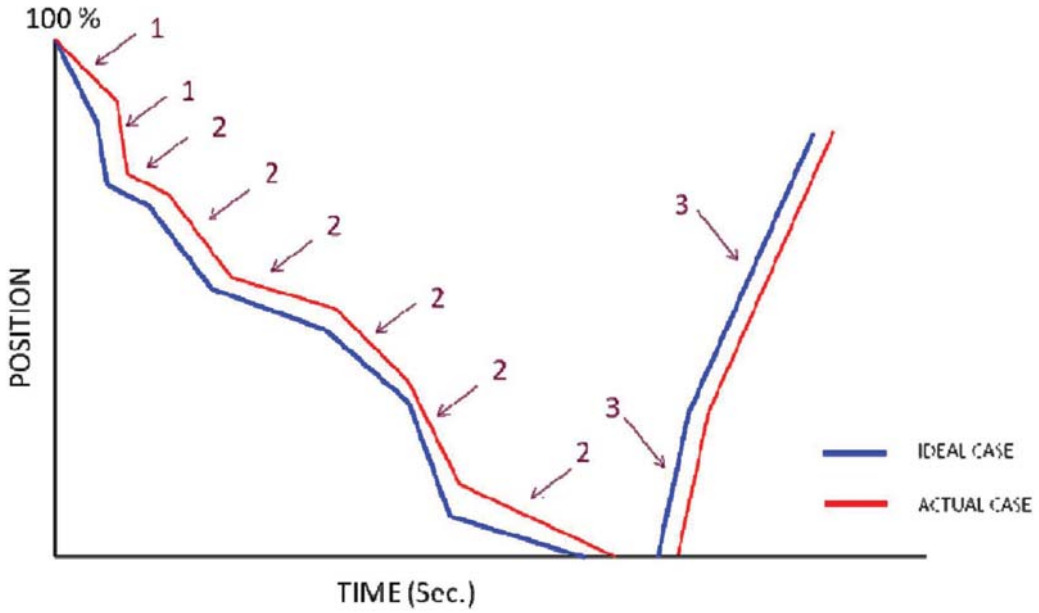
Press Speed-V
Press Force- F
Strain Rate- S
Billet height during forging operation (keeps reducing with progress of forging operation) – H

The Press Speed(V), Force(F) and Strain Rate(S) need to be controlled during forging.
For various applications, press should be able to operate under constant speed (V), constant Press Force(F) and constant Strain rate(S) apart from being able to operate under above controls, the press shall be able to smoothly undergo transition from one mode of control to another.
Press should be able to operate under combination of any of the above modes of control in sequential mode.

Operating the press in a Pre Defined Curve (Visualization):

By Pre-selecting combination of any of the above modes of control, a position – time curve forms. The forging operation shall be able to follow the curve. The actual path followed by part against set curve should be displayed simultaneously on screen at control panel.

A typical position – time curve with combination of various control modes is shown below:

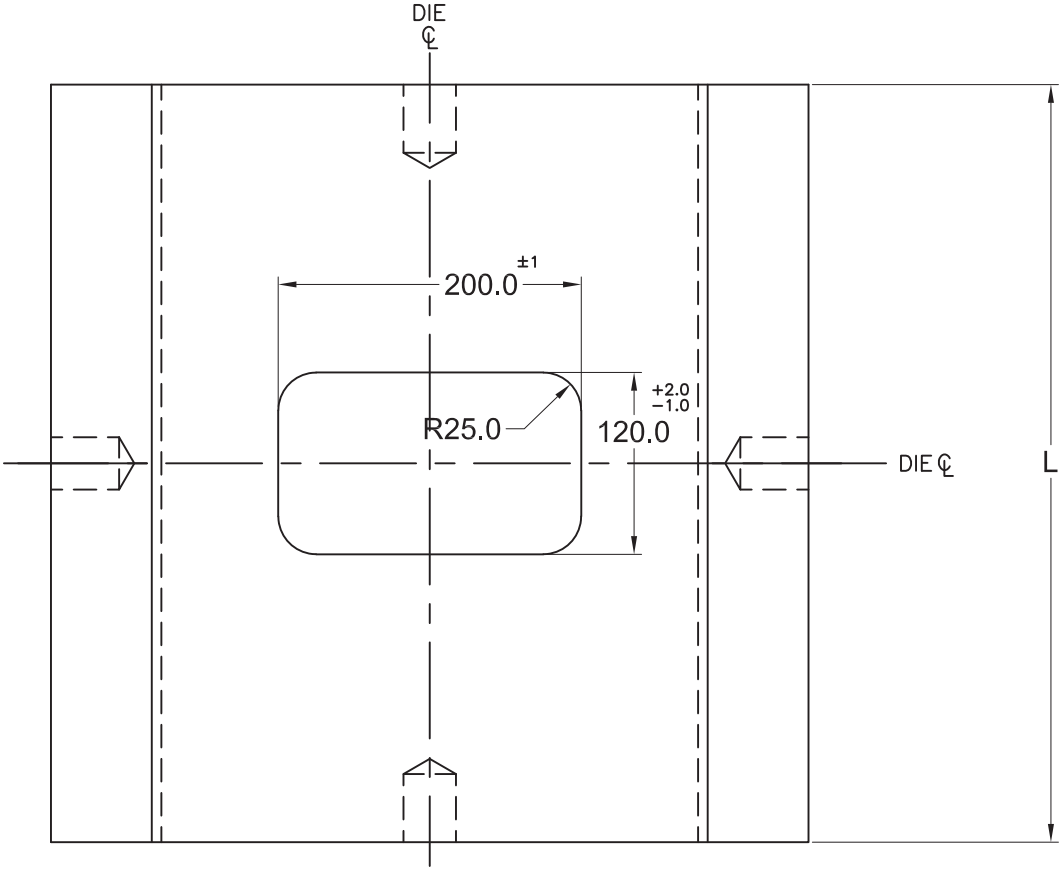


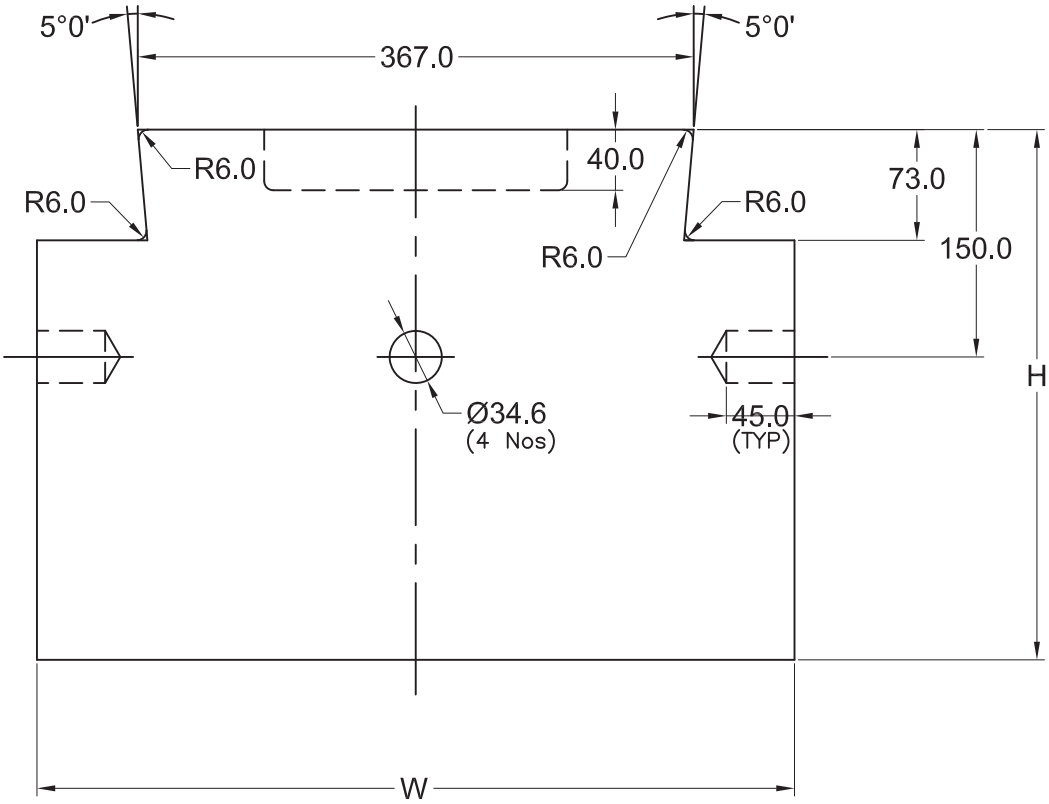
Position	Mode	Type of Movement	Parameter to be controlled	Tolerances on parameter	Parameter of end of movement	Tolerance parameter at the end of movement	Following Mode
1	Approach	V Constant speed- Fast	V 1 to 250 mm/s	±5%	Position set point (H)	± 2 mm	- stop - press - return
1	Approach	V Constant speed- Fast	<u>Step 1</u> V 1 to 100 mm/s	±5%	Position set point (H)	±2 mm	- stop - press - return
2	Pressing	V Constant speed	V 1 to 40 mm/s (upto half load) or 1 to 20 mm/sec (above half load)	±5 % if speed V > 5 mm/s or 0.1 mm/s if speed V<5 mm/s	Position set point (H)	Position ±2 mm	- stop - press - return
2	Pressing	F Constant Force	F Press force 0 to 10000T	minimum +/- 100 T or ±5 % of force set point	Position set point (H)	Position ±2 mm	- stop - press - return
2	Pressing	V /H Constant (Strain rate control)	V Strain Rate- 0.01 to 1	±5%	Position set point (H)	Position ±1 mm	- stop - press - return
2	Pressing	Dwelling Constant Force (F)	F 1 to 10000 T	±5%	Dwelling Time (0 to 300 s)	± 1 s	- stop - press - return
3	Return	Slowly	V Range speed 1 to 20 mm/s	±5 %	Position set point (H)	± 2 mm	- stop - press - return
3	Return	Fast	V 1 to 250 mm/s	±5 %	Position set point (H)	± 2 mm	- stop - press - return

During submission of technical quote, Vendors shall explain **Control-modes, transitions and process tolerances**. This shall include set versus actual curve followed by the part

ANNEXURE- 4

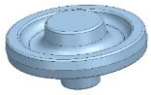
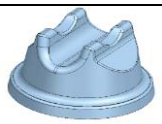
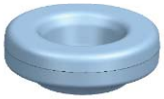
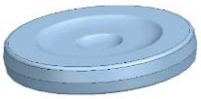
DOVETAIL DETAILS OF DIES





ALL DIMENSIONS ARE IN MM

Technical Specification of 20 Ton Counter Blow Hammer **Annexure-B**

1	**Introduction**			
1.1	Foundry & Forge Division (F&F), Hindustan Aeronautics Limited (HAL), Bengaluru, India is engaged in the development & manufacture of forgings and castings in various alloys for aeronautical and other engineering applications. F&F is planning to install a counter blow hammer with an energy rating of 200 kJ (minimum) in its new Forging Facility. The proposed counter blow hammer will be utilized for manufacturing of critical forging components such as aero-engine discs, blisks, landing gears, impellers and other forgings required for various HAL programs and global aero-engine OEMs. The establishment of the new facility is aimed to enhance HAL's capabilities to manufacture high-integrity aerospace forgings, especially for aero-engines with improved process control, dimensional accuracy, and repeatability. Few of the typical forgings planned to be produced utilizing the new counter blow hammer is as below.			
1.2	**Forging Details**	**Approx. Forging Weight (Kgs)**	**Approx. Dimensions (in mm)**	**Pictorial Representation**
1.2.1	Alloy Steel Forgings - Shaft	125	Dia 150 * 1030 L	
1.2.2	Alloy Steel Forgings - Gear	115	Dia 190 * 558 L	
1.2.3	Alloy Steel Forgings - Gear	90	Dia 365 * 175 H	
1.2.4	Titanium alloy forgings - Bracket	50	Dia 310 * 140 H	
1.2.5	Titanium alloy forgings - Flange	72	Dia 375 * 140 H	
1.2.6	Nickel alloy forgings - Impeller	53	Dia 365 * 73 H	
1.2.7	Nickel alloy forgings - Flange	55	Dia 350 * 73 H	
2	Scope of work			
2.1	The scope covers design, manufacture, supply, erection, commissioning, testing and performance proving of a brand new counter blow forging hammer of minimum 200 kJ rated energy, complete with all auxiliaries, controls, safety systems, vibration dampers, documentation and training on a turnkey basis. The technical & other requirements of the hammer are given below. The proposed hammer shall be capable of carrying out closed-die hot forging operations for aircraft, aero-engine and other engineering applications. It shall be designed for high productivity, repeatability, dimensional accuracy with all necessary safety features. Materials planned to be forged: Aluminium, alloy Steels, Titanium, and Nickel-based superalloys with forging temperatures up to 1200°C. The forging hammer is proposed to be installed in a new hangar. The forging hammer shall be accommodated with in the marked building section sketch which is enclosed at Annexure-1. The vendor's scope shall also include obtaining all necessary export licenses and regulatory approvals from the concerned government authorities in the country of origin for the supply and establishment of the facility at HAL-F&F.			

	Technical Specification of 20 Ton Counter Blow Hammer	Annexure-B
3	Technical Specifications of Hydraulically operated Counter Blow Hammer:	
	The Hydraulic operated Counter Blow Hammer shall be designed to provide a rated energy of 200 KJ for forging of various parts with following parameters.	
3.1	Minimum Die height (top and Bottom dies together) without dovetail	700 mm
3.2	Maximum Die height (top and Bottom dies together) without dovetail	1000 mm
3.3	Recommended Top Die height range (without dovetail)	350mm - 650mm
3.4	Recommended Bottom Die height range (without dovetail)	350mm - 650mm
3.5	Die Width (For both Top and Bottom)	450-1000 mm
3.6	Die Length (For both Top and Bottom)	450-1600 mm
3.7	Required minimum number of blows per minute at rated energy	40
3.8	Typical weight range of steel components to be forged	10 to 150 kg
3.9	The hammer shall be capable of imparting minimum 70 % of the total rated energy during the first blow at maximum die height and for a Work Piece/Preform height of 350mm	70% (min)
3.10	Combined impact velocity of Top and Bottom TUPS in the range of	5-6 m/s
3.11	Combined weights of Top and Bottom TUPS in the range of	40-70 Tons
3.12	Lower TUP Position Accuracy (+/-) with respect to die loading height	5.0 mm
3.13	Guide Clearance between TUPS and uprights	0.4 to 0.8 mm
3.14	Based on the typical input parameters provided above, the OEM shall design the Hydraulic Operated Counter blow hammer for a minimum rated energy of 200 kJ and shall submit the equipment design parameters and detailed energy calculations along with the following details as per Annexure -2	
4	Main Assemblies of Hammer:	
4.a	Following are main sub assemblies of the hammer. Detailed description is provided in respective section. Hammer frame consisting of Upper Cross Head, Uprights with guides, Upright base and Cross beam/Tie rod •Upper TUP •Lower TUP •Damping System •Hydraulic Drive Unit consisting of Oil tank, Control block, cylinders	
4.1	**Hammer Frame Details:**	
4.1.1	The hammer frame shall consisting of Upper Cross Head, Uprights with guides, Upright base and Cross beam/Tie rod which are connected to form a rigid unit. Upper cross head, Uprights, Upright base are to be designed and fabricated with steel plates in welded structure (Casting not acceptable). Uprights shall have precision hardened guide rails for the TUPS including a system to have precision guide adjustment. The weld seams of the hammer frame components shall be tested 100% on its seam length with ultrasonic testing. The ultrasonic testing to be carried out as per ISO 11666 acceptance level 2 and ISO 17640 test class B. The ultrasonic test results of the weld seams to be provided to HAL during fabrication stage of the hammer. The vendor has to provide material test certificates for the materials used for construction of hammer frame components. A Suitable oil/grease lubrication system shall be designed to ensure the guides are automatically lubricated at a pre-set frequency	
4.2	**Upper TUP**	
4.2.1	The upper TUP shall be a single piece made from forged or cast alloy steel with attached guideways which will be guided in the hammer frame. The guides of the upper TUP are to be equipped with a adjustment system and are to be lubricated automatically. The upper TUP should be aligned precisely by using wedge adjustment to ensure geometry of press. The material used for TUP shall have the following properties: Yield Strength: >300 N/mm², Ultimate Tensile Strength >500 N/mm², Elongation after fracture: >10%. The material test certificate to be produced during fabrication stage of the Hammer	

4.3	**Lower TUP**
4.3.1	The Lower TUP shall be a single piece made from forged or cast alloy steel with attached guideways which will be guided in the hammer frame. The guides of the lower TUP are to be equipped with a adjustment system and are to be lubricated automatically. The lower TUP shall be designed for easy installation and dismantling from & to the frame without the need to dismantle the uprights. The material used for TUP shall have the following properties: Yield Strength: >300 N/mm², Ultimate Tensile Strength >500 N/mm², Elongation after fracture: >10%. The material test certificate to be produced during fabrication stage of the Hammer
4.4	**Vibration Damping System**
4.4.1	A suitable vibration damping system to be designed and provided by the vendor to prevent transmission of vibrations to the ground. The dampers/anti vibration system shall be designed, supplied and installed by the vendor . Except civil foundations and concreting work, all the accessories required for the dampers/anti vibration system shall be part of vendor's scope. The system shall be installed under supervision of the vendor's technical expert. The detailed foundation drawing required for the damping system installation shall be provided by the vendor within 90 days of the PO placement/Acceptance of order along with the hammer foundation drawing.
4.5	**Hydraulic Drive Unit consisting of Oil tank, Control block and hydraulic cylinders**
4.5.1	Vendor shall design suitable hydraulic drive system for operation of the hammer. The main tank shall be positioned on the top of the hammer. The hydraulic system shall consist of main motors, pumps, control block with valves, accumulators, cylinders with piston etc. The ram movement shall be precisely controlled by the hydraulic drive. Constant Oil temperature for hydraulic system shall be maintained (30°C - 40°C) by installing an automatic temperature control system irrespective of ambient temperature. The Hydraulic unit shall be located at the top of the hammer. The piston rod shall be forged alloy steel. Vendor shall design the piston rod assembly in such a way that replacement of the piston rod is possible without draining off the main hydraulic oil tank during maintenance activity. The material test certificate of the piston rod to be submitted during fabrication of Hammer
4.5.2	The hammer shall be designed such that its construction does not obstruct the ramming of die locking keys using an overhead crane sling during die locking and unlocking operations. Note : "Vendor shall submit schematic diagrams / illustrative pictures explaining this feature. If required by HAL, the vendor shall present and explain the feature in detail to the HAL Technical Evaluation Committee during the technical evaluation"
5	**Mode of operations**
5.a	**Hammer shall be designed to operate in the following working modes.**
5.1	**Die Setting mode:** During fixing or setting the dies in between the upper and lower TUPS, provision shall be made to move either or both the TUPS in Inch mode (Jog Mode / Inching mode). The TUPS shall remain in its position at any length of the stroke of the hammer. This feature is required to enable the dies to get properly fixed to the Tups to ensure the dimensional accuracy of the die setting. Provision shall be made to move either one or both the TUPS by a predefined distance, as required, to facilitate die fixing**.**
5.2	**Manual mode:** During the manual mode operation of the hammer, provision shall be made available to engage the blow sequence by the foot switch. The blow sequence shall be made available to define in the control desk. Option shall be available for selection of blow energy for each blow.
5.3	**Programmable mode :** (a) The counter-blow forging hammer shall be equipped with an automatic Programme Mode for repeatable forging cycles. (b) Programme Mode shall be initiated through the foot pedal switch. Selection of program shall be made possible through control desk. The system shall be designed for execution of individual forging blows/strokes with preset energy through continuous engaging of foot pedal switch , until completion of sequence. Blow energy shall be independently programmable for each individual blow or stroke within the sequence. The Programme Mode shall provide programmable dwell time between successive blows or strokes. In case the Programme Mode is interrupted due to release of the foot pedal switch , the control system shall provide a pre-selection option to define to reinitiate the blow sequence from the previous/last completed blow or from the first blow. All Programme Mode operations shall be subjected to the machine safety logic, interlocks, and emergency stop system, in compliance with applicable forging machine safety standards.

5.4	**Maintenance mode:** The Maintenance mode shall have provision for password protection with key switch protected operating mode intended exclusively for inspection, preventive maintenance , troubleshooting , and repair activities. In this mode, manual and automatic operating mode functions shall be disabled, and the machine movements shall be limited to slow/inching mode, controlled motions under direct operator control. Movements of the upper and lower TUPS shall be possible only through two hand operation.
6	**Hydraulic drive System**
6.a	The hydraulic drive system of the hammer shall be designed with energy efficient pumps and motors , high response heavy duty proportional valves and controlled electronics for the rough working conditions of a forging shop. The vendor shall design and optimize the control elements of the hydraulic system in order to yield continuous performance under heavy duty forging operation cycles. The hydraulic system shall be built with instruments and filtering circuits to ensure contamination free hydraulic media to meet the standards of NAS 7/ISO4406 or better.
6.b	**Main components of hydraulic drive system** •Main tank •Cooling and Filtering System (CF Unit) •Main Hydraulic Pump Unit , control pump unit and auxiliary pumps •Main control manifold block •Quick-hammering control and flow valves •Accumulator bottle station •Heavy duty Piping, fitting and fastening structures •Heavy duty hydraulic cylinders and pistons
6.1	**Main Tank**
6.1.1	The main tank shall be positioned on the top of the hammer. The main hydraulic tank shall be of welded steel construction. The hydraulic main tank shall have main pumps, auxiliary pumps, pressure filters, return filters, breather filters, oil level gauges, drain valves and sampling ports. The tank shall be built with instruments for measurement of pressure, flow, contamination, moisture level, oil level, filter clog indicators and temperature. These instruments shall be interfaced with PLC to display and control various parameters through control station. The main tank shall be constructed with two chambers: (a) Return Oil chamber : It shall contain the hydraulic oil returned from the hydraulic circuit system. The return oil chamber also functions as a suction chamber for the piston rod. (b) Suction/clean chamber : It shall be constantly filtering the oil to clean hydraulic oil for the main- and auxiliary pumps. The return flow of the hydraulic oil should be smooth and the suction level of the pumps must be at a sufficient distance from the tank bottom to avoid cavitation of pumps. Suitable oil level indicators shall be designed and interfaced with PLC controls for the continuous monitoring and filtering of the oil in both the chambers.
6.2	**Cooling and Filtering System (CF Unit)**
	The hydraulic oil shall be continuously cooled and filtered. The filter unit shall have contamination indicator / sensors and interface with PLC. Cooling of the oil shall be carried out by oil-water-heat exchanger (Preferably Shell and Tube type). The heat exchanger shall be supplied and integrated with hammer by the vendor. Suitable capacity (TR) of water chiller unit shall be supplied. Suitable cellulose filter based continuous oil filtration system shall be supplied and integrated with hydraulic tank , in addition to the in-built filter circuit. Oil filtration unit shall have indicators / sensors to monitor contamination level (NAS / ISO) and moisture level in PPM. And these instruments shall be interfaced with PLC to display and control parameters through control station.
6.3	**Main Hydraulic Pump Unit, control pump unit and auxiliary pumps**
	High efficient hydraulic main pump units along with control pump and auxiliary pump units shall form the hydraulic drive system, to supply the hydraulic oil at required pressure to achieve rated energy of the hammer. These pumps shall be Energy efficient with continuous duty cycle and having ability to withstand the vibrations released by the hammer. Vendor shall supply and integrate suitable couplings with soft joints for the pump and motor assembly. The pump and motor shall be noise and vibration free. Vendor shall incorporate pressure checkpoints/inspection points which are required to identify the correctness of manifold function through sufficient number of hydraulic connector ports (like Minimess ports).
6.4	**Main Control manifold block**
	Vendor shall design the main control manifold block made of forged steel for equipping valves and accessories required for the hydraulic drive system. The manifold block shall control main motion of the hammer in various modes. It shall have high-pressure built-in logical/servo valves with switches for their high response control. Manifold block shall be equipped with safety valves, relief valves, check valves and other components necessary for control of the hammer cylinder and return cylinders at blow approach and reverse phases of the hammers. Vendor shall incorporate pressure checkpoints/inspection points which are required to identify the correctness of manifold function through sufficient number of hydraulic connector ports (like Minimess ports).

6.5	**Quick hammering controls and flow Valves**	
	Vendor shall provide Servo/Proportional/Suitable valve and manifold system to achieve high response hammering action by way of rapid flow of oil into and out of hammer Cylinders. These valves shall have features of high blow frequencies and accurate synchronization of upper and lower tups.	
6.6	**Accumulator bottle Station**	
	Vendor shall design sufficient number of accumulators in the accumulator bottle station to store hydraulic energy and deliver oil through manifold instantaneously. Accumulators shall be installed close to the hydraulic control block. Accumulators shall provide the hydraulic energy for fast acceleration of the drive piston. Accumulators shall have safety valves, manifold, pressure relief valve, minimess test point. Accumulators of bladder type are preferrable.	
6.6	**Air compressor**	
	Vendor shall supply and install an air compressor of suitable capacity if required, for operations of the sub systems of the hammer. The compressor shall be supplied with an air receiver , control panel and safety systems interfaced with main control panel of the hammer.	
6.7	**Piping, Fitting and Fastening Structures**	
	The control manifolds, working cylinders of the hammer and tanks are to be interconnected with pressure line and return line piping. The piping system to be supplied with shut-off valves and On/Off feedback where it is necessary. The pipings shall also comprises of check valves, high-quality fastening elements and steel structures for supporting the piping by fastening to the concrete foundation. This assembly also incorporate packing sheets, foundation bolts and other anchor material intended for installation of individual sub-assemblies on the foundation on site. Steel Ladder with hand rail (with steps for foot rest) shall be provided to reach hammer top platform. Top platform shall have safety lock in the platform door interfaced with PLC so that hammer cannot be operated if door is opened. All pipe lines shall be appropriately clamped wherever necessary to avoid vibration and over hang. The high pressure hoses used should be designed adequately (with proper clamping) to withstand maximum pressure.	
6.8	**Heavy Duty Hydraulic Cylinders and Pistons**	
	Vendor shall design the hydraulic cylinders and pistons made of forged steel and equipped with wear resistance and long lasting seals and guide rings to deliver the required pressure at rated hammer energy. The hammer shall have a rapid acceleration feature, which is required to deliver blow energies at rated frequencies. The vendor shall design the hydraulic system to comply with ISO 4413 standards. The hydraulic cylinders shall be connected with manifold block to deliver rapid flow of oil into and out of the cylinders.	
6.9	**Tup Synchronization System**	
	Vendor shall provide a proven Tup synchronization system to achieve a rated blow energy as per the set blow frequencies. Vendor shall achieve the energy of the hammer with simultaneous movement and impact of the upper and lower Tups. Vendor shall achieve the rated energy of the hammer by the closed loop servo hydraulic synchronization of the cylinders / couplings. Suitable position sensors shall be equipped in the system to achieve synchronization of the Tups.	
7	**Hydraulic system Data**	
7.1	Max. working pressure of hydraulic system (preferable)	200 bar
7.2	Position of the complete hydraulic system	At the Top of the hammer frame (shall be accommodated well within the area available over the top of the hammer including hydraulic accessories and control panel)
7.3	Hydraulic Oil to be used in the system	HVLP 46 hydraulic Oil with anti wear and high viscosity index conforming to DIN 51524 Part 3 and ISO 11158.
7.4	Water chiller unit	Refrigerant based water chiller unit with air cooled condenser shall be supplied ,integrated , and to be installed at Ground level (Location is shown in Annexure - 1).
7.5	Oil Filtering Unit (offline)	Shall supply suitable Cellulose filter insert based oil filtering unit with contamination and moisture monitoring probes with display and printer. (Make of the filtering unit: C C JENSEN)
7.6	Brand Specification for Pumps , Hydraulic accessories (like relief valve, check valve, servo valves, safety valves, non return valve, logic valves, cartridge valves, manifold blocks) & Proportional Valves	Moog/Rexroth/Eaton/Parker/OEM's own design

7.7	**Brand Specification : Hydraulic System**	
a	Pump	Bosch Rexroth/Eaton/Parker/Wupeko
b	Hydraulic cylinder Seals	Trelleborg/Freudenberg/Hunfer DFE/SKF
c	Pressure sensors	IFM/WIKA
d	Hydraulic Filters	Hydac/Mahle/Parker
e	Hydraulic Hoses	Parker/Gates/Eaton/ Contitec/OEM of the hammer
f	Temperature Sensors for Hydraulic	IFM/WIKA/Danfoss
g	Heat Exchanger	Alfa laval/OEM Specific
h	Accumulators	Hydac/Bosch Rexroth/Olaer
i	Manifold/Blocks	Bosch Rexroth/ OEM of the hammer
8	**Electric and Electronic Control**	
	The electric equipment shall mainly consist of the complete power and automation control of the Hammer. Vendor shall design , supply and integrate all the electric and electronic systems as listed below:	
8.1	**Switch Cabinets**	
	The main switch cabinet shall consist of :	
a	Main supply by means of three-pole Main switch	
b	Design of switch cabinet in channel wiring	
c	Design for ambient temperatures up to 40°C with cabinet cooling by air conditioning	
d	Lighting of the cabinet	
e	Power switchgear with overload protection of all electric components, power and auxiliary contactors	
f	Separate power circuits for the individual machinery groups Emergency stop push buttons	
g	Emergency stop push buttons	
8.2	**Control Cabinets**	
	Switch cabinets to house the PLC-systems and to generate the control voltage shall consist of:	
a	Overload protection	
b	Suitable air conditioning inside the panel to maintain panel temperature within operating range.	
c	Transformers for the generation of control voltage	
d	Power packs for the generation of control voltage	
e	Relays and auxiliary contactors	
f	Programmable Logic Control (PLC) unit consisting of:	
g	CPU	
h	Digital input and output components	
i	Analog input and output components	
j	Module for interfacing with the Ethernet for remote trouble shooting.	
k	Port for remote data transmission to the programming unit	

8.3	**Local Control Panels / Remote Control Cabinets**
	Local control panels / remote control cabinets/remote PLC I/O modules to operate the individual machines /equipment in the operation / maintenance modes shall comprise of :
a	Control and signaling devices to start and stop the individual assemblies
b	Emergency stop push button
8.4	**Industrial Panel IPC**
	The Panel IPC shall comprise of the following hardware :
a	21" Touch screen min.
b	-Make : Siemens/Beckhoff
c	User Licenses shall be provided by vendor for:
d	Windows operating system
e	Visualization
f	Recipe management
g	Any other application software
h	All above software's shall be configured ready for connection, including documentation
i	Back-up of all the machine and process related software's of PLC and SCADA in the form of Pen drive or Hard disc shall be provided to HAL by the vendor.
8.5	**Control Desk in Control room**
a	Panel IPC at Hammer shall be extended to control desk at control room for operation of hammer through Extended display/ /KVM/remote client arrangement.
b	The desk shall be ergonomically designed for continuous industrial operation with adequate space for monitor(s), keyboard, mouse, communication equipment, necessary push buttons for safe operation of the Hammer from the control room.
c	The approximate distance from Panel IPC to control desk is 10 mtrs.
d	Operator shall view and operate the same SCADA screens through a curved 24" monitor, keyboard and mouse provided at control desk.
e	The SCADA system shall provide common visualization, alarms, trends, diagnostics, and machine status information at both locations.
8.6	**Machine Visualization**
a	Graphic representation(MIMIC display) of machinery and plant sections(both static and dynamic visualization) which is showing the different working modes (ram movement, TUP lock, Hydraulic circuit schematic with cylinders, Hydraulic tank, Accumulators, all Valves, Position Sensors, limit switches, shutoff valves, filters, pumps, motors, temperature indicators, flow transmitters, Etc. and PLC input and Output of Analog and Digital)
b	Numeric display of measured operating values of individual assemblies on the basis of set values
8.7	**Process Visualization**
a	Process visualization of hammer, numeric and graphic display(MIMIC) of the process parameters.
b	During submission of technical quote, Vendor shall explain process visualization using actual screen shots as examples.
8.8	**Recipe/Programme Input**
a	A recipe/programme is a group of production-related set input values for the hammer. Input values shall be checked by control system and shall ensure a safe operation of the hammer.
b	Loading, Storage, deleting of recipes for individual parts in a data logging and retrieving system. Batch wise part data to be captured.

8.9	**Alarm Management**
a	Alarm list including faults with time stamp of message and acknowledgement Access to the operating and maintenance manuals and to the circuit diagrams of Electrical and Hydraulic
8.10	**Sensors: Following sensors shall be provided**
a	Pressure transmitters with display for the individual hydraulic pressure systems
b	Position transducers: For Measurement of the movements of the hammer
c	Position sensors: Proximity/Limit switches for position sensing.
d	Flow Meters: For measurement of Hydraulic oil flow in the circuit
e	Level Sensor: Hydraulic Oil level in the tank
f	Temperature Sensors: Hydraulic oil temperature
g	Any other type of sensor for safe operation of hammer.
8.11	**Safety Control**
a	The pre set safety circuit shall be monitored by the PLC. Any operation and machine related problem shall be displayed in clear text on operator screen indicating location of the failure.
b	In event of any process or machine related problem during operation, the safety circuit shall override the processing controls and it shall bring the hammer to rest position safely
c	In addition, Emergency stop push buttons at minimum 3 locations shall be provided. 1 on the hammer side , 1 on the PLC panel, 1 on the control desk. Features such as 2 hand control for movement shall be incorporated. On activation of emergency buttons, hammer shall be brought safely to rest position. Different password levels (for operators, engineers, manager, maintenance staff) with the disabling of individual inputs and functions.
d	Tool Change Mode: For tool change on upper or lower tups, none of the hammer components other than those used in the tool change shall be functional.
8.12	**Networks**
a	Communication connection (Ethernet) of the PLC controls and the PC visualization systems to exchange the process data. OPC UA communication shall be available for data exchange with other Server/MES/ERP Systems
b	Industrial managed Ethernet switches shall be provided for automation networks with support for PROFINET/Ethernet communication, VLAN, diagnostics, SNMP.
c	Switches shall be industrial grade and suitable for continuous operation in harsh industrial environments. Communication network from remote I/O panels and Control desk etc. shall be through Profinet/Ethernet
8.13	**Data Acquisition, Handling and Management System should have following functions**
a	Storage and display of process data as a time function for diagnosis and optimization purposes
b	Selection of individual machine and process parameters to represent the trend - Energy, Hydraulic pressures, no of parts, Velocity , Electrical Energy, Current and voltage
c	Graphic representation as online and historical trending for measured parameters - Energy, Hydraulic pressures
d	Axis scaling freely selectable, zoom function where applicable
e	Export / import function for archived files
f	Language -English
g	Alarm logger/History
h	All alarms for past 2 years shall be recorded including the date and time of their occurrence; they can be called up any time later.
i	Data acquisition /Trends

j	After forging operation, all machine and process related data shall be displayed on the operator desk to facilitate optimization for future operations	
k	Product programs	
l	Creating a product library	
m	Storage (data back-up)	
n	Overview of the programs stored on the hard disc	
8.14	**Remote/Online Support**	
a	Vendor shall offer remote diagnosis and support system for the hammer.	
b	The Vendor shall have online access to the hammer (including PLC, visualization PC etc.) whenever required by HAL.	
c	This is to enable immediate support in case of operational/maintenance and also software corrections can be made.	
d	Remark: Vendor shall provide free online support during warranty period.	
9	**Electrical Main Data**	
	Names of all equipment and devices which consume electrical power, their power rating shall be provided by vendor with quotation Total (approx.) power consumption shall also be provided by vendor with quotation **Note:** Total power requirement shall be within an upper limit of 2000 KW	
9.1	**Electric Design and specifications**	
	Technical data	
9.1.1	Main Incomer	Main incomer shall include ACB with electronic protection, under-voltage release, shunt trip, and energy monitoring.
9.1.2	Electric power supply available	415 V +/-10%, 50 Hz +/-3%, 3 phase, 4 wire ,A.C. system
9.1.3	Power supply Network	TN - C network 4 conductors L1-L2-L3/ PEN
9.1.4	Internal power Network (in switch cabinet)	TN - S network 5 conductors L1-L2-L3/N/PE
9.1.5	Neutral conductor	Unloaded
9.1.6	Operating voltage	3 x 415V
9.1.7	Voltage Tolerance	+/-10%
9.1.8	Control voltage	230 V AC /110V AC / 24 V DC
9.1.9	Switch cabinets	Min. 15 up to max. 35°C
9.1.10	Ambient temperature outside of air-conditioned switch cabinet rooms	up to max 45 °C
9.1.11	Design specifications (excluding single core marking)	IEC
9.1.12	Protective Earthing (PE).	IEC 60204-1 / IS 3043. Major equipment assemblies including main electrical panels, hydraulic power units, Motors more than 50 KW and press frame shall be provided with two independent protective earth connections. Recommendation of the part OEM's also to be considered for trouble free operation.

9.1.13	Equipotential bonding	IEC 60204-1
9.1.14	Functional Earth (PLC/Instrumentation)	IEC 60204-1/IEC 61000
9.2	**Switchgear assemblies / system technology**	
9.2.1	Type of protection inside of switch cabinet rooms	IP20
9.2.2	Type of protection outside of switch cabinet rooms - Machine-side and production-area cabinets: minimum IP55 according to IEC 60529.	Minimum IP55 according to IEC 60529
9.2.3	Switch cabinets inside of switch cabinet rooms	Suitable Panel Air Conditioners to be provided
9.2.4	PLC design	Remote I/O
9.2.5	Network	Main incomer shall include ACB/MCCB with electronic protection, under-voltage release, shunt trip, and energy monitoring.
9.2.6	Protocol	Profinet/TCPIP,OPC UA
9.2.7	Thermistor protection for motors	For >= 45 Kw motors
9.2.8	Thermistor protection for frequency converter motors (FC)	All motors
9.2.9	Core colours :	IEC 60446 / IEC 60204-1 colour identification
9.2.10	Surge protection	To be provided by vendor
9.2.11	Digital Energy meter in the switch cabinets	To be provided by vendor
9.2.12	Cable entry	Bottom Entry
9.2.13	PC – operating systems:	MS Windows
9.2.14	Reserve expansion space inside of switch cabinets	minimum 15%
9.2.15	Reserve space provided in PLC (without hardware):	minimum 20%
9.2.16	Reserve space provided in PLC (with hardware):	minimum 20%
9.3	**Brand specifications : Electric and electronic systems**	
9.3.1	Switch cabinets / control boxes	RITTAL/SIEMENS/SCHNEIDER
9.3.2	Desks	RITTAL/SIEMENS/SCHNEIDER
9.3.3	Main switches	SIEMENS/Eaton MOELLER/SCHNEIDER/ABB/GE
9.3.4	Switchgear	SIEMENS/Eaton MOELLER/SCHNEIDER/ABB/GE
9.3.5	Frequency converters	SIEMENS/SCHNEIDER/ABB/GE/BECKHOFF
9.3.6	Soft start devices	SIEMENS/SCHNEIDER/ABB/GE/BECKHOFF
9.3.7	Servo converter	SIEMENS/SCHNEIDER/ABB/GE/BECKHOFF
9.3.8	Servo motors	SIEMENS/BALDOR/LENZ/BECKHOFF
9.3.9	PLC system	SIEMENS

9.3.10	Remote PLC	SIEMENS/BECKHOFF
9.3.11	Safety control	PILZ PSS/SIEMENS/SICK or equivalent
9.3.12	Industrial PC based SCADA system	SIMATIC / IN TOUCH WONDERWARE SCHNIEDER/BECKHOFF/OEM specific
9.3.13	PC system visualization	BECKHOFF/SIEMENS
9.3.14	Monitor size	21“ TFT LCD (MINIMUM)
9.3.15	Control and signalling devices:	SIEMENS/MOELLER/SCHNEIDER/ABB/GE
9.3.16	Network components:	Suitable to PLC system
9.3.17	Programming device:	SIEMENS FIELD PG
9.3.18	UPS for PC system with 20 minutes backup	APC/POWERWARE/RITTAL/ SIEMENS
9.3.19	Panel AC	RITTAL/WERNER FINLEY/DAIKIN
9.3.20	Electric Motors	Siemens/ABB/CG
9.3.21	Distance transducers	ASM/SICK/MTS/TEMPSONIC/BALLUFF
9.4	**Supply Voltage**	
	The equipment shall comply with EN 50160 and IEC 61000-2-2 requirements to operate reliably under specified limits of voltage variation, frequency deviation, harmonic distortion, voltage unbalance, and power disturbances.	
9.5	**Connecting Cables**	
	Complete supply and installation of cables required for the hammer has to be carried out by the vendor. Only incoming supply to the vendor's main switch is in HAL' scope. HAL will provide Power to Main Panel only. Vendor shall suitably design power distribution for all control/remote panels.	
10	**Safety Protective Door / Shutter for Hammer :**	
	The hammer shall be equipped with a quick-opening and quick-closing foldable protective door/shutter/movable steel mesh on the front and back side of the hammer. During forging operation the quick door/shutter shall be closed by pneumatic/hydraulic/electric operation before the commencement of the blow operation , in order to upkeep the safety of the workmen. The door/shutter shall protect the operator/shop floor area from air flow, scale particles and other flying objects generated during forging operation. After completion of the forging operation, the door/shutter shall be opened to enable removal of the part from the die area. The opening and closing of the door/shutter shall be controlled from the operator desk/main control unit. The system shall be interlocked suitably with the hammer controls for safe operation. The door/shutter shall be designed for quick operation, with opening and closing time preferably 2-3 sec , without delay in starting of the forging operation. The complete system, including door/shutter, hinges/folding mechanism, actuator, hydraulic/pneumatic/electrical drive, sensors, limit switches, interlocks, control integration, safety photo voltaic guards and mounting arrangements, shall be in the vendor’s scope of supply. The design shall ensure that the door/shutter does not obstruct loading, unloading, die changing, maintenance access or normal hammer operation.	

11	**Die Locking Keys**
	The keys required for locking the dies, as shown in Annexure-2, shall be supplied by the vendor. One set of keys shall consist of 04 nos. The vendor shall supply 03 sets of die locking keys, totaling 12 nos. The die locking keys shall be manufactured from suitable tool steel, preferably DIN 2714 or equivalent, with appropriate heat treatment to ensure adequate strength, hardness, toughness and service life under forging operating conditions. The complete design, manufacture, supply and fitment compatibility of the die locking keys with the hammer die locking arrangement shall be in the vendor's scope.
12	**Industrial Video Monitoring System**
	The vendor shall supply, install and commission an industrial-grade CCTV camera system for real-time visualization of hammer and shop floor activities from the operator cabin. A minimum of 06 nos. industrial-grade IP CCTV cameras shall be provided at suitable locations to clearly cover the hammer working area, die area, manipulator/material handling area, and surrounding shop floor movement area. The CCTV system shall meet the following minimum requirements: Cameras shall be minimum 5 MP resolution IP cameras, suitable for continuous industrial operation. For critical viewing locations such as hammer die area and job handling area, 8 MP / 4K cameras are preferred for enhanced clarity. Cameras shall be suitable for forge shop environment and shall have protection against dust, heat, vibration, scale particles and shop floor contamination. Cameras shall have suitable wide-angle/varifocal lenses to ensure clear visualization of hammer operation, die area, job positioning, manipulator movement and nearby shop floor activities. Cameras installed near the hammer area shall be provided with suitable protective housings, heat shields and robust mounting arrangements. Live video feed from all cameras shall be displayed on a dedicated monitor inside the operator cabin. The system shall include NVR/DVR with minimum 30 days recording capacity, with provision for retrieval, backup and playback of recorded footage. All cameras, cables, network switches, power supply, mounting brackets, conduits, protective housings, accessories and software required for complete installation shall be included in the vendor's scope. The CCTV system shall be installed in the operator cabin and shall not obstruct machine operation, maintenance access or shop floor movement. Final camera locations shall be decided during detailed design/fabrication of hammer in consultation with HAL. 40 inch monitor for CCTV camera view which shall be installed in operator control room.
13	**Lubrication System**
	Hammer Lubrication System: Automatic lubrication required (oil and grease) for an accurate and maintenance-free guidance of all the moving parts. The lubrication system shall have sensors for pressure, flow and level controls to ensure it's effectiveness during application. Centralized control from control panel to all the lubrication units(oil and grease) with provision of error messages related to oil/grease level ,pressure and flow in corresponding areas to be provided. **Die Lubrication System:** The vendor shall provide a heavy-duty hand-held graphite spray system suitable for application of water-based graphite lubricant on forging dies during hot forging operations. The system shall comprise a stainless steel graphite storage tank with a continuous motorized stirrer/agitation system to prevent settling of graphite particles and ensure a homogeneous mixture at all times. The spray gun shall be ergonomically designed with adjustable spray pattern and flow control, capable of delivering uniform coating on upper and lower dies with flexible high-temperature hoses. The complete system shall include compressed air regulator, pressure gauges, filters, quick-connect couplings, trolley-mounted tank, all necessary accessories. The supplier shall provide all interconnecting hoses, spare nozzles, and commissioning the complete system. The vendor shall integrate the die lubrication system with PLC and shall work in Programme Mode, supporting both blasting and spraying lubrication methods. Lubrication impulses after each blow or stroke shall be programmable, including independent adjustment of signal duration for blasting and spraying functions.
14	**Cover Plates**
	The foundation pit openings around the hammer shall be covered with cover plates (made of steel) of sufficient thickness to withstand the assorted loads being moved in and around the hammer. It shall cover the entire hammer foundation area . The vendor shall fabricate and install these cover plates with sufficient support structure and braces. The top surface of the cover plates shall be designed as anti skid surface for safety . During hammer operation, there should not be any cavity of the foundation left open(important from safety point of view) . In addition, the cover plate shall have a load bearing capacity of at least 25 tons per sq. foot. The cover plate shall be in level with finished floor for smooth movement of the men and material handling equipment.

15	**Mandatory Accessories :**
15.1	Seal kit for all Hydraulic cylinders - 1 Set
15.2	Hydraulic Jack (50 Ton Capacity - 200 mm stroke length) with pump and hose - 2 Nos
15.3	Hydraulic oil filters - 1 Set
16	**Annual Maintenance Support (AMC) :**
	Vendor shall provide a separate budgetary quotation for the Annual Maintenance Contract (AMC) for a period of five years , which is applicable after the expiry of the warranty clause. The AMC cost is requested for ensuring the machine supplier commitment to support the hammer and also for budgetary purpose. This shall not be part of commercial evaluation of tender . This AMC quote shall include online support on need basis, service engineer visit on half yearly basis to trouble shoot and service of the hammer.
17	**Spares for maintenance/operations after warranty:**
17.1	Along with the technical quotation of hammer, vendors shall provide a complete list of spare parts for hammer mechanics / electrics / hydraulics . Price for spares shall be quoted separately in commercial quote. The price of spares shall not be part of commercial evaluation of tender.
17.2	This list of the spare shall have the details of the following: Name of spare parts Specifications Quantity Price Priority (VITAL/ESSENTIAL/DESIRABLE)
18	**Documentation to be provided by Vendor after Purchase Order Placement:**
a	All documentation shall be in English language and to be delivered as paper copies(3 sets). And also these documents shall be delivered in soft copy (Pen drive) as well.
b	Operation and Maintenance manual in English.
c	All Drawings will be submitted soft copy (E-mail & Pen drive) as well as hard copy.
d	The Documentation shall mainly consists of the following:
18.1	**MECHANICS**
a	Technical specifications of hammer
b	General assembly drawing of hammer
c	Plan arrangement and elevations of the hammer
d	Erection drawing of framework
e	Component erection drawings
f	The maximum weight of installed single unit and maximum dimension of installed single unit
g	Maintenance manuals of the hammer
18.2	**HYDRAULICS**
a	Plan arrangement and elevations of the hydraulic system
b	P & I diagram of the hydraulic system
c	Hydraulic equipment and piping erection drawings

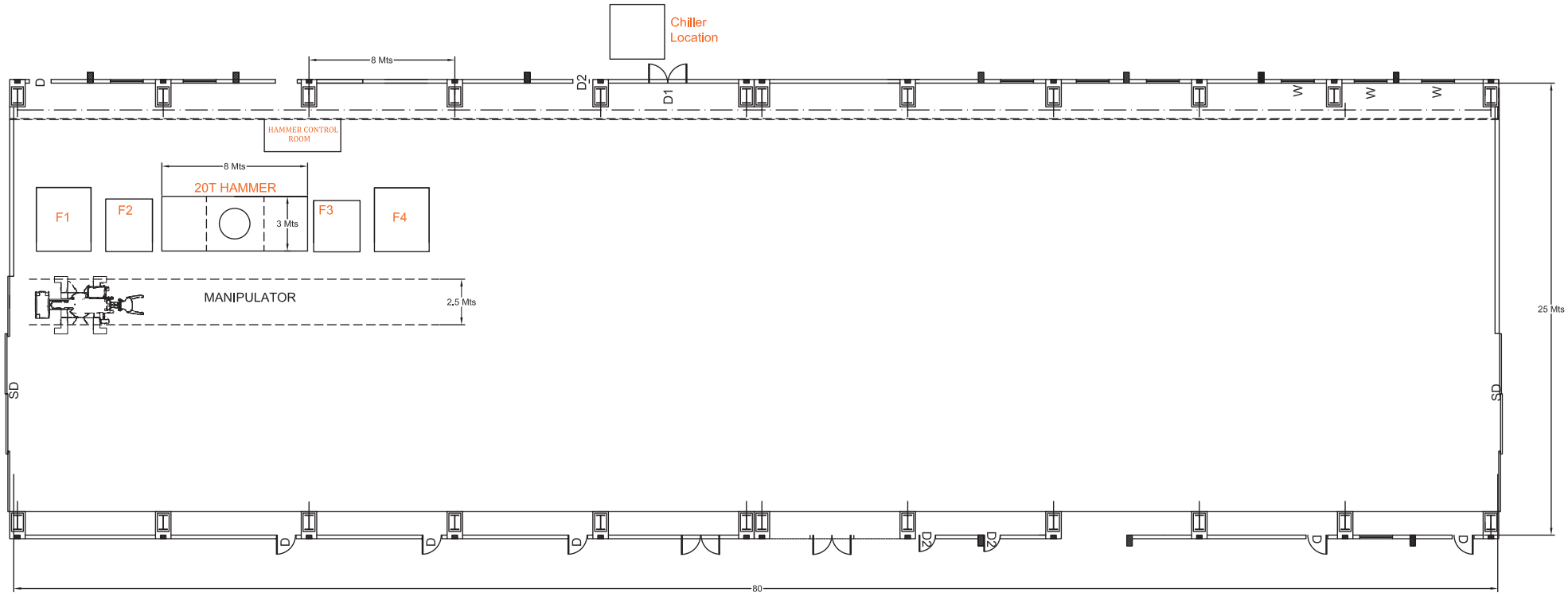
d	Erection drawings of various parts of the hydraulic system (including, main pump and motor, oil tank, cooler, filters, valve stands)	
e	Centralized lubrication system diagram	
f	Arrangement drawings catalogue of the main parts of the hydraulic system (including valve blocks of various functions, oil tanks, special valves, special pipeline fittings such as special connections, piping connectors, etc.)	
g	Test run instructions for the hydraulic system	
h	Operation, maintenance and troubleshooting instructions for the hydraulic system	
i	Catalogues, operation manuals, technical specifications, qualification certificates of the all components and parts of the hydraulic system	
j	List of hydraulic equipment for valve, pump, motor and various auxiliary equipment including name, type, manufacture, position No. in drawing, quantity.	
18.3	**ELECTRICS**	
a	Schematic diagram of the electric control system (VDE or EN)	
b	Motor List with the following information (type, power, protection class, voltage, cooling mode, quantity, location)	
c	Arrangement drawing of the operation rooms and the electric panels	
d	Erection drawings of all electrical equipment	
e	Panel apparatus arrangements of control cabinet and operator desk	
f	Terminal wiring diagram of the electrical control system	
g	List for motor, power and control/communication cable, sensor, switch, PLC etc. including name, type, manufacturer, position No	
h	List of Grounding standard documents (VDE or EN)	
i	Operation manual	
j	Catalogues, operation manual, technical specifications of the components and parts	
18.4	**CIVIL ENGINEERING**	
a	Arrangement plan and elevations of the foundation of the forging hammer indicating the net dimensions of the pit, and showing equipment erection elevation and foundation elevation (secondary grouting requirements)	
b	Basic drawings of civil engineering including dimension of the cable trench and cable tunnels, for electric control room	
c	Basic drawings of civil engineering for the installation of vibration damping /isolation system	
d	Foundation loading diagram (indicating loading points and directions of dynamic and static loads, maximum and minimum loads; loading points and directions of the foundation vibrating loads (Preliminary and /or Final if applicable)	
e	Arrangement plan of pits, holes and openings on the foundation, indicating the net dimensions of them.	
f	Information on drawings of the embedded parts of the hammer	
g	Arrangements and details of steel coverings around the foundation of the hammer	
h	Arrangements and details of the bracing for steel coverings around the foundation of the hammer	
i	Any other foundation related details required by HAL during design of foundation	
19	**Design/Calculation of Main Components**	
a	Vendor shall design the hammer by using Finite Element Analysis (FEA) Standard for Design and construction of main structural parts of the hammer has to comply with DIN EN 14673: 2006 + A1: 2010	
20	**Painting and Colour Coding for equipment and Pipelines**	
20.1	Hammer and other accessories	The hammer shall be painted with rust proof primer followed by two coats of enamel painting in accordance with ISO 12944. Painting shall enormously improve the aesthetic look of equipment . Preferred colour for the hammer structure is RAL 6018
20.2	Pipe lines	All hydraulic , lubrication , cooling water , compressed air and utility pipe lines shall be permanently identified in accordance with IS 2379 , ISO 20560-1. Identification shall include colour coding , flow direction arrows , service description , wherever applicable.

21	**Civil Foundation:**
21.1	After Purchase Order placement , vendor shall submit all necessary approved foundation drawings in hard copy to HAL within 3 months for enabling HAL to commence foundation works.
21.2	Vendor shall supply embedded steel plates, cable conduits, Foundation bolts and sleeves to HAL-F&F to facilitate concrete foundation work.
21.3	During foundation work, HAL will intimate the vendor to depute engineer to inspect the actual foundation details before and after Foundation concrete work.
21.4	The Specialist's air travel cost , hotel fare, local transport to and from HAL shall be at vendor's cost. Vendor can specify most appropriate time for it's specialists visit , frequency of visit during the hammer foundation work.
22	**Pre Dispatch Inspection**
	Before shipment of the consignment, a Pre Dispatch Inspection shall be carried out by HAL representatives at vendor's site. Vendor has to satisfactorily demonstrate/produce all sub assemblies , material certificates, electrical and PLC panels, hydraulic system and OEM certificates for bought out parts(brands shall meet the requirement of RFQ). Vendor shall intimate readiness of the hammer for Pre Dispatch Inspection to HAL , 90 days in advance. The following major components/systems will be inspected during PDI: 1. Dimensional verification of hammer structures, assemblies, sub assemblies and other systems. 2. Salient features of the hammer 3. Hydraulic System including cylinders ,tanks, filtering system, Servo system, pipes and fittings 4. Manifolds, Pumps and Motors 5. Instrumentation and Control systems 6. Lubrication system 7. Main control Desk 8. Tools/Dies/locking keys 9. Electrical Panels 10. Data Acquisition and storage SCADA system 11. Bought out items and OEM certificates 12. Electrical, Mechanical and Hydraulic drawings and documentation There will not be any separate cost towards PDI activities and same shall be borne by the vendor. However, HAL reserves the right to waive the Pre dispatch inspection(PDI), either partially or in full, if deemed necessary.
23	**Erection and Installation:**
	Erection and Installation of the hammer will solely be vendor's responsibility. Subsequent to this , vendor shall carry out erection work using their own people, using their own loading/unloading and lifting cranes and erection tools and equipment.
24	**Commissioning, Acceptance and Training**
	Commissioning: During commissioning dry run with all electrical,electronic,mechanical and hydraulic functions shall be carried out . This shall be solely at vendor's responsibility. After erection and commissioning , an acceptance test will be performed. As part of commissioning, vendor shall provide first fill of hydraulic oil, grease, oil lubrication required for hammer equipment .
25	**Acceptance Test Method**
	Acceptance test of the hammer shall be performed by using the existing dies of HAL. The hot forging trials shall be performed with various alloy materials including steel , Nickel and Titanium under full range of hammer loads for all operations / working modes. HAL will carry out an extensive acceptance test on different types of parts that are being planned for a period of 1 month . During the acceptance test process, all the required features expected from the hammer in all the working modes shall be checked and verified.

26	**Delivery Schedule and terms:**
	The 20 Ton counter blow hammer along with all associated equipment and auxiliaries to be delivered (which includes supply , installation, commissioning and final acceptance) within 24 months from the date of acceptance of the order by the vendor. Site readiness for installation of the equipment is scheduled by June 2028. The vendor shall submit a detailed project execution schedule indicating all major milestones and timelines with the technical offer and shall ensure compliance with the stipulated project completion period. Delivery Term: DPU (Delivery at Place Unloaded) INCOTERMS 2020. Delivery Place: Foundry and Forge Division, Hinduatan Aeronautics Limited, Bangalore, India. Complete scope of logistics including movements to the installation location is in the scope of vendor.
27	**TRAINING**
	After successful completion of acceptance test, vendor specialists shall train HAL's operation and service personnel for 10 days.
28	**Warranty**
	Warranty period: Two years from the date of signing the final acceptance letter. In case of any failure noticed in the parts during warranty period , the vendor should give free replacement .
29	**HAL Scope of Supply**
29.1	**CIVIL ENGINEERING**
	•Foundations and grouting for all equipment and auxiliaries as per vendor drawing. •Parts concreted in the foundation for reinforcement •Trenches for cables, pipe lines, drainage lines for fluids/emulsions •Painting/coating of foundations and civil works if required. •Operator room with air-conditioning, telephone, illumination, furniture etc. •Main Hangar with illumination, 2 over head lifting cranes with capacity 10T and 50T respectively.
29.2	**ELECTRICAL ENGINEERING**
	•External wiring/energy supply between the transformer and the Electrical panels to 2nos of Main switch cabinets and Switch cabinet of Chamber Furnace. •All other power supply for any additional panels and internal cabling is in vendors scope only. •Transformers & HT/LT switchgears •Site lighting •Electrical/electronic earthing of the complete equipment
29.3	**SPARES, CONSUMABLES**
	•Storage space for consumables, spare and wear parts •Raw material of sufficient quantity and quality for commissioning, acceptance
29.4	**Air and Water Supply**
	•Supply of compressed air Water at Room temperature •Sump and drainage pumps.
29.5	**GENERAL**
	•Free and clear access to all mounting places including flat and unobstructed floor in the production bay •Storage of supplied goods at Site to avoid loss or damage due to weather, climate or other influences when erection cannot proceed immediately •Skilled operating personnel for hammer operation (suitably qualified and trained) •Stores for production material and tools and associated handling equipment •Any necessary pre-heating equipment •Scale and waste pits with associated covering including scale and waste receptacles, transportation facilities / conveyors.

30	**Qualification Criteria:**
30.1	**Past experience:**
	1. The proposed counter blow hammer will be utilized for the manufacture of critical aircraft & aero-engine forgings for the programs of HAL and therefore OEMs. The forged components produced on this equipment are to meet the stringent dimensional, quality and process requirements of HAL & global aero-engine OEMs.Indian Airworthiness agencies & OEMs carry out process audits and qualification of the forging equipment before approving the facility for forging manufacturing. Therefore, the vendor shall have past experience of supplying similar forging equipment to global forging industries and the supplied equipment should have met the operational and quality requirements . Following are the experience requirements; a) The Vendor / OEM shall have successfully designed, manufactured, supplied, installed and commissioned at least three (03) Counter Blow Hammers having a rated forging energy of 100 kJ or above, out of which at least one (01) Counter Blow Hammer shall have a rated forging energy of 200 kJ or above. b) At least one of the (01) Counter Blow Hammer shall have been supplied more than ten (10) years prior to the date of bid submission. Vendor / OEM shall furnish documentary evidence in support of the above experiences in the form of Purchase Order / Installation Certificates / Commissioning Certificates / Customer Performance Certificates. HAL's Technical Evaluation Committee will evaluate such evidences and in case any additional proof is required, same will be asked by HAL. **Failure to submit the required documentary evidence shall render the bid liable for rejection.**
30.2	**Financial Standing:**
	Average financial turnover of the bidder during the last three completed financial years shall be atleast INR 50.00 Crs.In case the bidder participates in both the line-items (i.e., 10000 Ton Hydraulic Press and 20 Ton counter blow hammer together) the average financial turnover shall be atleast INR 290 crores. The bidder shall submit the audited financial statements/reports (relevant portions) for the last three completed financial years as a proof of evidence in support of the above requirement. **Failure to submit the required documentary evidence shall render the bid liable for rejection.**
30.3	Bids submitted by bidders quoting as authorized representative of the same or other principal manufacturer shall also be considered for qualification provided: a) their principal manufacturer meets all the qualification criteria without exemption, and b) the principal manufacturer furnishes a legally enforceable tender-specific authorization in the prescribed form assuring full guarantee and warranty obligations as per the general and special conditions of contract; and c) the bidder himself should have been associated, as authorized representative of the same or other Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service as the case may be) for same or similar Product (i.e., hydraulic forging press & forging hammer as the case may be) for past three years ending on the Relevant Date (i.e, date of bid submission).
31	**Annexures**
	All requirements as per below annexures need to be accepted by vendors during submission of technical quotes.
	Annexure-1 : Plan of the hangar with hammer and other accessories location
	Annexure 2 : Details to be furnished by the vendor along with the technical quote for energy calculation and other technical parameters.
	Annexure 3 : Dovetail size of Dies
	Notes: Vendor may be called for Technical Clarification during Technical Evaluation stage if HAL desires.
	Special Notes:
	All the above mentioned requirements/parameters are **Essential ,** unless otherwise it is explicity specified.

Annexure - I: LAYOUT



NOTES :

All dimensions in Mtrs

Distance between Columns : 8

F1 & F4 : Furnace

F2 & F3 : Furnace

Height of crane hook path : 15

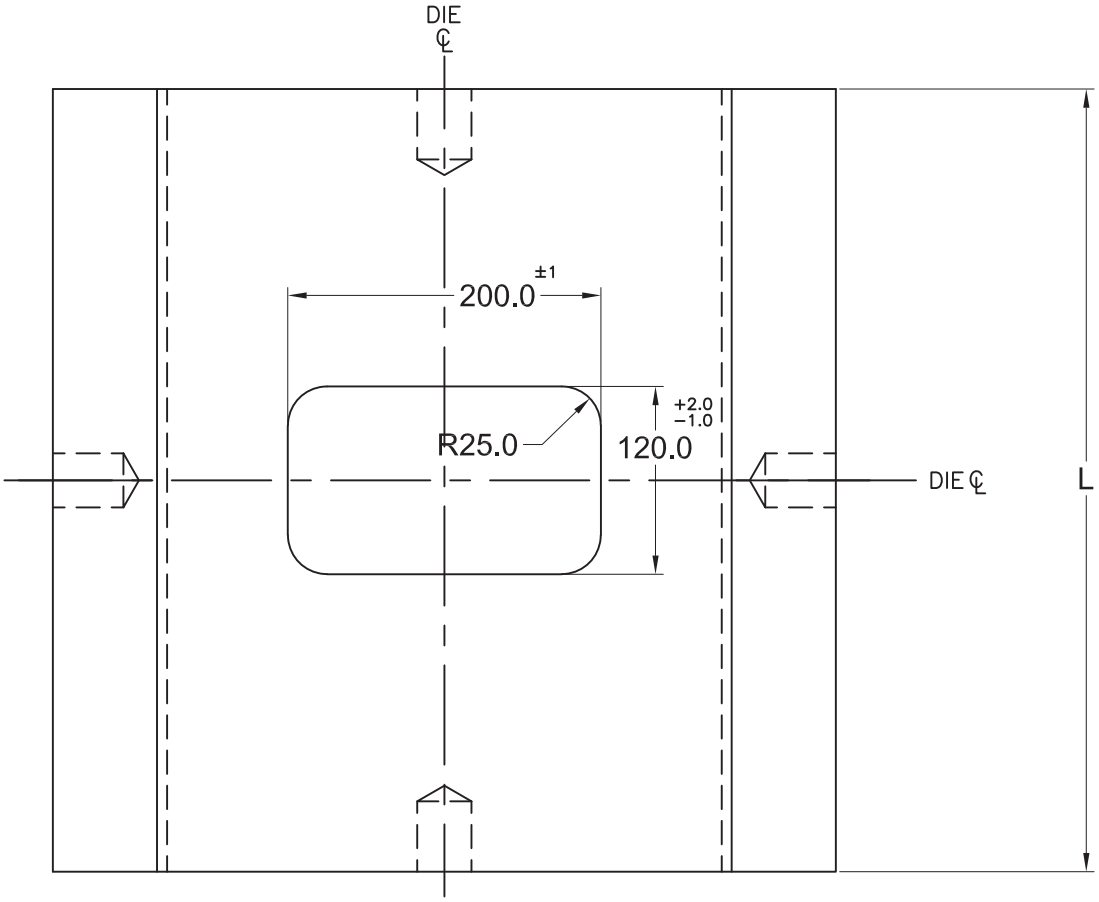
Annexure - 2

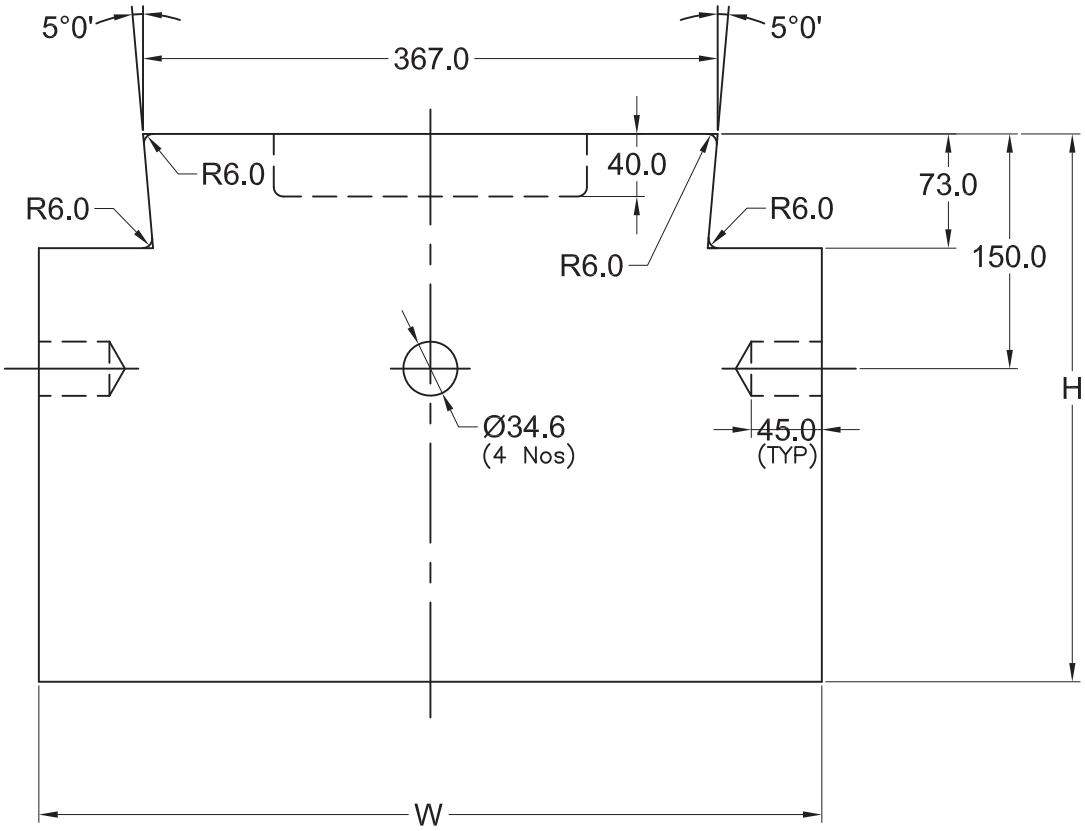
Based on the typical input parameters provided in the specification sheet , the OEM shall design the Hydraulic Operated Counter blow hammer for a minimum rated energy of 200 kJ and shall submit the detailed energy calculations along with the following details :

Sl No	Description	Vendor Remarks
1	Typical Operating pressure for the hydraulic system- 200 Bar	
2	Stroke Length of Top Tup Mass	
3	Stroke Length of Bottom Tup Mass	
4	Velocity of Top Tup	
5	Velocity of Bottom Tup	
6	Weight Bottom Tup	
7	Weight Top Tup	
8	Energy achievable for work piece height of 350mm (Energy in % and kJ)	
9	Day light of the hammer	
10	Working Principle of Operation of Counter blow: Brief description of operation of hammer to be provided with pictorial representation. (Operation sequence)	
11	Width of the frame base at floor level (Approx. 4000 mm)	
12	Depth of the frame base at floor level for reference (Approx. 2000 mm)	
13	Quantity of main pumps proposed in hydraulic system	
14	Quantity of main motors proposed hydraulic system	
15	Type of Main pumps used in hydraulic system	
16	Oil volume of the hydraulic system	
17	Vendor shall explain machine visualization using screen shots as examples.	
18	Vendor shall explain in technical quote about the provision for stick Slip free Movement of Moving Cross Heads being planned. Provision for stick slip free movement of moving cross head shall be made for hammer operations at slow speeds.	

ANNEXURE- 3

DOVETAIL DETAILS OF DIES





ALL DIMENSIONS ARE IN MM

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A

		Compliance
1	**Introduction**	
a	Foundry & Forge Division (F&F), Bengaluru, a Division of Hindustan Aeronautics Limited (HAL), is engaged in the development and manufacturing of forgings and castings in various alloys for aeronautical and other engineering applications. In line with the Division's ongoing capacity augmentation and technology up gradation initiatives, F&F Division is planning to establish a Hydraulic forging Press of 10000 Ton Capacity in its new forging hangar. The proposed 10000 Ton forging press will be utilized for manufacturing of critical forging components such as landing gears, hubs, gear forgings, shafts, aero-engine discs, blisks, and other forgings required for various HAL programs and global aero-engine OEMs. The establishment of the new facility is aimed to enhance HAL's capability to manufacture high-integrity aerospace forgings, especially for aero-engines with improved process control, dimensional accuracy, and repeatability.	
b	1.This press shall be capable of carrying out forging operations in the following modes and the typical production utilization will be as follows. a. Closed die forging (~60%) : Primarily intended for the production of aircraft structural forgings, including landing gear components, hubs, and other critical aluminium alloy closed die forgings b. Open die forging (~10%) : Primarily intended for preforming/gathering operations prior to closed die forging, upsetting operations, and other intermediate forging operations as required. c. Near Isothermal forging (~30%) : Primarily intended for the manufacture of aero-engine disc forgings and other critical rotating components in Titanium (Ti) and Nickel(Ni) based super alloys under near isothermal forging conditions 2. Further, the press shall also perform coining operation (Cold compression/warpage removal) of forgings. 3. Materials and typical Forging temperatures to be forged: Aluminium Alloys: 385°C to 460°C, Alloy Steels: 1000°C to 1180°C, Titanium alloys : 700°C to 1000°C, Nickel super alloys : 950°C to 1160°C	

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A		Compliance
2	**Scope of Work:**		
	Vendor shall carryout Design , manufacture , supply, installation, commissioning, training, documentation and prove out of a brand new 10,000 Ton forging press along with near isothermal forging facility and integrated robotic manipulator for handling forgings on turnkey basis as per specifications given below. Typical forgings planned to be produced utilizing the new 10000 Ton hydraulic [ress is attached in the Annexure-1 with details of type of the material and approx. dimensions. The machine is planned to be installed in the new production hangar which is currently under construction. The new forging press will be positioned within the marked section of layout enclosed at Annexure-2.In case any minor modification to the proposed layout of the press facility is required, the same shall be indicated in the technical bid document. The vendor's scope shall also include obtaining all necessary export licenses and regulatory approvals from the concerned government authorities in the country of origin for the supply and establishment of the facility at HAL-F&F.		
3	**Technical Description of Press**		
3.1	**TECHNICAL SPECIFICATION OF THE PRESS**		
3.1.1	**Press Capacity:**		
a	Rated Press Capacity (minimum)	**10000 Ton** (additional 20% booster load capacity : Up to 12000 Ton)	
b	Press type	Four Column Push down	
c	Number of main ram cylinders	3 Nos	
d	Cylinders capacity at rated load of 10000 Ton	Center Cylinder : **5000 Ton** ; Two side cylinders : **2500 Ton each**	
e	Cylinders capacity at booster load of 12000 Ton	Center Cylinder : **6000 Ton** ; Two side cylinders : **3000 Ton each**	
f	Cylinders orientation	Left to right (Inline with moving bolster direction)	
g	Number of retraction ram cylinders	4 Nos	
3.1.2	**Cross Slide:**		
a	Vertical stroke of the Slide shall be within the range of	3000 mm to 3500 mm	
b	Eccentricity (minimum)	200 mm	
c	Eccentric moment Load (left to right) (Minimum)	20,000 kNm	
d	Eccentric moment Load (front to back) (Minimum)	20,000 kNm	

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A		Compliance
3.1.3	**Day light details**		
a	Daylight at Top Dead Center (TDC)	4000 mm to 5000 mm	
b	Daylight at Bottom Dead Center (BDC)	1000mm to 1500 mm	
c	Top and bottom Bolster size (width x breadth) (minimum)	2500 x 2500 mm	
d	Minimum distance between the column and die bolster	350 mm each on each side	
3.1.4	**Press Speed (For Open die and Closed die operations):**		
a	Rapid approach speed (variable)	1 mm/s to 250 mm/s	
b	Rapid retraction speed (variable)	1 mm/s to 250 mm/s	
3.1.5	**Forging Speeds for rated press capacity (10000 Ton)**		
a	Speed at loads up to 50% of maximum press capacity	1 mm/s to 40 mm/s	
b	Speed at the maximum press capacity	1 mm/s to 20 mm/s	
3.1.6	**Forging Speeds for booster press capacity (12000 Ton)**		
a	Velocity at 12000 Ton (variable)	1 mm/s to 10 mm/s	
3.1.7	**Press Speed (For near Isothermal mode)**		
a	Rapid approach speed (variable)	1 mm/s to 100 mm/s	
b	Rapid retraction speed (variable)	1 mm/s to 100 mm/s	
c	During the isothermal operations minimum operating speed at rated load capacity	0.04 ± 0.01 mm/s	
3.1.8	**Moving bottom bolster**		
a	Stroke	4500-5000 mm	
b	Force (Minimum)	100 Ton	
c	Direction of travel	From the center of the press to the left side when viewed from operator desk	
d	Speed (Variable)	1mm/s to 200 mm/sec	

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A

			Compliance
3.1.9	**Ejectors (Top and Bottom)**		
a	Stroke (minimum)	600 mm	
b	Force (minimum)	200 Ton	
c	Speed (Both Ejection and Retraction) (variable)	1 mm/s to 100 mm/s	
3.1.10	**Connected Load**		
a	Total connected load - Maximum. (Includes press, Isothermal attachment, manipulator, and all other accessories)	5500 KVA	
b	Input Power Supply	415V ± 10%, 50Hz ± 3%. Motors shall be selected for voltages working up to 415Volts only. Operating voltage beyond 3 phase, 415V ± 10% is not allowed.	
3.1.11	**Press Dimensions**		
a	Max height of the press above floor level including the pre fill tank	15000 mm	
b	Bottom bolster height above floor level (typical)	400 mm	
3.1.12	**Booster load capacity up to 12000 Ton**	20% of daily machine operating time (on need basis)	
3.2	Major components of the press are as follows and their description is detailed in the below sections.		
a	• Press Frame (Consisting of Upper beam, Tie rods and Lower beam) • Moving cross slide • Moving cross Slide Guiding system • Cross Slide connection to main cylinder • Parallelism monitoring and control system • Main Cylinders and retraction cylinders • Hydraulic Ejectors • Moving Lower Bolster with guiding mechanism • Tool clamping		

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
b	Standard for Design and construction of main structural parts of the press shall comply with DIN EN 14673: 2006 + A1: 2010. All critical load-bearing structural forgings, including tie rods, columns, main cylinders shall be subjected to 100% ultrasonic testing (UT) in accordance with ASTM A388/A388M or an internationally recognized equivalent standard. Necessary reports shall be shared to HAL during fabrication stage of the press.	
3.2.1	**Press Frame**	
	The press frame shall consist of a press bed, four columns, and a press crown forming a rigid closed-frame structure. The frame shall be designed and optimized using Finite Element Method (FEM) analysis to ensure adequate strength and minimal deflection of press frame, cross slide and columns under loads. The frame components shall be of cast or welded steel construction, duly thermo-stress relieved. Necessary FEM design calculations shall be shared to HAL during the phase of press design. The crown and bed shall be rigidly connected by four columns with hydraulically pre-stressed tie rods, ensuring high structural rigidity and preventing joint separation under full load conditions. Each column shall be made of casting / welded structure & designed as hollow rectangle section. The four columns shall be enclosing the tie rods. Together with upper and lower beam, the columns constitute the pre-stressed frame.	
3.2.2	**Moving cross slide**	
	The moving cross slide shall be manufactured from torsion-resistant steel castings/welded structure, designed to withstand high loads. Slide tilting under off-center loading conditions shall be minimized through an optimized guidance ratio and precisely adjustable slide guiding elements. The slide shall function as a rigid pressing member. The clamping surface shall be provided with T-slots for mounting the upper die as per HAL's requirement. A slide locking system shall be provided to prevent the slide movement during the maintenance time. The slide shall be mechanically locked at the top dead center (TDC) position by means of a locking bar operated by a hydraulic cylinder. The end positions of the locking bar shall be electrically monitored through PLC. The locking shall be controlled by the operator from the operator control panel.	

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3.2.3	**SLIDE GUIDING SYSTEM**	
	Robust guide brackets with large-area flat guide surfaces surrounding the columns shall be provided to effectively withstand eccentric loads. The guide clearance shall be adjustable easily and precisely by means of wedge arrangements, ensuring accurate alignment and smooth, stable operation of the ram. Preferably vendor may provide five number (5 No) adjustable flat guide surfaces per column. Hardened and tempered guide flats with bronze linings shall be provided on the columns to achieve superior guiding performance. An automatic grease lubrication system shall be installed to ensure continuous lubrication of all guide surfaces. Shoes shall be fixed to the moving crosshead, the slide-ways shall be fixed to the press frame columns.	
3.2.4	**SLIDE CONNECTION TO MAIN CYLINDER**	
	The press shall be equipped with double spherical bearing (double ball-joint) connections between the moving slide (ram) and the main hydraulic cylinders to effectively accommodate angular misalignment and eccentric loading during forging operations. Main cylinder connection to Cross slide shall be made with double spherical joint, and retraction cylinders shall be connected with moving cross slide by single spherical joint. The bearing arrangement shall ensure that torque and bending moments acting on the slide due to eccentric loading are isolated from the cylinder pistons, thereby minimizing side loading on the hydraulic cylinders. The design shall reduce wear of cylinder bushings and seals, enhance the service life of cylinder components to improve the overall reliability and operational life of the press.	
3.2.5	**Ram Parallelism monitoring and Control mechanism of the press**	
	The press frame shall incorporate vertical tie rods connecting the upper beam (crown), columns, and lower beam to form a rigid structural assembly. The vertical tie rods shall be hydraulically pre-tensioned to impart the required initial pre-stress to the press frame, ensuring structural rigidity, dimensional stability, eccentricity and uniform load distribution during all forging operations. The press shall be equipped with a real-time parallelism monitoring system to continuously monitor and control the parallelism of the moving ram with respect to the press bed in both the left-right and front-back directions. The system shall provide continuous feedback to the control system to maintain ram parallelism within the specified tolerance throughout the forging stroke. The values shall be displayed in the main control panel. Hydraulic jacks used for pre stressing the tie rods shall be supplied along with the press.	

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3.2.6	**Main Cylinders and Retraction Cylinders**	
	The main hydraulic cylinders and retraction cylinders shall be of heavy-duty construction and shall be completely assembled, pressure tested, and performance tested at the manufacturer's works prior to installation on the press. The cylinders shall be designed to withstand the specified forging loads and duty cycle with adequate factor of safety and shall ensure reliable long-term operation. The main hydraulic cylinders and retraction cylinders shall be of single-acting design and shall incorporate high-quality sealing systems, wear-resistant guide elements, and guiding arrangements to minimize internal and external leakage, reduce wear, and ensure smooth operation throughout the service life. The pistons shall be manufactured from high-quality forged or cast steel, suitably heat-treated and machined for heavy-duty forging applications. Adequate guide rings and seals shall be housed within the cylinder assembly and shall be readily accessible for inspection and replacement to facilitate maintenance and minimize equipment downtime. Fixtures and jigs are to be provided for replacement of seals of Ram Cylinders.	
3.2.7	**Hydraulic Ejectors**	
	Vendor shall provide total 2 Nos of part Ejectors- 1No for Bottom bolster and 1No for Top bolster. The press shall be provided with a hydraulically actuated ejector cylinder installed in the press bed for automatic ejection of forged components from the die after completion of the forging operation. The ejector shall be designed with adequate force and stroke to ensure reliable removal of the forged part under all specified operating conditions. The ejectors shall normally remain in its home position and shall be automatically actuated through the press control system based on the programmed forging sequence. The ejectors shall operate only when all prescribed interlocks, including the correct position of the moving bolster (where applicable), are satisfied. After reaching the programmed upper end position and ejecting the forged component, the ejectors shall remain at the end position for an adjustable dwell time before automatically returning to its home position, thereby enabling the subsequent forging cycle.	

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	Bottom Moving Bolster	
3.2.8	The press shall be provided with a heavy-duty hydraulically operated moving bolster designed to facilitate rapid and safe die change operations. The supplier shall design the moving bolster to withstand the maximum forging loads, including severe impact and eccentric loading encountered during rough forging operations, without permanent deformation or loss of alignment. The moving bolster shall be actuated by hydraulic cylinders (preferably single acting type) and shall provide smooth, accurate, and repeatable movement into and out of the press. Mechanical end stops and cushioning arrangements shall be provided to ensure precise positioning and controlled deceleration at the end of travel. The bolster shall be supported on full-length low-friction, wear-resistant sliding surfaces and shall incorporate lateral guide elements and anti-lift retaining arrangements to maintain accurate alignment during operation. The moving bolster shall be manufactured from high-strength forged steel and shall be provided with suitable clamping arrangements for secure mounting of the lower die/tooling. The design shall be capable of carrying the complete lower die assembly during die change operations. The position of the moving bolster shall be continuously monitored by two independent displacement measuring systems to ensure precise positioning and safe operation. The sliding surfaces shall incorporate an automatic lubrication system with lubrication grooves or equivalent arrangements to ensure continuous lubrication throughout the travel. The slideway and hydraulic drive system shall be rigidly integrated with the press structure to eliminate relative movement and maintain positioning accuracy. The complete slide track shall be protected by robust steel drag plates or equivalent protective covers to prevent ingress of scale, dirt, and other contaminants, thereby ensuring reliable operation and extended service life. To perform tool change by over head crane, Lower bolster shall be shifted out of the shadow of the press/movable cross head. The outward direction of the moving bolster shall be designed towards left side of the press when it is viewed from operator desk. The vendor shall supply one bottom moving bolster (thickness ~ 400 mm) for mounting the bottom die. One side of the bottom bolster shall be securely fastened to the bottom platen, the other side shall be machined dovetail keyways for mounting HAL's dies. The vendor shall also supply all die locking keys required for securing the bolster and the dies . The bolster shall be manufactured from Tool Steel DIN 1.2714 or an internationally recognized equivalent grade with equivalent or superior mechanical properties.	

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3.2.9	**Top Bolster**	
	A thermal insulation plate shall be provided between top bolster and cross slide. The plate shall be designed to minimize heat transfer from the dies to the press structure, thereby maintaining die temperature and improving process stability. The insulation plates shall be manufactured from a high-strength, low thermal conductivity material suitable for repeated high-temperature forging operations. The thermal plate shall ensure uniform die temperature distribution, minimize thermal distortion of the press structure, and facilitate reliable long-term operation. The top bolster shall be manufactured from high-strength forged steel and shall be provided with suitable clamping arrangements for secure mounting of the upper die/tooling to the cross slide. The design shall be capable of carrying the complete top die assembly during die change operations. The vendor shall supply one top bolster (Thickness ~ 400 mm) for mounting the top die. One side of the top bolster shall be securely fastened to the cross slide , while the other side shall be machined dovetail keyways for mounting HAL's dies. The vendor shall also supply all die locking keys required for securing the bolster and the dies .The bolster shall be manufactured from Tool Steel DIN 1.2714 or an internationally recognized equivalent grade with equivalent or superior mechanical properties.	
3.2.10	**Die Locking Mechanism**	
	The top and bottom dies used for open-die forging and closed-die forging shall be secured to the press by means of a dovetail locking mechanism, using locking keys on two parallel sides perpendicular to the die-shifting axis. The dovetail dimensions of the HAL designed dies is specified in Annexure-4**.** The top and bottom bolsters shall also be designed to permit mounting of the die keys parallel to the die-shifting axis by rotating the bolsters by 90° . The press design shall provide adequate clearance and accessibility for fixing and removing the locking keys of both the top and bottom dies using a rammer suspended from the overhead crane. The arrangement shall ensure that the key-ramming operation is not obstructed in either locking direction. Provision for key installation and removal in both directions shall be incorporated in the design. Detailed drawings demonstrating the key-fixing arrangement, clearances, and accessibility shall be submitted along with the technical quotation. Additionally, the vendor shall supply top and bottom adaptor plates of minimum dimensions 2000 mm × 2000 mm (L × W). One side of each adaptor plate shall be machined with a dovetail arrangement for mounting the dies, while the other side shall be machined for secure locking to the respective bolsters. The vendor shall supply all additional locking keys required for securing the adaptor plates and dies .	

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3.2.11	**Cover Plate**	
	The vendor shall provide heavy-duty steel cover plates to form a continuous operating platform at shop floor level for safe movement of operators, forging manipulators, and associated handling equipment during loading and unloading of forgings/tools. The cover plates shall completely cover the entire press foundation area, including the lower bolster cylinder pit and the full travel span of the moving bolster and associated hydraulic cylinders. During all operating conditions, no open cavities, gaps, or exposed foundation pits shall remain within the operating area to ensure personnel safety. The cover plates shall be designed and structurally verified to withstand a uniformly distributed and concentrated load corresponding to a minimum load capacity of 40 tones, including the weight of the forging manipulator, tooling, and any other operational loads, without permanent deformation. The plates shall be securely supported and fixed to prevent movement during operation. The operating platform shall be provided with gradual sloping transitions on all accessible sides to facilitate smooth and safe movement of the forging manipulator and other material handling equipment. The surface of the cover plates shall be anti-skid and suitable for continuous operation in a hot forging environment.	
3.2.12	**Mechanical Stopper**	
	Vendor shall provide a positive stroke limitation stopper to the columns in order to prevent the cross slide beyond Bottom Dead Centre. This mechanical stopper shall act as fail safe protection to the movement of Cross slide. Vendor shall design mechanical stoppers with welded steel structure, assemble and integrate to the columns. These mechanical stoppers shall be designed with detachable provisions for easy assembly and removal. It shall adequately to withstand the dead weight of the cross slide and cylinders.	
3.2.13	**Working Platform**	
	Vendor shall design a maintenance platform made of Steel and adequately fastened and fixed over the top frame and to the parked position of the moving cross head to carryout maintenance activities/inspection. The platform shall have approach ladder with safety cage. Approach ladder shall have intermediate resting platform of suitable size at parked position of the cross slide. The approach shall be designed with suitable rails for full body harness.The entry door for top of the press shall have safety latche interlocked with PLC .	
3.2.14	**Layout drawing**	
	The supplier shall submit, along with the technical offer, a detailed three-dimensional (3D) layout/model of the proposed hydraulic forging press clearly identifying all major components, including but not limited to the press frame, hydraulic cylinders, moving bolster, ejector system, manipulator , isothermal attachment, hydraulic power unit, piping, platforms, cover plates, and other associated equipment.	

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
3.3	**Hydraulic System and Piping's**	
a	Press shall be designed to have a complete, fully integrated hydraulic direct drive system and shall be designed in accordance with ISO 4413.	
b	**Main components of hydraulic drive system are :** • Hydraulic Direct Drive • Proportional Pre-Fill Valve system • Hydraulic Tank and pre-fill tank • Main control and Return cylinder manifolds • Pressure Monitoring System • Oil filtration system • Automatic Force Control • Oil-Water Cooling system	
3.3.1	**Hydraulic Direct Drive**	
	The press shall be equipped with a heavy-duty hydraulic direct drive system designed to provide precise, smooth, and energy-efficient operation under all specified forging conditions. The hydraulic drive shall comprise multiple high-efficiency axial/radial piston pumps, electric motors, flexible couplings, pump mounting bases, hydraulic tank, filtration and cooling systems, and all associated control and safety devices. The hydraulic system shall be designed for a maximum operating pressure of 350 bar for open and closed die forging at rated and booster load. For isothermal forging, vendor may select suitable high pressure pumps beyond 350 bar of radial /Axial type for achieving desired speed/ Strain rate. Vendor shall provide 2 Nos of standby pumps in addition to the main pumps of the hydraulic system. The hydraulic control system shall be of modular manifold construction to minimize external piping, reduce leakage points, and ensure smooth, shock-free operation without pressure surges. The hydraulic direct drive system shall provide accurate control of ram position, speed, force, acceleration, and deceleration throughout the forging cycle. The supplier shall clearly identify and indicate the makes and models of all major hydraulic drive components in the technical offer. The details of availability of the boost force during the stroke shall be indicated in the technical offer and the boost force shall be available over a minimum length of the last 50 mm of the working stroke or for a maximum of 10% of all strokes whichever is less .	

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3.3.2	**Proportional Pre-Fill Valve system**	
	The press shall be equipped with a high response proportional pre-fill valve system for the main slide cylinders. The pre-fill valve shall be capable of independent operation regardless of the pressure existing in the main cylinder and shall support continuous programmable intermediate positions, controlled opening and closing ramps, and precise pressure regulation through the press control system. The pre-fill valve system shall provide rapid controlled pressure relief and decompression of the main cylinder, with a minimum decompression time shall not be more than 2 Sec.The decompression function shall be achieved directly through the proportional pre-fill valve without the requirement of a separate pre-decompression circuit. Vendor shall provide a variable decompression time programmable from 2 sec to 10 Sec. The system shall be designed to minimize cycle time, reduce hydraulic shock and pressure fluctuations, improve forging repeatability, and enhance the overall reliability, energy efficiency, and service life of the hydraulic system.	
3.3.3	**Hydraulic Tank**	
	The hydraulic reservoir shall be of compartmentalized construction with multiple chambers to provide effective deaeration, sedimentation of contaminants, and stabilization of the hydraulic fluid during continuous press operation. The design shall ensure adequate settle down time for the hydraulic fluid to minimize turbulence, foaming, and air entrapment before recirculation. The hydraulic reservoir shall be equipped with a continuous visual and digital hydraulic oil level monitoring system. The oil level shall be continuously displayed on the operator interface and appropriate visual and audible alarms shall be provided for low and high oil level conditions. The hydraulic reservoir shall also be provided with suitable inspection openings, drain arrangements, breather filters, and access provisions to facilitate inspection, cleaning, and maintenance. The level fluctuation within the tank during the operation creates an air circulation, which shall be exchanged by built-in air filters. A sensor in the air breather, oil filters shall monitor the degree of soiling, which shall be communicated to the press control via electrical signal. In case of soiling level exceeding set parameters, related error shall be displayed on screen. Hydraulic tank and pre-fill tank shall have adequate number of pressure, level, temperature and contamination monitoring sensors and communicate to the press PLC.	

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3.3.4	**Main control and Return cylinder manifolds**	
	The press shall be provided with dedicated hydraulic manifolds for the main cylinder and return cylinder circuits. The manifolds shall be of modular block construction and shall incorporate all necessary directional, proportional, servo, logical cartridge valves, pressure control, flow control, safety, oil filters and isolation valves required for precise control of the respective hydraulic functions. The manifolds shall be designed to minimize external piping, pressure losses, and potential leakage points while ensuring smooth, accurate, and repeatable operation of the main and return cylinders. This design shall facilitate rapid response, controlled acceleration and deceleration, synchronized cylinder movement, and stable pressure regulation throughout the forging cycle. The manifold blocks shall be manufactured from high-strength forged steel. The manifold arrangement shall provide easy access for inspection, maintenance, and replacement of components without requiring major dismantling of the hydraulic system. A system of pressure checkpoints/inspection points is required to facilitate identification of correctness of function of the hydraulic-system through sufficient number of hydraulic connector ports.	
3.3.5	**Pressure Monitoring of the Hydraulic system**	
	The hydraulic system shall be equipped with high-accuracy pressure transducers for continuous monitoring of all critical hydraulic circuits. The pressure transducers shall incorporate fail-safe diagnostics and shall be designed to detect wire breakage, short circuits, sensor failures, and other electrical faults. Any such fault shall immediately generate a visual and audible alarm on the control panel and shall initiate appropriate protective actions to ensure safe operation of the press. The measured pressure values shall be continuously displayed, recorded, and made available to the press control system for process monitoring, diagnostics, and interlocking. The pressure sensors shall have local digital display on the sensor unit.	
3.3.6	**OIL FILTRATION SYSTEM**	
	The hydraulic system shall be provided with an additional OFFLINE oil filtration unit along with ONLINE filtration system. OFFLINE filtration System: Unit shall have filtration capability of 3 µm or finer for continuous conditioning of the hydraulic oil during press operation. The filtration unit shall continuously monitor the condition of the filter element, and upon reaching the predetermined contamination level, the press control system shall automatically generate visual and audible alarms on the press control panel, providing timely indication to the operator for filter replacement or maintenance. Vendor shall supply suitable Cellulose filter insert based oil filtering unit with contamination and moisture monitoring probes with display and printer. (Make of the filtering unit: C C JENSEN)	

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3.3.7	**AUTOMATIC FORCE CONTROL**	
	The press shall be equipped with an automatic hydraulic cylinder management system for the main slide cylinders. The system shall enable automatic and dynamic activation/deactivation of individual cylinder areas during the forging cycle based on the required forming force, ram position, and process parameters, without any intervention by the operator. The hydraulic control system shall automatically distribute the available hydraulic oil flow from the main drives to the appropriate cylinder areas through high-response servo/proportional hydraulic controls to optimize ram speed, force, and energy utilization throughout the working stroke. The transition between different cylinder configurations shall be smooth and automatic, without pressure shocks or interruption of the forging process. The complete cylinder management system shall operate fully automatically under PLC/CNC control and shall optimize press performance by achieving the best combination of forming capacity, ram speed, and energy efficiency during the entire forging cycle. No manual selection or operator action shall be required during normal operation.	
3.3.8	**Accumulator Station**	
	The accumulator station shall consist of an accumulator with downstream Nitrogen bottles. This station shall be coupled with safety and shut-off valves to the return cylinder manifold. It Shall not be used for main pressing operation.	
3.3.9	**Pressure hold Pump Unit**	
	This unit shall be a source of regulated flow and pressure for auxiliary functions It shall further preform the function of maintaining pressure in accumulator station. Note: The motors involved in this operation shall be independent from main pump motors	
3.3.10	**Piping, Fitting and Fastening Structures**	
	The control manifolds, working cylinders of the press and tanks to be interconnected with pressure and return piping. The piping system to be supplied of shut-off valves with electric check of function, where necessary. The piping shall also comprise of check valves, high-quality fastening elements and steel structures for supporting the piping to fastening to the concrete foundation. This assembly also incorporates packing sheets, foundation bolts and other anchor material intended for installation of individual sub-assemblies on the foundation on site. All pipes lines shall be appropriately clamped wherever necessary to avoid vibration and overhang. The high pressure hoses used should be designed adequately (with proper clamping) to withstand maximum pressures .	
3.3.11	**-Provision for Stick Slip free Movement of Moving Cross Head**	
	Provision for stick slip free movement of moving cross head shall be made for press operations at slow speeds.	

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A

		Compliance
3.3.12	**Lubrication System:**	
	Automatic lubrication is required for an accurate and maintenance-free guidance of all the moving parts. The lubrication system shall be fully controlled by electrical control system .The lubrication system shall have sensors to ensure it's effectiveness during application. Centralized control from control panel to all the lubrication units with provision of error messages in corresponding areas to be provided. The lubrication system shall be of Bijur/Lincoln make. The press shall be designed with independent grease lubrication systems for moving bolster- 1 Set, Ram spherical joints and Ram guiding system- 1Set. A standby pumping system shall be provided in addition to the main grease pumping system with local display and control along with PLC interface of control desk. Standby pumping system shall be able to be used for any of the two pumping systems during failure if any.	
3.3.13	**Oil-Water Cooling heat exchanger**	
	The hydraulic system shall be provided with a thermostatically controlled hydraulic oil cooling system incorporating high-efficiency counter-flow heat exchangers. The cooling system shall automatically regulate the hydraulic oil temperature within the specified operating range under all operating conditions . The cooling system shall be complete with temperature sensors, flow control valve, circulation pumps (where applicable), and all associated piping, instrumentation, and controls.	
a.	The Cooling unit shall be provided for the main oil tank/ any other required oil tanks. This unit shall be of make Hydac/Alfa Laval. It shall draw oil from the Return Oil chamber, filters, passes oil through heat exchanger and fills into the clean chamber. This shall ensure conditioning of the circulating oil with regard to cleanliness and constant temperature for a proper press operation.	
b.	During press operation ,the heat absorbed by the hydraulic oil must be removed by cooling via oil-water heat-exchanger so that it's operating viscosity can be maintained. Cooling water quantity to be regulated depending on oil temperature. The oil temperature in the main tank to be measured with temperature detectors. The proper sensors and detection system shall be provided and linked to PLC for alarms in case of temperature is too high. Interlocking with press operation shall be provided for the same.	
c.	Furthermore, collected dirt particles and wear debris to be filtered with the appropriate fineness of ONLINE filtration in order to reach the required class of oil purity. The filter soiling degree to be monitored by electrical soiling indication and monitored at the control desk. The system shall maintain the appropriate NAS level (approx. NAS 6) of oil that is required for most optimum working of the hydraulic system.	
d.	The type of pumps used shall guarantee a constant quantity of oil, independent from the contamination level of the filters. The arrangement and the location of the filters shall enable an easy access for maintenance and service activities. Fluid contamination monitoring device (online) with alarm to be connected to operator control. Pilot pressure system also shall have inline filtration and continuous circulation filtration loop.	

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e.	Note: Complete hydraulic system shall have to be accommodated in hydraulic room shown in Annexure-2		
	Oil volume for hydraulic system.	(*)To be provided by vendor with technical quote	
	Oil to be used in the hydraulic system	HLP 46 Hydraulic oil with high viscous index	
	Heat dissipation from power pack in hydraulic room （approx.）	(*)To be provided by vendor with technical quote	
3.3.14	**Water Chiller Unit for Hydraulic Oil**		
a.	The press shall be designed and equipped with a complete cooling system for the hydraulic system, Near-Isothermal Forging System, manipulator and all other systems requiring cooling. The cooling arrangement may consist of a single integrated chiller system or multiple dedicated chiller/cooling units for individual equipment or subsystems, as required to ensure optimum performance, reliability, maintainability, and energy efficiency. The cooling system shall be adequately sized to meet the total heat load of the complete installation and shall ensure continuous operation of the press under all specified operating conditions. The scope shall include chillers, pumps, heat exchangers, cooling circuits, piping, valves, evaporator cooling tower, instrumentation, controls, insulation, and all other accessories required for a complete and reliable cooling system. The vendor shall clearly indicate the proposed cooling methodology, cooling capacities, equipment served by each cooling system, and the location of all chiller units in the technical proposal. A detailed layout drawing showing the location of the chiller unit(s), cooling piping network, and interfaces with the press and associated equipment shall be submitted as part of the technical offer. Vendor shall provide one working and one standby chiller of equal capacity to ensure uninterrupted cooling needs of the facility.Vendor shall provide water chiller of at least 150 TR capacity for each of the working chiller and standby chiller		
b.	The Chiller have following features: 1. Screw type compressors for chiller. 2. Water cooled/Air cooled condenser 3. Environmental friendly refrigerant 4. All working pumps shall have one standby pump. 5. Chilled water tank with insulation 6. Cooling tower with temperature controller 7. Micro controller based cooling water management and control system. 8. Automatic switchover between standby and working chiller with help of control system. 9. A separate PLC based SCADA control system for Operation. The alarms and operation shall be interfaced with Press PLC and Operation of ON/OFF, timer control shall be carried out from the Operator Desk. 10. SCADA system shall have Flow rate, compressor status, temperature of water Inlet and outlet, pressure of water and refrigerant. Adequate solenoid valves shall be provided for chiller selection management of chilled water management 11. Piping, Instrumentation and Insulation wherever applicable for the chilled water pipelines. 12. Make: Voltas/Daikin/Bluestar		

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
4	**ELECTRIC EQUIPMENT**	
	The electric equipment shall mainly consist of the complete power and automation control of the forging press equipment.	
	Control and Operation	
4.1	The press shall be equipped with a Industrial PC (IPC)-based control system housed in control cabinet of the control room and provided with a Full HD (FHD) industrial-grade operator monitor. Operator Interface application shall provide a graphical process visualization system with intuitive, user-friendly screens for operation, monitoring, diagnostics, alarms, trends, and maintenance functions. The Operator Interface application shall display real-time process parameters, machine status, fault diagnostics, hydraulic system status, production data, and historical event logs. The press control system shall be based on a Siemens TIA Portal PLC with programming conforming to IEC 61131 standards. Motion control and high-speed machine automation may be implemented using Beckhoff Twin CAT or an equivalent industrial automation platform. Communication between the PLC, PC, drives, sensors, and field devices shall be through PROFINET and Ether CAT industrial communication protocols or equivalent. The safety control system shall be implemented using a dedicated Safety PLC integrated with the main control system and shall comply with the latest international safety standards. The control system shall incorporate comprehensive machine interlocks, emergency stop functions, safety monitoring, fault diagnostics, and safe operating modes to ensure safe and reliable operation of the press under all operating conditions.	
	Slide Control and Monitoring	
4.2	The press control system shall provide a dedicated Operator Interface application screen for slide (ram) control with a clear and intuitive interface for setting, monitoring, and modifying all relevant operating parameters. The operator shall be able to program slide capacity, ram speed, stroke length, and slide position switching points through the Operator Interface application. The slide capacity and ram speed shall be continuously adjustable over the operating range specified by the supplier. The SCADA application shall provide real-time digital display of ram position, hydraulic pressure, forging force/capacity, ram speed, and operating status. The system shall incorporate a teach-in function for programming and storing all slide position switching points for different forging recipes. The ram position shall be continuously measured using high-resolution absolute encoders, while the hydraulic pressure shall be continuously monitored using high-accuracy electronic pressure transducers. The slide return sequence shall be programmable based on ram position (stroke-dependent) and, where applicable, hydraulic pressure (pressure-dependent). All process parameters shall be continuously monitored, recorded, and made available for diagnostics, process optimization, and production data logging	

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	Ram Parallelism Monitoring System	
4.3	The press shall be equipped with a high-accuracy digital ram parallelism monitoring system to continuously measure and evaluate the parallelism between the moving ram (slide) and the moving bolster/press bed throughout the entire forging stroke. The system shall continuously monitor the left-right and front-back parallelism and provide real-time feedback to the press control system to ensure accurate ram alignment and protection against excessive eccentric loading. The current parallelism deviation shall be continuously displayed on the Operator Interface application in real time, enabling the operator to monitor the alignment and optimize the forging process. The system shall generate visual and audible alarms whenever the preset parallelism limits are approached. If the permissible parallelism deviation exceeds the preset safety limit, the press control system shall automatically stop the forging operation in a safe manner to protect the press structure, dies, and hydraulic components from damage. All parallelism deviations, alarms, trips, and related events shall be automatically recorded in the press event/error log with date and time stamps for diagnostics, maintenance, and process analysis.	
	Visualization	
4.4	The press shall be provided with a modern SCADA featuring graphical process visualization for efficient monitoring and control of all metal forming operations. The SCADA shall incorporate ergonomically designed control elements, intuitive navigation, and user-friendly graphical displays to facilitate operation, process monitoring, diagnostics, maintenance, and troubleshooting. The visualization system shall provide comprehensive real-time information on machine status, process parameters, alarms, trends, and production data. The operator interface screen shall be logically organized into multiple functional sections to ensure quick access to all relevant information and controls. As a minimum, the display shall include: **Machine Status and Process Overview:** Display of press operating mode, machine status, ram position, forging force, hydraulic pressures, temperatures, alarms, and active process sequence. **Operation and Control Panel:** Operator controls for machine operation, recipe selection, parameter setting, manual/automatic modes, diagnostics, and maintenance functions. **Alarm, Event, and Diagnostic Window:** Real-time display of warnings, faults, interlocks, safety messages, and event history with date and time stamps. **Navigation and System Information:** Menu navigation, user login/access levels, production statistics, trend displays, maintenance information, and system health monitoring. The SCADA shall support recipe management, process data logging, historical trending, multilingual operation, user access control, and remote diagnostics. The complete visualization system shall be integrated with the PLC and safety control system to provide comprehensive monitoring and control of all press functions.	

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5	**Modes of Operation of the Press:**	
	The hydraulic forging press shall be designed and equipped to operate in **Open Die Forging, Closed Die Forging, and Near-Isothermal Forging modes**. The press control system shall support **Manual, Semi-Automatic, and Fully Automatic modes** of operation. The operator shall be able to select the desired forging mode and operating mode through the Operator Interface application, with all associated process parameters, interlocks, ram motion profiles, die heating/cooling functions, and hydraulic control sequences being automatically configured. The control system shall permit storage and retrieval of forging recipes for each operating mode to ensure repeatability, process consistency, and ease of operation.	
5.1	**Open die forging mode:**	
	The press shall be capable of operating in Open Die Forging Mode for the manufacture of forgings of various sizes and geometries. In this mode, the press control system shall permit independent programming and control of ram position, stroke length, ram speed, forging force, dwell time, and return stroke to suit different forging operations such as preforming/gathering operations prior to closed die forging, upsetting operations, and other intermediate forging. The control system shall support manual and automatic operation in Open Die Forging Mode. The operator shall be able to create, modify, store, and recall forging recipes through the SCADA, with programmable switching points, forging sequences, and process parameters. The system shall continuously monitor , control and display ram position, forging force, hydraulic pressure, and parallelism throughout the forging cycle and shall automatically protect the press against overloads, excessive eccentric loading, and abnormal operating conditions.	
5.2	**Closed die forging mode:**	
	The press shall be capable of operating in Closed Die Forging Mode for the production of precision forged components using single-impression and multi-impression closed dies. The control system shall provide precise control of ram position, forging force, ram speed, stroke length, dwell time, and return stroke to ensure repeatable die filling, dimensional accuracy, and optimum material flow. The press shall support Manual , semi automatic and Automatic operation in Closed Die Forging Mode. The control system shall permit creation, storage, and retrieval of forging recipes with programmable process parameters, including ram motion profiles, force limits, speed profiles, strain rates , dwell times. Automatic execution of the complete forging cycle shall be possible through a single command after loading the appropriate recipe. The press shall continuously monitor , control and display forging force, ram position, hydraulic pressure, die parallelism, and other critical process parameters throughout the forging cycle. The control system shall provide automatic overload protection, eccentric load monitoring, and process interlocks to safeguard the press, dies, and tooling. The system shall ensure high repeatability, consistent product quality, reduced cycle time, and safe operation during closed die forging.	

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5.2.1	**Die Heating System for closed die forging mode:** The press shall be provided with a dedicated die heating system capable of heating the upper and lower forging dies at temperatures up to 450°C during closed die forging operations. As the die sizes and geometries will vary depending on the forging component, the supplier shall provide a MOBILE external die heating system (Preferably electric heating system) suitable for heating a wide range of die dimensions. The dies will be preheated externally using the die heating furnaces available at HAL to the required temperature before installation/fixing in the press. After fixing of the dies to the bolsters, the die heating system shall carry out heating of the dies. The die heating methodology proposed for the closed-die forging mode shall be clearly indicated in the technical bid using appropriate pictorial/illustrative representations.	
5.3	**Near Isothermal Forging Mode:**	
5.3.1	The press shall be designed and equipped to perform Near-Isothermal Forging of aerospace-grade alloys, including nickel-based and titanium alloys, at process temperatures up to 950°C under inert gas atmosphere like Argon. The complete system shall ensure controlled and uniform temperature distribution of the billet and dies throughout the forging cycle to achieve optimum material flow, dimensional accuracy, and metallurgical properties. The supplier shall provide a fully integrated near-isothermal forging system comprising Electrical resistance chamber furnace, thermal insulation system, bolster, ram extension, hydraulic and electrical interfaces, control system, and all associated accessories required for fully automatic operation. The Die/Die stack shall be maintained at 950 Deg C using the resistance furnace chamber heaters. Suitable thermocouples are to be provided for measurement of die and furnace temperatures The portable chamber furnace shall be installed between the press cross slide (ram) and the press bed and shall be designed as a heavy-duty chamber furnace integrated with the hydraulic press. Induction heating is not allowed for die stack/billet. The system shall be designed and supplied with bottom die and upper die ejector systems for near isothermal forging mode also.	
5.3.2	**Proposed sequence of Near Isothermal Forging operation:** 1. The billets shall be heated separately in preheating furnaces to the required forging temperature, typically in the range of 900°C to 1150°C, depending on the material and forging process requirements. 2. After achieving the specified soaking time and temperature, the billets shall be transferred using a robotic manipulator and positioned inside the near-isothermal chamber furnace, where the die assembly is maintained at 950°C. 3. The forging operation shall be carried out in accordance with the programmed process parameters, including forging force, ram speed, stroke, dwell time, and other specified process settings. 4. Upon completion of the forging cycle, the forged component shall be automatically ejected using the integrated upper and lower die ejector systems. 5. The forged component shall then be removed from the near-isothermal chamber furnace using the robotic manipulator and transferred to the designated unloading station for subsequent processing.	

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		Compliance
5.3.3	The Chamber Furnace shall have two operating positions: **Parking Position:** The chamber furnace shall be provided with a parking position located outside the press and away from the moving bolster to facilitate die preparation, tool change, loading and unloading of dies/tools, inspection, maintenance, and other preparatory activities for near-isothermal forging operations. After completion of tool installation and preparation, the chamber furnace shall be capable of preheating the dies and tooling to the specified operating temperature while in the parking position. This arrangement is intended to minimize the heating time and overall setup time after the furnace is moved to the working position. Suitable provisions for electrical power supply, argon gas supply, hydraulic and/or pneumatic connections, and all necessary control interfaces shall also be provided at the parking position. **Working Position:** The working position shall be the forging position located at the center of the press, where the chamber furnace, moving bolster, ram extension, and die assembly are accurately positioned, aligned, and automatically locked prior to commencement of the near-isothermal forging cycle. The positioning and locking arrangement shall ensure precise alignment, repeatability, and safe operation throughout the forging process. The ram extension shall be securely clamped to the press ram during near-isothermal forging operations.	
5.3.4	**Proposed Working Sequence of the Near-Isothermal Chamber Attachment:** 1. The dies, tool holders, and associated tooling shall be installed inside the near-isothermal chamber furnace. 2. The chamber furnace shall be energized to heat the dies and tooling to the specified set temperature. Argon gas purging shall be carried out, whenever required, to establish and maintain the specified inert atmosphere. 3. Upon attaining the required temperature, the complete chamber furnace assembly shall be transferred from the parking position to the press using a transfer car or other suitable transfer mechanism. The furnace assembly shall then be positioned on the moving bolster, accurately aligned with the press centerline, and securely locked in position. Prior to transportation, electrical power, hydraulic/pneumatic and control connections at the parking position shall be safely disconnected. 4. The moving bolster, together with the chamber furnace assembly, shall then be moved to the forging position inside the press. The ram extension shall be accurately aligned and securely locked to the press ram. The electrical power, argon gas, cooling, hydraulic/pneumatic, and control connections provided at the press shall then be connected to enable near-isothermal forging operations. 5. Upon completion of the forging operation, the electrical power, argon gas, cooling, hydraulic/pneumatic, and control connections shall be disconnected. The chamber furnace assembly shall then be withdrawn from the press and transferred back to the designated parking position using the transfer mechanism.	
5.3.5	The complete system shall be capable of heating the die assembly, tool holders, and associated tooling from ambient temperature to 950°C within a maximum period of 24 hours. The design shall be suitable for heating of tooling assemblies having a total mass of up to 15,000 kg including tool holders manufactured from nickel-based alloys or equivalent high-temperature materials. The furnace shall be provided with front and back side doors with vertical operation door on the front side door. Back side door shall be used for die and tools handling and maintenance. The front and back doors shall be of hinged type operated by hydraulic/pneumatic system interlocked with PLC and Press operation. Small vertical door shall facilitate Robotic manipulator for loading and unloading of the forgings without opening of the complete furnace.	

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5.3.6	The press control system shall provide dedicated Near-Isothermal Forging Mode with automatic control of furnace temperature, slide movement, forging force, ram speed, dwell time, moving bolster positioning, furnace door operation, safety interlocks, and process sequencing. All operating parameters shall be programmable through the Operator control desk, and complete forging recipes shall be capable of being created, stored, modified, and recalled for repeatable production. The supplier shall ensure complete integration of the furnace, bolster, press hydraulics, manipulator interface, and automation system to achieve reliable, safe, and repeatable near-isothermal forging operations.	
5.3.7	The Near-Isothermal Forging System shall be provided with a comprehensive process temperature monitoring system for continuous measurement of the temperatures of both the work piece (billet/forging) and the dies (upper and lower die assemblies) throughout the forging cycle. The temperatures of the work piece and the dies shall be continuously displayed in real time on the main operator control desk and shall also be available for recording, trending, and storage in the press data acquisition system. The system shall provide programmable high- and low-temperature alarms, and all temperature data shall be linked to the forging recipe and archived for complete process traceability. The supplier shall provide a high-temperature industrial camera system to enable continuous visual monitoring of the forging process preferable inside the near-isothermal heating chamber (or) the camera shall be fitted outside the shell of the furnace through a glass pane view port . The live video feed shall be displayed in real time on the operator's control desk and shall also be capable of being recorded for process analysis, diagnostics, and quality traceability.	
5.3.8	The Near-Isothermal Forging System shall be designed with inert gas (Argon) purging of the furnace chamber to enable processing under an inert atmosphere. This argon purging will be carried out on need basis during isothermal forging requirement. The system shall include all necessary provisions such as gas inlet and outlet connections, sealing arrangements, piping interfaces, instrumentation, control logic, and safety interlocks to facilitate integration of argon gas supply system. The design shall ensure effective purging of the furnace chamber and maintenance of the specified atmosphere during forging operations. Vendor shall provide suitable Argon gas manifold system for working and standby gas cylinders. Supply of Argon gas cylinders is HAL's scope. Vendor shall design Argon gas bank requirement for continuous working of 24 hours. The complete changeover between conventional forging mode and near-isothermal forging mode, including the installation/removal of the chamber furnace assembly, moving bolster, ram extension, associated tooling, and all mechanical, hydraulic, pneumatic, electrical, cooling, gas, and control interfaces, shall be completed within 2 hours under normal working conditions by trained operating personnel.	

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5.3.9	The Near-Isothermal Forging System shall be provided with an integrated hydraulic ejection system capable of safely and reliably ejecting the forged component from the lower die after completion of the forging cycle. The ejection system shall be designed to operate under near-isothermal conditions and shall be fully integrated with the press control system. The ejection sequence shall be automatic, programmable, and interlocked with the ram position, moving bolster position, and furnace operation to ensure safe and reliable operation. The moving bolster and furnace arrangement shall be designed to permit the forging manipulator to safely load the preheated billet into the furnace chamber and remove the forged component from the lower die after ejection without interference with the furnace structure or press components. The furnace chamber, access door, moving bolster, and tooling arrangement shall provide adequate access and clearance for manipulator operation throughout the loading and unloading cycle.		
5.3.10	The Near-Isothermal Forging Attachment shall be transferred from the parking position to the working position using a transfer car or an equivalent suitable transfer mechanism. The transfer mechanism shall accurately position the chamber furnace assembly on the moving bolster and ensure precise alignment with the press centerline prior to commencement of the forging cycle. The vendor shall provide a detailed description/ animation of Near-Isothermal Forging System and its operating mechanism as part of the technical offer. This shall include illustrative drawings/schematics/ 3D representations clearly explaining the complete operational sequence, including the chamber furnace transfer mechanism, alignment and locking arrangement, utility connections (electrical, hydraulic/pneumatic, cooling, control, and argon gas), and the complete changeover procedure between conventional forging mode and near-isothermal forging mode. The vendor shall clearly indicate the changeover methodology, sequence of operations, special tools/fixtures (if any), and the estimated time required for each activity in the technical bid.		
5.3.11	The complete die design and manufacturing of the dies for near isothermal forging operations, including die impression/profile, die blocks, inserts will be under the scope of HAL. Prior to manufacture die-interface components by HAL, the vendor shall submit the following drawings/documents to HAL : a. Die-stack interface with the chamber furnace. b. Die loading/unloading arrangement. c. Furnace working envelope d.Temperature measurement/thermocouple arrangement.		
5.3.12	**Billet dimensions for Isothermal Forging Operations**		
a.	Max. billet diameter in heating furnace	300 mm	
b.	Max. billet height in heating furnace	800 mm	
c.	Max. diameter of forged part	800 mm	

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			Compliance
d.	Max. Weight of billet	500 kg	
5.3.13	**Electrical resistance Chamber Furnace for Isothermal Forging**		
a.	Type	Electrical resistance	
b.	Working Space (W X D X H)	2200x2400x2800 mm (Approx.)	
c.	Front and Back service doors (W X H) - 2Nos	2000 X 2000 mm (Approx.)	
d.	Operation door (W X H)	1500 X 1000 mm (Approx.)	
e.	Stroke of Operation door (typical)	1300 mm	
f.	Furnace Power	400 KW (Approx.)	
g.	Temperature of the furnace(Minimum)	1100 Deg C	
h.	Insulation Material	Suitable ceramic board/Fiber modules	
i.	Insulation thickness	250mm minimum	
j.	Heating Elements	Kanthal ROB with Fibrothol vacuum formed insulation or suitable heaters with insulation	
k.	Outer wall temperature	Less than 60 Deg C.	
l.	Data Logger	Eurotherm make Digital recorder	
m.	Temperature control system	Eurotherm make temperature controllers for main and safety thermocouples	
n.	Power control	MCCB→Contactor→Thyristor→Heating Elements	
o.	Furnace Accuracy	±10 Deg C in the range of 650 Deg C to Maximum temperature of furnace	
q.	Furnace shell	Furnace shell be made of MS plates/GI steel frame.	
r.	Cladding for the furnace shell	Powder coated panels shall be provided for aesthetic looking.	

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6	**Robotic Manipulator**		
a.	Vendor shall supply Robotic Manipulator and integrate with press and furnaces of HAL. The Robotic manipulator shall be capable of loading and unloading work pieces between the heating furnaces, press, loading and unloading station. The manipulator shall facilitate loading of billets into the furnaces, the transfer of heated work pieces from the furnaces to the forging area and, upon completion of the forging operation, transfer the forged components to the designated unloading location. The manipulator shall be of hydraulic type. Vendor shall carry out design, supply, installation, commissioning , integration with Press and furnaces and prove out of the following: 1. Robotic manipulator for handling of hot parts (billets/performs/finished forgings) to and from furnaces and press. 2. The robotic manipulator should be rail bound and should function in fully automatic mode, semi automatic, manual mode. 3. Automatic loading of billets into the furnace shall be carried out using a robotic manipulator. The billets shall preferably be positioned vertically for the forging operation, while semi-finished forgings shall preferably be positioned horizontally. 4. Integration of Robotic Manipulator with 4 Nos furnaces and also provide scope for addition of 4 Nos of furnaces. 5. One unloading station with metal pallets for stacking of parts after unloading from press . Layout consisting of press and with indicative positions of furnaces is attached at Annexure-2 for reference.		
b.	The manipulator shall be designed with suitable interchangeable grippers for handling forgings of various shapes, sizes, and profiles during all specified forging operations. The vendor shall design and supply multiple grippers to suit the different forging components and operations. The grippers shall be designed for quick replacement with minimum changeover time. The final design, quantity (minimum 4 no's) , and configuration of the grippers shall be finalized after placement of the Purchase Order in consultation with HAL, based on the forging components and operational requirements.		
	Technical specifications of Robotic manipulator		
6.1	**Part Details:**		
6.1.1	Max. part weight	1500 kg	
6.1.2	Min. part weight	20 kg	
6.1.3	Max. diameter after Forging/upsetting	1500 mm	
6.1.4	Min. Diameter	100 mm	
6.1.5	Max. billet height	1200 mm	
6.1.6	Min. billet height	100 mm	
6.1.7	Travel distance required as per site conditions(Approximate)	20,000mm	
6.1.8	Positioning Accuracy (High speed mode)	±5mm	

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6.1.9	Transfer time allowed from furnace door opening to placing part on press (Max)	35 Sec	
6.1.10	Additional Transfer time allowed for precision mode (Maximum)	5 Sec	
6.2	**Working envelope:**		
6.2.1	Vertical stroke (Minimum)	1200mm	
6.2.2	Min height from floor	600mm	
6.2.3	Max height from floor (More is preferable)	1800mm	
6.2.4	Linear(horizontal) stroke (minimum)	4200 mm	
6.2.5	Slew Axis (minimum)	270 Degrees	
6.2.6	Tong Tilt up (minimum)	5°	
6.2.7	Tong Tilt Down (minimum)	15°	
6.2.8	Tong rotation Axis	360°	
6.3	**Speeds**		
6.3.1	Slew (Minimum)	0-50 Degrees/sec	
6.3.2	Vertical (Minimum)	0.4 m/s	
6.3.3	Horizontal (Minimum)	1.5 m/s	
6.3.4	Tong rotation (Minimum)	60°/s	
6.3.5	Repeatability (Minimum)	+/- 5 mm	

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6.4	**Integration with Furnaces of HAL**	
6.4.1	Supplier shall carryout the integration of robotic manipulator with furnaces of HAL(as per the layout proposed in the Annexure - 2) The indicative dimensions of the furnaces are as follows: **High temperature Box type chamber Furnaces: 2 Nos** Size: 1800mm W X 1800mm Depth X 900mm Height : Bed height from Floor: 900-1200mm, Temperature range: 650 Deg C - 1180 Deg C **High temperature Box type Chamber furnaces: 2 Nos** Size: 2500mm W X 2500mm Depth X 900mm Height : Bed height from Floor: 900-1200mm, Temperature range: 650 Deg C - 1180 Deg C **Low temperature Box type furnaces: 2 Nos** 1800mm W X 1800mm Depth X 900mm Height: Bed height from Floor: 900-1200mm, Temperature range: 150 Deg C - 650 Deg C **Low temperature Box type furnaces: 2 Nos** Size: 2500mm W X 2500mm Depth X 900mm Height : Bed height from Floor: 900-1200mm, Temperature range: 150 Deg C - 650 Deg C Supplier shall design tongs such a way that maximum number of billets and forgings can be loading and unloading is possible in coordination with HAL after PO placement. The above dimensions of the furnaces are indicative, actual dimensions of the furnaces will be provided after PO placement. The manipulator control system shall be interfaced with PLC of furnaces of HAL for door declamping/clamping and Opening and closing for transfer of parts.	
6.4.2	Manipulator shall be rail bound and rails shall be grouted in flush with floor level. Vendor shall provide a suitable high temperature camera at suitable location on the Manipulator for visualization during operations. This shall be integrated to main control desk of the press. Power supply for loading manipulator shall be taken through a drag chain placed in side ground with suitable guide channel, Heavy duty drage channel shall be provided by the vendor. Make: Igus/equivalent A suitable Operator cabin with controls shall be provided on the manipulator for manual operation/Maintenance activities	
6.4.3	Vendor shall provide recipe management for manipulator operations. There should be facility to perform test run for operations in auto mode and semi auto mode. Vendor shall provide a separate HMI/Industry PC in the press control room & shall be integrated with press & furnace. Automatic / Semi - automatic / manual operation shall also be available from the remote control panel installed in the press control room. In semi automatic mode , manipulator shall move to a desired position upon selection.	
6.4.4	The vendor shall provide a detailed description/ animation of Robotic Manipulator and its operating mechanism as part of the technical offer. This shall include illustrative drawings/ schematics/ 3D representations clearly explaining the complete operational sequence.	

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6.5	**Manipulator Performance Requirement**	
	The forging manipulator and its control system shall be designed to enable completion of the forging cycle for a representative closed die forging component within 240 seconds, measured from unloading of the heated billet from the pre heating furnace into the press until completion of the forging operation and removal of the forged component and moving to the unloading station. The manipulator shall ensure smooth, precise, and repeatable handling of the work piece without adversely affecting the forging sequence or process quality. The vendor shall demonstrate compliance with this requirement during the Factory Acceptance Test (FAT) with simulated robot motions and Site Acceptance Test (SAT) using a mutually agreed representative forging component and process sequence. The complete forging cycle time, including billet handling, positioning, forging manipulations, and part removal, shall be recorded and submitted as part of the acceptance documentation.	
7.0	**Die Lubrication System**	
	The Die lubrication unit shall be designed for storing , stirring and dispensing the lubricant at the desired pressure and flow through a hand held spray gun. This die lubrication shall be made available through out the operating cycle of the press during forging operations. The main components of the die lubricant system is described below:	
7.1	**Die lubrication storage tank:**	
	The lubricant tank shall made of Stainless steel material and having a capacity of approximately 100 liters. The compressed air regulator ,filter and diaphragm pump shall be installed over the tank. The tank shall have provision for filling/top up of the die lubricant. And the tank shall be provided with level indicator , gate valve and drain valve. The tank shall be mounted over a movable skid with hand rails.	
7.2	**Pressure Compensating Unit**	
	The tank shall be provided with a pressure compensation unit to maintain the pressure of the die lubricant and dispenses same through handheld spray gun. Pressure compensation bellows shall be provided with solenoid valves and pressure sensors/gauges. The system shall draw power and logic controls through a panel fitted on the tank	
7.3	**Pneumatic motor stirrer**	
	The lubrication tank shall be assembled with a pneumatic motor stirrer to homogenously mix the stored die lubrication . The pneumatic motor operated stirrer shall be mounted over top of the tank.	
7.4	**Hand Spray Gun for applicant of lubricant**	
	Hand held spray gun (Qty: 2 no's) shall be designed and supplied for spraying of graphite based lubricant during forging operations. The graphite lubricant will be supplied by HAL. Vendor shall design the system based on the details of the graphite lubricant provided by HAL. Apart from hand held spray, the system shall have provision for spray lance and nozzles with solenoid valves controlled through control desk operations.	

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8	**Electrical Main Data**	
	Names of all equipment and devices which consume electrical power, its power rating shall be provided by vendor with technical bid. Total (approx.) power consumption shall also be provided.	
8.1	**Electric and Electronic Control** The electric equipment shall mainly consist of the complete power and automation control of the Press	
8.1.1	**Switch Cabinets**	
a.	The main switch cabinet shall consist of :	
b.	Main supply by the means of three-pole Main switch	
c.	Design of switch cabinet in channel wiring	
d.	Design for ambient temperatures up to 40°C with cabinet cooling by air conditioning	
e.	Lighting to the cabinet	
f.	Power switchgear with overload protection of all electric components, power and auxiliary contactors	
g.	Separate power circuits for the individual machinery groups	
h.	Emergency stop push buttons	
i.	Vendor shall provide minimum TWO different electrical panels to distribute Power to the electrical systems. Maximum connected load to each panel shall not be more than 2500 KVA.	
j.	A separate electrical panel is to be provided for isothermal chamber furnace	
k.	There shall be a minimum 200 mm gap between Power cables and control cables in the trench. Vendor shall accordingly provide cable trays. All the cables shall be properly routed through cable trays.	
8.1.2	**Control Cabinets**	
a.	Switch cabinets to house the PLC-systems and to generate the control voltage shall consist of:	
b.	Overload protection	
c.	Suitable air conditioning inside the panel to maintain panel temperature within operating range.	
d.	Transformers for the generation of control voltage	
e.	Power packs for the generation of control voltage	

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f.	Relays and auxiliary contactors	
g.	Programmable Logic Control (PLC) unit consisting of: •CPU •Digital input and output components •Analog input and output components •Module for interfacing with the Ethernet for remote trouble shooting. •Port for remote data transmission to the programming unit	
8.1.3	**Local Control Panels / Remote Control Cabinets**	
a.	Local control panels / remote control cabinets/remote PLC I/O modules to operate the individual machines /equipment in the operation / maintenance modes shall comprise of :	
b.	Control and signalling devices to start and stop the individual assemblies	
c.	Emergency stop push button	
8.1.4	**Control Desk**	
a.	All the operations of press shall be controlled from control desk using push buttons, joy sticks and potentiometers/Encoders. The control desk shall have following :	
b.	Desk top	
c.	The desk top shall essentially comprise of the following hardware :	
d.	Industrial PC with IPC847E or latest + 24 inch monitors (2 Nos).	
e.	One DELL commercial computer + 40 inch monitor for advanced press monitoring, machine action and CCTV camera view installed in hydraulic room.	
f.	Full HD colour monitor, keyboard, optical mouse or trackball	
g.	User Licenses shall be provided by the vendor for: •Windows operating system - Windows 11 or latest, SCADA or any other software •Visualization •Recipe management •Any other application software •All above software's shall be configured ready for connection, including documentation	
8.1.5	**Machine Visualization**	
a.	Graphic representation(MIMIC display) of machinery and plant sections(both static and dynamic visualization) which is showing the different working modes (ram movement, cross slide lock, Hydraulic circuit schematic with cylinders, Hydraulic tank, Accumulators, all Valves, Position Sensors, limit switches, shutoff valves, filters, pumps, motors, temperature indicators, flow transmitters, etc. and PLC input and Output of Analog and Digital)	

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b.	Numeric display of measured operating values of individual assemblies on the basis of set values	
c.	Additional detail information (e.g. Identification of all electrical devices, pressure, temperature and distance sensors, servo valves and their working parameters)	
8.1.6	**Process Visualization**	
	Visualization of the process in the Press, numeric and graphic display(MIMIC) of the process parameters. During submission of technical quote, Vendor shall explain process visualization using actual screen shots as examples.	
8.1.7	**Recipe/Programme Input**	
a.	A recipe/programme is a group of production-related set input values for the Press.	
b.	Input values shall be checked by Press inbuilt system shall ensure a safe operation of the Press.	
c.	Loading, Storage, deleting of recipes for individual parts in a data logging and retrieving system. Batch wise part data to be captured.	
8.1.8	**Alarm Management**	
a.	Alarm list including faults with time stamp of message and acknowledgement	
b.	Diagnosis of faults: By a click of button on fault message or code, one can reach to graphical / visual display or a link to check in manual showing the fault location in the machine. This shall be accompanied with details of the fault .	
c.	Tabular and/or graphical/visual display (with green, yellow/grey and red colours or in any other format or colour codes)of the states of various assemblies.	
d.	Access to the operating and maintenance manuals and to the circuit diagrams of Electrical and Hydraulic systems. During submission of technical quote, vendor shall explain alarm management system using screen shots as examples.	

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8.1.9	**Sensors shall be provided for the measurement of the following**	
a.	Pressure transmitters: with display for the individual hydraulic pressure systems	
b.	Position transducers: For Measurement of the movements of the various assemblies of press	
c.	Position sensors: Proximity/Limit switches for position sensing.	
d.	Flow Meters: For measurement of Hydraulic oil and water flow in the circuit	
e.	Level Sensor: Hydraulic Oil level in the tanks	
f.	Temperature Sensors: Hydraulic oil and water temperature	
g.	Any other type of sensor for safe operation of Press.	
8.1.10	**Safety Control**	
a.	The pre set safety circuit shall be monitored by the PLC. Any operation and machine related problem shall be displayed in clear text on operator screen indicating location of the failure.	
b.	In event of any process or machine related problem during operation, the safety circuit shall override the processing controls and it shall bring the press to rest position safely.	
c.	In addition, Emergency stop push buttons at minimum 3 locations shall be provided. 1 on the press side , 1 on the PLC panel, 1 on the control desk. Features such as 2 hand control for movement shall be incorporated. On activation of emergency buttons, press shall be brought safely to rest position.	
d.	Different password levels(for operators, engineers, manager, maintenance staff) with the disabling of individual inputs and functions.	
e.	Tool Change Mode: For tool change on upper or lower dies, none of the press components other than those used in the tool change shall be functional .	
f.	The emergency stop should comply with ISO 13850 standards.	
8.1.11	**Networks**	
a.	Communication connection (Ethernet) of the PLC controls and the PC visualization systems to exchange the process data	
b.	OPC UA communication shall be available for data exchange with other Server/MES/ERP Systems.	
c.	Industrial managed Ethernet switches shall be provided for automation networks with support for PROFINET/Ethernet communication, VLAN, diagnostics, SNMP.	
d.	Switches shall be industrial grade and suitable for continuous operation in harsh industrial environments.	

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8.1.12	**Data Acquisition, Handling and Management System**	
8.1.12.1	**Function:**	
	Storage and display of process data as a time function for diagnosis and optimization purposes	
8.1.12.2	**Application:**	
a	Selection of individual machine and process parameters to represent the trend - Hydraulic pressures, no of parts, Velocity Electrical Energy, Current, voltage, oil and water temperatures.	
b	Graphic representation as online and historical trending for measured parameters - Energy, Hydraulic pressures, position, force and temperature	
c	-Axis scaling freely selectable, zoom function where applicable	
d	-Export / import function for archived files	
e	-Screen print-out	
f	-Language -English	
g	-Alarm logger/History	
h	All alarms for past 2 years shall be recorded including the date and time of their occurrence; they can be called up any time later.	
i	-Data acquisition /Trends	
g	After forging operation, all machine and process related data shall be displayed on the screen to facilitate optimization for optimization of next batch/part	
8.1.12.3	**-Product programs**	
a	-Creating a product library	
b	-Storage (data back-up)	
c	-Overview of the programs stored on the hard disc	
8.1.12.4	**Remote/Online Support**	
a	Vendor shall offer remote diagnosis and support system for the press.	
b	The Vendor shall have online access to the press (including PLC, visualization PC etc.) whenever required by HAL.	
c	This is to enable immediate support in case of defects and also software corrections can be made. **Remark:** Vendor shall provide free online support during warranty period.	

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A

			Compliance
9.0	**Electric Design and specifications**		
a	Electric power supply available	415 V +/-10%, 50 Hz +/-3%, 3 phase, 4 wire, A.C. system	
b	Type of net	TN -S network	
c	Neutral conductor	Unloaded	
d	Control voltage	230 V AC/ 24 V DC	
e	Press-operator and Control Room (containing PLC+Visualisation PC) temperature switch cabinet / control room	Min. 15 up to max. 25 °C	
f	Ambient temperature outside of air-conditioned switch cabinet rooms	up to max 45 °C	
g	Design specifications (excluding single core marking)	VDE / UVV / EN / IEC	
9.1	**Switchgear assemblies / system technology**		
a	Type of protection for panels inside cabinet rooms	IP20	
b	Type of protection outside cabinet rooms	IP54	
c	Switch cabinets inside cabinet rooms	with doors and suitable air conditioning to be provided by vendor	
d	PLC design	Remote I/O	
e	Network	Industrial Ethernet (TCP/ IP)	
f	Protocol	Profinet/Ethernet	
9.2	**All pumps of the hydraulic system**		
a	Thermistor protection for motors	For >= 45 Kw motors	
b	Surge protection	Required	
c	Digital Energy meter in the switch cabinets	Required	
d	Cable entry	Bottom Entry	
e	PC – operating systems:	MS Windows	
f	Reserve expansion space inside of switch cabinets	minimum 15%	
g	Reserve space provided in PLC (without hardware):	minimum 20%	
h	Reserve space provided in PLC (with hardware):	minimum 20%	

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A

			Compliance
9.3	**Brand specifications : Electrical and Electronic systems:**		
a	Switch cabinets / control boxes	RITTAL/SIEMENS/SCHNEIDER	
b	Desks	RITTAL/SIEMENS/SCHNEIDER	
c	Main switches	SIEMENS/MOELLER Eaton /SCHNEIDER/ABB/GE/L&T/CG	
d	Switchgear	SIEMENS/MOELLER Eaton /SCHNEIDER/ABB/GE/L&T/CG	
e	Soft start devices	SIEMENS/SCHNEIDER/ABB/GE	
f	Servo converter	SIEMENS/SCHNEIDER/ABB/GE	
g	Motors	Siemens/ABB/L&T/Schneider/Crompton Greaves/GE/CG	
h	Servo motors	SIEMENS/BALDOR/LENZ/BECKHOFF	
i	PLC system	SIEMENS	
j	Remote PLC	SIEMENS	
k	Safety control	PILZ/Sick/Siemens	
l	Visualization (SCADA)	SIMATIC /IN TOUCH WONDERWARE/OEM of the Press	
m	PC system	BECKHOFF/SIEMENS	
n	Monitor size (Minimum)	24“ Full HD	
o	Energy Meter	Schneider/Siemens/ABB	
p	Control and signalling devices:	SIEMENS/MOELLER/SCHNEIDER/ABB/GE	
q	Network components:	Suitable to PLC system	
r	Control Cables	LAPP	
s	Programming device:	Siemens Field PG	
t	UPS for PC system with 20 minutes backup	APC/POWERWARE/RITTAL/EATON	
u	AC for panels	Rittal/Dai-chi/Werner Finley	
v	Cables	All shall be copper cables with ground wire	
w	Distance Transducers	Balluf/ASM/SICK/MTS/Tempesonics	

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A

			Compliance
9.4	**Brand specifications : Hydraulic System**		
a	Pump	Bosch Rexroth/Eaton/Parker/Wepuko	
b	Valves(Direction, check, relief/logic and cartridges)	Bosch Rexroth/Eaton/Parker	
c	Proportional/Servo	Moog/Rexroth	
d	Hydraulic cylinder Seals	Trelleborg/Freudenberg/Hunfer DFE/SKF	
e	Pressure sensors	IFM/WIKA	
f	Decompression valve	Bosch Rexroth/Parker/ Hoerbiger/OEM of the Press	
g	Hydraulic Filters	Hydac/Mahle/Parker	
h	Hydraulic Hoses	Parker/Gates/Eaton/ Contitec/OEM of the Press	
i	Temperature Sensors for Hydraulic	IFM/WIKA/Danfoss	
j	Heat Exchanger	Alfa laval/OEM Specific	
k	Accumulators	Hydac/Bosch Rexroth/Olaer	
l	Manifold/Blocks	Bosch Rexroth/ OEM of the Press	
10	**Control-modes, Transitions and Process Tolerances forging operations**		
	The press visualization system shall provide the capability to display and monitor all control modes, mode transitions, and process tolerances during operation. It shall also display the set (reference) versus actual process curves followed by the work piece throughout the forging cycle. The required control modes, process parameters, and permissible tolerance limits are specified in Annexure-3. The press shall be capable of achieving and maintaining all specified parameter tolerance limits throughout the forging process.		

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
11	**Mandatory Accessories :**	
11.1	**Forging Temperature Monitoring System**	
	A non-contact temperature measurement system using infrared pyrometers shall be provided to continuously measure the temperature of the billet/forging during the forging process where billets are positioned. The system shall be capable of accurately monitoring the forging temperature throughout the forging cycle without interfering with the forging operation. The measured temperature shall be displayed in real time at the press control desk as well as on a dedicated display screen located in the forging shop/hangar. The system be integrated with the press control and data acquisition system for monitoring, recording, and traceability of the forging process. The temperature measurement system shall be suitable for operation in the forging environment and shall provide reliable measurements under high-temperature conditions, taking into account scale, emissivity variations, and radiant heat. The vendor shall specify the measurement range, accuracy, response time, and method adopted for emissivity compensation. The proposed system shall be of proven industrial design and shall have been successfully implemented in heavy forging and/or automotive forging industries for online forging temperature monitoring. The vendor shall supply valid calibration certificates of the pyrometers.	
11.2	**Industrial Video Monitoring System**	
	The vendor shall supply, install and commission an industrial-grade CCTV camera system for real-time visualization of press and shop floor activities from the operator cabin. A minimum of 06 nos. industrial-grade IP CCTV cameras shall be provided at suitable locations to clearly cover the press working area, die area, manipulator/material handling area, and surrounding shop floor movement area. The CCTV system shall meet the following minimum requirements: Cameras shall be minimum 5 MP resolution IP cameras, suitable for continuous industrial operation. For critical viewing locations such as press working area and job handling area, 8 MP / 4K cameras are preferred for enhanced clarity. Cameras shall be suitable for forge shop environment and shall have protection against dust, heat, vibration, scale particles and shop floor contamination. Cameras installed near the press area shall be provided with suitable protective housings, heat shields and robust mounting arrangements. Cameras shall have day/night vision capability, wide dynamic range and good low-light performance for clear visibility under varying shop lighting conditions. Live video feed from all cameras shall be displayed on a dedicated monitor inside the operator cabin. The system shall include NVR/DVR with minimum 30 days recording capacity, with provision for retrieval, backup and playback of recorded footage. All cameras, cables, network switches, power supply, mounting brackets, conduits, protective housings, accessories and software required for complete installation shall be included in the vendor's scope. The CCTV system shall be installed operator in the operator cabin and shall not obstruct machine operation, maintenance access or shop floor movement. Final camera locations shall be decided during detailed design/manufacturing of press in consultation with HAL. 40 inch monitor for CCTV camera view which shall be installed in operator control room.	

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press **Annexure-A**

			Compliance
12	**Mandatory Critical spare Components/tools**		
	1. Vendor shall supply the following critical spares along with the equipment: a. Seal kits/Wear strips for each of Main cylinders, retraction cylinders, Moving bolster cylinders including jigs, fixtures and special tools required for replacement. b. One set of Pre-fill valve/decompression valve, Proportional and Servo valves c. One set of Robotic manipulator cylinders and motors d. One set of Mobile Oil contamination monitoring kit with printer I. One set of Hydraulic Oil filters/Breathers f. One set of Distance transducers g. One set of Heating elements for Chamber Furnace h. One set of Pressure, distance, level transducers and flow meters. I. One set Tool kit with trolley for machine operation and maintenance		
13	**Spares After Warranty:**		
	Along with the technical quotation of press, vendors shall provide a complete list of spare parts for press mechanics / electrics / hydraulics for two years normal operation after warranty period. The quotation for spares shall be separate from quotation of the press and should be valid for a period of 2 years from the date of completion of warranty. The price of Post Warranty Spares shall not be part of commercial evaluation of tender.		
13.1	This list shall contain the following:		
a	Name of equipment		
b	Name of spare parts		
c	Specifications		
d	Quantity		
e	Price		
f	Priority (VITAL/ESSENTIAL/DESIRABLE)		
14	**Warranty :**		
14.1	**Warranty period:** Two years from the date of signing the final acceptance letter. In case of any failure noticed in the parts during warranty period , the vendor should give free replacement .		
14.2	Any replacement job in above warranty periods shall be executed by vendor by deputing it's service engineer at HAL. Travel cost, hotel charges and local transport cost of the service engineer has to be borne by the vendor .		
14.3	Vendor to ensure minimum uptime of 90% of the machine during warranty period In case of 95% uptime not met for a certain period of time during warranty, then warranty period shall extend by that extent. Working hours shall be counted at 90 hrs. per week (@ 15 hrs. per day, 6 days a week). The downtime of machine shall be considered from the breakdown of machine to its restoration to normal.		

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A

			Compliance
15	**Annual Maintenance Contract (AMC):**		
	Vendor shall provide a separate budgetary quotation for the Annual Maintenance Contract (AMC) for five years , which will be applicable after the expiry of the warranty clause. The AMC cost is requested solely for ensuring the machine supplier commitment to support the equipment and also for the budgetary purpose and shall not be part of commercial evaluation of tender. This AMC quote shall include online support on need basis, service engineer visit on half yearly basis to trouble shoot and service of the press.		
16	**Painting and Colour Coding for equipment and Pipelines**		
16.1	Hydraulic Press and other accessories	The Press shall be painted with rust proof primer followed by two coats of enamel painting in accordance with ISO 12944. Painting shall enormously improve the aesthetic look of equipment . Preferred colour for the press structure is RAL 6018	
16.2	Pipe lines	All hydraulic , lubrication , cooling water , compressed air and utility pipe lines shall be permanently identified in accordance with IS 2379 , ISO 20560-1. Identification shall include colour coding , flow direction arrows , service description , wherever applicable.	
17	**Civil Foundation Details:**		
17.1	After Purchase Order placement , vendor shall share all necessary foundation drawings of Press and manipulator with HAL within 3 months so that foundation works can be started.		
17.2	During foundation work, HAL will call vendor specialists to inspect the actual foundation details so that corrections if any can be carried out immediately. The Specialist's air travel cost , hotel fare, local transport to and from HAL shall be at vendor's cost. Vendor can specify most appropriate time for it's specialists visit , frequency of visit. Vendor shall plan for his visit based on the progress of the foundation at one or more times.		
17.3	Vendor shall supply Foundation bolts & nuts, levelling pads, embedded plates required for Civil foundation and erection of the press		

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
18	**Delivery Schedule:**	
	The 10000 Ton Press along with all associated equipment and auxiliaries to be delivered (which includes supply, installation, commissioning and final acceptance) within 30 months from the date of acceptance of the order by the vendor. Site readiness for installation of the equipment is scheduled by June 2028. The vendor shall submit a detailed project execution schedule indicating all major milestones and timelines with the technical offer and shall ensure compliance with the stipulated project completion period. Delivery Term: DPU (Delivery at Place Unloaded) INCOTERMS 2020. Delivery Place: Foundry and Forge Division, Hindustan Aeronautics Limited, Bangalore, India. Complete scope of logistics including movements to the installation location is in the scope of vendor.	
19	**Pre Dispatch Inspection(PDI)**	
	Before shipment of the consignment, a Pre Dispatch Inspection shall be carried out by HAL representatives at vendor's site. Vendor has to successfully demonstrate all sub assemblies, material certificates, electrical and PLC panels, SCADA System, hydraulic systems and OEM certificates for bought out parts(brands shall meet the requirement of tender). 1. Dimensional verification of press structures, assemblies, sub assemblies and other systems. 2. Salient features of the press 3. Isothermal Forging attachment 4. Robotic Manipulator 5. Hydraulic System including tanks, filtering system, Servo system, pipes and fittings 6. Main cylinders and retraction cylinders 7. Manifolds, Pumps and Motors 8. Instrumentation and Control systems 9. Lubrication system 10. Main control Desk 11. Tools/Dies 12. Electrical Panels 13. Data Acquisition and storage SCADA system 14. Bought out items and OEM certificates 15. Electrical, Mechanical and Hydraulic drawings and documentation There will not be any separate cost towards PDI activities and same shall be borne by the vendor. However, HAL reserves the right to waive the Pre dispatch inspection(PDI), either partially or in full, if deemed necessary.	
20	**Erection , Installation, Commissioning, Acceptance and Training:**	
20.1	**Erection & Installation:**	
	Erection and Installation of the press will solely be vendor's responsibility. Subsequent to this , vendor shall carry out erection work using it's own people, using it's own loading/unloading and lifting cranes and erection tools and equipment. Vendor shall also supply heavy duty cable conduits, cable trays, vibration pads for erection of the press.	

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
20.2	**Commissioning**	
	Commissioning involving the dry run with all electrical, electronic, mechanical and hydraulic functions shall be carried out . This shall be solely vendor's responsibility. After erection and commissioning , an acceptance test will be performed. As a part of commissioning , vendor shall Provide First fill of Hydraulic oil, Grease, Refrigerant, Oil lubrication required for press equipment.	
20.3	**Acceptance Test Method**	
20.3.1	HAL will carryout an extensive acceptance test process for TWO months period after vendor declares that press facility is ready for hot trails under full range of loads and for all operations. Vendor shall demonstrate maximum press load capacity of 10000T (max. 12000T boost capacity) by means of calibrated Pressure gauge with respect to cylinder dimensions. HAL reserves the right to check press capacity independently during acceptance test. During the acceptance test process, all the required features expected from the Press for Open die, closed die and Isothermal forging in all modes of operation including robotic manipulator integration and functions shall be checked. Along with this all the Control modes, transitions and process tolerances of the press shall be checked. The equipment shall perform without any problems in the complete acceptance trial period. In case of any problem arising in the machine in this period that is attributed to the vendor, the trial period gets extended to that extent.	
20.3.2	**Site Acceptance Test (SAT) for Open and Closed die forging :** A representative Open die and Closed die forging operations shall be carried out during SAT to demonstrate the functionality of the press as per defined parameters . The vendor shall also demonstrate seamless integration and synchronized operation of the manipulator with the press for automatic loading, unloading, and handling of the workpiece throughout the complete forging cycle. Dies/tools required for the SAT is in HAL's scope. **Site Acceptance Test (SAT) for near Isothermal forging** : A representative near-isothermal forging operation shall be carried out during SAT to demonstrate the functionality of the near-isothermal forging system supplied by vendor. The vendor shall also demonstrate seamless integration and synchronized operation of the manipulator with the press and near-isothermal system for automatic loading, unloading, and handling of the workpiece throughout the complete forging cycle. Dies/tools required for the SAT is in HAL's scope.	
20.4	**TRAINING**	
	After successful completion of acceptance test, vendor specialists shall train HAL's operation's and service personnel for 15 working days. After successful commissioning and prove out of the press at HAL, Vendor has to depute his Engineers at HAL for a period of ONE month for monitoring and troubleshooting of the equipment.	

Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A

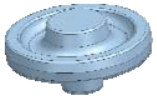
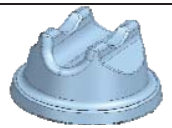
		Compliance
21.0	**HAL Scope of Supply**	
21.1	**CIVIL ENGINEERING**	
	Foundations and grouting for all equipment (press and manipulator) and auxiliaries as per vendor drawing.	
	Parts concreted in the foundation for reinforcement	
	Trenches for cables, pipe lines, drainage lines for fluids/emulsions	
	Painting/coating of foundations and civil works if required.	
	Operator room with air-conditioning, telephone, illumination, furniture etc.	
	Main Hangar with illumination, 2 over head lifting cranes with capacity 10T and 50T respectively.	
	Hydraulic and electrical room with illumination, over head lifting crane with capacity 5T .	
21.2	**ELECTRICAL ENGINEERING**	
	External wiring/energy supply between the transformer and the Electrical panels to 2nos of Main switch cabinets and Switch cabinet of Chamber Furnace. All other power supply for any additional panels and internal cabling is in vendors scope only.	
	Transformers & HT/LT switchgears	
	Site lighting	
	Electrical/electronic earthing of the complete equipment	
21.3	**SPARES, CONSUMABLES**	
	Storage space for consumables, spare and wear parts	
	Raw material of sufficient quantity for commissioning, acceptance test	
21.4	**Air and Water Supply**	
	Supply of compressed air Water at Room temperature	
	Sump and drainage pumps.	

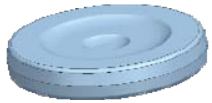
	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
22	**Qualification Criteria:**	
22.1	**Past Experience:**	
	The proposed 10000 Ton will be utilized for the manufacture of critical aircraft & aero-engine forgings for the programs of HAL and therefore OEMs. The forged components produced on this press are to meet the stringent dimensional, quality and process requirements of HAL & global aero-engine OEMs. Indian Airworthiness agencies & OEMs carry out process audits and qualification of the forging equipment before approving the facility for forging manufacturing. Therefore, the vendor shall have proven experience in supplying of hydraulic presses to the standards of global industry. Vendor shall have past experience of supplying similar forging equipment to forging industries and the supplied equipment should have met the operational and quality requirements . Following are the experience requirements: a) The Vendor / OEM shall have successfully designed, manufactured, supplied, installed and commissioned at least Five (05) Hydraulic Forging Presses and out of which at least two (02) Hydraulic Forging Presses shall have a rated capacity 10,000 Tons or above. b) The Vendor / OEM shall have successfully designed, manufactured, supplied, installed and commissioned at least two (02) Near-Isothermal / Isothermal Forging Presses capable of Forging of Titanium / Nickel-based alloys. c) At least one of the above presses should have been supplied more than ten (10) years prior to the date of bid submission. The vendor shall submit documentary evidence in support of the above experience (a), (b) &(c) in the form of customer purchase orders/completion certificates/commissioning certificates/ performance certificates .HAL's technical Evaluation Committee will evaluate such evidences and in case any additional proof is required, same will be asked by HAL. **Failure to submit the required documentary evidence shall render the bid liable for rejection.**	
22.2	**Financial Standing:**	
	Average financial turnover of the bidder during the last three completed financial years shall be atleast INR 240.00 Crs.In case the bidder participates in both the line-items (i.e., 10000 Ton Hydraulic Press and 20 Ton counter blow hammer together) the average financial turnover shall be atleast INR 290 crores. The bidder shall submit the audited financial statements/reports (relevant portions) for the last three completed financial years as a proof of evidence in support of the above requirement. **Failure to submit the required documentary evidence shall render the bid liable for rejection.**	

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
22.3	Bids submitted by bidders quoting as authorized representative of the same or other principal manufacturer shall also be considered for qualification provided: a) their principal manufacturer meets all the qualification criteria without exemption, and b) the principal manufacturer furnishes a legally enforceable tender-specific authorization in the prescribed form assuring full guarantee and warranty obligations as per the general and special conditions of contract; and c) the bidder himself should have been associated, as authorized representative of the same or other Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service as the case may be) for same or similar Product ((i.e., hydraulic forging press / forging hammer as the case may be) for past three years ending on the Relevant Date (i.e, date of bid submission).	
23	**Documentation to be provided by Vendor after Purchase Order Placement:**	
a	All documentation shall be provided in the English language and delivered in three (3) hard-copy sets. In addition, a soft copy of all documents shall be supplied on a USB flash drive (pen drive) . Unit of measurement shall be in metric (SI).	
b	Operation and Maintenance manual.	
c	All Drawings shall be submitted a soft copy as well a hard copy. Drawings shall be submitted by E-Mail or USB flash drive (pen drive).	
d	The Documentation shall mainly consists of following:	
23.1	**Mechanics**	
a	Technical specifications of press	
b	General assembly drawing of forging press	
c	Plan arrangement and elevations of the forging press	
d	Erection drawing of framework	
e	Component erection drawings	
f	Erection drawing of fixing device of top die	
g	The maximum weight of installed single unit and maximum dimension of installed single unit	
h	Maintenance manuals of the press	
23.2	**HYDRAULICS**	
a	Plan arrangement and elevations of the high-pressure pump station	
b	P & I diagram of the hydraulic system	
c	Arrangement plan of the hydraulic pump station (including elevations)	
d	Hydraulic equipment and piping erection drawings	

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
e	Erection drawings of various parts of the hydraulic system (including, main pump and motor, oil tank, cooler, filters, valve stands)	
f	Centralized lubrication system diagram	
g	Arrangement drawings catalogue of the main parts of the hydraulic system (including valve blocks of various functions, oil tanks, special valves, special pipeline fittings such as special connections, piping connectors, etc.)	
h	Test run instructions for the hydraulic system	
i	Operation, maintenance and troubleshooting instructions for the hydraulic system	
j	Catalogues, operation manuals, technical specifications, qualification certificates of the all components and parts of the hydraulic system	
k	List of hydraulic equipment for valve, pump, motor and various auxiliary equipment including name, type, manufacture, position No. in drawing, quantity.	
23.3	**ELECTRICS**	
a	Schematic diagram of the electric control system (VDE or EN)	
b	Motor List with the following information (type, power, protection class, voltage, cooling mode, quantity, location)	
c	Arrangement drawing of the operation rooms and the electric control rooms	
d	Erection drawings of all electrical equipment	
e	Panel apparatus arrangements of control cabinet and operator desk	
f	Terminal wiring diagram of the electrical control system	
g	List for motor, power and control/communication cable, sensor, switch, PLC etc. including name, type, manufacturer, position No. in drawing, quantity	
h	List of Grounding standard documents (VDE or EN)	
i	Operation manual	
j	Catalogues, operation manual, technical specifications of the components and parts	
23.4	**CIVIL ENGINEERING**	
a	Arrangement plan and elevations of the foundation of the forging press / high-pressure pump station indicating the net dimensions of the pit, and showing equipment erection elevation and foundation elevation (secondary grouting requirements)	
b	Basic drawings of civil engineering and ventilation including dimension of the cable trench and cable tunnels, for electric room and control room	
c	Foundation loading diagram (indicating loading points and directions of dynamic and static loads, maximum and minimum loads; loading points and directions of the foundation vibrating loads (Preliminary and /or Final if applicable)	

	Compliance Matrix for Technical specifications of 10000 Ton Hydraulic Press Annexure-A	Compliance
d	Arrangement plan of pits, holes and openings on the foundation, indicating the net dimensions of them.	
e	Arrangement plans of embedded parts at the foundation of the hydraulic forging machine and at the foundation of the high pressure pump station, indicating the ID numbers., dimensions, loading directions and loads (dynamic loads and static loads) of the embedded parts	
f	Information on drawings of the embedded parts of the hydraulic forging machine and of the high pressure pump station	
g	Arrangements and details of steel coverings around the foundation of the hydraulic forging machine and around the foundation of the high pressure pump station	
h	Arrangements and details of the bracing for steel coverings around the foundation of the hydraulic forging machine and around the foundation of the high pressure pump station	
i	Any other foundation related details required by HAL during design of foundation	
24	**Annexures**	
	All requirements as per below annexures need to be accepted by vendors during submission of technical quotes.	
	Annexure-1 : Typical forgings planned to be produced utilizing the new 10000 Ton hydraulic Press	
	Annexure 2 : Plan of the hangar with press , manipulator , hydraulic room and other accessories location	
	Annexure 3 : Control-modes, Transitions and Process Tolerances forging operations	
	Annexure 4 : Dovetail size of Dies	
	Notes: Control-modes, Transitions and Process Tolerances forging operations	
	Vendor may be called for Technical Clarification during Technical Evaluation stage if HAL desires.	
	Special Notes:	
	All the above mentioned requirements/parameters are Essential , unless otherwise it is explicity specified.	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer			**Annexure-B**	**Compliance**
1	**Introduction**				
1.1	Foundry & Forge Division (F&F), Hindustan Aeronautics Limited (HAL), Bengaluru, India is engaged in the development & manufacture of forgings and castings in various alloys for aeronautical and other engineering applications. F&F is planning to install a counter blow hammer with an energy rating of 200 kJ (minimum) in its new Forging Facility. The proposed counter blow hammer will be utilized for manufacturing of critical forging components such as aero-engine discs, blisks, landing gears, impellers and other forgings required for various HAL programs and global aero-engine OEMs. The establishment of the new facility is aimed to enhance HAL's capabilities to manufacture high-integrity aerospace forgings, especially for aero-engines with improved process control, dimensional accuracy, and repeatability. Few of the typical forgings planned to be produced utilizing the new counter blow hammer is as below.				
1.2	**Forging Details**	**Approx. Forging Weight (Kgs)**	**Approx. Dimensions (in mm)**	**Pictorial Representation**	
1.2.1	Alloy Steel Forgings - Shaft	125	Dia 150 * 1030 L		
1.2.2	Alloy Steel Forgings - Gear	115	Dia 190 * 558 L		
1.2.3	Alloy Steel Forgings - Gear	90	Dia 365 * 175 H		
1.2.4	Titanium alloy forgings - Bracket	50	Dia 310 * 140 H		
1.2.5	Titanium alloy forgings - Flange	72	Dia 375 * 140 H		

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer				Annexure-B	Compliance
1.2.6	Nickel alloy forgings - Impeller	53	Dia 365 * 73 H		
1.2.7	Nickel alloy forgings - Flange	55	Dia 350 * 73 H		
2	Scope of work				
2.1	The scope covers design, manufacture, supply, erection, commissioning, testing and performance proving of a brand new counter blow forging hammer of minimum 200 kJ rated energy, complete with all auxiliaries, controls, safety systems, vibration dampers, documentation and training on a turnkey basis. The technical & other requirements of the hammer are given below. The proposed hammer shall be capable of carrying out closed-die hot forging operations for aircraft, aero-engine and other engineering applications. It shall be designed for high productivity, repeatability, dimensional accuracy with all necessary safety features. Materials planned to be forged: Aluminium, alloy Steels, Titanium, and Nickel-based superalloys with forging temperatures up to 1200°C. The forging hammer is proposed to be installed in a new hangar. The forging hammer shall be accommodated with in the marked building section sketch which is enclosed at Annexure-1. The vendor's scope shall also include obtaining all necessary export licenses and regulatory approvals from the concerned government authorities in the country of origin for the supply and establishment of the facility at HAL-F&F.				
3	Technical Specifications of Hydraulically operated Counter Blow Hammer:				
	The Hydraulic operated Counter Blow Hammer shall be designed to provide a rated energy of 200 KJ for forging of various parts with following parameters.				
3.1	Minimum Die height (top and Bottom dies together) without dovetail			700 mm	
3.2	Maximum Die height (top and Bottom dies together) without dovetail			1000 mm	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer	**Annexure-B**	**Compliance**
3.3	Recommended Top Die height range (without dovetail)	350mm - 650mm	
3.4	Recommended Bottom Die height range (without dovetail)	350mm - 650mm	
3.5	Die Width (For both Top and Bottom)	450-1000 mm	
3.6	Die Length (For both Top and Bottom)	450-1600 mm	
3.7	Required minimum number of blows per minute at rated energy	40	
3.8	Typical weight range of steel components to be forged	10 to 150 kg	
3.9	The hammer shall be capable of imparting minimum 70 % of the total rated energy during the first blow at maximum die height and for a Work Piece/Preform height of 350mm	70% (min)	
3.10	Combined impact velocity of Top and Bottom TUPS in the range of	5-6 m/s	
3.11	Combined weights of Top and Bottom TUPS in the range of	40-70 Tons	
3.12	Lower TUP Position Accuracy (+/-) with respect to die loading height	5.0 mm	
3.13	Guide Clearance between TUPS and uprights	0.4 to 0.8 mm	
3.14	Based on the typical input parameters provided above, the OEM shall design the Hydraulic Operated Counter blow hammer for a minimum rated energy of 200 kJ and shall submit the equipment design parameters and detailed energy calculations along with the following details as per Annexure -2		
4	Main Assemblies of Hammer:		
4.a	Following are main sub assemblies of the hammer. Detailed description is provided in respective section. Hammer frame consisting of Upper Cross Head, Uprights with guides, Upright base and Cross beam/Tie rod •Upper TUP •Lower TUP •Damping System •Hydraulic Drive Unit consisting of Oil tank, Control block, cylinders		

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer **Annexure-B**	**Compliance**
4.1	**Hammer Frame Details:**	
4.1.1	The hammer frame shall consisting of Upper Cross Head, Uprights with guides, Upright base and Cross beam/Tie rod which are connected to form a rigid unit. Upper cross head, Uprights, Upright base are to be designed and fabricated with steel plates in welded structure (Casting not acceptable). Uprights shall have precision hardened guide rails for the TUPS including a system to have precision guide adjustment. The weld seams of the hammer frame components shall be tested 100% on its seam length with ultrasonic testing. The ultrasonic testing to be carried out as per ISO 11666 acceptance level 2 and ISO 17640 test class B. The ultrasonic test results of the weld seams to be provided to HAL during fabrication stage of the hammer. The vendor has to provide material test certificates for the materials used for construction of hammer frame components. A Suitable oil/grease lubrication system shall be designed to ensure the guides are automatically lubricated at a pre-set frequency	
4.2	**Upper TUP**	
4.2.1	The upper TUP shall be a single piece made from forged or cast alloy steel with attached guideways which will be guided in the hammer frame. The guides of the upper TUP are to be equipped with a adjustment system and are to be lubricated automatically. The upper TUP should be aligned precisely by using wedge adjustment to ensure geometry of press. The material used for TUP shall have the following properties: Yield Strength: >300 N/mm², Ultimate Tensile Strength >500 N/mm², Elongation after fracture: >10%. The material test certificate to be produced during fabrication stage of the Hammer	
4.3	**Lower TUP**	
4.3.1	The Lower TUP shall be a single piece made from forged or cast alloy steel with attached guideways which will be guided in the hammer frame. The guides of the lower TUP are to be equipped with a adjustment system and are to be lubricated automatically. The lower TUP shall be designed for easy installation and dismantling from & to the frame without the need to dismantle the uprights. The material used for TUP shall have the following properties: Yield Strength: >300 N/mm², Ultimate Tensile Strength >500 N/mm², Elongation after fracture: >10%. The material test certificate to be produced during fabrication stage of the Hammer	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
4.4	**Vibration Damping System**	
4.4.1	A suitable vibration damping system to be designed and provided by the vendor to prevent transmission of vibrations to the ground. The dampers/anti vibration system shall be designed, supplied and installed by the vendor . Except civil foundations and concreting work, all the accessories required for the dampers/anti vibration system shall be part of vendor's scope. The system shall be installed under supervision of the vendor's technical expert. The detailed foundation drawing required for the damping system installation shall be provided by the vendor within 90 days of the PO placement/Acceptance of order along with the hammer foundation drawing.	
4.5	**Hydraulic Drive Unit consisting of Oil tank, Control block and hydraulic cylinders**	
4.5.1	Vendor shall design suitable hydraulic drive system for operation of the hammer. The main tank shall be positioned on the top of the hammer. The hydraulic system shall consist of main motors, pumps, control block with valves, accumulators, cylinders with piston etc. The ram movement shall be precisely controlled by the hydraulic drive. Constant Oil temperature for hydraulic system shall be maintained (30°C - 40°C) by installing an automatic temperature control system irrespective of ambient temperature. The Hydraulic unit shall be located at the top of the hammer. The piston rod shall be forged alloy steel. Vendor shall design the piston rod assembly in such a way that replacement of the piston rod is possible without draining off the main hydraulic oil tank during maintenance activity. The material test certificate of the piston rod to be submitted during fabrication of Hammer	
4.5.2	The hammer shall be designed such that its construction does not obstruct the ramming of die locking keys using an overhead crane sling during die locking and unlocking operations. Note : "Vendor shall submit schematic diagrams / illustrative pictures explaining this feature. If required by HAL, the vendor shall present and explain the feature in detail to the HAL Technical Evaluation Committee during the technical evaluation"	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
5	**Mode of operations**	
5.a	**Hammer shall be designed to operate in the following working modes.**	
5.1	**Die Setting mode:** During fixing or setting the dies in between the upper and lower TUPS, provision shall be made to move either or both the TUPS in Inch mode (Jog Mode / Inching mode). The TUPS shall remain in its position at any length of the stroke of the hammer. This feature is required to enable the dies to get properly fixed to the Tups to ensure the dimensional accuracy of the die setting. Provision shall be made to move either one or both the TUPS by a predefined distance, as required, to facilitate die fixing**.**	
5.2	**Manual mode:** During the manual mode operation of the hammer, provision shall be made available to engage the blow sequence by the foot switch. The blow sequence shall be made available to define in the control desk. Option shall be available for selection of blow energy for each blow.	
5.3	**Programmable mode :** (a) The counter-blow forging hammer shall be equipped with an automatic Programme Mode for repeatable forging cycles. (b) Programme Mode shall be initiated through the foot pedal switch. Selection of program shall be made possible through control desk. The system shall be designed for execution of individual forging blows/strokes with preset energy through continuous engaging of foot pedal switch , until completion of sequence. Blow energy shall be independently programmable for each individual blow or stroke within the sequence. The Programme Mode shall provide programmable dwell time between successive blows or strokes. In case the Programme Mode is interrupted due to release of the foot pedal switch , the control system shall provide a pre-selection option to define to reinitiate the blow sequence from the previous/last completed blow or from the first blow. All Programme Mode operations shall be subjected to the machine safety logic, interlocks, and emergency stop system, in compliance with applicable forging machine safety standards.	
5.4	**Maintenance mode:** The Maintenance mode shall have provision for password protection with key switch protected operating mode intended exclusively for inspection, preventive maintenance , troubleshooting , and repair activities. In this mode, manual and automatic operating mode functions shall be disabled, and the machine movements shall be limited to slow/inching mode, controlled motions under direct operator control. Movements of the upper and lower TUPS shall be possible only through two hand operation.	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
6	**Hydraulic drive System**	
6.a	The hydraulic drive system of the hammer shall be designed with energy efficient pumps and motors , high response heavy duty proportional valves and controlled electronics for the rough working conditions of a forging shop. The vendor shall design and optimize the control elements of the hydraulic system in order to yield continuous performance under heavy duty forging operation cycles. The hydraulic system shall be built with instruments and filtering circuits to ensure contamination free hydraulic media to meet the standards of NAS 7/ISO4406 or better.	
6.b	**Main components of hydraulic drive system** •Main tank •Cooling and Filtering System (CF Unit) •Main Hydraulic Pump Unit , control pump unit and auxiliary pumps •Main control manifold block •Quick-hammering control and flow valves •Accumulator bottle station •Heavy duty Piping, fitting and fastening structures •Heavy duty hydraulic cylinders and pistons	
6.1	**Main Tank**	
6.1.1	The main tank shall be positioned on the top of the hammer. The main hydraulic tank shall be of welded steel construction. The hydraulic main tank shall have main pumps, auxiliary pumps, pressure filters, return filters, breather filters, oil level gauges, drain valves and sampling ports. The tank shall be built with instruments for measurement of pressure, flow, contamination, moisture level, oil level, filter clog indicators and temperature. These instruments shall be interfaced with PLC to display and control various parameters through control station. The main tank shall be constructed with two chambers: (a) Return Oil chamber : It shall contain the hydraulic oil returned from the hydraulic circuit system. The return oil chamber also functions as a suction chamber for the piston rod. (b) Suction/clean chamber : It shall be constantly filtering the oil to clean hydraulic oil for the main- and auxiliary pumps. The return flow of the hydraulic oil should be smooth and the suction level of the pumps must be at a sufficient distance from the tank bottom to avoid cavitation of pumps. Suitable oil level indicators shall be designed and interfaced with PLC controls for the continuous monitoring and filtering of the oil in both the chambers.	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
6.2	**Cooling and Filtering System (CF Unit)**	
	The hydraulic oil shall be continuously cooled and filtered. The filter unit shall have contamination indicator / sensors and interface with PLC. Cooling of the oil shall be carried out by oil-water-heat exchanger (Preferably Shell and Tube type). The heat exchanger shall be supplied and integrated with hammer by the vendor. Suitable capacity (TR) of water chiller unit shall be supplied. Suitable cellulose filter based continuous oil filtration system shall be supplied and integrated with hydraulic tank , in addition to the in-built filter circuit. Oil filtration unit shall have indicators / sensors to monitor contamination level (NAS / ISO) and moisture level in PPM. And these instruments shall be interfaced with PLC to display and control parameters through control station.	
6.3	**Main Hydraulic Pump Unit, control pump unit and auxiliary pumps**	
	High efficient hydraulic main pump units along with control pump and auxiliary pump units shall form the hydraulic drive system, to supply the hydraulic oil at required pressure to achieve rated energy of the hammer. These pumps shall be Energy efficient with continuous duty cycle and having ability to withstand the vibrations released by the hammer. Vendor shall supply and integrate suitable couplings with soft joints for the pump and motor assembly. The pump and motor shall be noise and vibration free. Vendor shall incorporate pressure checkpoints/inspection points which are required to identify the correctness of manifold function through sufficient number of hydraulic connector ports (like Minimess ports).	
6.4	**Main Control manifold block**	
	Vendor shall design the main control manifold block made of forged steel for equipping valves and accessories required for the hydraulic drive system. The manifold block shall control main motion of the hammer in various modes. It shall have high-pressure built-in logical/servo valves with switches for their high response control. Manifold block shall be equipped with safety valves, relief valves, check valves and other components necessary for control of the hammer cylinder and return cylinders at blow approach and reverse phases of the hammers. Vendor shall incorporate pressure checkpoints/inspection points which are required to identify the correctness of manifold function through sufficient number of hydraulic connector ports (like Minimess ports).	
6.5	**Quick hammering controls and flow Valves**	
	Vendor shall provide Servo/Proportional/Suitable valve and manifold system to achieve high response hammering action by way of rapid flow of oil into and out of hammer Cylinders. These valves shall have features of high blow frequencies and accurate synchronization of upper and lower tups.	

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer	Annexure-B	Compliance
6.6	**Accumulator bottle Station**	
	Vendor shall design sufficient number of accumulators in the accumulator bottle station to store hydraulic energy and deliver oil through manifold instantaneously. Accumulators shall be installed close to the hydraulic control block. Accumulators shall provide the hydraulic energy for fast acceleration of the drive piston. Accumulators shall have safety valves, manifold, pressure relief valve, minimess test point. Accumulators of bladder type are preferrable.	
6.6	**Air compressor**	
	Vendor shall supply and install an air compressor of suitable capacity if required, for operations of the sub systems of the hammer. The compressor shall be supplied with an air receiver , control panel and safety systems interfaced with main control panel of the hammer.	
6.7	**Piping, Fitting and Fastening Structures**	
	The control manifolds, working cylinders of the hammer and tanks are to be interconnected with pressure line and return line piping. The piping system to be supplied with shut-off valves and On/Off feedback where it is necessary. The pipings shall also comprises of check valves, high-quality fastening elements and steel structures for supporting the piping by fastening to the concrete foundation. This assembly also incorporate packing sheets, foundation bolts and other anchor material intended for installation of individual sub-assemblies on the foundation on site. Steel Ladder with hand rail (with steps for foot rest) shall be provided to reach hammer top platform. Top platform shall have safety lock in the platform door interfaced with PLC so that hammer cannot be operated if door is opened. All pipe lines shall be appropriately clamped wherever necessary to avoid vibration and over hang. The high pressure hoses used should be designed adequately (with proper clamping) to withstand maximum pressure.	
6.8	**Heavy Duty Hydraulic Cylinders and Pistons**	
	Vendor shall design the hydraulic cylinders and pistons made of forged steel and equipped with wear resistance and long lasting seals and guide rings to deliver the required pressure at rated hammer energy. The hammer shall have a rapid acceleration feature, which is required to deliver blow energies at rated frequencies. The vendor shall design the hydraulic system to comply with ISO 4413 standards. The hydraulic cylinders shall be connected with manifold block to deliver rapid flow of oil into and out of the cylinders.	

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer		Annexure-B	Compliance
6.9	**Tup Synchronization System**		
	Vendor shall provide a proven Tup synchronization system to achieve a rated blow energy as per the set blow frequencies. Vendor shall achieve the energy of the hammer with simultaneous movement and impact of the upper and lower Tups. Vendor shall achieve the rated energy of the hammer by the closed loop servo hydraulic synchronization of the cylinders / couplings. Suitable position sensors shall be equipped in the system to achieve synchronization of the Tups.		
7	**Hydraulic system Data**		
7.1	Max. working pressure of hydraulic system (preferable)	200 bar	
7.2	Position of the complete hydraulic system	At the Top of the hammer frame (shall be accommodated well within the area available over the top of the hammer including hydraulic accessories and control panel)	
7.3	Hydraulic Oil to be used in the system	HVLP 46 hydraulic Oil with anti wear and high viscosity index conforming to DIN 51524 Part 3 and ISO 11158.	
7.4	Water chiller unit	Refrigerant based water chiller unit with air cooled condenser shall be supplied ,integrated , and to be installed at Ground level (Location is shown in Annexure - 1).	
7.5	Oil Filtering Unit (offline)	Shall supply suitable Cellulose filter insert based oil filtering unit with contamination and moisture monitoring probes with display and printer. (Make of the filtering unit: C C JENSEN)	
7.6	Brand Specification for Pumps , Hydraulic accessories (like relief valve, check valve, servo valves, safety valves, non return valve, logic valves, cartridge valves, manifold blocks) & Proportional Valves	Moog/Rexroth/Eaton/Parker/OEM's own design	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer		Annexure-B Compliance
7.7	**Brand Specification : Hydraulic System**		
a	Pump	Bosch Rexroth/Eaton/Parker/Wupeko	
b	Hydraulic cylinder Seals	Trelleborg/Freudenberg/Hunfer DFE/SKF	
c	Pressure sensors	IFM/WIKA	
d	Hydraulic Filters	Hydac/Mahle/Parker	
e	Hydraulic Hoses	Parker/Gates/Eaton/ Contitec/OEM of the hammer	
f	Temperature Sensors for Hydraulic	IFM/WIKA/Danfoss	
g	Heat Exchanger	Alfa laval/OEM Specific	
h	Accumulators	Hydac/Bosch Rexroth/Olaer	
i	Manifold/Blocks	Bosch Rexroth/ OEM of the hammer	
8	**Electric and Electronic Control**		
	The electric equipment shall mainly consist of the complete power and automation control of the Hammer. Vendor shall design , supply and integrate all the electric and electronic systems as listed below:		
8.1	**Switch Cabinets**		
	The main switch cabinet shall consist of :		
a	Main supply by means of three-pole Main switch		
b	Design of switch cabinet in channel wiring		
c	Design for ambient temperatures up to 40°C with cabinet cooling by air conditioning		
d	Lighting of the cabinet		
e	Power switchgear with overload protection of all electric components, power and auxiliary contactors		
f	Separate power circuits for the individual machinery groups Emergency stop push buttons		

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
g	Emergency stop push buttons	
8.2	**Control Cabinets**	
	Switch cabinets to house the PLC-systems and to generate the control voltage shall consist of:	
a	Overload protection	
b	Suitable air conditioning inside the panel to maintain panel temperature within operating range.	
c	Transformers for the generation of control voltage	
d	Power packs for the generation of control voltage	
e	Relays and auxiliary contactors	
f	Programmable Logic Control (PLC) unit consisting of:	
g	CPU	
h	Digital input and output components	
i	Analog input and output components	
j	Module for interfacing with the Ethernet for remote trouble shooting.	
k	Port for remote data transmission to the programming unit	
8.3	**Local Control Panels / Remote Control Cabinets**	
	Local control panels / remote control cabinets/remote PLC I/O modules to operate the individual machines /equipment in the operation / maintenance modes shall comprise of :	
a	Control and signaling devices to start and stop the individual assemblies	
b	Emergency stop push button	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
8.4	**Industrial Panel IPC**	
	The Panel IPC shall comprise of the following hardware :	
a	21" Touch screen min.	
b	-Make : Siemens/Beckhoff	
c	User Licenses shall be provided by vendor for:	
d	Windows operating system	
e	Visualization	
f	Recipe management	
g	Any other application software	
h	All above software's shall be configured ready for connection, including documentation	
i	Back-up of all the machine and process related software's of PLC and SCADA in the form of Pen drive or Hard disc shall be provided to HAL by the vendor.	
8.5	**Control Desk in Control room**	
a	Panel IPC at Hammer shall be extended to control desk at control room for operation of hammer through Extended display/ /KVM/remote client arrangement.	
b	The desk shall be ergonomically designed for continuous industrial operation with adequate space for monitor(s), keyboard, mouse, communication equipment, necessary push buttons for safe operation of the Hammer from the control room.	
c	The approximate distance from Panel IPC to control desk is 10 mtrs.	
d	Operator shall view and operate the same SCADA screens through a curved 24" monitor, keyboard and mouse provided at control desk.	
e	The SCADA system shall provide common visualization, alarms, trends, diagnostics, and machine status information at both locations.	

		Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
8.6		**Machine Visualization**	
	a	Graphic representation(MIMIC display) of machinery and plant sections(both static and dynamic visualization) which is showing the different working modes (ram movement, TUP lock, Hydraulic circuit schematic with cylinders, Hydraulic tank, Accumulators, all Valves, Position Sensors, limit switches, shutoff valves, filters, pumps, motors, temperature indicators, flow transmitters, Etc. and PLC input and Output of Analog and Digital)	
	b	Numeric display of measured operating values of individual assemblies on the basis of set values	
8.7		**Process Visualization**	
	a	Process visualization of hammer, numeric and graphic display(MIMIC) of the process parameters.	
	b	During submission of technical quote, Vendor shall explain process visualization using actual screen shots as examples.	
8.8		**Recipe/Programme Input**	
	a	A recipe/programme is a group of production-related set input values for the hammer. Input values shall be checked by control system and shall ensure a safe operation of the hammer.	
	b	Loading, Storage, deleting of recipes for individual parts in a data logging and retrieving system. Batch wise part data to be captured.	
8.9		**Alarm Management**	
	a	Alarm list including faults with time stamp of message and acknowledgement Access to the operating and maintenance manuals and to the circuit diagrams of Electrical and Hydraulic	
8.10		**Sensors: Following sensors shall be provided**	
	a	Pressure transmitters with display for the individual hydraulic pressure systems	
	b	Position transducers: For Measurement of the movements of the hammer	
	c	Position sensors: Proximity/Limit switches for position sensing.	
	d	Flow Meters: For measurement of Hydraulic oil flow in the circuit	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer **Annexure-B**	**Compliance**
e	Level Sensor: Hydraulic Oil level in the tank	
f	Temperature Sensors: Hydraulic oil temperature	
g	Any other type of sensor for safe operation of hammer.	
8.11	**Safety Control**	
a	The pre set safety circuit shall be monitored by the PLC. Any operation and machine related problem shall be displayed in clear text on operator screen indicating location of the failure.	
b	In event of any process or machine related problem during operation, the safety circuit shall override the processing controls and it shall bring the hammer to rest position safely	
c	In addition, Emergency stop push buttons at minimum 3 locations shall be provided. 1 on the hammer side , 1 on the PLC panel, 1 on the control desk. Features such as 2 hand control for movement shall be incorporated. On activation of emergency buttons, hammer shall be brought safely to rest position. Different password levels (for operators, engineers, manager, maintenance staff) with the disabling of individual inputs and functions.	
d	Tool Change Mode: For tool change on upper or lower tups, none of the hammer components other than those used in the tool change shall be functional.	
8.12	**Networks**	
a	Communication connection (Ethernet) of the PLC controls and the PC visualization systems to exchange the process data. OPC UA communication shall be available for data exchange with other Server/MES/ERP Systems	
b	Industrial managed Ethernet switches shall be provided for automation networks with support for PROFINET/Ethernet communication, VLAN, diagnostics, SNMP.	
c	Switches shall be industrial grade and suitable for continuous operation in harsh industrial environments. Communication network from remote I/O panels and Control desk etc. shall be through Profinet/Ethernet	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer	**Annexure-B**	**Compliance**
8.13	**Data Acquisition, Handling and Management System should have following functions**		
a	Storage and display of process data as a time function for diagnosis and optimization purposes		
b	Selection of individual machine and process parameters to represent the trend - Energy, Hydraulic pressures, no of parts, Velocity , Electrical Energy, Current and voltage		
c	Graphic representation as online and historical trending for measured parameters - Energy, Hydraulic pressures		
d	Axis scaling freely selectable, zoom function where applicable		
e	Export / import function for archived files		
f	Language -English		
g	Alarm logger/History		
h	All alarms for past 2 years shall be recorded including the date and time of their occurrence; they can be called up any time later.		
i	Data acquisition /Trends		
j	After forging operation, all machine and process related data shall be displayed on the operator desk to facilitate optimization for future operations		
k	Product programs		
l	Creating a product library		
m	Storage (data back-up)		
n	Overview of the programs stored on the hard disc		

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer			Annexure-B	Compliance
8.14	**Remote/Online Support**			
a	Vendor shall offer remote diagnosis and support system for the hammer.			
b	The Vendor shall have online access to the hammer (including PLC, visualization PC etc.) whenever required by HAL.			
c	This is to enable immediate support in case of operational/maintenance and also software corrections can be made.			
d	Remark: Vendor shall provide free online support during warranty period.			
9	**Electrical Main Data**			
	Names of all equipment and devices which consume electrical power, their power rating shall be provided by vendor with quotation Total (approx.) power consumption shall also be provided by vendor with quotation **Note:** Total power requirement shall be within an upper limit of 2000 KW			
9.1	**Electric Design and specifications**			
	Technical data			
9.1.1	Main Incomer	Main incomer shall include ACB with electronic protection, under-voltage release, shunt trip, and energy monitoring.		
9.1.2	Electric power supply available	415 V +/-10%, 50 Hz +/-3%, 3 phase, 4 wire ,A.C. system		
9.1.3	Power supply Network	TN - C network 4 conductors L1-L2-L3/ PEN		
9.1.4	Internal power Network (in switch cabinet)	TN - S network 5 conductors L1-L2-L3/N/PE		

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer			Annexure-B	Compliance
9.1.5	Neutral conductor	Unloaded		
9.1.6	Operating voltage	3 x 415V		
9.1.7	Voltage Tolerance	+/-10%		
9.1.8	Control voltage	230 V AC /110V AC / 24 V DC		
9.1.9	Switch cabinets	Min. 15 up to max. 35°C		
9.1.10	Ambient temperature outside of air-conditioned switch cabinet rooms	up to max 45 °C		
9.1.11	Design specifications (excluding single core marking)	IEC		
9.1.12	Protective Earthing (PE).	IEC 60204-1 / IS 3043. Major equipment assemblies including main electrical panels, hydraulic power units, Motors more than 50 KW and press frame shall be provided with two independent protective earth connections. Recommendation of the part OEM's also to be considered for trouble free operation.		
9.1.13	Equipotential bonding	IEC 60204-1		
9.1.14	Functional Earth (PLC/Instrumentation)	IEC 60204-1/IEC 61000		
9.2	**Switchgear assemblies / system technology**			
9.2.1	Type of protection inside of switch cabinet rooms	IP20		
9.2.2	Type of protection outside of switch cabinet rooms - Machine-side and production-area cabinets: minimum IP55 according to IEC 60529.	Minimum IP55 according to IEC 60529		
9.2.3	Switch cabinets inside of switch cabinet rooms	Suitable Panel Air Conditioners to be provided		

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer			Annexure-B Compliance
9.2.4	PLC design	Remote I/O	
9.2.5	Network	Main incomer shall include ACB/MCCB with electronic protection, under-voltage release, shunt trip, and energy monitoring.	
9.2.6	Protocol	Profinet/TCPIP,OPC UA	
9.2.7	Thermistor protection for motors	For >= 45 Kw motors	
9.2.8	Thermistor protection for frequency converter motors (FC)	All motors	
9.2.9	Core colours :	IEC 60446 / IEC 60204-1 colour identification	
9.2.10	Surge protection	To be provided by vendor	
9.2.11	Digital Energy meter in the switch cabinets	To be provided by vendor	
9.2.12	Cable entry	Bottom Entry	
9.2.13	PC – operating systems:	MS Windows	
9.2.14	Reserve expansion space inside of switch cabinets	minimum 15%	
9.2.15	Reserve space provided in PLC (without hardware):	minimum 20%	
9.2.16	Reserve space provided in PLC (with hardware):	minimum 20%	
9.3	**Brand specifications : Electric and electronic systems**		
9.3.1	Switch cabinets / control boxes	RITTAL/SIEMENS/SCHNEIDER	

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer			Annexure-B	Compliance
9.3.2	Desks	RITTAL/SIEMENS/SCHNEIDER		
9.3.3	Main switches	SIEMENS/Eaton MOELLER/SCHNEIDER/ABB/GE		
9.3.4	Switchgear	SIEMENS/Eaton MOELLER/SCHNEIDER/ABB/GE		
9.3.5	Frequency converters	SIEMENS/SCHNEIDER/ABB/GE/BECKHOFF		
9.3.6	Soft start devices	SIEMENS/SCHNEIDER/ABB/GE/BECKHOFF		
9.3.7	Servo converter	SIEMENS/SCHNEIDER/ABB/GE/BECKHOFF		
9.3.8	Servo motors	SIEMENS/BALDOR/LENZ/BECKHOFF		
9.3.9	PLC system	SIEMENS		
9.3.10	Remote PLC	SIEMENS/BECKHOFF		
9.3.11	Safety control	PILZ PSS/SIEMENS/SICK or equivalent		
9.3.12	Industrial PC based SCADA system	SIMATIC / IN TOUCH WONDERWARE SCHNIEDER/BECKHOFF/OEM specific		
9.3.13	PC system visualization	BECKHOFF/SIEMENS		
9.3.14	Monitor size	21“ TFT LCD (MINIMUM)		
9.3.15	Control and signalling devices:	SIEMENS/MOELLER/SCHNEIDER/ABB/GE		
9.3.16	Network components:	Suitable to PLC system		

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer			**Annexure-B**	**Compliance**
9.3.17	Programming device:	SIEMENS FIELD PG		
9.3.18	UPS for PC system with 20 minutes backup	APC/POWERWARE/RITTAL/ SIEMENS		
9.3.19	Panel AC	RITTAL/WERNER FINLEY/DAIKIN		
9.3.20	Electric Motors	Siemens/ABB/CG		
9.3.21	Distance transducers	ASM/SICK/MTS/TEMPSONIC/BALLUFF		
9.4	**Supply Voltage**			
	The equipment shall comply with EN 50160 and IEC 61000-2-2 requirements to operate reliably under specified limits of voltage variation, frequency deviation, harmonic distortion, voltage unbalance, and power disturbances.			
9.5	**Connecting Cables**			
	Complete supply and installation of cables required for the hammer has to be carried out by the vendor. Only incoming supply to the vendor's main switch is in HAL' scope. HAL will provide Power to Main Panel only. Vendor shall suitably design power distribution for all control/remote panels.			

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer	Annexure-B	Compliance
10	**Safety Protective Door / Shutter for Hammer :**	
	The hammer shall be equipped with a quick-opening and quick-closing foldable protective door/shutter/movable steel mesh on the front and back side of the hammer. During forging operation the quick door/shutter shall be closed by pneumatic/hydraulic/electric operation before the commencement of the blow operation , in order to upkeep the safety of the workmen. The door/shutter shall protect the operator/shop floor area from air flow, scale particles and other flying objects generated during forging operation. After completion of the forging operation, the door/shutter shall be opened to enable removal of the part from the die area. The opening and closing of the door/shutter shall be controlled from the operator desk/main control unit. The system shall be interlocked suitably with the hammer controls for safe operation. The door/shutter shall be designed for quick operation, with opening and closing time preferably 2-3 sec , without delay in starting of the forging operation. The complete system, including door/shutter, hinges/folding mechanism, actuator, hydraulic/pneumatic/electrical drive, sensors, limit switches, interlocks, control integration, safety photo voltaic guards and mounting arrangements, shall be in the vendor's scope of supply. The design shall ensure that the door/shutter does not obstruct loading, unloading, die changing, maintenance access or normal hammer operation.	
11	**Die Locking Keys**	
	The keys required for locking the dies, as shown in Annexure-2, shall be supplied by the vendor. One set of keys shall consist of 04 nos. The vendor shall supply 03 sets of die locking keys, totaling 12 nos. The die locking keys shall be manufactured from suitable tool steel, preferably DIN 2714 or equivalent, with appropriate heat treatment to ensure adequate strength, hardness, toughness and service life under forging operating conditions. The complete design, manufacture, supply and fitment compatibility of the die locking keys with the hammer die locking arrangement shall be in the vendor's scope.	

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer	Annexure-B	Compliance
12	**Industrial Video Monitoring System**	
	The vendor shall supply, install and commission an industrial-grade CCTV camera system for real-time visualization of hammer and shop floor activities from the operator cabin. A minimum of 06 nos. industrial-grade IP CCTV cameras shall be provided at suitable locations to clearly cover the hammer working area, die area, manipulator/material handling area, and surrounding shop floor movement area. The CCTV system shall meet the following minimum requirements: Cameras shall be minimum 5 MP resolution IP cameras, suitable for continuous industrial operation. For critical viewing locations such as hammer die area and job handling area, 8 MP / 4K cameras are preferred for enhanced clarity. Cameras shall be suitable for forge shop environment and shall have protection against dust, heat, vibration, scale particles and shop floor contamination. Cameras shall have suitable wide-angle/varifocal lenses to ensure clear visualization of hammer operation, die area, job positioning, manipulator movement and nearby shop floor activities. Cameras installed near the hammer area shall be provided with suitable protective housings, heat shields and robust mounting arrangements. Live video feed from all cameras shall be displayed on a dedicated monitor inside the operator cabin. The system shall include NVR/DVR with minimum 30 days recording capacity, with provision for retrieval, backup and playback of recorded footage. All cameras, cables, network switches, power supply, mounting brackets, conduits, protective housings, accessories and software required for complete installation shall be included in the vendor's scope. The CCTV system shall be installed in the operator cabin and shall not obstruct machine operation, maintenance access or shop floor movement. Final camera locations shall be decided during detailed design/fabrication of hammer in consultation with HAL. 40 inch monitor for CCTV camera view which shall be installed in operator control room.	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
13	**Lubrication System**	
	Hammer Lubrication System: Automatic lubrication required (oil and grease) for an accurate and maintenance-free guidance of all the moving parts. The lubrication system shall have sensors for pressure, flow and level controls to ensure it's effectiveness during application. Centralized control from control panel to all the lubrication units(oil and grease) with provision of error messages related to oil/grease level ,pressure and flow in corresponding areas to be provided. **Die Lubrication System:** The vendor shall provide a heavy-duty hand-held graphite spray system suitable for application of water-based graphite lubricant on forging dies during hot forging operations. The system shall comprise a stainless steel graphite storage tank with a continuous motorized stirrer/agitation system to prevent settling of graphite particles and ensure a homogeneous mixture at all times. The spray gun shall be ergonomically designed with adjustable spray pattern and flow control, capable of delivering uniform coating on upper and lower dies with flexible high-temperature hoses. The complete system shall include compressed air regulator, pressure gauges, filters, quick-connect couplings, trolley-mounted tank, all necessary accessories. The supplier shall provide all interconnecting hoses, spare nozzles, and commissioning the complete system. The vendor shall integrate the die lubrication system with PLC and shall work in Programme Mode, supporting both blasting and spraying lubrication methods. Lubrication impulses after each blow or stroke shall be programmable, including independent adjustment of signal duration for blasting and spraying functions.	
14	**Cover Plates**	
	The foundation pit openings around the hammer shall be covered with cover plates (made of steel) of sufficient thickness to withstand the assorted loads being moved in and around the hammer. It shall cover the entire hammer foundation area . The vendor shall fabricate and install these cover plates with sufficient support structure and braces. The top surface of the cover plates shall be designed as anti skid surface for safety . During hammer operation, there should not be any cavity of the foundation left open(important from safety point of view) . In addition, the cover plate shall have a load bearing capacity of at least 25 tons per sq. foot. The cover plate shall be in level with finished floor for smooth movement of the men and material handling equipment.	
15	**Mandatory Accessories :**	
15.1	Seal kit for all Hydraulic cylinders - 1 Set	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
15.2	Hydraulic Jack (50 Ton Capacity - 200 mm stroke length) with pump and hose - 2 Nos	
15.3	Hydraulic oil filters - 1 Set	
16	**Annual Maintenance Support (AMC) :**	
	Vendor shall provide a separate budgetary quotation for the Annual Maintenance Contract (AMC) for a period of five years , which is applicable after the expiry of the warranty clause. The AMC cost is requested for ensuring the machine supplier commitment to support the hammer and also for budgetary purpose. This shall not be part of commercial evaluation of tender . This AMC quote shall include online support on need basis, service engineer visit on half yearly basis to trouble shoot and service of the hammer.	
17	**Spares for maintenance/operations after warranty:**	
17.1	Along with the technical quotation of hammer, vendors shall provide a complete list of spare parts for hammer mechanics / electrics / hydraulics . Price for spares shall be quoted separately in commercial quote. The price of spares shall not be part of commercial evaluation of tender.	
17.2	This list of the spare shall have the details of the following: Name of spare parts Specifications Quantity Price Priority (VITAL/ESSENTIAL/DESIRABLE)	
18	**Documentation to be provided by Vendor after Purchase Order Placement:**	
a	All documentation shall be in English language and to be delivered as paper copies(3 sets). And also these documents shall be delivered in soft copy (Pen drive) as well.	
b	Operation and Maintenance manual in English.	
c	All Drawings will be submitted soft copy (E-mail & Pen drive) as well as hard copy.	

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer		Annexure-B	Compliance
d	The Documentation shall mainly consists of the following:		
18.1	**MECHANICS**		
a	Technical specifications of hammer		
b	General assembly drawing of hammer		
c	Plan arrangement and elevations of the hammer		
d	Erection drawing of framework		
e	Component erection drawings		
f	The maximum weight of installed single unit and maximum dimension of installed single unit		
g	Maintenance manuals of the hammer		
18.2	**HYDRAULICS**		
a	Plan arrangement and elevations of the hydraulic system		
b	P & I diagram of the hydraulic system		
c	Hydraulic equipment and piping erection drawings		
d	Erection drawings of various parts of the hydraulic system (including, main pump and motor, oil tank, cooler, filters, valve stands)		
e	Centralized lubrication system diagram		
f	Arrangement drawings catalogue of the main parts of the hydraulic system (including valve blocks of various functions, oil tanks, special valves, special pipeline fittings such as special connections, piping connectors, etc.)		
g	Test run instructions for the hydraulic system		
h	Operation, maintenance and troubleshooting instructions for the hydraulic system		
i	Catalogues, operation manuals, technical specifications, qualification certificates of the all components and parts of the hydraulic system		

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer	Annexure-B	Compliance
j	List of hydraulic equipment for valve, pump, motor and various auxiliary equipment including name, type, manufacture, position No. in drawing, quantity.	
18.3	**ELECTRICS**	
a	Schematic diagram of the electric control system (VDE or EN)	
b	Motor List with the following information (type, power, protection class, voltage, cooling mode, quantity, location)	
c	Arrangement drawing of the operation rooms and the electric panels	
d	Erection drawings of all electrical equipment	
e	Panel apparatus arrangements of control cabinet and operator desk	
f	Terminal wiring diagram of the electrical control system	
g	List for motor, power and control/communication cable, sensor, switch, PLC etc. including name, type, manufacturer, position	
h	List of Grounding standard documents (VDE or EN)	
i	Operation manual	
j	Catalogues, operation manual, technical specifications of the components and parts	
18.4	**CIVIL ENGINEERING**	
a	Arrangement plan and elevations of the foundation of the forging hammer indicating the net dimensions of the pit, and showing equipment erection elevation and foundation elevation (secondary grouting requirements)	
b	Basic drawings of civil engineering including dimension of the cable trench and cable tunnels, for electric control room	
c	Basic drawings of civil engineering for the installation of vibration damping /isolation system	
d	Foundation loading diagram (indicating loading points and directions of dynamic and static loads, maximum and minimum loads; loading points and directions of the foundation vibrating loads (Preliminary and /or Final if applicable)	
e	Arrangement plan of pits, holes and openings on the foundation, indicating the net dimensions of them.	
f	Information on drawings of the embedded parts of the hammer	
g	Arrangements and details of steel coverings around the foundation of the hammer	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B		Compliance
h	Arrangements and details of the bracing for steel coverings around the foundation of the hammer		
i	Any other foundation related details required by HAL during design of foundation		
19	**Design/Calculation of Main Components**		
a	Vendor shall design the hammer by using Finite Element Analysis (FEA) Standard for Design and construction of main structural parts of the hammer has to comply with DIN EN 14673: 2006 + A1: 2010		
20	**Painting and Colour Coding for equipment and Pipelines**		
20.1	Hammer and other accessories	The hammer shall be painted with rust proof primer followed by two coats of enamel painting in accordance with ISO 12944. Painting shall enormously improve the aesthetic look of equipment . Preferred colour for the hammer structure is RAL 6018	
20.2	Pipe lines	All hydraulic , lubrication , cooling water , compressed air and utility pipe lines shall be permanently identified in accordance with IS 2379 , ISO 20560-1. Identification shall include colour coding , flow direction arrows , service description , wherever applicable.	
21	**Civil Foundation:**		
21.1	After Purchase Order placement , vendor shall submit all necessary approved foundation drawings in hard copy to HAL within 3 months for enabling HAL to commence foundation works.		
21.2	Vendor shall supply embedded steel plates, cable conduits, Foundation bolts and sleeves to HAL-F&F to facilitate concrete foundation work.		
21.3	During foundation work, HAL will intimate the vendor to depute engineer to inspect the actual foundation details before and after Foundation concrete work.		
21.4	The Specialist's air travel cost , hotel fare, local transport to and from HAL shall be at vendor's cost. Vendor can specify most appropriate time for it's specialists visit , frequency of visit during the hammer foundation work.		

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
22	**Pre Dispatch Inspection**	
	Before shipment of the consignment, a Pre Dispatch Inspection shall be carried out by HAL representatives at vendor's site. Vendor has to satisfactorily demonstrate/produce all sub assemblies , material certificates, electrical and PLC panels, hydraulic system and OEM certificates for bought out parts(brands shall meet the requirement of RFQ). Vendor shall intimate readiness of the hammer for Pre Dispatch Inspection to HAL , 90 days in advance. The following major components/systems will be inspected during PDI: 1. Dimensional verification of hammer structures, assemblies, sub assemblies and other systems. 2. Salient features of the hammer 3. Hydraulic System including cylinders ,tanks, filtering system, Servo system, pipes and fittings 4. Manifolds, Pumps and Motors 5. Instrumentation and Control systems 6. Lubrication system 7. Main control Desk 8. Tools/Dies/locking keys 9. Electrical Panels 10. Data Acquisition and storage SCADA system 11. Bought out items and OEM certificates 12. Electrical, Mechanical and Hydraulic drawings and documentation There will not be any separate cost towards PDI activities and same shall be borne by the vendor. However, HAL reserves the right to waive the Pre dispatch inspection(PDI), either partially or in full, if deemed necessary.	

Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer	Annexure-B	Compliance
23	**Erection and Installation:**	
	Erection and Installation of the hammer will solely be vendor's responsibility. Subsequent to this , vendor shall carry out erection work using their own people, using their own loading/unloading and lifting cranes and erection tools and equipment.	
24	**Commissioning, Acceptance and Training**	
	Commissioning: During commissioning dry run with all electrical,electronic,mechanical and hydraulic functions shall be carried out . This shall be solely at vendor's responsibility. After erection and commissioning , an acceptance test will be performed. As part of commissioning, vendor shall provide first fill of hydraulic oil, grease, oil lubrication required for hammer equipment .	
25	**Acceptance Test Method**	
	Acceptance test of the hammer shall be performed by using the existing dies of HAL. The hot forging trials shall be performed with various alloy materials including steel , Nickel and Titanium under full range of hammer loads for all operations / working modes. HAL will carry out an extensive acceptance test on different types of parts that are being planned for a period of 1 month . During the acceptance test process, all the required features expected from the hammer in all the working modes shall be checked and verified.	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
26	**Delivery Schedule and terms:**	
	The 20 Ton counter blow hammer along with all associated equipment and auxiliaries to be delivered (which includes supply , installation, commissioning and final acceptance) within 24 months from the date of acceptance of the order by the vendor. Site readiness for installation of the equipment is scheduled by June 2028. The vendor shall submit a detailed project execution schedule indicating all major milestones and timelines with the technical offer and shall ensure compliance with the stipulated project completion period. Delivery Term: DPU (Delivery at Place Unloaded) INCOTERMS 2020. Delivery Place: Foundry and Forge Division, Hinduatan Aeronautics Limited, Bangalore, India. Complete scope of logistics including movements to the installation location is in the scope of vendor.	
27	**TRAINING**	
	After successful completion of acceptance test, vendor specialists shall train HAL's operation and service personnel for 10 days.	
28	**Warranty**	
	Warranty period: Two years from the date of signing the final acceptance letter. In case of any failure noticed in the parts during warranty period , the vendor should give free replacement .	
29	**HAL Scope of Supply**	
29.1	**CIVIL ENGINEERING**	
	•Foundations and grouting for all equipment and auxiliaries as per vendor drawing. •Parts concreted in the foundation for reinforcement •Trenches for cables, pipe lines, drainage lines for fluids/emulsions •Painting/coating of foundations and civil works if required. •Operator room with air-conditioning, telephone, illumination, furniture etc. •Main Hangar with illumination, 2 over head lifting cranes with capacity 10T and 50T respectively.	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer Annexure-B	Compliance
29.2	**ELECTRICAL ENGINEERING**	
	•External wiring/energy supply between the transformer and the Electrical panels to 2nos of Main switch cabinets and Switch cabinet of Chamber Furnace. •All other power supply for any additional panels and internal cabling is in vendors scope only. •Transformers & HT/LT switchgears •Site lighting •Electrical/electronic earthing of the complete equipment	
29.3	**SPARES, CONSUMABLES**	
	•Storage space for consumables, spare and wear parts •Raw material of sufficient quantity and quality for commissioning, acceptance	
29.4	**Air and Water Supply**	
	•Supply of compressed air Water at Room temperature •Sump and drainage pumps.	
29.5	**GENERAL**	
	•Free and clear access to all mounting places including flat and unobstructed floor in the production bay •Storage of supplied goods at Site to avoid loss or damage due to weather, climate or other influences when erection cannot proceed immediately •Skilled operating personnel for hammer operation (suitably qualified and trained) •Stores for production material and tools and associated handling equipment •Any necessary pre-heating equipment •Scale and waste pits with associated covering including scale and waste receptacles, transportation facilities / conveyors.	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer **Annexure-B**	**Compliance**
30	**Qualification Criteria:**	
30.1	**Past experience:**	
	1. The proposed counter blow hammer will be utilized for the manufacture of critical aircraft & aero-engine forgings for the programs of HAL and therefore OEMs. The forged components produced on this equipment are to meet the stringent dimensional, quality and process requirements of HAL & global aero-engine OEMs.Indian Airworthiness agencies & OEMs carry out process audits and qualification of the forging equipment before approving the facility for forging manufacturing. Therefore, the vendor shall have past experience of supplying similar forging equipment to global forging industries and the supplied equipment should have met the operational and quality requirements . Following are the experience requirements; a) The Vendor / OEM shall have successfully designed, manufactured, supplied, installed and commissioned at least three (03) Counter Blow Hammers having a rated forging energy of 100 kJ or above, out of which at least one (01) Counter Blow Hammer shall have a rated forging energy of 200 kJ or above. b) At least one of the (01) Counter Blow Hammer shall have been supplied more than ten (10) years prior to the date of bid submission. Vendor / OEM shall furnish documentary evidence in support of the above experiences in the form of Purchase Order / Installation Certificates / Commissioning Certificates / Customer Performance Certificates. HAL's Technical Evaluation Committee will evaluate such evidences and in case any additional proof is required, same will be asked by HAL. **Failure to submit the required documentary evidence shall render the bid liable for rejection.**	
30.2	**Financial Standing:**	
	Average financial turnover of the bidder during the last three completed financial years shall be atleast INR 50.00 Crs.In case the bidder participates in both the line-items (i.e., 10000 Ton Hydraulic Press and 20 Ton counter blow hammer together) the average financial turnover shall be atleast INR 290 crores. The bidder shall submit the audited financial statements/reports (relevant portions) for the last three completed financial years as a proof of evidence in support of the above requirement. **Failure to submit the required documentary evidence shall render the bid liable for rejection.**	

	Compliance Matrix for Technical Specification of 20 Ton Counter Blow Hammer **Annexure-B**	**Compliance**
30.3	Bids submitted by bidders quoting as authorized representative of the same or other principal manufacturer shall also be considered for qualification provided: a) their principal manufacturer meets all the qualification criteria without exemption, and b) the principal manufacturer furnishes a legally enforceable tender-specific authorization in the prescribed form assuring full guarantee and warranty obligations as per the general and special conditions of contract; and c) the bidder himself should have been associated, as authorized representative of the same or other Principal Manufacturer for same set of services as in present bid (supply, installation, satisfactorily commissioning, after sales service as the case may be) for same or similar Product (i.e., hydraulic forging press & forging hammer as the case may be) for past three years ending on the Relevant Date (i.e, date of bid submission).	
31	**Annexures**	
	All requirements as per below annexures need to be accepted by vendors during submission of technical quotes.	
	Annexure-1 : Plan of the hangar with hammer and other accessories location	
	Annexure 2 : Details to be furnished by the vendor along with the technical quote for energy calculation and other technical parameters.	
	Annexure 3 : Dovetail size of Dies	
	Notes: Vendor may be called for Technical Clarification during Technical Evaluation stage if HAL desires.	
	Special Notes:	
	All the above mentioned requirements/parameters are **Essential ,** unless otherwise it is explicity specified.	

Tender No F/ DGM(IMM)/CAP/924/1

General Conditions of Tender

PART 1: Tender clauses

1. Tender Due Date:

The due date for submission of quote is **30/10/2026; 1230 Hrs at Foundry and Forge Division, Hindustan Aeronautics Limited, Post Bag No. 1791, Vimanapura Post, Bangalore – 560017, Karnataka, INDIA.**

2. Validity of the Quotation:

Price quoted should be net and unless otherwise specified should remain valid for HAL acceptance for a minimum of 180 Days from the closing date of tender.

3. Submission of Bid:

a) The bidder is required to submit bids directly to HAL either through post/courier/by hand/drop box in sealed cover with clear marking of bidder details. The cover should be marked with tender number, due date and bidder's postal address. Response received, without bearing the bidder address will not be entertained. Bid submitted by bidder's authorized dealer/distributor/ channel partner should accompany with signed or scanned copy of signed authorization letter of the bidder to whom tender has been originally issued. In the absence of authorization letter in technical bid, the bids submitted shall be considered as unsolicited.

b) Submission of Bid is in two bid system and through manual mode:

i) This is a two-bid system, the bidders are required to submit technical bid and commercial bid separately. Each bid shall be put in separate sealed cover marked with tender Number, due date and indicated as technical bid or commercial bid as the case may be. Both sealed covers shall be put in a single cover, which will again be sealed and superscribed with tender number and due date.

ii) The technical bid should also include EMD in original form, NDA and Integrity Pact. Technical bid without EMD in original form will be rejected. In case of EMD sent by SWIFT/Wire Transfer, Transaction Code should be indicated along with the technical bid. The technical bid will be accepted only after confirmation of receipt of EMD in time.

iii) Bid received with technical bid and commercial bid in open condition inside one envelope will be rejected.

iv) Submitting only one bid with rates and technical details as a single bid will be rejected.

c) In case of bid documents are bulky and cannot be dropped in the tender box, the same can be handed over to :

Sri H B Narasimha Kiran, Deputy General Manager (IMM),
Foundry and Forge Division, Hindustan Aeronautics Limited,
Vimanapura, Bangalore, Karnataka, India.

4. Late Bid:

a) Bid received after the due date and time specified in the tender shall be considered as Late Bid and will not be considered further.

b) HAL will not be responsible for loss or delay in receipt of Bid documents/ Bid in transit.

c) HAL reserves the right to reject incomplete bid.

5. Opening of Tenders issued in Manual mode:

a) Tenders shall be opened on the due date indicated above or the next working day of the due date in the presence of the intending Bidders and that Bidder or his authorized representative may attend the Tender opening with valid authorization letter and Identity Proof. A formal intimation will be provided to all the bidders to attend for tender opening with the date and time of tender opening (Technical & Price Bids separately.) Tenders will be opened at Foundry and Forge Division, Hindustan Aeronautics Limited, Post Bag No. 1791, Vimanapura Post, Bangalore – 560017, Karnataka, INDIA.

b) During Tender opening of technical bid, only the details of documents submitted in the technical bid will be read out. During tender opening of Price Bid, only the important particulars like price, payment and delivery terms will be read out.

6. Tender Evaluation:

a) The tender will be evaluated on line-item basis on the lowest offer received on DPU Incoterms 2020.

b) Technically acceptable Bid with lowest price conforming to the specification will be considered for placement of order.

c) If two or more bidders quote the same price, HAL reserves the right to seek revised offer from the same bidders and placing order on revised L-1 offer. If same situation prevails then HAL reserve the right to place order on any of them.

d) Conditional discounts will not be considered in evaluation of tender.

e) The technical bid will be opened on the tender opening date . After technical evaluation, the Commercial bids of those bidders who are technically acceptable will be opened.

The below additional provision may be considered in case of Indigenous:

f) Applicability of the Taxes (IGST/CGST etc.) should be explicitly indicated by the bidder in the response either in percentage or in absolute terms. In the absence of this input the offer would be considered all inclusive.

The below additional provision may be considered in case of Foreign:

g) Bid received in different currency will be converted to Indian Rupees. The TT selling rate for foreign currency exchange rate for conversion will be adopted as per the SBI Bank HAL Branch in India as on due date of tender opening.

7. Integrity Pact:

(i) Integrity Pact (IP) as per HAL format enclosed shall be duly ink signed by the bidder along with the witnesses. Failure to sign Integrity Pact as per HAL's standard format shall lead to rejection of offer. The submission of Integrity Pact without deviation is a mandatory requirement.

(ii) It is requested to forward the original signed Integrity Pact (as per HAL format) to the following Contact Person and Address:

Address of the Division/Dept.:

Foundry and Forge Division,
Hindustan Aeronautics Limited, Post Bag No. 1791,
Vimanapura Post, Bangalore – 560017, Karnataka, INDIA

Contact Person Name/Designation:
H B Narasimha Kiran, Deputy General Manager (IMM)
Tel No.: +91-80-22322601 (Mobile: +91-9739748229)

(iii) In respect of IP and its monitoring authority i.e. the Independent External Monitor (IEM), who is appointed by HAL, in line with the communication received from Central Vigilance Commission (CVC).

The present IEM/s is/are:

Shri Sunil Kumar Bansal, IPS (Retd.) Email id: sunilku555@gmail.com
Shri Chaitanya Kumar Varma, CE&MES (Retd.) Email id: ck_varma@yahoo.co.in
Shri Ashok Kumar Tripathy, IAS (Retd.) Email id: tripathyak@yahoo.com

(iv) The bidder may approach the IEM nominated only for IP related issues. Any other specific clarifications/query/status with reference to tender and request for validity, extension of the tender etc., should be forwarded to concerned tender issuing HAL Officer. (H B Narasimha Kiran, Deputy General Manager (IMM) Tel No.: +91-80-22322601 (Mobile: +91-9739748229)

(v) Both Omnibus IP and Standalone IP formats are enclosed with RFQ. In case if Bidder has already signed Omnibus IP with any other Divisions of HAL and validity of the same exists for this contract period, then Bidder may forward the copy of the same. If Omnibus IP is not signed, then Bidder may choose to execute either of the IP formats i.e. Omnibus IP or Standalone IP.

8. Conflict of Interest:

Any bidder having a conflict of interest, which substantially affects fair competition, shall not be eligible to bid in this tender. Bids found to have a conflict of interest shall be rejected as nonresponsive. A bidder in this Tender Process shall be considered to have a conflict of interest if the bidder:

a) directly or indirectly controls, is controlled by or is under common control with another Bidder; or

b) receives or have received any direct or indirect subsidy/ financial stake from another bidder; or

c) has the same legal representative as another bidder for purposes of this bid. A Principal can authorize only one representative, and the representative also should not represent or quote on behalf of more than one Principal. However, this shall not debar more than one Authorised distributor from quoting equipment manufactured by an Original Equipment Manufacturer (OEM), in procurements under Proprietary Article Certificate; or

d) has a relationship with another bidder, directly or through common third parties, that puts it in a position to have access to information about or influence the bid of another Bidder or influence the decisions of the Procuring Entity regarding this Tender process; or participates in more than one bid in this tender process; or

e) Participation in any capacity by a Bidder (including the participation of a Bidder as sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of a non-bidder firm as a sub-contractor in more than one bid; or

f) would be providing goods, works, or non-consulting services resulting from or directly related to consulting services that it provided (or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm), for the procurement planning (inter-alia preparation of feasibility/ cost estimates/ Detailed Project Report (DPR), design/

technical specifications, Terms of Reference (ToR)/ Activity Schedule/ schedule of requirements or the Tender Document etc.) of this Tender process; or

g) has a close business or family relationship with a staff of the Procuring Organization who:

i) are directly or indirectly involved in the preparation of the Tender document or specifications of the Tender Process, and/or the evaluation of bids; or

ii) would be involved in the implementation or supervision of resulting Contract.

h) In cases of authorized distributors quoting on behalf of their principal manufacturers, an authorized distributor cannot represent two manufacturers or quote on their behalf in a particular tender enquiry.

There can be only one bid from the following:

i) The principal manufacturer directly or through an authorized distributor on his behalf; and

ii) Authorized distributor on behalf of only one principal.

9. Parallel Arrangement:

Any Order awarded to the successful bidder as a result of this tender, will be on non-exclusive basis. HAL reserves the right of entering into parallel contract(s)/ release parallel Order(s) with any other firms now or hereafter.

10. Goods and Services Tax (GST):

I. GST Registration Status:

i) All the Bidders should ensure that they are GST compliant and their quoted tax structure/ rates as per GST Act/ Rules. Bidder should be registered under GST and furnish GSTIN number and GST Registration Certificate in their offer unless they are specifically exempted from registration under specific notification/ circular/ section/ rule issued by statutory authorities.

ii) GST Registration Number (15-digit GSTIN):

If the bidder has multiple business verticals in a state and has separate registration for each vertical, the GSTIN of each vertical is concerned with the supply and service involved, as per the scope of Schedule of Requirements and Price Schedule quoted. If the supply/ service provided is from multiple states, the bidder should mention GST registration numbers for each state separately.

iii) Composition scheme:

If the Bidder has opted for a composition levy under Section 10 of CGST, he should declare the fact while bidding along with GSTIN and GST registration certificate.

II. HSN Code and GST Rate:

i) HSN (Harmonized System of Nomenclature) code for the goods provided in this Tender Document is only indicative. It shall be the responsibility of Bidder to ensure that they quote the exact HSN Code and corresponding GST rate for the goods being offered by them.

ii) As per the GST Act, the bid and contract must show the GST Tax Rates (and GST Cess if applicable) and GST Amount explicitly and separate from the bid/contract price (exclusive of GST). If the price is stated to be inclusive of GST, the current rate included in the price must be declared by the bidder.

iii) If a Bidder asks for GST (and GST Cess if applicable) to be paid extra, the rate and nature of such taxes applicable should be shown separately. Bidders should quote 'GST' if payable extra on the total basic rate of each cost element and quote GST in '%' inclusive of cess.

iv) If GST, other taxes, duties are not specified, or column is left blank in the price schedule, it shall be presumed that no such tax/ levy is applicable or payable by the Procuring Entity.

v) The supply of commodities or services or both, if imported into India, shall be considered as supply under inter-state commerce/ trade and shall attract integrated tax (IGST). The IGST rate and GST cess shall be applicable on the 'Custom Assessable Value' plus the 'Basic Customs duty applicable thereon'.

11. Eligible Goods & Services:

a) Country of Origin:

The term "origin" used in this clause means the place where the Services (and incidental Goods including subcontracted components) are arranged and delivered, or manufactured.

b) Bidder's country which shares a land border with India:

(Note: For details please refer HAL Circular no. HAL/CD/617(GFR-Rule144(xi))/2020/444 dt.04-09-2020. The appropriate Appendix i.e. Appendix-A (Type I & II) & Appendix-B (Type I & II), may be considered for inclusion along with RFQ/RFP).

Any bidder from a country, which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority (i.e. the registration committee constituted by the Department for Promotion of Industry and Internal Trader (DPIIT). However, the bidders from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged

in development projects are not required to register with Competent Authority and will be eligible to bid in this tender.

Bidder from a country, which shares a land border with India, for the purpose of this Order means:-

i) An entity incorporated, established or registered in such a country; or

ii) A subsidiary of an entity incorporated, established or registered in such a country; or

iii) An entity substantially controlled through entities incorporated, established or registered in such a country; or

iv) An entity whose beneficial owner is situated in such a country; or

v) An Indian (or other) agent of such an entity; or

vi) A natural person who is a citizen of such a country; or

vii) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above.

Unless otherwise stipulated in the Contract, country of origin of 'Services' and related 'Goods' under the contract shall have their origin in India or other countries and must confirm to the declaration made by the Vendor in its bid regarding but not limited to any restrictions on certain countries with land-borders with India.

The successful bidder shall not be allowed to sub-contract works to any vendor from a country, which shares a land border with India unless such vendor is registered with the Competent Authority.

c) Minimum Local Content:

(Note: For details, please refer HAL Circular no. HAL/CD/617(PPP-MII-Rev-4)/2021/ 659 dt.27-01-2021.)

d) Minimum Local content (Make in India Policy):

The 'local content' requirement to categorize a Vendor as 'Class-I local supplier' is minimum 50%. For 'Class-II local supplier', the 'local content' requirement is minimum 20%. Nodal Ministry/Department may prescribe only a higher percentage of minimum local content requirement to categorize a Vendor as 'Class-I local supplier'/'Class-II local supplier'. For the items, for which Nodal Ministry/ Department has not prescribed higher minimum local content notification, it shall be 50% and 20% for 'Class-I local supplier'/'Class-II local supplier' respectively.

e) Vendor's a status as MSEs:

It is relevant to note that as per Government of India direction, the aspect of MSEs policies also included in the tender and the same is covered in the other terms & conditions which are part of RFQ. The aspect as indicated below would be applicable for procurement which falls under divisible category (i.e., not applicable for indivisible category).

That the bidder has to indicate MLC as part of offer & Self Certificate and Auditor might have also indicated MLC as per their certification. In case there is difference in those values, the lowest of them will be considered as the applicable MLC & the offer will be dealt accordingly. Other MLC information will be treated as invalid.

12. Earnest Money Deposit (or Bid Security):

a. EMD for a value of Rs. 10,00,000/- to be submitted in the form of DD/Banker's Cheque/Pay Order/Bank Guarantee of Scheduled Bank. In case of foreign bidder equivalent amount in free convertible currency to be submitted. EMD should be valid for 28 days beyond the validity of the bid. EMD can be sent through SWIFT/ Wire Transfer to HAL Account No. 39187603916, SBIN0001114, SWIFT: SBININBB147.
b. Offers not accompanied with requisite amount of EMD or EMD not submitted in the specified form in original shall be summarily rejected.
c. EMD will not carry any interest for the period it is retained with HAL. EMD will be forfeited if a bidder withdraws, amends, impairs and/or derogates within validity period.
d. Bidders exempted from submission of EMD as per Govt. of India directives must submit certified copy of Govt. of India authority for such exemption in lieu of EMD.
e. EMD of unsuccessful bidder will be returned within 15 working days of completion of technical evaluation or within 15 working days of determination of successful bidder (as the case may be).
f. EMD in original form should be enclosed along with the technical bid. Technical bid without EMD in original form will be rejected.
   Earnest Money Deposit for Foreign Bidders:
g. EMD remittance document, either in Indian currency or any other convertible currency of the specified amount, can be arranged by the Indian subsidiary/branch office in India of a foreign bidder which shall be submitted along with a certificate confirming the relationship of subsidiary/branch office in the bidder's offer.

13. Non-conformities between Figures and Words:

In case of non-conformities/errors are observed in responsive bids between the quoted prices in figures and in words. This should be taken care of in the manner indicated below:

i) If, in the price structure quoted for the required goods, there is discrepancy between the unit price and total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly;

ii) If there is an error in a total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and the total shall be corrected; and

iii) If there is a discrepancy between words and figures, the amount in words shall prevail.

Such a discrepancy in an offer should be conveyed to the bidder asking him to respond by a target date and if the bidder does not agree to HAL's observation, then the bid is liable to be rejected.

14. The Bidder/s agrees to submit such document/s like submission of Integrity Pact/supporting additional documents etc. as called for in RFQ, subsequent to opening of the Bid and before finalizing the contract or PO, depending upon the then circumstances and decision of HAL. Any failure to submit such document/s or Integrity Pact in HAL given format, shall amount to rejection of the Bid, which decision shall be at the discretion of HAL.

PART - II:

A. Bank Guarantee Clauses:

1 Security Deposit:

Successful Vendor, shall have to deposit 5% of the value of the order as Security Deposit (to be calculated only on basic cost excluding taxes & duties, if such details are furnished separately in the bid submitted) within 15 days of receipt of the purchase order, by demand draft or bank guarantee in a prescribed format of HAL from a schedule bank in India/ bank of international repute (for Foreign vendor), valid up to 60 days after the completion of contract period/last supply. This Security Deposit will bear no interest and will be returned only after the contract is completed to the entire satisfaction of HAL.

In case, quotes received without indicating the break-up details of GST, ED etc. and order placed subsequently on composite value (without indicating break-up details of taxes & duties) then the Security Deposit to be sought on the composite value (including taxes & duties).

a) In case the contract is not executed to the entire satisfaction of HAL the security deposit shall be forfeited.

b) No claim will be entertained against HAL either in respect of interest, if any due on the security deposit or depreciation in value.

c) On due performance and completion of the contract in all respects, the security deposit will be returned to the vendor, without any interest, upon return in good condition of any specifications, drawings, samples or any other property belonging to

the purchaser, which may have been issued to the vendor.

d) In case the vendor fails to submit the requisite Security Deposit within the stipulated time or any extended time, it may be treated as a withdrawal of an offer by the L1 bidder, and the case may be retendered, besides taking necessary punitive actions including forfeiture of EMD, deregistration and debarment of such Vendors.

2 Performance Bank Guarantee:

Vendor shall furnish a Performance Bank Guarantee as per HAL's format (enclosed) for 10 % of order value (to be calculated only on basic cost excluding taxes & duties, if such details are furnished separately in the bid submitted) valid till end of the guarantee/warranty period from a scheduled bank in India/ Bank of international repute (for foreign vendor) from the date of acceptance.

a) Performance Bank Guarantee for Indigenous vendor*:*

Vendor shall furnish a Performance Bank Guarantee as per HAL's format for 10% of order value (to be calculated only on basic cost excluding taxes & duties, if such details are furnished separately in the bid submitted) valid till end of the guarantee/warranty period from a scheduled bank in India.

b) Performance Bank Guarantee for Foreign*:*

Vendor shall furnish a Performance Bank Guarantee as per HAL's format (Enclosed) for **10%** of order value (to be calculated only on basic cost excluding taxes & duties, if such details are furnished separately in the bid submitted) valid till end of the guarantee/warranty period from a bank of International repute.

B. <u>Clauses with regard to Supplies:</u>

1. Packing:

The Vendor will be held responsible for the stores being sufficiently and properly packed for tropical storage and for transport by rail, road, sea or air so as to ensure their being free from loss or injury on arrival at their destination. The packing and marking of packages shall be done by and at the expense of the vendor. Each package shall contain a Packing Note quoting Purchase Order number and date showing its contents in detail. Each shall be properly marked with Purchase Order No., Consignee's name & address, package- handling instructions etc. The package shall have adequate provision for handling during transit.

2. Receipt & Dispatch:

The Vendor is responsible for obtaining a clear receipt from the Transport Authorities specifying the goods dispatched. Vendor will not book any consignment on a said to contain' basis. If vendor does so, vendor does it on his own responsibility. HAL will take no responsibility for

short deliveries or wrong supply of goods when the same are booked on said to contain' basis. HAL shall pay for only such stores as are actually received by them in accordance with the contract.

3. Quantity:

a) The quantity is one number for each line item as indicated in the price bid.

4. Quality & Workmanship:

1) Generally, the stores shall be of the best quality and workmanship. Vendor shall comply with the contract in all respects be to the satisfaction of HAL. Where tenders are called for in accordance with 'particulars', the vendor's bids to supply in accordance with such `particulars' shall be deemed to be an admission on his part that he has fully acquainted himself with the details thereof and no claim on his part which may arise on account of non-examination or insufficient examination of the 'particulars' will in any circumstances be considered. The vendor shall supply the stores in accordance with the 'particulars' unless any deviation is authorised as an exception expressly specified in the Purchase Order.

2) The Stores/Goods supplied shall conform to the standards, if mentioned in the Technical Specifications, or, where no applicable standard is mentioned, to the authoritative standards appropriate to the goods' country of origin. Such standards shall be the latest issued by the concerned institution.

5. Inspection, Consequences of Rejection:

The goods, goods shall be finally inspected & accepted only after successful commissioning, prove out and acceptance . If any stores are rejected, then HAL shall be at liberty to:

a) Either:

i) Allow the vendor to re-submit stores in replacement of those rejected within a time specified by HAL, the vendor bearing the cost of freight in such replacement without being entitled to any extra payment, (or)

ii) Buy the quantity of stores rejected or other of a similar nature elsewhere at the risk and cost of the vendor without effecting the vendor's liability as regards the supply of any further consignments due under the contract, (or)

iii) Terminate the contract and recover from the vendor the loss HAL may thereby incur. The vendor shall not be entitled to any gain on the repurchase,

b) Any stores rejected by HAL's Inspector must be removed by the vendor

within 14 days from the date of receipt of intimation of rejection and at his own cost, failing which the vendor shall be liable to pay storage charges at 1% for each day of delay on the invoice value of the stores. If the stores are not removed within a month from the date of intimation of rejection, the stores will be liable, to be sold by HAL at the vendor's risk and responsibility and the proceeds adjusted towards storage charges.

c) In case any payment is made against delivery and it is found that the supplied item is rejected during inspection/commissioning, vendor will be required to choose any one of the following options to collect the rejected item for replacement:

iv) Refund the amount paid and collect the item for replacement.

v) Submit a Bank Guarantee for the amount already paid and collect the item for replacement.

vi) Bring the replacement item to HAL and collect the rejected item.

6. Deliveries, Consequences of Breach:

The date of delivery stipulated in the Purchase Order shall be deemed to be the essence of the Contract, and delivery must be completed on or by the dates mentioned in the Purchase Order or the tender. Should the Vendor fail to deliver the stores or any consignment thereof within the period prescribed for such delivery, HAL shall be entitled at their option:

a. To recover from the Vendor as per liquidated damages, and not by way of penalty, a sum of 0.5% of the price of any stores which the vendor has failed to deliver as aforesaid, for each week or part thereof during which the delivery or such stores may be in arrears subject to a maximum of 10% of the price of the stores in default (or)

b. To purchase elsewhere, with or without notice to the Vendor on the account and at the risk of the Vendor, the stores not delivered or others of a similar description (where other exactly complying with the particulars are not available), HAL's decision in this respect will be final (or)

c. To terminate the contract in the event of action being taken under Para – (a) & (b) above, the Vendor shall be liable for any loss which HAL may sustain on the account, but the Vendor shall not be entitled to any gain on repurchases made against default.

7. Plant and Machinery Supplies:

Plant and Machinery, requiring inspection and test after erection at site if the completed plant or any portion thereof before it is taken over, is defective or fail to fulfill the requirements of the contract, HAL shall give the vendor notice setting from details of such defects or failures and the vendor shall forthwith make the defective plant good to make it comply with the requirements of the contract. Should Vendor fail to do so within a reasonable time, then HAL may reject and replace at the cost of the vendor the whole or any portion of the plant and machinery, as per the requirements of the contract, all such replacement shall be carried out by HAL, within a reasonable time, at reasonable price and where reasonably possible, to the same particulars under competitive conditions.

8. The Vendor need to comply with sustainability criteria and legal requirements of environment or pollution control and other mandatory and statutory regulations, if any, applicable from time to time, for the goods/services under procurement.

C. <u>Product Support Clauses:</u>

1 Product Support/ Obsolescence:

Considering the life of the equipment it is requested to ensure that there should not be any obsolescence issue not only in terms of items but in terms of technology also in the next 30 years. In case of obsolescence, bidder should intimate HAL at least 3 years in advance about obsolescence and should also absorb the cost for overcoming the obsolescence and provide continuous support for the next 30 years.

HAL may be requiring various spares for the offered system/item in future. Exact requirement for the spare requirement will be intimated separately. Bidder to confirm that the cumulative price of all spares of item/system should not increase the unit cost of the item/system.

Vendor shall continue to support the equipment for a minimum period of 30 years from the date of supply by making available spare parts and assemblies of the equipment supplied. For any reason Vendor wishes/ decides to close/ discontinue the line for manufacture of the products or procurement of certain components, sub-components, Vendor undertakes to notify such a decision to HAL by means of a prior 3 years notice (before closure of the said production line) in writing so as to enable HAL to place buy order/a life time buy of all spares before closure of said production line. Vendor will transfer tools, drawings etc., to HAL after such notice period. Vendor shall indicate the source from where HAL can procure these items. The said aspect would also form an integral part of the contract.

2 **Warranty:**

Warranty shall be for a period of two years as mentioned in Technical bid. The vendor shall be responsible for any defects that may develop due to faulty materials, design or workmanship and shall remedy such defects at his own cost when called upon to do so by HAL who shall state in writing in what respect the portion is faulty. If it becomes necessary for the vendor to replace or renew any defective portion of the goods the vendor shall make such replacement or renewal without any extra cost to HAL. Refer technical bid document for the same.

During warranty minimum uptime of 95% shall be ensured failing which warranty period shall deem to be proportionately extended. During warranty period equipment shall be replaced/repaired free of cost including any to & fro freight/insurance involved. Vendor shall attend to warranty calls within 7 days notice.

3 **Post-Warranty Service:**

Arrangements for after sales service and maintenance (authorized service center) on site during warranty & post warranty period should be clearly indicated providing with name, address, phone, Mob no, email Id of the contact person, infrastructure along with spare parts inventory held by your Authorized Technical Service Center. The Vendor to indicate the validity period of authorization for the technical service center.

D. <u>Clauses related to available Recourse for Breach by Vendor:</u>

1 **Liquidated Damages:**

In the event of an order, we reserve the right to deduct a sum of 0.5% per week excluding taxes of delay or part thereof, subject to a maximum of 10% as our claim-towards liquidated damages on the undelivered/delayed part of the order.

2 **Penalties for Misdemeanors:**

(Note: The below sub clause (a) and (c) both are applicable before execution of the contract or placing of Purchase Order on a successful bidder and (b) shall be applicable only after execution of contract or placing of Purchase Order.)

Without prejudice to and in addition to the rights of the HAL to other remedies as per the Tender-documents or the contract, If the HAL concludes that a

(prospective) bidder/ Vendor directly or through an agent has committed a misdemeanor in competing for the tender or in executing a contract, the HAL shall be entitled, and it shall be lawful on his part to take appropriate measures, including the following:

a) If Bidder/s bids are under consideration in any procurement:

- Enforcement of Bid Securing Declaration in lieu of forfeiture or encashment of Bid Security.
- Calling off of any pre-contract negotiations, and;
- Rejection and exclusion of Bidder from the Tender Process

b) If a contract has already been awarded:

i) Termination of Contract for Default and availing all remedies prescribed thereunder;

ii) Encashment and/ or Forfeiture of any contractual security or bond relating to the procurement;

iii) Recovery of payments including advance payments, if any, made by the HAL along with interest thereon at the prevailing rate;

c) Remedies in addition to the above:

In addition to the above penalties, the HAL shall be entitled for any of the following action/s, and it shall be lawful on his part to:

i) File information against Bidder or any of its successors, with the Competition Commission of India for further processing, in case of anti-competitive practices;

ii) Initiate proceedings in a court of law against Bidder or any of its successors, under the Prevention of Corruption Act, 1988 or the Indian Penal Code or any other law for transgression not addressable by other remedies listed in this sub-clause.

iii) Remove Bidder or any of its successors from the list of registered Vendors for a period not exceeding two years. Vendors removed from the list of registered vendors or their related entities may be allowed to apply afresh for registration after the expiry of the period of removal.

iv) Initiation of suitable disciplinary or criminal proceedings against any individual or staff found responsible.

v) Debar a bidder/ Vendor from participation in future procurements without prejudice to HAL's legal rights and remedies. Debarment shall

automatically extend to all the allied firms of the debarred firm. In the case of Joint Venture/ consortium, all its members shall also stand similarly debarred:

HAL may debar a bidder or any of its successors from participating in any Tender Process undertaken by all its procuring entities for a period not exceeding two years commencing from the date of debarment for. HAL shall maintain such a list which shall also be displayed on their website.

HAL may debar a bidder from participating in any Tender Process undertaken for a period not exceeding three years commencing from the date of debarment for misdemeanors. HAL shall maintain such a list which shall be circulated to all its Divisions.

3 Exit Clause:

Exit criteria: The contract/order may be terminated under the following circumstances:

i) In the event of unsatisfactory performance by the Vendor during the contract period, or any of the information provided by the Vendor is found to be untrue, or Vendor is found to have attempted to influence any person involved with the contract through unethical means, the contract shall be terminated with three months advance notice without any financial implication to Buyer.

Notwithstanding the foregoing, in cases where it is found that a Vendor is engaged in unethical practices, they shall be barred from participating in the future contracts for a period of two years.

ii) If there is change in Buyer requirement, contract shall be terminated with three months advance notice. The liability of Buyer in this case will be agreed mutually. In the event of termination of contract by either party the Vendor shall ensure the following:

a) IPR's are transferred to Buyer to enable Buyer to proceed on the work with other Vendor. Vendor also will render all assistance till the other Vendor fully take over the balance work.

b) Transfer title and deliver all or any part thereof of the supplies, materials, work-in-progress, finished Products, Tooling, drawings and data produced or acquired by Vendor specifically for the Product being terminated.

c) Supply of products and its components / spares at least for a period of two years from the date of such termination.

iii) The Vendor is declared bankrupt or becomes insolvent.

iv) The delivery of material is delayed due to causes of Force Majeure by more than six months.

v) Based on the decision of the Arbitration Tribunal.

4 Termination for Default of Vendor or for other reasons:

HAL shall have the right to short close present Contract in part or in full by giving 1 month prior notice to the Vendor, in any of the following cases:-

a) The work is delayed or cancelled for causes attributable to force majeure.

b) The Vendor is declared bankrupt or becomes insolvent.

c) It is noticed that the firm has utilized the services of any agent to get the resulting Order and paid any commission to such agent.

d) As per decision of the Arbitration Tribunal.

e) In case any part of the Order is subcontracted by the Vendor without prior permission of HAL.

f) If the performance of the Vendor is not found satisfactory during the execution of work.

In any of the above stated case, no claim of damage etc., by the Vendor will be allowed.

5 Insolvency:

If Vendor enters into liquidation, whether compulsory or voluntary (other than amalgamation or reconstruction with another party taking over all its rights as well as commitments) or becomes insolvent or suffers a receiver of the whole or part of its asset to be appointed,

i) Shall forthwith notify the same to HAL before initiating any liquidation process and HAL shall have the right without prejudice to his other rights or remedies to terminate the unexecuted part of this Contract.

ii) In such an event, HAL shall become entitled forthwith to get the refund within 30 days of all the advance payments received by Vendor and expenditure incurred by as a part of its obligations under this contract it has not fulfilled.

In such an event if applicable, Vendor is liable for return of any materials/items (including drawings, designs etc) to HAL, which are held at his end as a part of

the obligations under this contract.

6 **Indemnity:**

The successful bidder/Vendor shall defend, indemnify and hold HAL harmless from and against all actions, causes of action, liabilities, claims, suits, judgment, liens, awards, damages of any kind and nature whatsoever and expenses and costs of litigation to the extent such claims arise out of infringement of any IPR, patent, copyright, trademark or involve wrongful use of trade secret or confidential information or negligence attributable to the Vendor.

7 **Appropriation:**

Whenever under this contract any sum of money is recoverable from any payable by the vendor, HAL shall be entitled to recover such sum by appropriating in part or whole by deducting any sum then due or which at any time thereafter may become due to the vendor in this or any other contract entered by HAL as a whole its Divisions and Branch Offices etc., held by him alone or in partnership with others. Should this sum be not sufficient to cover the full amount recoverable, the vendor shall pay to HAL on demand the remaining balance due.

E. **Mandatory Clauses as per Ministry or Govt. of India:**

1 **Bribes and Gifts**

Any bribe, commission, gift or advantage given, promised or offered by or on behalf of the Vendor or his parties, agent or servant or any one on his or their behalf to any officer, servant, representative or agent 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 Vendor may incur, subject to the Vendor 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 thereof. 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.

2 **Immunity to Government of India**

It is understood and agreed that the Government of India is not a party to this Contract/PO and has no liabilities, obligations or rights hereunder. It is expressly understood and agreed that HAL is an independent legal entity with power and authority to enter into contracts solely in its own behalf under the applicable Laws of India and General Principles Contract Law. The vendor shall agree, acknowledge and understand that HAL is not an agent, representative or

delegate of the Government of India. It is further understood and agreed that the 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, vendor expressly waives releases and foregoes any and all actions or claims against the Government of India arising out of this contract, not to sue the Government of India as to any manner, claim, and cause of action or thing whatsoever arising out of or under this Contract/PO.

3 Agents/Agency Commission

(Note: HAL has not appointed/authorized any person/agent to deal with the vendors in respect of the said contract. In case, if someone claims and interacts with the vendors it shall be duty of the vendors to bring such instances to the notice of HAL Management).

The Vendor confirms and declares to the Buyer that the Vendor 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 Vendor; 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 Vendor 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 Vendor 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 Vendor will be liable to refund that amount to the Buyer. The Vendor 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 Vendor 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 Secured Overnight Financing Rate (SOFR) (for foreign vendor) and Marginal Cost of Funds-based Lending Rate (MCLR) of State Bank of India plus 2% per annum (for Indian vendor). The Buyer will also have the right to recover any such amount from any contracts/ Purchase order concluded earlier

with Buyer.

4 **Make In India**

Considering the present requirement, HAL suggests the successful bidder to explore the possibility of manufacturing of the offered items in India to promote Govt. of India's Make in India Policy. At this stage, HAL proposes to buy the systems/ items directly from the bidder for the firm requirement indicated above.

5 **Fall Clause**

The price quoted shall be in no event exceed the lowest price at which you sell the supplies or offer to sell supplies of identical description for similar quantity/terms to any person(s)/ organization including the purchases by any department of the Govt. of India, 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.

If at any time during the said period, the vendor reduces the sales price, sells or offers to sell such supplies to any person/ organization including the purchaser or any department of Central Govt. or any Dept. of State Govt., or any statutory undertaking of the Central or State Govt., as the case may be at a price lower than the price chargeable under the contract, Vendor shall forthwith notify such reduction/ sale or offer to sale to the HAL and the price payable under the contract for the supplies supplied after the date of coming into force of such reduction or sale or offer to sale shall stand correspondingly reduced.

F. Dispute Resolution Mechanisms

1 **Settlement of Disputes and Arbitration**

a) **Below clause is applicable to organizations other than PSUs/ DPSUs or MSEs or Foreign Vendors:**

Amicable Settlement by way of Mediation:

Any dispute or difference whatsoever arising between the parties out of or relating to the construction, meaning, scope, operation or effect of this contract or the validity or the breach thereof shall be settled by bilateral discussions initially.

If both parties wish to constitute a High-Level Committee (HLC) from external sources then preferably such committee may consist of a retired Judge or a retired High-Ranking officer and/or a technical expert in that disputed field for which both parties disputed.

The discussions shall be referred to a HLC of experts from internal or external sources, constituted by both parties to mediate on the existing difference or dispute between the Parties. Any dispute, which cannot be settled amicably, within 90 days or till such date/period as mutually extended from the date on which both Parties constitutes the HLC and the same is not covered in Arbitration proceedings also, then such dispute, disagreement or question which exists, shall be referred for adjudication by the Courts.

The Committee internal or external may contain sole or such odd numbers where one member shall be the Presiding officer of the mediation process and committee shall be well versed in the field of mediation.

Any settlement agreement arrived through above Mediation process requires prima facie approval of Competent Authority of HAL (on behalf of HAL) before parties signing such settlement agreement or it becomes final.

Each party shall bear its own cost of preparing and presenting its case. The cost of Mediation including the fees and expenses of the Mediators shall be shared equally between the Parties, unless otherwise agreed in mediation.

Except as may be required by law, neither a party nor its representatives may disclose the existence, content, or results of any mediation hereunder without the prior written consent of other party.

Arbitration:

(Note: Arbitration shall be invoked if the value of the disputed claim is less than Rs 10 Crore only)

The Arbitration Proceedings shall be conducted in India under the Indian Arbitration and Conciliation Act, 1996 and its subsequent amendments from time to time. The award of such Arbitration shall be enforceable in Indian Courts only. The arbitration tribunal shall be consisting of Sole Arbitrator, who shall be nominated by both parties mutually within one (1) month from the date of invoking Arbitration clause by the effected party, failing which the Arbitrator may be nominated under the provisions of Indian Arbitration and Conciliation Act, 1996 and its subsequent amendments from time to time.

In case if both Parties agree for an Arbitration Tribunal consisting of three Arbitrators, then out of three Arbitrators two Arbitrators shall be appointed by each party to the Contract and the so appointed two Arbitrators shall jointly appoint the third Arbitrator who shall be the Presiding officer.

In the event of a vacancy caused in the office of the Arbitrator, the party/parties which/who nominated such Arbitrator shall be entitled to nominate another in the place of retiring/outgoing Arbitrator and the arbitration proceedings shall continue from the stage they were left by the retiring Arbitrator.

The seat of Arbitration shall be at Bengaluru, India and the language of the Arbitration shall be English. The award of the Arbitration shall be final and binding between the parties to this Contract/PO.

Each party shall bear its own cost of preparing and presenting its case. The cost of Arbitration including the fees and expenses of the Arbitrator shall be shared equally between the Parties, unless otherwise awarded by the Arbitration Tribunal.

Except as may be required by law, neither a party nor its representatives may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of other party.

b) Applicable only for MSEs:

The Micro, Small and Medium Enterprises Development (MSMED) Act, 2006 provides parties to a dispute (where one of the parties is a Micro or Small Enterprise) to be referred to Micro and Small Enterprises Facilitation Council if the dispute is regarding any amount due under Section 17 of the MSMED Act, 2006. If a Micro or Small Enterprise, being a party to dispute, refers to the provisions in MSMED Act 2006, these provisions shall prevail over the Indian Arbitration and Conciliation Act, 1996.

c) Settlement of Disputes and Arbitration with PSUs/ DPSUs:

(Note: May also refer below guidelines:

a) DPE D.O. No. 15(9)/86-BPE(Fin) dt. 29-03-1989
b) HAL Commercial Circular vide no. 59, dt. 25-08-1989
c) O.M. No. 334774/DoLA/AMRD/2019 dt. 31-03-2020
d) HAL CO Circular vide no. HAL/HR/24(9)-2/2022 dt. 26-12-2022)

In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such disputes or

differences shall be taken up by either party for resolution through AMRCD (Administrative Mechanism for Resolution of CPSE's Disputes) as mentioned in DPE **OM No. 05/0003/2019-FTS-10937 dated 14-12-2022** and the decision of AMRCD on the said dispute will be binding on both the Parties.

d) Settlement of Disputes and Arbitration for Foreign Vendors:

Amicable Settlement:

Any dispute or difference whatsoever arising between the parties out of or relating to the construction, meaning, scope, operation or effect of this contract or the validity or the breach thereof shall be settled by bilateral discussions.

In case of technical disputes involving confidential matters, the issue shall be referred to a high-level technical authority for each party, appointed for this purpose.

Any dispute, which cannot be settled amicably as above, within 60 days from the date on which either party informs the other in writing by a notice that such dispute, disagreement or question exists, shall be settled by Arbitration.

Arbitration:

The arbitration tribunal shall be consisting of sole arbitrator. The arbitrator, who shall not be a citizen or domicile of the country of either of the parties or of any other country unacceptable to any of the parties, shall be nominated by the parties within ninety (90) days of the receipt of the notice mentioned above, failing which the arbitrator may be nominated and Arbitration shall be conducted under the provisions of Indian Arbitration and Conciliation Act, 1996 or by dispute resolution institution like International Centre for Alternative Dispute Resolution (ICADR) or India International Arbitration Centre (IIAC).

The Arbitration Proceedings shall be conducted in India under the Indian Arbitration and Conciliation Act, 1996 and its subsequent amendments from time to time. The law applicable to conducting Arbitration shall be Indian Laws.

The Arbitration Tribunal shall have its seat in India. The language of the arbitration shall be English. The award of the Arbitration shall be final and binding between the parties to this Contract/PO. The award of such Arbitration shall be enforceable in Indian Courts only.

Each party shall bear its own cost of preparing and presenting its case. The cost of Arbitration including the fees and expenses of the arbitrator shall be shared equally by the Vendor and the HAL, unless otherwise awarded by the Arbitration Tribunal.

Except as may be required by law, neither a party nor its representatives may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of (all/both) parties.

(Note: In case, the Foreign Vendor doesn't agree for above Arbitration clause with Indian Law and the vendor insists for a neutral country law, then below clause need to be included in the Contract/PO in place of above clause.)

The Arbitration Tribunal shall be consisting of sole Arbitrator. The Arbitrator, who shall not be a citizen or domicile of the Country of either of the Parties or of any other Country unacceptable to any of the Parties, shall be nominated by the Parties within ninety (90) days of the receipt of the notice mentioned above, failing which the arbitrator may be nominated and conduct the Arbitration in accordance with the Rules of the ICC International Court of Arbitration (ICA).

The seat and place of any such arbitration will be in Paris, France and the language of the Arbitration will be English. The award of the Arbitration shall be final and binding on the parties to this contract/PO.

Each party shall bear its own cost of preparing and presenting its case. The cost of Arbitration including the fees and expenses of the arbitrator shall be shared equally by the Vendor and HAL, unless otherwise awarded by the Arbitration Tribunal.

Except as may be required by law, neither a party nor its representatives may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of both parties.

2 Supply and Payment during Arbitration:

Supply 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.

3 Jurisdiction and Governing/Applicable laws:

The Court at Bangalore only shall have jurisdiction to deal with and to decide any legal matter whatsoever arising out of this contract.

This contract shall be governed by and subject to and interpreted and construed in accordance with the Laws of Republic of India, which are in force from time to time.

Nothing in this contract shall entitle the Parties to this contract to exercise the rights, privilege and powers conferred under this contract in any manner which will contravene the Laws of India.

G. Payment related clauses:

Preferred Payment Terms: In the event of an order, 100% payment will be made within 30 days after final acceptance of equipment (Including installation commissioning training and prove out of equipment) duly certified by Engineer In Charge by RTGS or any other latest Electronic Payment remittance mode.

HAL is registered on TReDS platform (Trade Receivable Discounting Systems), as being promoted by GOI directives. It is suggested that all the MSME Vendors to take note of the same and consider for registration on any TReDS platform and avail the platform services which is being made available as per Government initiative.

Firm Prices

The contract prices will be firm and fixed as per contract terms till execution of contract and exclude subsequent claims or price increases of any kind.

Taxes:

1 In respect of Foreign bidders, bidders has to bear all taxes, duties and levies payable in their country and HAL will bear all statutory levies, other than withholding tax and Goods & Service tax, payable in India.

2 **Withholding Tax** (If applicable appropriate clause needs to be included in the RFQ).

a) HAL would be deducting at source applicable Income Tax as per Government of India Rules applicable at the time of making payments in respect of services rendered in India. (Generally, on the amounts towards services like training, technical assistance offered by the bidder and Licence 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 bidder on deduction of such amounts, if applicable.

b) Bidder should bear the applicable withholding income tax in India. Tax would be deducted at source by HAL as per Double Taxation Avoidance Agreement (DTAA) where the bidder could claim the benefit of double taxation in their country as per the bilateral

agreement between the two countries. Certificate to this effect would be issued by HAL to enable the bidder to claim the benefit under DTAA.

c) Bidder is required to indicate the PAN No. issued by Indian Income Tax Authorities.

3 For Indian Vendors taxes applicable to be indicated separately. Failing which the unit rate will be considered as all Inclusive.

Payment For Stores/Supplies:

Unless otherwise agreed to between the parties, HAL will affect payment for the delivery of the stores by Electronic Bank Transfer (ECE/RTGS) to the Vendor's bank account as notified to HAL on submission of bills in triplicate. Payment for the stores on each delivery will be made to the vendor after goods are received and passed by inspection. Normally 30 days will be allowed for inspection after receipt of goods.

Statutory Variation Clause:

Unless otherwise stated in the contract, statutory increase in applicable GST rate only during the original delivery period shall be to Procuring Entity's/Buyer account. Any increase in the rates of GST beyond the original completion date during the extended delivery period shall be borne by the Vendor. The benefit of any reduction in GST rate must be passed on to the Procuring Entity/Buyer during the original and extended delivery period. However, GST rate amendments shall be considered for quoted HSN code only, against documentary evidence, provided such an increase of GST rates takes place after the last date of bid submission.

4. Confidentiality and IPR related clauses

1 **Confidentiality**

The Vendor shall hold confidential technical data and information supplied by the Purchaser or on behalf of the Purchaser and shall not reproduce any such technical data or information or divulge the same to any third party without the prior written consent of the Purchaser. The Purchaser shall hold confidential technical data and information supplied by the Vendor or on behalf of the Vendor and shall not reproduce any such technical data or information or divulge the same to any third party without prior written consent of the Vendor except as far as may be necessary for either party to carry out its obligations under this Contract.

Part – A:

IPR Clause for indemnification of HAL in case of Infringement of Third Party IPR:

a) HAL shall have the right to use the Supplies/Services procured under the contract

that may contain any Intellectual Property/ Intellectual Property Rights. Vendor shall indemnify and protect at its own cost, HAL in respect of cost/claims/ liabilities (including attorney's fees) arising from any violation of Intellectual Property Rights of any third party with respect to Supplies/Services provided by 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, 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 the amount equivalent to the cost of supplies procured/ to be procured, development cost already paid to Vendor and damages suffered by HAL arising due to inability to put to use the supplies/ services or a portion thereof.

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.

H. Miscellaneous/Boilerplate Clauses:

Relationship of the Parties:

It is understood that each party is an independent party and that all personnel engaged in the work under the Purchase Order/s that are supplied by either party shall in no sense be employees of the other party.

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.

I. Counterparts:

This Agreement/Contract shall be signed in two counterparts, each of which will be deemed as an original document.

J. Survival of Special Clauses:

The clauses dealing with arbitration and confidentiality shall survive and continue

to have effect after the expiry or termination for any reason whatsoever of the services placed.

K. Assignment/Subcontract:

Neither of the parties of this contract shall be entitled without the other party's consent to assign or transfer to a third party all or part of the benefits or obligations of this contract/PO. Provided the assigning party shall issue prior notice of 30 days to the other party conveying its intention to assignment/subcontract to third party and the other party whose consent is sought shall not delay more than 30 days from the date of receipt of such request.

L. Amendment to Contract/PO:

Any amendment to Contract/ Purchase Order would be enforceable only if made in writing and duly signed by authorized representatives of both the parties hereto.

M. Waiver:

Failure of either Party at any time to enforce any of the provisions of this Contract/PO shall not per se constitute a waiver by that Party of any such provisions nor in anyway affect the validity of the Contract/PO or any part hereof.

N. Entire Agreement:

This Contract/PO contains the entire agreement between the parties with respect to the subject matter of this Contract/PO and supersedes any prior representations or agreements, oral or written, and all other communications between the parties relating to the subject matter of this Contract/PO. This Contract/PO will not be varied except in writing signed by an authorized representative of each Party.

O. Severability:

If any provision or portion of a provision of this Contract/PO is determined to be illegal, invalid, or unenforceable by Law/Regulation/Court, then that portion or provision will be stricken/deleted and the validity and enforceability of the remaining provisions of Contract/PO will not be affected.

P. Force Majeure:

1 For Indian Vendor

On the occurrence of any unforeseen event, beyond the control of either Party, directly interfering with the delivery of Services arising during the currency of the contract, such as war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, or acts of God, the affected Party shall, within

a week from the commencement thereof, notify the same in writing to the other Party with reasonable evidence thereof. Unless otherwise directed by the Procuring Entity in writing, the Vendor shall continue to perform its obligations under the contract as far as reasonably practicable and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event. If the force majeure condition(s) mentioned above be in force for 90 days or more at any time, either party shall have the option to terminate the contract on expiry of 90 days of commencement of such force majeure by giving 14 days' notice to the other party in writing. In case of such termination, no damages shall be claimed by either party against the other, save and except those which had occurred under any other clause of this contract before such termination.

Notwithstanding the remedial provisions like Liquidated Damages or Termination, none of the Party shall seek any such remedies or damages for the delay and/or failure of the other Party in fulfilling its obligations under the contract if it is the result of an event of Force Majeure.

2 For Foreign Vendor

If at any time during the execution of the supply order, the performance in whole or in part by either HAL or and by Vendor is delayed by any reason of force majeure situations such as:

a) earthquakes, landslides;

b) explosion and fire, unless as a direct result of Vendor negligence or acts or omissions;

c) riot, commotion, sabotage or civil disorder, unless solely restricted to employees of Vendor;

d) contamination by radio-activity from any nuclear fuel, nuclear waste or radio-active toxic explosion;

e) War, hostilities (whether or not war is declared), invasion, act of foreign enemies or embargo;

f) Rebellion, revolution, insurrection, or military or usurped power or civil war.

g) Any natural calamities like epidemics or pandemics as declared by Government or any Government sanctions imposed from time to time.

Acts of God & laws of respective governments or any other causes beyond the control of either parties, hereinafter referred to as "events", provided notice of the occurrence of such event/s is/are communicated by either party,

to the other party within 21 days from the date of occurrence thereof, neither party shall by reason of such events be entitled to terminate the contract nor shall either party have any claim for damages against the other in respect of such non-performance and or delay in performance of the contract / order. Executions on either side shall be resumed as soon as practicable after such event has come to an end or ceased to exist and the decision of HAL as to whether activities can resume or not, shall be conclusive and final. Occurrence of the event to be certified by Chamber of Commerce / Indian High Commission or Embassies / Government in that Country.

The performance in whole or in part under the captioned order/ contract is prevented or delayed by reason of any such event for a period exceeding sixty days either party may at its option terminate the contract / further processing of the order/contract. The relative obligations of both the parties remain suspended during the actual period of force majeure.

The effected Party shall take all necessary measures and steps to mitigate the delay upon resuming the works or on end of the force majeure event. The HAL may extend the delivery schedule as mutually agreed, on receipt of written communication from Vendor regarding occurrence of 'Force Majeure' conditions, but not exceeding three months from the scheduled delivery date. If the 'Force Majeure' conditions extend beyond this period, the HAL shall have the right to cancel the order without any financial implication to Vendor or on terms mutually agreed.

4 Delivery:

a) Deliveries quoted should be in line with the details as mentioned in Technical bid.

b) Please confirm whether the item/equipment quoted/ offered is of-the-shelf or to be manufactured specific-to-type. If the items/equipment is manufactured specific-to-type, bidder to quote firm delivery schedule taking into consideration of the period actually required based on the complexity of the equipment. In the event of an order, HAL reserve the right to claim towards liquidated damages on the undelivered part of the order. This clause will be strictly followed by HAL. Therefore your delivery schedule should be firm and definite in line with the technical bid.

c) Bidder to note that the delivery schedule should be for:

   i) Period required for the delivery/dispatch of equipment and

   ii) Period required for installation and commissioning of the subject equipment after intimation from HAL about readiness of the site.

5 Export Licence:

Vendors should categorically confirm the availability/ability to obtain of export license from their government for exporting the system. Vendor shall be required to obtain and maintain all Export/Import licenses and permits etc., as the case may be, required for performing supplies against this tender. Obtaining export license shall be entire responsibility of the vendor with in the delivery schedule.

6 Export Licence Permission:

i) A specific confirmation from Bidders/Vendors on availability of export license from their respective Government should be provided and a copy of such relevant permission/license issued should be enclosed.

ii) Bidders/Vendors shall be required to obtain and maintain all Export/Import licenses and permits etc., as the case may be, required for performing supplies against this tender. Obtaining export license and timely availability shall be entire/sole responsibility of the Bidders/Vendors, which forms a part of obligations of the contract. However, any unforeseen delay should be promptly informed to HAL with proper justification.

If End user certificate is required from HAL, the format of the same may be enclosed with this offer.

iii) Bidders/Vendors may indicate status of export permit based on the present rules/regulations of their respective country and normal time frame for obtaining such export permission if an order is placed in near future and the said time frame should be covered within the delivery schedule indicated.

iv) Bidders/Vendors should also confirm that necessary clearances are available/ will be made available from their Governmental authorities regarding the sharing of technical data required on a need-to-know basis.

v) The prices to be quoted by Bidders/Vendors for exports should be competitive in international market scenario.

7 Limitation of Liability:

Except in cases of criminal negligence or willful 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.

8 Others

a) Please furnish list of similar equipment supplied in or anywhere in India with

customer's full address, value and telephone/telex etc.

b) Please indicate if any training arrangements for item/system in India and factory acceptance test.

c) Please also indicate necessary onsite technical support during installation of the system at no extra cost.

d) Vendors should ensure the availability of spares of the offered products as mentioned in technical bid.

e) Operation manuals/ maintenance manual should accompany the system at no extra Cost as specified in the technical bid

f) Please also indicate status of export permit based on the present rules/regulations of your country and normal time frame for obtaining such export permission if an order is placed on you in near future and the same should be covered within the delivery schedule indicated.

g) Vendors (OEMs) while submitting the proposal should categorically declare that items quoted by them are their own manufactured products and are not resold (2nd sale). Offers without such declaration are likely to be ignored.

h) Quotation should accompany the detailed catalogues and literature.

i) The Harmonized System of tariff nomenclature against the items for which quotation is rendered should be indicated.

j) HAL conditions of contract will govern any resultant order arising out of the enquiry (copy on application) and bidder's quotation will be subject to the said conditions.

ENCLOSURE TO TENDER NO: F/DGM(IMM)/CAP/924/1

COMMERCIAL TERMS & CONDITIONS

(PLEASE INDICATE YOUR RESPONSE/ COMPLAINCE/ ACCEPTANCE TO THE FOLLOWING TERMS)

Vendor /supplier name:-

Sl No	Description	Vendor /supplier's Compliance
1	**Price:**	
1.1	The quoted prices shall be indicated in the price bid as per required delivery schedule. Prices should be in the currency of the country of supply or any other foreign convertible foreign country such as Euro/USD/GBP, etc. a) HAL being manufacturers, Vendor to indicate in the quotation manufacturers discount if any. b) Vendor to confirm that the prices quoted are the lowest export price and is the same as they would normally quote to Government Department. c) Price quoted should be net of Incoterms DPU. d) Quoted Price should be firm and fixed including complete scope of work.	
2	**Packing:**	
2.1	The Vendor will be responsible for the stores being sufficiently and properly packed for tropical storage and for transport by rail, road, sea or air so as to ensure their being free from loss or injury on arrival at their destination. The packing and marking of packages shall be done by and at the expense of the Vendor. Each package shall contain a Packing Note quoting Purchase Order number and date showing its contents in detail. Each package shall be properly marked with Purchase Order No., Consignee's name & address, package-handling instructions etc. The packages will be marked "HAL" appropriately on all sides for the purpose of easy identification. The package shall have adequate provision for handling during transit. Further, items shall be packed for long storage also. Hazardous packing/ IATA charge if any, if to be borne by HAL, should be clearly indicated in the quotation, else the same shall be considered as already included in the quoted unit price.	
2.2	Details of the machine serial numbers and other required information should be affixed as label on the packing. The packing should indicate the directional representation and directions with safety instructions for unpacking as a label on he packing.	
2.3	All assemblies to be identified with unique part numbers and Individual parts to be identified with part number if packed seperately from any assy. The packing list accompanying the shipment should reflect the same.	
2.4	Whererever applicable the name plate on the part should include the software version implemented in the part.	
2.5	The number of Packages/Consignements against each equipment should be mentioned on the package. Example (Package 1 of 20)	
3	**Warranty:**	
3.1	Vendor /supplier warrants that each product shall be free from defects in materials and workmanship, in conformance to the specification and fit for the intended purpose and undisputed title of the product before selling the same to HAL.	
3.2	**Warranty Period:** The warranty period shall be twenty four (24) months from the date of installation commissioning prove out and final acceptance of the machine at HAL in line with technical bid.	
3.3	Warranty will cover all manufacturing defects and will be attended to by the Vendor /supplier on free of cost basis including to & fro transportation. Vendor /supplier would either carryout repair / re-work of the items returned under warranty or replace the item in case of repair / rework is not feasible. The cost of repair / replacement inclusive of to & fro charges of defective unit would be borne by the Vendor /supplier. Supplier shall respond to warranty calls within 07 days notice	
3.4	If the item fails under warranty period, for the purpose of computation of the remaining warranty period, the warranty period of said item shall be reputed to have stopped from the date of intimation of failure by HAL and to have restarted on the date of receipt of repaired/replaced item at HAL	
4	**Liquidated Damages:**	
4.1	The date of delivery stipulated in the Purchase Order shall be deemed to be the essence of the Contract and delivery must be completed on or before the dates mentioned in the Purchase Order. The Vendor shall not supply the items more than 30 days before the scheduled date unless and until requested by HAL. Should the supplier fail to deliver the stores or any consignment thereof within the period prescribed for such delivery, HAL shall be entitled to recover from the supplier as per liquidated damages, and not by way of penalty, a sum of 0.5% of the price of any stores which the Supplier has failed to deliver as aforesaid, for each week or part thereof during which the delivery or such stores may be in arrears subject to a maximum of 10% of the price of the stores in default.	

ENCLOSURE TO TENDER NO: F/DGM(IMM)/CAP/924/1
COMMERCIAL TERMS & CONDITIONS

(PLEASE INDICATE YOUR RESPONSE/ COMPLAINCE/ ACCEPTANCE TO THE FOLLOWING TERMS)

Vendor /supplier name:-

Sl No	Description	Vendor /supplier's Compliance
5	**Penalties for Misdemeanours:**	
5.1	Without prejudice to and in addition to the rights of HAL to other remedies as per the Tender-documents or the contract, If HAL concludes that a (prospective) Vendor/ Supplier directly or through an agent has committed a misdemeanour in competing for the tender or in executing a contract, HAL shall be entitled, and it shall be lawful on his part to take appropriate measures, including the following: a) If Vendor/s bids are under consideration in any procurement: i) Enforcement of Bid Securing Declaration in lieu of forfeiture or encashment of Bid Security. ii) Calling off of any pre-contract negotiations, and; iii) Rejection and exclusion of Vendor from the Tender Process	
5.2	If the Vendor/supplier is awarded the contract i) Termination of Contract for Default and availing all remedies prescribed thereunder; ii) Encashment and/ or Forfeiture of any contractual security or bond relating to the procurement; iii) Recovery of payments including advance payments, if any, made by HAL along with interest thereon at the prevailing rate	
5.3	In addition to the above penalties, HAL shall be entitled for any of the following action/s, and it shall be lawful on its part to: i) File information against Vendor or any of its successors, with the Competition Commission of India for further processing, in case of anti-competitive practices; ii) Initiate proceedings in a court of law against Vendor or any of its successors, under the Prevention of Corruption Act, 1988 or the Indian Penal Code or any other law for transgression not addressable by other remedies listed in this sub-clause. iii) Remove Vendor or any of its successors from the list of registered suppliers for a period not exceeding two years. Suppliers removed from the list of registered vendors or their related entities may be allowed to apply afresh for registration after the expiry of the period of removal. iv) Initiation of suitable disciplinary or criminal proceedings against any individual or staff found responsible. v) Debar a Vendor/ Supplier from participation in future procurements without prejudice to HAL's legal rights and remedies. Debarment shall automatically extend to all the allied firms of the debarred firm. In the case of Joint Venture/ consortium, all its members shall also stand similarly debarred: HAL may debar a Vendor or any of its successors from participating in any Tender Process undertaken by all its procuring entities for a period not exceeding two years commencing from the date of debarment. HAL may debar a Vendor from participating in any Tender Process undertaken for a period not exceeding three years commencing from the date of debarment for misdemeanors. HAL shall maintain such a list which shall be circulated to all its Divisions.	
6	**Deliveries, Consequences of Breach /Risk Purchase:**	
6.1	The date of delivery stipulated in the Purchase Order shall be deemed to be the essence of the Contract, and delivery must be completed on or by the dates mentioned in the Purchase Order or the tender. Should the Vendor fail to deliver the stores or any consignment thereof within the period prescribed for such delivery, HAL shall be entitled at their option: a. To recover from the Vendor, liquidated damages as per the Liquidated damages clause above b. To purchase elsewhere, with or without notice to the Vendor on the account and at the risk of the Vendor, the stores not delivered or others of a similar description (where other exactly complying with the particulars are not available), HAL's decision in this respect will be final (or) c. To terminate the contract in the event of action being taken under Para – (a) & (b) above, the Vendor shall be liable for any loss which HAL may sustain on the account, but the Vendor shall not be entitled to any gain on repurchases made against default.	
6.2	Indicate the delivery lead time in terms of weeks / months from the date of receipt of order . Deliveries quoted should be firm or as per the schedule indicated in the Technical bid.	
6.3	Please confirm that items shall be delivered on DPU (INCOTERMS 2020)	
6.4	**Monitoring of Progress of the Order:** After the placement of Purchase Order, the progress of execution of the order will be monitored by HAL for compliance with various activities towards achieving Contract and delivery schedule milestones. In case the Order execution does not proceed as per the agreed timelines for various contractual milestones, the Buyer will have the right to invoke termination of the Order. Supplier is to abide by the timelines for delivery milestones. The supplier shall update the progress of execution of the contract at regular intervals of time like every 15 days or 30 days as suitable or mutually agreed.	

ENCLOSURE TO TENDER NO: F/DGM(IMM)/CAP/924/1
COMMERCIAL TERMS & CONDITIONS

(PLEASE INDICATE YOUR RESPONSE/ COMPLAINCE/ ACCEPTANCE TO THE FOLLOWING TERMS)

Vendor /supplier name:-

Sl No	Description	Vendor /supplier's Compliance
7	**Settlement of Disputes and Arbitration:**	
7.1	**Amicable Settlement:** Any dispute or difference whatsoever arising between the parties out of or relating to the construction, meaning, scope, operation or effect of this contract or the validity or the breach thereof shall be settled by bilateral discussions. In case of technical disputes involving confidential matters, the issue shall be referred to a high level technical authority for each party, appointed for this purpose. Any dispute, which cannot be settled amicably as above, within 60 days from the date on which either party informs the other in writing by a notice that such dispute, disagreement or question exists, shall be settled by Arbitration.	
7.2	**Arbitration:** The Arbitration Proceedings shall be conducted in India under the Indian Arbitration and Conciliation Act, 1996 and its subsequent amendments from time to time. The award of such Arbitration shall be enforceable in Indian Courts only. The law applicable to conducting arbitration shall be Indian law. (Note: Indian law or foreign law to be negotiated and decided by the parties to contract and need to modify accordingly). The arbitration tribunal shall be consisting of sole arbitrator. The arbitrator, who shall not be a citizen or domicile of the country of either of the parties or of any other country unacceptable to any of the parties, shall be nominated by the parties within ninety (90) days of the receipt of the notice mentioned above, failing which the arbitrator may be nominated under the provisions of Indian Arbitration and Conciliation Act, 1996 or by dispute resolution institution like International Centre for Alternative Dispute Resolution (ICADR) or India International Arbitration Centre (IIAC). In case, nomination of sole arbitrator under Indian Arbitration and Conciliation Act, 1996 or by dispute resolution institution like ICADR/IIAC is not acceptable to either of the parties, then the sole arbitrator may be nominated by the President of International Chamber of Commerce, Paris, but the said nomination would be after consultation with both the parties and shall preclude any citizen with domicile of any country as mentioned above.68 The Arbitration Tribunal shall have its seat in India. The award of the Arbitration shall be final and binding on the parties to this contract. Each party shall bear its own cost of preparing and presenting its case. The cost of Arbitration including the fees and expenses of the arbitrator shall be shared equally by the Vendor and the HAL, unless otherwise awarded by the Arbitration Tribunal. The language(s) of the arbitration shall be English. Except as may be required by law, neither a party nor its representatives may disclose the existence, content, or results of any arbitration hereunder without the prior written consent of (all/both) parties.	
7.3	**Supply and Payment during Arbitration:** Supply 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.	
8	**Jurisdiction /Applicable laws:**	
8.1	The Court at Bangalore only shall have jurisdiction to deal with and to decide any legal matter whatsoever arising out of this contract. This contract shall be governed by and subject to and interpreted and construed in accordance with the Laws of Republic of India, as may be in force from time to time. Nothing in this contract shall entitle the Parties to this contract to exercise the rights, privilege and powers conferred under this contract in a manner which will contravene the Laws of India.	

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Vendor /supplier name:-

Sl No	Description	Vendor /supplier's Compliance
9	**Agent / Agency Commission:**	
9.1	(Note: HAL has not appointed/authorized any person/agent to deal with the vendors in respect of the said contract. In case, if someone claims and interacts with the vendors it shall be duty of the vendors to bring such instances to the notice of HAL Management). The Vendor confirms and declares to the buyer that the Vendor 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 Vendor; 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 Vendor 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 Vendor 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 Vendor will be liable to refund that amount to the Buyer. The Vendor 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 Vendor 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 Secured Overnight Financing Rate (SOFR) (for foreign vendors) and Marginal Cost of Funds-based Lending Rate (MCLR) plus 2% per annum (for Indian vendors). The Buyer will also have the right to recover any such amount from any contracts/ Purchase Order concluded earlier with Buyer.	
10	**Terms of Payment:**	
10.1	In the event of an order, 100% payment will be made within 30 days after final accepteance.	
11	**Export License:**	
11.1	Vendor should categorically confirm the availability/ability to obtain of export license from their government for exporting the system. Vendor shall be required to obtain and maintain all Export/Import licenses and permits etc., as the case may be, required for performing supplies against this tender. Obtaining export license shall be entire responsibility of the vendor within delivery period.	
12	**Taxes:**	
12.1	Vendor has to bear all taxes, duties and levies payable in their country and HAL will bear all statutory levies, other than withholding tax and Goods & Service tax, payable in India.	
12.2	**Withholding Tax:**	
	HAL would be deducting at source applicable Income Tax as per Government of India Rules applicable at the time of making payments in respect of services rendered in India. (Generally on the amounts towards services like training, technical assistance offered by the bidder and Licence 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 bidder on deduction of such amounts, if applicable.	
	Bidder should bear the applicable withholding income tax in India. Tax would be deducted at source by HAL as per Double Taxation Avoidance Agreement (DTAA) where the bidder could claim the benefit of double taxation in their country as per the bilateral agreement between the two countries. Certificate to this effect would be issued by HAL to enable the bidder to claim the benefit under DTAA.	
	Bidder is required to indicate the PAN No. issued by Indian Income Tax Authorities if available.	
13	**Immunity to Government of India:**	
13.1	It is understood and agreed that the Government of India is not a party to this agreement and has no liabilities, obligations or rights hereunder. It is expressly understood and agreed that HAL is an independent legal entity with power and authority to enter into contracts solely in its own behalf under the applicable Laws of India and General Principles Contract Law. The vendor shall agree, acknowledge and understand that HAL is not an agent, representative or delegate of the Government of India. It is further understood and agreed that the 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, vendor expressly waives releases and foregoes any and all actions or claims against the Government of India arising out of this contract, not to sue the Government of India as to any manner, claim, and cause of action or thing whatsoever arising out of or under this agreement.	
14	**Confidentiality:**	

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Vendor /supplier name:-

Sl No	Description	Vendor /supplier's Compliance
14.1	The vendor shall hold confidential technical data and information supplied by the Purchaser or on behalf of the Purchaser and shall not reproduce any such technical data or information or divulge the same to any third party without the prior written consent of the Purchaser. The Purchaser shall hold confidential technical data and information supplied by the vendor or on behalf of the vendor and shall not reproduce any such technical data or information or divulge the same to any third party without prior written consent of the vendor except as far as may be necessary for either party to carry out its obligations under this Contract. Non-adherence to this confidentiality clause by the Bidder/Contractor/vendor shall be treated, as a material breach of this Tender/Contract/Agreement. The provisions of this clause shall survive and remain in force notwithstanding the termination or expiry of this Contract/Agreement.	
15	**Validity:**	
15.1	Price quoted should be net and unless otherwise specified should remain valid for a minimum of **180 days** from the closing date of tender.	
16	**Limitation of Liability:**	
16.1	Except in cases of criminal negligence or wilful misconduct, the aggregate liability of the Supplier to 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 Supplier to indemnify HAL concerning IPR infringement.	
17	**Effective/Commencement Date:**	
17.1	Effective/Commencement Date (T0): deliveries of supplies and performance of the services shall commence as from the date T0, which shall be the date of receipt of order acceptance.	
18	**Documents/ Inspection-quality assurance- acceptance:**	
18.1	Supplier should provide all the documents as mentioned in the technical and price bid	
18.2	**Malicious Code Certificate:** Vendor is required to submit a 'Malicious Code Certificate' (only for Electronic items and Software) as per Appendix-1 along with the offer/ each supply.	
18.3	**Documentation Retention Period:** All documents related to supplies shall be retained by the vendor for 10 years.	
19	**Inspection, Consequences of Rejection:**	
19.1	The goods on receipt in HAL will be subject to inspection and tests, if necessary and HAL inspector's decision as regards acceptance/rejection of goods shall be final and binding between the parties. If any stores are rejected, then HAL shall be at liberty to: a) Either: i) Allow the vendor to re-submit stores in replacement of those rejected within a time specified by HAL, the vendor bearing the cost of freight in such replacement without being entitled to any extra payment, (or) ii) Buy the quantity of stores rejected or other of a similar nature elsewhere at the risk and cost of the vendor without effecting the vendor's liability as regards the supply of any further consignments due under the contract, (or) iii) Terminate the contract and recover from the vendor the loss HAL may thereby incur. The vendor shall not be entitled to any gain on the repurchase, b) Any stores rejected by HAL's Inspector must be removed by the vendor within 14 days from the date of receipt of intimation of rejection and at his own cost, failing which the vendor shall be liable to pay storage charges at 1% for each day of delay on the invoice value of the stores. If the stores are not removed within a month from the date of intimation of rejection, the stores will be liable, to be sold by HAL at the vendor's risk and responsibility and the proceeds adjusted towards storage charges. c) In case any payment is made against delivery and it is found that the supplied item is rejected during inspection/commissioning, vendor will be required to choose any one of the following options to collect the rejected item for replacement: i) Refund the amount paid and collect the item for replacement. ii) Submit a Bank Guarantee for the amount already paid and collect the item for replacement. iii) Bring the replacement item to HAL and collect the rejected item.	

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Vendor /supplier name:-

Sl No	Description	Vendor /supplier's Compliance
20	**Quality & Workmanship:**	
20.1	1) Generally the stores shall be of the best quality and workmanship. Contractor shall comply with the contract in all respects be to the satisfaction of HAL. Where tenders are called for in accordance with 'particulars', the contractor's tenders to supply in accordance with such `particulars' shall be deemed to be an admission on his part that he has fully acquainted himself with the details thereof and no claim on his part which may arise on account of non-examination or insufficient examination of the 'particulars' will in any circumstances be considered. The contractor shall supply the stores in accordance with the 'particulars' unless any deviation is authorised as an exception expressly specified in the Purchase Order. 2) The Stores/Goods supplied shall conform to the standards, if mentioned in the Technical Specifications, or, where no applicable standard is mentioned, to the authoritative standards appropriate to the Goods' country of origin. Such standards shall be the latest issued by the concerned institution.	
21	**Counterfeit Parts:**	
21.1	Seller represents and warrants that it has policies and procedures in place to ensure that none of the supplies or materials furnished under this Purchase Order/contract are "counterfeit parts" and certifies, to the best of its knowledge and belief that no such parts have been or are being furnished to Buyer by Seller. "Counterfeit parts" are parts that may be of new manufacture, but are misleadingly labelled to provide the impression they are of a different class or quality or from a different source than is actually the case. They also include refurbished parts, complete with false labelling, that are represented as new parts or any parts that are designated as counterfeit by any Government/Authority under control, and If Buyer reasonably determines that Seller has supplied counterfeit parts to Buyer, Buyer shall promptly notify Seller and Seller shall immediately replace the counterfeit parts with parts acceptable to Buyer. Notwithstanding any other provision contained herein, Seller shall be liable for all costs incurred by Buyer to remove and replace the counterfeit parts, including without limitation to any loss/ damage in part/full to Aircraft caused due to such counterfeit part and Buyer's external and internal costs of removing such a counterfeit parts, of reinsertingreplacement parts and of any testing necessitated by the reinstallation of Seller's goods after counterfeit parts have been exchanged. In addition, Buyer may unilaterally terminate this order for Convenience depending on the impact of the delivery of Counterfeit parts on the Seller's overall performance on this order. Seller's warranty against counterfeit parts shall survive any termination or expiration of this Purchase Order/Contract. Buyer reserves the right to seize and quarantine any / all counterfeit products it receives from Seller on this Purchase Order/Contract. Counterfeit products may be forwarded to the Original Component Manufacturer and / or the appropriate authority for final analysis, possible confiscation and / or destruction. If products furnished by the Seller are determined to in fact be counterfeit, Seller agrees to reimburse Buyer on the full purchase price paid as well as any shipping or third party testing charges incurred by Buyer. Further the Buyer reserves the right to ban the Seller thereafter for such period as deemed appropriate.	
22	**Delivery, packing and dispatch:**	
22.1	**Procedure for delivery**	
	Vendor /supplier should notify HAL at least fifteen (15) working days prior to the scheduled delivery dates, of the anticipated date of delivery and / or the dispatch particulars (size, weight and number of package) of the deliverable or part thereof to be dispatched.	
22.2	Within two working days of the dispatch of the consignment, supplier shall notify in writing all details concerning the dispatch to HAL.	
22.3	Vendor /supplier shall notify HAL, Foundry and Forge Division, if any material/part found to be non-conforming after dispatch from their premises.	
22.4	Vendor /supplier has to notify the HAL, regarding any changes in the Product/Material specification/revision and/or process defined and shall obtain the HAL F&F Division approval for changes before dispatch.	
22.5	The Vendor is responsible for obtaining a clear receipt from the Transport Authorities specifying the goods dispatched. Vendor will not book any consignment on a said to contain' basis. If vendor does so, vendor does it on his own responsibility. HAL will take no responsibility for short deliveries or wrong supply of goods when the same are booked on said to contain' basis. HAL shall pay for only such stores as are actually received by them in accordance with the contract.	
22.6	**Country of origin:** The term "origin" used in this clause means the place from where the Services (and incidental Goods, including subcontracted components) are arranged and delivered, or manufactured. Vendor to confirm the country of orign for the quoted item	
22.7	Vendor to provide details of parts/sub assembly/assembly made/assembled in the countries sharing the Indian border *(For information follolwing countries share land border with India: Bangladesh, Bhutan, China, Myanmar, Nepal and Pakistan)*	

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Vendor /supplier name:-

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23	**Bribes and Gifts:**	
23.1	Any bribe, commission, gift or advantage given, promised or offered by or on behalf of the Vendor or his parties, agent or servant or any one on his or their behalf to any officer, servant, representative or agent 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 Vendor may incur, subject to the Vendor 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 thereof. 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.	
24	**Conflict of Interest:**	
24.1	The Vendor to confirm that he does not have a conflict of interest. Bids found to have a conflict of interest shall be rejected as nonresponsive. A Vendor in this Tender Process shall be considered to have a conflict of interest if the Vendor: a) directly or indirectly controls, is controlled by or is under common control with another Vendor; or b) receives or have received any direct or indirect subsidy/ financial stake from another Vendor; or c) has the same legal representative as another Vendor for purposes of this bid. A Principal can authorize only one representative, and the representative also should not represent or quote on behalf of more than one Principal. However, this shall not debar more than one Authorised distributor from quoting equipment manufactured by an Original Equipment Manufacturer (OEM), in procurements under Proprietary Article Certificate; or d) has a relationship with another Vendor, directly or through common third parties, that puts it in a position to have access to information about or influence the bid of another Vendor or influence the decisions of the Procuring Entity regarding this Tender process; or participates in more than one bid in this tender process; or e) Participation in any capacity by a Vendor (including the participation of a Vendor as sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of a non-Vendor firm as a sub-contractor in more than one bid; or f) would be providing goods, works, or non-consulting services resulting from or directly related to consulting services that it provided (or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm), for the procurement planning (inter-alia preparation of feasibility/ cost estimates/ Detailed Project Report (DPR), design/ technical specifications, Terms of Reference (ToR)/ Activity Schedule/ schedule of requirements or the Tender Document etc.) of this Tender process; or g) has a close business or family relationship with a staff of the Procuring Organization who: i) are directly or indirectly involved in the preparation of the Tender document or specifications of the Tender Process, and/or the evaluation of bids; or ii) would be involved in the implementation or supervision of resulting Contract. h) In cases of authorised distributors quoting on behalf of their principal manufacturers, an authorised distributor cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. There can be only one bid from the following: i) The principal manufacturer directly or through an authorised distributor on his behalf; and ii) Authorised distributor on behalf of only one principal.	
25	**Right to access Supplier Facilities and applicable Records:**	
25.1	HAL shall have right of access to any and all the facilities where work is being performed or is scheduled to be performed, including those facilities of Supplier's sub-tier Suppliers, in order to perform inspections, surveys or system surveillance as part of verification of conformance to the requirements and also to all the applicable records.	
26	**Relationship of the parties**	
26.1	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.	
26.2	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.	
27	**Assignment/Subcontract:**	
27.1	Neither of the parties of this contract shall be entitled without the other party's consent to assign or transfer to a third party all or part of the benefits or obligations of this contract/PO.	
28	**Survival of Special Clauses:**	

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28.1	The clauses dealing with arbitration and confidentiality shall survive and continue to have effect after the expiry or termination for any reason whatsoever of the services placed.	
29	**Waiver:**	
29.1	Failure of either Party at any time to enforce any of the provisions of this Contract shall not per se constitute a waiver by that Party of any such provisions nor in anyway affect the validity of the Contract or any part hereof.	
30	**Amendment to Contract/PO:**	
30.1	Any amendment to Contract/ Purchase Order would be enforceable only if made in writing and duly signed by authorized representatives of both the parties hereto.	
31	**Language:**	
31.1	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.	
32	**Fall Clause:**	
32.1	The price quoted shall be in no event exceed the lowest price at which you sell the supplies or offer to sell supplies of identical description for similar quantity/terms to any person(s)/ organization including the purchases by any department of the Govt. of India, 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.	
32.2	If at any time during the said period, the vendor reduces the sales price, sells or offers to sell such supplies to any person/ organization including the purchaser or any department of Central Govt. or any Dept. of State Govt., or any statutory undertaking of the Central or State Govt., as the case may be at a price lower than the price chargeable under the contract, Vendor shall forthwith notify such reduction/ sale or offer to sale to the HAL and the price payable under the contract for the supplies supplied after the date of coming into force of such reduction or sale or offer to sale shall stand correspondingly reduced.	
33	**Appropriation:**	
33.1	Whenever under this contract any sum of money is recoverable from any payable by the vendor, HAL shall be entitled to recover such sum by appropriating in part or whole by deducting any sum then due or which at any time thereafter may become due to the vendor in this or any other contract entered by HAL as a whole its Divisions and Branch Offices etc., held by him alone or in partnership with others. Should this sum be not sufficient to cover the full amount recoverable, the vendor shall pay to HAL on demand the remaining balance due.	
34	**Product Support/ Obsolescence:**	
34.1	Considering that the expected life of the equipment is spread over 30 years, it is requested to ensure that there should not be any obsolescence issue not only in terms of items but in terms of technology also in the next 30 years. In case of obsolescence, Vendor should intimate HAL at least 3 years in advance about obsolescence and should also absorb the cost for overcoming the obsolescence and provide continuous support for the next 30 years. HAL may be requiring various spares for the offered system/item in future. Exact requirement for the spare requirement will be intimated separately. Vendor to confirm that the cumulative price of all spares of item/system should not increase the unit cost of the item/system.	
34.2	For any reason Supplier wishes/ decides to close/ discontinue the line for manufacture of the products or procurement of certain components, sub-components, Supplier undertakes to notify such a decision to HAL by means of a prior 3 years notice (before closure of the said production line) in writing so as to enable HAL to place buy order/a life time buy of all spares before closure of said production line. Supplier will transfer tools, drawings etc., to HAL after such notice period. Supplier shall indicate the source from where HAL can procure these items. The said aspect would also form an integral part of the contract.	
35	**Opening of Tender:**	
35.1	Tender will be opened on date / time as mentioned in the Tender document. Vendor /supplier or their authorized reps. desirous to attend the tender opening may forward written confirmation with name of authorized person and designation prior to tender opening.	
36	**Exit Criteria:**	

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36.1	The contract/order may be terminated under the following circumstances: i) In the event of unsatisfactory performance by the Vendor during the contract period, or any of the information provided by the Vendor is found to be untrue, or Vendor is found to have attempted to influence any person involved with the contract through unethical means, the contract shall be terminated with three months advance notice without any financial implication to Buyer. Notwithstanding the foregoing, in cases where it is found that a Vendor is engaged in unethical practices, they shall be barred from participating in the future contracts. ii) If there is change in Buyer requirement, contract shall be terminated with one month advance notice. The liability of Buyer in this case will be agreed mutually. In the event of termination of contract by either party the Vendor shall ensure the following: a) IPR's are transferred to Buyer to enable Buyer to proceed on the work with other Vendor. Vendor also will render all assistance till the other Vendor fully take over the balance work. (If applicable) b) Transfer title and deliver all or any part thereof of the supplies, materials, work-in-progress, finished Products, Tooling, drawings and data produced or acquired by Vendor specifically for the Product being terminated. c) Supply of products and its components / spares at least for a period of 05 years from the date of such termination. iii) The Vendor is declared bankrupt or becomes insolvent. iv) The delivery of material is delayed due to causes of Force Majeure by more than six months. v) Based on the decision of the Arbitration Tribunal.	
37	**Termination for Default of Seller or for other reasons:**	
37.1	HAL shall have the right to short close present Contract in part or in full by giving 1 month prior notice to the Vendor, in any of the following cases:- a) The work is delayed or cancelled for causes attributable to force majeure. b) The Vendor is declared bankrupt or becomes insolvent. c) It is noticed that the firm has utilized the services of any agent to get the resulting Order and paid any commission to such agent. d) As per decision of the Arbitration Tribunal. e) In case any part of the Order is subcontracted by the Vendor without prior permission of HAL. f) If the performance of the Vendor is not found satisfactory during the execution of work. In any of the above stated case, no claim of damage etc., by the Vendor will be allowed.	

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Vendor /supplier name:-

Sl No	Description	Vendor /supplier's Compliance
38	**Insolvency:**	
38.1	If Vendor enters into liquidation, whether compulsory or voluntary (other than amalgamation or reconstruction with another party taking over all its rights as well as commitments) or becomes insolvent or suffers a receiver of the whole or part of its asset to be appointed, i) Shall forthwith notify the same to HAL and the HAL shall have the right without prejudice to his other rights or remedies to terminate the unexecuted part of this Contract. ii) In such an event, HAL shall become entitled forthwith to get the refund within 30 days of all the advance payments received by Vendor and expenditure incurred by as a part of its obligations under this contract it has not fulfilled. In such an event if applicable, Vendor is liable for return of any materials/items (including drawings, designs etc) to HAL, which are held at his end as a part of the obligations under this contract.	
39	**Indemnity:**	
39.1	The successful bidder/Vendor shall defend, indemnify and hold HAL harmless from and against all actions, causes of action, liabilities, claims, suits, judgment, liens, awards, damages of any kind and nature whatsoever and expenses and costs of litigation to the extent such claims arise out of infringement of any IPR, patent, copyright, trademark or involve wrongful use of trade secret or confidential information or negligence attributable to the Vendor.	
40	**Shelf Life:**	
40.1	Please confirm the shelf life/ item life if any, for the offered/quoted items.	
40.2	**Periodical Exercising:** Supplier to provide the periodical exercising schedule that is required to be carried out on the equipment if kept in stores for longer period. Separate sheet may be enclosed giving the details.	
40.3	**Total Technical Life**: Vendor to confirm the total technical life for the offered item	
41	**Others:**	
41.1	Vendor to intimate the Change in supplier name (due to M&A) to HAL on Immediate basis	
41.2	Quotation should be free from correction, over-writing, using correcting fluid etc.	
41.3	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 Vendor /supplier must supply the same at the rate quoted.	
41.4	Any terms & conditions which has not been the part of the bid or Purchase Order, if put forward in subsequent correspondence, shall not be considered by HAL.	
41.5	Please confirm that items quoted/offered are your own manufactured products and not resold.	
41.6	Please indicate the detailed address, contact details, email ID for future correspondence/ clarification/order placement.	
42	**Parallel Arrangement:**	
42.1	Any Order awarded to the successful bidder as a result of this tender, will be on non-exclusive basis. HAL reserves the right of entering into parallel contract(s)/ release parallel Order(s) with any other firms now or hereafter.	
43	**Integrity Pact :**	
43.1	The submission of Integrity Pact without deviation is a mandatory requirement. Vendors only those who commit themselves to IP with the buyer would be considered competent to participate in the bidding process. In other words, entering into this pact would be a preliminary qualification.	
43.2	Vendor to confirm that Integrity Pact submitted duly signed along with offer is strictly as per HAL's format i.e. without any deviations.	
43.3	Please confirm that scanned copy of the signed Integrity Pact duly as per the HAL format is submitted along with the offer (as indicated in RFQ covering) and hard copy (2 copies in original) are sent through Post/courier on the address indicated in RFQ .	
44	**Compliance to all paras of RFQ covering letter:**	

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	Please confirm compliance to all paras of RFQ covering letter	
45	**Performace Bank Guarnatee**	
	Seller shall furnish a performance Bank Guarantee for 10% of basic value valid till end of the warranty period as per HAL's format enclosed (Annexure V) from a reputed bank in India preferably from Nationalized Bank / Or Bank of International repute. In case of foreign bank confirmation charges shall be borne by supplier. The bank guarantee should be submitted directly from bank.	
46	**Security Deposit**	
	Successful Vendor, shall have to deposit 5% of the value of the order as Security Deposit (to be calculated only on basic cost excluding taxes & duties, if such details are furnished separately in the bid submitted) within 15 days of receipt of the purchase order, by demand draft or bank guarantee in a prescribed format of HAL from a schedule bank in India/ bank of international repute (for Foreign vendor), valid up to 60 days after the completion of contract period/last supply. This Security Deposit will bear no interest and will be returned only after the contract is completed to the entire satisfaction of HAL.	

Price Bid Format

Hindustan Aeronautics Limited

Tender No: F/DGM(IMM)/CAP/924/1

Sl No.	Description	Currency of Quote:						
		Quantity	Unit of Measurement	Unit Rate	Currency	Delivery Schedule	Total Amount	REMARK
A) Cost of Equipment including warranty period of 24 months								
A1.1	**Design, Manufacture, Supply, Installation, Commissioning Training and Proving out of 10000 Ton Hydraulic forging Press as per attached Technical Specifications at Annexure-A.**	1	No.					
B)	**Cost of AMC for 05 years after expiry of Warranty period (Not applicable in evaluation for this tender):**							
Sl. No.	Description	Currency of Quote:						
		1st year Rate	2nd year Rate	3rd year Rate	4th year Rate	5th year Rate	Total Amount	REMARK
B1.1	AMC including spares covered under this							
B2.1	Mandatory Spares/ Spares of consumable nature not covered under AMC BUT required for normal operation							
ADDITIONAL SHEET may be used for giving detailed break-up for taxes, spares, accessories etc.								

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Sl No.	Description	Currency of Quote:						
		Quantity	Unit of Measurement	Unit Rate	Currency	Delivery Schedule	Total Amount	REMARK
A) Cost of Equipment including warranty period of 24 months								
A1.1	**Design, Manufacture, Supply, Installation, Commissioning and Proving out of 20 Ton Counter Blow hammer as per the technical specifications attached at Annexure-B.**	1	No.					
B)	**Cost of AMC for 05 years after expiry of Warranty period (Not applicable in evaluation for this tender):**							
Sl. No.	Description	Currency of Quote:						
		1st year Rate	2nd year Rate	3rd year Rate	4th year Rate	5th year Rate	Total Amount	REMARK
B1.1	AMC including spares covered under this							
B2.1	Mandatory Spares/ Spares of consumable nature not covered under AMC BUT required for normal operation							
ADDITIONAL SHEET may be used for giving detailed break-up for taxes, spares, accessories etc.								

DECLARATION BY THE BIDDER FOR OPEN TENDER FOR BOTH FOREIGN & INDIAN VENDORS

<<on company letter head>>

a) "I/We the authorized representatives of_____ *(name of company)* hereby declare and confirm that in the last 3 consecutive years, the _____*(name of the company)* is not black listed or been debarred, suspended, disqualified, removed, business dealings banned or otherwise prevented from bidding by Ministry/Department/Organization/CPSE of Govt. of India or restrained by any Court Order.

b) "I/We the authorized representatives of_____ *(name of company)* hereby declare and confirm that there are no criminal case/s is/are pending in the name of the company for the last 5 years

Further, I/We the authorized representatives of _____ *(name of company)* are aware that any false information provided herein will result in the rejection of our Bid/Offer and cancellation of any PO/Contract if awarded at any stage when this declaration is found incorrect and shall be subjected to appropriate legal action."

Signature:

Name:

Designation:

Date:

Company Seal:

DECLARATION BY THE BIDDER FOR OPEN TENDER FOR INDIAN VENDORS ONLY

<<on company letter head>>

The statutory details of the firm are as follows:

a) PAN Number *(Copy to be enclosed):*

b) GSTIN Number *(Copy to be enclosed):*

c) Category of the vendor *(General / SC/ST / Women):*

d) Udhyam Number *(Copy to be enclosed):*

e) MSE Status *(Micro / Small):*

f) Sijan URN Number *(Steps for registration in portal is enclosed):*

g) Bank Details (ECS Mandate Form & Cancelled Cheque)

   a. Bank Account Number
   b. Bank Name
   c. IFSC Code

h) Contact Person Name:

i) Contact Person email

j) Contact Number:

"I/We the authorized representatives of_____ *(name of company)* hereby declare and confirm that above details are certified and enclosed all the details

Signature:

Name:

Designation:

Date:

Company Seal

ENCLOSURE TO TENDER NO. F/DGM(IMM)/CAP/924/1

CHECKLIST
(To be submitted along with Technical Bid)

The Bidders should invariably tick (√) the relevant column :

a) Technical Bid (Un priced bid):

Activity	Quoted	Not Quoted
Design, Manufacture, Supply, Installation, Commissioning and Proving out of 10000 Ton Hydraulic forging Press as per attached Technical Specifications at Annexure-A.		
Design, Manufacture, Supply, Installation, Commissioning and Proving out of 20 Ton Counter Blow hammer as per the technical specifications attached at Annexure-B.		

Note: Price details should not be indicated in the Technical Bid. If price details mentioned in the Technical Bid, offers will not be considered for evaluation.

b) Commercial Bid (Price Bid):

Description	Price Quoted	Price not Quoted
Design, Manufacture, Supply, Installation, Commissioning and Proving out of 10000 Ton Hydraulic forging Press as per attached Technical Specifications at Annexure-A.		
Design, Manufacture, Supply, Installation, Commissioning and Proving out of 20 Ton Counter Blow hammer as per the technical specifications attached at Annexure-B.		

c) Documents along with Technical Bids:

Activity	Submitted along with Technical Bid	Not Submitted
Compliance Matrix of Technical Specification** for Item Sl No 1		
Compliance Matrix of Technical Specification** for Item Sl No 2		
Complete Documentation as per Commercial Check list		

****The Compliance matrix as per HAL format is to be submitted along with Technical Bid and vendor to take due care for submission of the same.**

Note: All the applicable price, Taxes & duties are quoted in the Price Bid only. If any Taxes & duties are not quoted, it can be assumed as inclusive of Quoted Price and there is no separate at any stage. Vendor has to clearly mention the quoted prices along with applicable currency in the price bid. Vendor can use their price bid format and submit the same in the Price Bid Cover only".

Authorised signatory on behalf of Bidder.

F/DGM(MM)/CAP/924/1

Checklist for the details of the documents to be furnished along with Technical bid - 10000 Ton Hydraulic Forging Press

SL No	Details of Documents to be Furnished Along with the Technical Bid	Submitted (Yes/No)
1	Completely filled **Technical Compliance Matrix** as per Annexure-A.	
2	As per Sl No 3.2.14: A detailed **three-dimensional (3D) layout/mode**l of the proposed hydraulic forging press.	
3	As per Sl No 3.3.14 (a) : A **detailed layout drawing** showing the location of the chiller unit(s), cooling piping network, and interfaces with the press and associated equipment.	
4	As per Sl No 5.2.1 : The **die heating methodology proposed** for the closed-die forging mode using appropriate pictorial/illustrative representations.	
5	As per Sl No 5.3.10 : **Detailed description/ animation of Near-Isothermal Forging System** and its operating mechanism.	
6	As per Sl No 6.4.4: Detailed **description/ animation of Robotic Manipulato**r and its operating mechanism.	
7	As per Sl No 8.1.6: Explanation of **process visualization** using actual screen shots as examples.	
8	As per Sl No 13: Complete list of **spare parts for press mechanics / electrics / hydraulics** for two years normal operation after warranty period.	
9	As per Sl No 15: Budgetary quotation for the **Annual Maintenance Contract (AMC) for five years** after the warranty period.	
10	As per Sl No 18: **Detailed project execution schedule** indicating all major milestones and timelines	
11	As per Sl No 22.1: Documents pertaining to **Past Experience** as per RFQ	
12	As per Sl No 22.2: **Audited financial statements/report of last three completed financial years** in support of financial standing ,as specified in the tender document.	

F/DGM(MM)/CAP/924/1

Checklist for the details of the documents to be furnished along with Technical bid - 20 Ton Counter Blow Hammer

SL No	Details of Documents to be Furnished Along with the Technical Bid	Submitted (Yes/No)
1	Completely filled **Technical Compliance Matrix** as per Annexure-B	
2	As per Sl No 3.14: **Equipment design parameters and detailed energy calculations** along with filled details as per Annexure -2	
3	As per Sl No 4.5.2 : **Description of the mechanism for die locking/unlocking keys using an overhead crane sling** with schematic diagrams / illustrative pictures.	
4	As per Sl No 8.7(b) : **Description/explanation** of process visualization using actual screen shots as examples.	
5	As per Sl No 16: **Budgetary quotation for the Annual Maintenance Contract (AMC)** for five years after the warranty period.	
6	As per Sl No 17: **Complete list of spare parts for press mechanics / electrics / hydraulics** required for two years normal operation after warranty period.	
7	As per Sl no 26 : **Detailed project execution** schedule indicating all major milestones and timelines	
8	As per Sl No 30.1: **Documents in support of Past Experience**, as specified in the tender document.	
9	As per Sl No 30.2: **Audited financial statements/report of last three completed financial years in support of financial standing** ,as specified in the tender document.	

F/DGM(IMM)/CAP/924/1

Checklist for the details of the documents to be furnished along with Technical bid

SL No	Details of Documents to be Furnished Along with the Technical Bid	Submitted (Yes/No)	Details
1	Is Earnest Money Deposit (EMD) submitted?		
2	Is Signed Non Disclosure Agreement submitted?		
3	Is Integrity Pact (Omnibus / Stanalone) Submitted?		
4	Is Commercial Terms Compliance Statement completely filled and submitted?		
5	Is the Price bid is enclosed **in separate** cover and sealed?		
6	Is the Validity of the quote provided for 180 Days?		
7	Is the declaration by the bidder for open tender submitted?		
8	Is the Price bid Ink Signed and Seal affixed **enclosed seperately**?		
9	Are the delivery Incoterms clearly indicated?		
10	Is Indian GST Registration Certificate (if applicable) is enclsoed		
11	Is Indian PAN Card (if applicable) is enclsoed		
12	Is the HSN Code mentioned in the Price Bid		
13	(For Indian Bidders Only) Is ECS Mandate form duly attested by your banker in original enclosed?		
14	(For Foreign Bidders Only) Is MT799 / MT199 Sent from your banker to State Bank of India HAL IFB Branch and the copy of the same is attached?		
15	(For Indian Bidders only): Is Certificate of Local Content enclosed?		
16	(For Indian Bidders only): Is Industry Type certifricate enclosed?		
17	(Only Foreign Bidders) Bidders to confirm that: The prices quoted are the lowest export price and is the same as they would normally quote to Govt. Department. (Duly Signed Self Delaration on letter head)		
18	(Only Foreign Bidders) Bidder shall be required to obtain and maintain all Export/Import licenses and permits etc., as the case may be, required for performing supplies against this tender. Obtaining export license shall be entire responsibility of the Bidder. A Declaration of the same to be provided		
19	(Only Foreign Bidders) Is your country border shares with Indian Border?		
20	(Only Foreign Bidders) Please mention your DUNS?		

Annexure-I

Proposed Omnibus Integrity Pact

Tender Ref. No. & Date:…….

Integrity Pact (Omnibus)

Whereas Hindustan Aeronautics Ltd. ("HAL") having its registered office at 15/1, Cubbon Road, Bangalore – 560 001, India represented by General Manager / Executive Director hereinafter referred to as the Buyer and the first party, proposes to procure (indicate name or category of the Equipment, like Aircraft Parts/ Avionic Items/ Accessories etc), hereinafter referred to as Goods and/ or Services and / or Works.

And

M/s…….., represented by…….. , Chief Executive Officer (which term, unless expressly indicated by the contract, shall be deemed to include its successors and its assignee), hereinafter referred to as the Bidder(s)/Seller(s) and the second party, is willing to offer/ has offered the Goods and/ or Services and / or Works.

2. Whereas the Bidder(s)/Seller(s) is a private company/public company /partnership/ registered export agency, constituted in accordance with the relevant law in the matter and the Buyer is a Public Sector Undertaking and registered under Companies Act 1956.Buyer and Bidder(s)/Seller(s) shall hereinafter be individually referred to as "Party" or collectively as the "Parties", as the context may require.

3. Preamble

3.1 Buyer proposes to procure herein referred Goods/ or Services and / or Works and the Bidder(s)/Seller(s) is willing to offer / has offered / will offer the Goods/ or Services and / or Works under laid down organizational procedures intending to enter into contract/s for supply of/ Goods / etc of all such items/products/Goods and / or Services and / or Works including …..……and the Bidder(s)/Seller(s) is one amongst several Bidders/Proprietary Vendor/Customer Nominated Source/Licensor who has indicated a desire to bid/supply in such tendering process.

3.2 Buyer has decided that an Omnibus Integrity Pact (Omnibus IP) can be signed with Bidder(s)/Seller(s), which will avoid taking multiple approvals, from both sides for signing IP for individual tender / contract. Bidder(s)/Seller(s) and Buyer are entering into this Omnibus IP for covering all tenders / contract / agreements / Purchase Order etc., between the Bidder(s)/Seller(s) and Buyer within its ambit.

3.3 The Buyer values and takes primary responsibility for full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness / transparency in its relations with its Bidder(s) and/or Seller(s).

3.4 In order to achieve these goals, the Buyer has appointed Independent External Monitor(s) (IEM) in consultation with Central Vigilance Commission, who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

4. Commitments of the Buyer.

4.1 The Buyer commits itself to take all measures necessary to prevent corruption and fraudulent practices and to observe the following principles:-

i) No employee of the Buyer, personally or through family members, will in connection with the tender, or the execution of a contract demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

ii) The Buyer will during the tender process treat all Bidder(s)/Seller(s) with equity and reason. The Buyer will in particular, before and during the tender process, provide to all Bidder(s)/Seller(s) the same information and will not provide to any Bidder(s)/Seller(s) confidential / additional information through which the Bidder(s)/Seller(s) could obtain an advantage in relation to the process or the contract execution.

iii) The Buyer will exclude from the process all known prejudiced persons.

4.2 If the Buyer obtains information on the conduct of any of its employees which is a criminal offence under the Indian legislation, Prevention of Corruption Act 1988 as amended from time to time or if there be a substantive suspicion in this regard, the Buyer will inform to its Chief Vigilance Officer and in addition can initiate disciplinary action.

5. Commitments of the Bidder(s) / Seller(s).

5.1 The Bidder(s)/Seller(s) commit himself to take necessary measures to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

i) The Bidder(s)/Seller(s) will not, directly or through any other persons or firm, offer promise or give to any of the Buyer's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage during the tendering or qualification process or during the execution of the contract.

ii) The Bidder(s)/Seller(s) will not enter with other Bidder(s)/Seller(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

iii) The Bidder(s)/Seller(s) will not commit any offence under the Indian legislation, Prevention of Corruption Act 1988 as amended from time to time. Further, the Bidder(s)/Seller(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Buyer as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

5.2 Adoption of IP by Joint Ventures/Sub-Contractors:

i) In case the Bidder(s)/ Seller(s) is a Joint Venture, then all the Partners of the Joint Venture should sign this Integrity Pact. The Bidder(s) / Seller(s) shall ensure the compliance of the provisions of this Integrity Pact by all its Joint Venture Partners. Further, the Bidder(s)/Seller(s) shall be held responsible for any violation/breach of the provisions of IP by any one or more of its Partners.

ii) In case of sub-contracting, the Bidder(s)/Seller(s) i.e. the Principal Contractor shall be solely responsible for adherence to the provisions of this Omnibus IP by its sub-contractor(s). Further, the Bidder(s)/Seller(s) i.e. the Principal Contractor shall be held liable for any violation/breach of the provisions by its sub-contractor(s).

5.3 The Bidder(s)/Seller(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

5.4 Agents / Agency Commission:

The Seller(s)/Bidder(s) confirms and declares to the Buyer that the Seller(s)/Bidder(s) is the original manufacturer or authorized distributor / stockiest 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 Goods and / or Services and / or Works referred to in tender / offer / contract / Purchase order to which this Omnibus IP applies 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 tender /contract / purchase order to the Seller(s)/Bidder(s); 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(s)/Bidder(s) 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(s)/Bidder(s) 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 the respective contract / purchase order, the Seller(s)/Bidder(s) 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(s)/Bidder(s) who shall in such event be liable to refund to the buyer, all Agency Commission payments made by the Seller(s)/Bidder(s) along with interest at the rate of 2% per annum above Secured Overnight Financing Rate (SOFR) (for foreign vendors) and Marginal Cost of Funds-based Lending Rate (MCLR) of State Bank of India plus 2% per annum (for Indian vendors). The rate of interest as on the last date of submission of bid/s i.e. Tender Due date would be applicable. The Buyer will also have the right to recover any such amount from any contracts/ Purchase order concluded earlier or later with Buyer.

6. Previous Transgression

6.1 The Bidder(s)/Seller(s) declares that no previous transgressions have occurred in the last three years from the signing of the Omnibus IP with any other company in any country conforming to the anticorruption approach or with any other Public Sector Enterprise in India that could justify Bidder's/ Sellers' exclusion from the tender process.

6.2 If the Bidder(s)/Seller(s) makes incorrect statement on this subject, Bidder(s)/Seller(s) can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason without any liability whatsoever on the Buyer.

7. Company Code of Conduct

Bidder(s)/Seller(s) are also advised to have a company code of conduct (clearly rejecting the use of bribes and other unethical behavior) and a compliance program for the implementation of the code of conduct throughout the company.

8. Sanctions for Violation

8.1 If the Bidder(s)/ Seller(s), before award or during execution has committed a transgression through a violation of Clause 5 & Clause 6, above or in any other form such as to put his reliability or credibility in question, the Buyer is entitled to disqualify the Bidder(s)/ Seller(s) from the tender process or take action as per the procedure mentioned herein below:

i) To disqualify the Bidder(s)/Seller(s) in the tender process & exclusion from future contracts.

ii) To debar the Bidder(s)/Seller(s) from entering into any bid from Buyer for a period of two years.

iii) To immediately cancel the contract, if already signed / awarded without any liability on the Buyer to compensate the Bidder(s)/Seller(s) for damages, if any. Subject to Clause 5.4, any lawful payment due to the Bidder(s)/Seller(s) for supplies effected till date of termination would be made in normal course.

iv) To encash EMD / Advance Bank Guarantees / Performance Bonds/Warranty Bonds, etc. which may have been furnished by the Bidder(s)/Seller(s) to the extent of the undelivered Goods and/ or Services and / or Works.

8.2 If the Buyer obtains knowledge of conduct of a Bidder(s)/Seller(s) or of an employee or a representative or an associate of a Bidder(s)/Seller(s) which constitutes corruption, or if the Buyer has substantive suspicion in this regard, the Buyer will inform to its Chief Vigilance Officer.

9. Compensation for Damages

9.1 If the Buyer has disqualified the Bidder(s)/Seller(s) from the tender process prior to the award according to Clause 8, the Buyer is entitled to demand and recover the damages equivalent to Earnest Money Deposit in case of open tendering.

9.2 If the Buyer has terminated the contract according to Clause 8, or if the Buyer is entitled to terminate the contract according to Clause 8, the Buyer shall be entitled to encash the advance bank guarantee and performance bond/ warranty bond, if furnished by the Bidder(s)/Seller(s), in order to recover the payments, already made by the Buyer for undelivered Goods and/ or Services and / or Works.

9.3 The Bidder(s)/Seller(s) shall also be liable to refund to the Buyer, the Agency Commission / payments made by the Seller(s) / Bidder(s) along with interest at the rate of 2% per annum above Secured Overnight Financing Rate (SOFR) (for foreign vendors) and Marginal Cost of Funds-based Lending Rate (MCLR) of State Bank of India plus 2% per annum (for Indian vendors). The rate of interest as on the last date of submission of bid/s i.e. Tender Due date would be applicable.

9.4 In case of occurrence of violation of any clause of this Omnibus IP then the amount due under this Omnibus IP can be recovered by the Buyer from any Contract/Agreement signed with the Bidder(s)/Seller(s) to which this Omnibus IP is applicable.

10. Independent External Monitor(s)

10.1 The Buyer has appointed Independent External Monitor(s) for this Omnibus IP in consultation with the Central Vigilance Commission.

10.2 As soon as the Omnibus Integrity Pact is signed, the Buyer shall furnish a brief background of the case to the Independent External Monitor(s).

10.3 The Bidder(s)/Seller(s), if they deem it necessary, may furnish any information as relevant to their bid to the Independent External Monitor(s). Further, after the award of work, as also, during execution of the contract, any issue specifically raised before the IEMs shall be looked into by the panel of IEMs.

10.4 If any complaint with regard to violation of the Omnibus IP is received by the Buyer in a procurement case, the Buyer shall refer the complaint to the Independent External Monitor(s) for their comments / enquiry.

10.5 If the Independent External Monitor(s) need to peruse the records of the buyer in connection with the complaint sent to them by the buyer, the buyer shall make arrangement for such perusal of records by the Independent External Monitor(s), in accordance with the CVC guidelines.

10.6 The report of enquiry, if any, made by the Independent External Monitor(s) shall be submitted to CMD, HAL as far as possible within 2 weeks, but not more than 30 days for a final and appropriate decision in the matter keeping in view the provision of this Omnibus IP.

11. Law and Place of Jurisdiction

This Omnibus IP is subject to Indian Laws and exclusive Jurisdiction of Courts at Bangalore, India.

12. Other Legal Actions

The actions stipulated in this Omnibus IP are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force, relating to any civil or criminal proceedings.

13. Omnibus IP Duration

13.1 This Omnibus IP shall come into force from the date when both parties have legally signed it and the validity of this Omnibus IP shall be for ------- (upto 5 years) with applicability to all tenders /orders /contracts /agreements which are executed by the respective Bidder/tender issued/executed during the existence of this Omnibus IP.

13.2 In addition to above, the validity of the Omnibus IP for respective Tender/order/contract/agreement shall remain valid upto six months from declaration of unsuccessful Bidder. Further, for successful Bidder, validity of this IP shall survive upto12 months from making last payment w.r.t the respective Tender/order/contract/agreement.

13.3 Further, if the Contract/Agreement covered under this Omnibus IP is extended/renewed for any period then this Omnibus IP shall also be deemed extended/renewed for such period of extension/renewal.

13.4 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this Omnibus IP as specified above, unless it is discharged / determined by CMD, HAL.

13.5 Should one or several provisions of this Omnibus IP turn out to be invalid, the remainder of this Omnibus IP remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

14. Other Provisions

14.1 Changes and supplements need to be made in writing. Side agreements have not been made.

14.2 The Bidder(s)/Seller(s) signing this Omnibus IP shall not initiate any Legal action or approach any court of law during the examination of any allegations/complaint by IEM and until the IEM delivers the report.

14.3 In view of the nature of this Omnibus IP, this Omnibus IP shall not be terminated by any party and will subsist throughout its stated period.

14.4 Nothing contained in this Omnibus IP shall be deemed to assure the Bidder(s)/Seller(s) of any success or otherwise in the tendering process.

15. This Omnibus IP is signed with HAL exclusively and hence shall not be treated as precedence for signing of Integrity Pact / Omnibus IP with MoD or any other Organization.

16. The Parties hereby sign this Omnibus IP at_____on_____{Bidder(s)/Seller(s)} and at _____on_____ (Buyer)

BUYER	BIDDER / SELLER
Signature:	**Signature:**
Executive Director/General Manager	Authorized Signatory (*) (β)
Hindustan Aeronautics Ltd., ……Division	
Date:	**Date:**
Stamp:	**Stamp:**
Witness	Witness
1._____ _____	1._____ _____
2._____ _____	2._____ _____

(*) – Authorized signatory of the company / authorized person who has signed the offer.

(β) – In case the Bidder(s)/Seller(s) is a Joint Venture, all the Partners of Joint Venture should sign this Integrity Pact (Indicating Name, Designation of the respective persons)

Annexure-II

Proposed Standalone Integrity Pact

Tender Ref. No. & Date:……

Integrity Pact (Standalone)

Whereas Hindustan Aeronautics Ltd. ("HAL") having its registered office at 15/1, Cubbon Road, Bangalore – 560 001, India, acting through its ……..Division, represented by General Manager / Executive Director hereinafter referred to as the Buyer and the first party, proposes to procure (indicate name or category of the Equipment, like Aircraft Parts/ Avionic Items/ Accessories etc), hereinafter referred to as Goods and / or Services and / or Works.

And

M/s…….., represented by…… , Chief Executive Officer (which term, unless expressly indicated by the contract, shall be deemed to include its successors and its assignee), hereinafter referred to as the Bidder(s)/ Seller(s) and the second party, is willing to offer/ has offered the Goods and / or Services and / or Works.

2. Whereas the Bidder(s) / Seller(s) is a private company/public company /partnership/ registered export agency, constituted in accordance with the relevant law in the matter and the Buyer is a Public Sector Undertaking and registered under Companies Act 1956. Buyer and Bidder(s)/Seller(s) shall hereinafter be individually referred to as "Party" or collectively as the "parties", as the context may require.

3. Preamble

3.1 Buyer has called for tenders under laid down organizational procedures intending to enter into contract/s for supply of Goods / Services / Works etc of……and the Bidder / Seller is one amongst several bidders/Proprietary Vendor/Customer Nominated Source/Licensor who has indicated a desire to bid/supply in such tendering process.

3.2 The Buyer values and takes primary responsibility for full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness / transparency in its relations with its Bidder(s) and / or Seller(s).

3.3 In order to achieve these goals, the Buyer has appointed Independent External Monitor(s) (IEMs) in consultation with Central Vigilance Commission, who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

4. Commitments of the Buyer.

4.1 The Buyer commits itself to take all measures necessary to prevent corruption and fraudulent practices and to observe the following principles: -

i) No employee of the Buyer, personally or through family members, will in connection with the tender, or the execution of a contract demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

ii) The Buyer will during the tender process treat all Bidder(s)/Seller(s) with equity and reason. The Buyer will in particular, before and during the tender process, provide to all Bidder(s)/Seller(s) the same information and will not provide to any Bidder(s)/Seller(s) confidential / additional information through which the Bidder(s)/Seller(s) could obtain an advantage in relation to the process or the contract execution.

iii) The Buyer will exclude from the process all known prejudiced persons.

4.2 If the Buyer obtains information on the conduct of any of its employees which is a criminal offence under the Indian legislation Prevention of Corruption Act 1988 as amended from time to time or if there be a substantive suspicion in this regard, the Buyer will inform to its Chief Vigilance Officer and in addition can initiate disciplinary action.

5. Commitments of the Bidder(s)/Seller(s).

5.1 The Bidder(s)/Seller(s) commit himself to take necessary measures to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

i) The Bidder(s)/Seller(s) will not, directly or through any other persons or firm, offer promise or give to any of the Buyer's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage during the tendering or qualification process or during the execution of the contract.

ii) The Bidder(s)/Seller(s) will not enter with other Bidder(s) / Seller(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

iii) The Bidder(s)/Seller(s) will not commit any offence under the Indian legislation, Prevention of Corruption Act 1988 as amended from time to time. Further, the Bidder(s)/Seller(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Buyer as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

5.2 Adoption of IP by Joint Ventures/Sub-Contractors:

i) In case the Bidder(s)/Seller(s) is a Joint Venture, then all the Partners of the Joint Venture should sign this Integrity Pact. The Bidder(s)/Seller(s) shall ensure the compliance of the provisions of this Integrity Pact by all its Joint Venture Partners. Further, the Bidder(s)/Seller(s) shall be held responsible for any violation/breach of the provisions of IP by any one or more of its Partners.

ii) In case of sub-contracting, the Bidder(s)/Seller(s) i.e. the Principal Contractor shall be solely responsible for adherence to the provisions of this Integrity Pact by its sub-contractor(s). Further, the Bidder(s)/Seller(s) i.e. the Principal Contractor shall be held liable for any violation/breach of the provisions by its sub-contractor(s).

5.3 The Bidder(s)/ Seller(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

5.4 Agents / Agency Commission:

The Seller(s)/Bidder(s) confirms and declares to the Buyer that the Seller(s)/Bidder(s) is the original manufacturer or authorized distributor/stockiest 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 Goods and/or Services and/or Works referred to in this tender/ 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 tender/ contract/ purchase order to the Seller(s)/Bidder(s); 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(s)/Bidder(s) 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(s)/Bidder(s) 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(s)/Bidder(s) 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(s)/Bidder(s) who shall in such event be liable to refund to the buyer, all Agency Commission payments made by the Seller(s)/Bidder(s) along with interest at the rate of 2% per annum above Secured Overnight Financing Rate (SOFR) (for foreign vendors) and Marginal Cost of Funds-based Lending Rate (MCLR) of State Bank of India plus 2% per annum (for Indian vendors). The rate of interest as on the last date of submission of bid/s i.e. Tender Due date would be applicable. The Buyer will also have the right to recover any such amount from any contracts/ Purchase order concluded earlier or later with Buyer.

6. Previous Transgression

6.1 The Bidder(s)/Seller(s) declares that no previous transgressions have occurred in the last three years from the date of signing of this Integrity Pact with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify Bidder's/ Sellers' exclusion from the tender process.

6.2 If the Bidder(s)/Seller(s) makes incorrect statement on this subject, Bidder(s)/Seller(s) can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason without any liability whatsoever on the Buyer.

7. Company Code of Conduct

Bidder(s)/Seller(s) are also advised to have a company code of conduct (clearly rejecting the use of bribes and other unethical behavior) and a compliance program for the implementation of the code of conduct throughout the company.

8. Sanctions for Violation

8.1 If the Bidder(s)/ Seller(s), before award or during execution has committed a transgression through a violation of Clause 5 & Clause 6, above or in any other form such as to put his reliability or credibility in question, the Buyer is entitled to disqualify the Bidder(s)/ Seller(s) from the tender process or take action as per the procedure mentioned herein below:

i) To disqualify the Bidder(s)/ Seller(s) with the tender process & exclusion from future contracts.

ii) To debar the Bidder(s)/ Seller(s) from entering into any bid from Buyer for a period of two years.

iii) To immediately cancel the contract, if already signed / awarded without any liability on the Buyer to compensate the Bidder(s)/Seller(s) for damages, if any. Subject to Clause 5.4, any lawful payment due to the Bidder(s)/Seller(s) for supplies effected till date of termination would be made in normal course.

iv) To encash EMD / Advance Bank Guarantees / Performance Bonds/Warranty Bonds, etc. which may have been furnished by the Bidder(s)/Seller(s) to the extent of the undelivered Goods and / or Services and / or Works.

8.2 If the Buyer obtains knowledge of conduct of a Bidder(s)/Seller(s) or of an employee or a representative or an associate of a Bidder(s)/Seller(s) which constitutes corruption, or if the Buyer has substantive suspicion in this regard, the Buyer will inform to its Chief Vigilance Officer.

9. Compensation for Damages

9.1 If the Buyer has disqualified the Bidder(s) / Seller(s) from the tender process prior to the award according to Clause 8, the Buyer is entitled to demand and recover the damages equivalent to Earnest Money Deposit in case of open tendering.

9.2 If the Buyer has terminated the contract according to Clause 8, or if the Buyer is entitled to terminate the contract according to Clause 8, the Buyer shall be entitled to encash the advance bank guarantee and performance bond/ warranty bond, if furnished by the Bidder(s)/Seller(s), in order to recover the payments, already made by the Buyer for undelivered Goods and / or Services and / or Works.

9.3 The Bidder(s)/Seller(s) shall also be liable to refund to the Buyer, the Agency Commission/ payments made by the Seller(s)/Bidder(s) along with interest at the rate of 2% per annum above Secured Overnight Financing Rate (SOFR) (for foreign vendors) and Marginal Cost of Funds-based Lending Rate (MCLR) of State Bank of India plus 2% per annum (for Indian vendors). The rate of interest as on the last date of submission of bid/s i.e. Tender Due date would be applicable.

10. Independent External Monitor(s)

10.1 The Buyer has appointed Independent External Monitor(s) for this Integrity Pact in consultation with the Central Vigilance Commission.

10.2 As soon as the Integrity Pact is signed, the Buyer shall furnish a brief background of the case to the Independent External Monitor(s).

10.3 The Bidder(s)/Seller(s), if they deem it necessary, may furnish any information as relevant to their bid to the Independent External Monitor(s). Further, after the award of work, as also, during execution of the contract, any issue specifically raised before the IEMs shall be looked into by the panel of IEMs.

10.4 If any complaint with regard to violation of the IP is received by the buyer in a procurement case, the buyer shall refer the complaint to the Independent External Monitor(s) for their comments / enquiry.

10.5 If the Independent External Monitor(s) need to peruse the records of the buyer in connection with the complaint sent to them by the buyer, the buyer shall make arrangement for such perusal of records by the Independent External Monitor(s), in accordance with the CVC guidelines.

10.6 The report of enquiry, if any, made by the Independent External Monitor(s) shall be submitted to CMD, HAL as far as possible within 2 weeks, but not more than 30 days, for a final and appropriate decision in the matter keeping in view the provision of this Integrity Pact.

11. Law and Place of Jurisdiction

This Integrity pact is subject to Indian Laws, and exclusive Jurisdiction of Courts at Bangalore, India.

12. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

13. Integrity Pact Duration

13.1 This Integrity Pact begins when both parties have legally signed it. It expires for the successful Bidder(s)/Seller(s) 12 months after the last payment under the contract, and for all other unsuccessful Bidder(s)/Seller(s) within 6 months from date of placement of order / finalization of contract against this tender.

13.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this Integrity Pact as specified above, unless it is discharged / determined by CMD, HAL.

13.3 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

14. Other Provisions

14.1 Changes and supplements need to be made in writing. Side agreements have not been made.

14.2 The Bidder(s)/Seller(s) signing this IP shall not initiate any Legal action or approach any court of law during the examination of any allegations/complaint by IEM and until the IEM delivers the report.

14.3 In view of the nature of this Integrity Pact, this Integrity Pact shall not be terminated by any party and will subsist throughout its stated period.

14.4 Nothing contained in this Integrity Pact shall be deemed to assure the Bidder(s)/ Seller(s) of any success or otherwise in the tendering process.

15. This Integrity Pact is signed with HAL exclusively and hence shall not be treated as precedence for signing of IP with MoD or any other Organization.

16. The Parties hereby sign this Integrity Pact at _____ on _____ {Bidder(s)/Seller(s)} and at _____on_____ (Buyer)

BUYER	BIDDER / SELLER
Signature: Executive Director/General Manager Hindustan Aeronautics Ltd., ……Division	**Signature:** Authorized Signatory (*) (β)
Date: **Stamp:**	**Date:** **Stamp:**
Witness	Witness:
1._____ _____ 2._____ _____	1._____ _____ 2._____ _____

(*) – Authorized signatory of the company / authorized person who has signed the offer.

(β) – In case the Bidder(s)/Seller(s) is a Joint Venture, all the Partners of Joint Venture should sign this Integrity Pact (Indicating Name, Designation of the respective persons)

NON-DISCLOSURE AGREEMENT

This "Agreement" is made and entered into as of the last date of execution hereof by and between:

Name of the vendor, a Company registered under the Companies Act 2013, having its Registered Office at Registered Office Address, hereinafter referred to as "XYZ"

AND

Hindustan Aeronautics Limited, an Indian Company registered under the Companies Act, 1956, having its Registered Office at 15/1 Cubbon Road, Bangalore 560001, India, through its …… Division having office at ……hereinafter referred to as "HAL"

XYZ and HAL shall hereinafter be individually referred to as "Party" or collectively as the "Parties", as the context demands.

THE PARTIES AGREE AS FOLLOWS:

1. DEFINITIONS

1.1. **"Agreement"** means this Non-Disclosure Agreement.

1.2. **"Confidential Information"** means information which is not in the public domain, is proprietary to HAL and/or XYZ and includes, but is not limited to, the following.

a) Scientific or technical information, know-how, inventions, designs, drawings, diagrams, schematics, processes, procedures, formulae, technologies or methods;

b) Reports, data, logos, trademarks, specifications, computer software, source codes, object codes, flow charts, databases, and trade secrets;

c) Commercial information including prices and terms & conditions of Orders/Contracts entered into between the Parties;

d) Copies of the documents and information described in a), b) and c) above.

1.3. **"Disclosing Party"** abbreviated as **"DP"** shall mean the Party that discloses the Confidential Information.

1.4. **"Purpose"** shall be as described in Article 2.1 infra in relation to the outsourced or insourced scope of work.

1.5. **"Receiving Party"** abbreviated as **"RP"** shall mean the Party that receives the Confidential Information.

2. PURPOSE

2.1. The purpose of this Agreement is to set forth the rights and obligations of the Parties with respect to the use, handling and protection of Confidential

Information which is disclosed by and between the Parties for the purpose of execution by XYZ of the following work outsourced by HAL (hereinafter referred to as the "**Purpose**").

Brief description of the Outsourcing/insourcing work. Additionally, the reference number of the Contract/Order and date can be mentioned here.

2.2. For furthering the purpose as above, the Parties may disclose Confidential Information to each other which the Parties shall handle in strict compliance to the provisions of this Agreement.

3. PROCEDURE FOR DISCLOSURE

3.1. When disclosed in writing or through electronic means to the RP, Confidential Information will be clearly stamped or marked by the DP as such. Such stamping or marking may include terms such as "Restricted", "Confidential", "Commercially Confidential", "Proprietary", "Secret" or "Top Secret".

3.2. When disclosed orally, Confidential Information will be identified as such at the time of disclosure by the DP and later reduced to writing or electronic form within 15 calendar days and sent to the RP. However, inadvertent failure of the DP to reduce to writing as above and communicate to the RP shall not discharge the RP from its obligations under this Agreement.

3.3. In the event that the DP fails to identify information disclosed to the RP as Confidential Information, the DP may correct such lapse by notifying the RP in writing as soon as possible. The RP shall not be in breach of this Agreement if such information is used or shared with any third party, without regard to the terms of this Agreement, prior to the receipt of such notification from the DP.

4. OBLIGATIONS OF THE RECEIVING PARTY

The RP shall have the following obligations with respect to Confidential Information:

4.1. To prevent disclosure of Confidential Information to any third party other than its own employees or sub-contractor. Sharing information with its employees or sub-contractor shall also be strictly on a need-to-know basis and solely for the Purpose. Further, a similar Non-Disclosure Agreement is required to be entered with the sub-contractor.

4.2. To store and protect the Confidential Information with utmost care.

4.3. Not to remove any stampings or markings appearing on Confidential Information.

4.4. Not to use Confidential Information for any reason other than the Purpose unless specifically authorised in writing by the DP.

5. EXCEPTIONS TO OBLIGATIONS OF THE RECEIVING PARTY

The obligations with respect to handling of Confidential Information set forth in this Agreement are not applicable to any information which:

5.1. prior to its disclosure by the DP was already known to the RP provided that immediately upon the disclosure by the DP, the RP will bring such fact to the attention of the DP in writing; or

5.2. is at the time of disclosure in the public domain or which comes into public domain later, where the publication of such information is not through a breach of this Agreement; or

5.3. is legally received from a third party, but the RP has no reasonable cause to believe that the third party has obtained such information through a breach of contract between such third party and the DP; or

5.4. is independently developed by the RP or a third party, without any breach of contract wherein the DP is a party; or

5.5. is approved for release or use by written authorization of the DP; or

5.6. is required to be disclosed by law or is mandated to be disclosed by an order by a Court of law or other governmental authority having jurisdiction.

Subject to the following Provisos.

a) Even if a part of the Confidential Information is exempted under any one of the above exceptions, the RP's obligations as to the remainder of the Confidential Information shall remain in force.

b) The burden of proof that one or more of the exceptions set forth above will apply to a specific case of disclosure shall rest on the RP.

6. TERM AND TERMINATION

6.1. This Agreement shall come into effect from the date of signature by both the Parties and shall remain in force for a minimum period of five years or the date of termination, whichever is earlier. The term of this Agreement can be extended by mutual agreement through a signed amendment in writing.

6.2. This Agreement can be terminated by either Party giving at least 30 days' notice in writing to the other Party.

6.3. Expiry or termination of this Agreement shall not ipso facto relieve the RP of its obligations under this Agreement which shall be in force for a further period of five years from such date of expiry or termination unless the DP formally discharges the RP from its obligations in writing.

7. RETURN OR DESTRUCTION OF CONFIDENTIAL INFORMATION

7.1. Unless there is an agreement to the contrary, the RP shall return all Confidential Information (and all copies thereof) within thirty (30) days of the completion of the period as per Para 6.3 above. Soft copies stored electronically by the RP shall also be permanently erased by the RP within such time limit.

7.2. If the DP is not satisfied by the actions as above, it shall demand further evidence or actions from the RP within 30 days. If no such demand is raised by

the DP in writing within this time limit, the RP shall be automatically discharged from all of its obligations under this Agreement.

8. CONTACT PERSONS

All communications related to this Agreement and exchange of information shall be handled by the following officials.

HINDUSTAN AERONAUTICS LIMITED	XYZ
Name: Designation: Address: Contact No.: E-mail: Fax No.:	Name: Designation: Address: Contact No.: E-mail: Fax No.:

As regards the employees identified above, each Party shall have the right and power and authorization to re-designate such employees within their organization, who will have authorization to receive and /or transmit Confidential Information exchanged by the Parties under this Agreement. Any such re-designation which is made by any of the Parties shall be effected by rendering written notice of such change to the other Party.

9. REMEDIES

In the event of breach of obligations under this Agreement by the RP, the DP shall be entitled to injunctive relief for rectification of the consequences of the breach as well as for preventing further dissemination of Confidential Information in violation of the terms hereof. Such relief shall be in addition to other legal remedies available to the DP to recoup the losses caused by the breach or to compensate for loss of reputation.

10. DISPUTE RESOLUTION

If XYZ is a Private Company, Proprietorship, LLP, etc.:

All disputes arising out of this Agreement at the first instance shall be resolved by mutual discussions. Disputes which cannot be so resolved shall be settled by arbitration in accordance with the Rules of Domestic Commercial Arbitration of Indian Council of Arbitration, by a single arbitrator appointed in accordance with the said Rules. The seat of arbitration shall be ….. (Insert the name of the city) in India. The proceedings shall be conducted in English Language. The arbitration award shall be final and binding on the Parties. During pendency of the arbitration proceedings, the Parties shall continue to perform their obligations under this Agreement.

If XYZ is a PSU or a Government entity:

In the event of any dispute relating to this Agreement, Parties agree to schedule a mandatory meeting at a mutually agreed location and attended by the representatives designated by the Parties to resolve the dispute. Any dispute

that is not resolved within thirty days from the date of the meeting as above shall be taken up by either Party for resolution through AMRCD as mentioned in DPE OM No. 05/0003/2019-FTS-10937 dated 14-12-2022 and the decision of AMRCD on the said dispute shall be binding on the Parties.

11. AMENDMENT

Any amendment to this Agreement must be made in writing and shall be signed on behalf of the Parties.

12. NOTICE OF BREACH

RP shall notify the DP immediately upon discovery of any unauthorized use or disclosure of Confidential Information by RP or its representatives, or any other breach of this Agreement by RP or its representatives, and will cooperate with efforts by the DP to help the DP regain possession of Confidential Information and prevent its further unauthorized use.

13. SEVERABILITY

The invalidity or unenforceability of any provisions of this Agreement shall not affect the validity or enforceability of any other provision of this Agreement and other provisions shall remain in full force and effect.

14. WAIVER

The failure of either Party, at any time, to require performance and/or enforcement of any provision of this Agreement by the other Party shall not be construed as a waiver of its rights under this Agreement, nor shall it affect its rights at some later date to enforce its rights under this Agreement.

15. SUCCESSORS

Subject to Article 15 ("Assignment"), this Agreement shall be binding upon and inure to the benefit of the respective successors and permitted assignees of both the Parties.

16. INTELLECTUAL PROPERTY RIGHTS

16.1 No rights, except as provided herein, are granted to the RP by virtue of disclosure of Confidential Information by DP. Such rights shall remain with the DP or concerned third parties, as the case may be.

16.2 No license or conveyance of any rights to either Party under any discoveries, inventions, patents, trade secrets, copyrights, or other form of intellectual property is expressly granted or implied by the disclosure or exchange of Confidential Information between the Parties.

17. CLASSIFIED INFORMATION

Nothing herein shall be deemed to replace or prejudice any governmental security classification referenced on any part of the Confidential Information and the RP undertakes to respect and observe any such classification and to

treat the same with such degree of care and security as is required by the relevant governmental authority in the country of the DP. This obligation shall continue for the duration of this Agreement and thereafter until such time as the said authority shall deem appropriate.

18. GENERAL

As to any matter which is not expressly covered herein, the terms and conditions of the Order/Contract for outsourcing or insourcing to which this Agreement relates shall apply.

IN WITNESS WHEREOF, the Parties by their duly authorized representatives have signed this Agreement in two (2) originals, one for each Party.

HINDUSTAN AERONAUTICS LIMITED	XYZ
Signature: Name: Title: Date:	Signature: Name: Title: Date:

Witnesses:	Witnesses:
1.	1.
2.	2.

Annexure - 5

Application Form for Registration as Approved Vendor (for Vendors based in India)

IMM Department

Application for Registration as Approved Vendor for Goods and Services

(for Vendors based in India)

Ref:.....

(Office Use Only)

Complete all sections of the form, sign the declaration and send the completed form and attachments in an envelope marked 'Application for Registration as Approved Vendor':

Head of IMM Department

Hindustan Aeronautics Limited

…….Division

(Vendor is requested to preferably apply for 'Registration as Approved/Empanelled **Vendor**' through HAL e-Procurement Portal - https://eproc.hal-india.co.in)

The columns in this form may be filled up. No column should be left blank. If applicant has no information to give in a particular column, "Nil" may be mentioned. In case, information not relevant in your case, please indicate "Not Applicable" in such column

Section 1: Applicant Particulars

Registration Category: *(Tick the correct category and strike out which is not applicable in the selected category)*	☐	Original Equipment Manufacturer (OEM)/ Licensor				
	☐	Stockist/ Distributor/ Dealer/ Trader				
	☐	Partner/ India Sales Office/ Subsidiary of Registered Foreign Vendor				
	☐	Service Provider				
	☐	Others (Please mention ……)				
Name of the Individual/ Firm/ Company:						
Constitution or Legal status:						
Registration Number:		Registering Authority		Date of Registration		
Type of Enterprise: *(strike out which is not applicable)*	Large/ Medium/ Small/ Micro		Whether Registered on GeM		Yes/ No	
			If yes, GeM Seller ID			
Year of commencement of Business:		PAN		GSTIN		
Registered Office Address:						
	City		State		PIN	

Primary Email ID:		Tel. No. (with STD Code)	
Primary Mobile no.:		Fax No.	
Company Website/ URL			
Address of Factory$:			
Address for Correspondence$: Telephone no.:			
Senior Most Executive Name: Designation: Email ID: Mobile No.:			
Contact/ Dealing Person Name: Designation: Email ID: Mobile No.:			

$ If not same as Registered Office Address.

Section 2: Applicant profile

2.1 Type of Ownership:

☐	Individual/ Single person/ Proprietorship	☐	Partnership	☐	Limited Liability Partnership
☐	Public Limited Company	☐	Private Limited Company	☐	Research Institute
☐	PSU/ Govt. of India Undertaking/ State Govt. Undertaking			☐	Registered Co-Operative Society
☐	Joint Venture or other tie-up for technology, equipment, financial backing and/or Project Management (Please specify……..)				
☐	Other, please specify ……				

Note: Enclose copies of Income Tax Return (in case of individual) Partnership Deed/ Articles & Memorandum of Association/ JV Agreement/ Certificate of Incorporation/ Certificate of Registration etc. as applicable, duly certified by Chartered Accountant.

2.2 (a) Are you a Medium, Small or Micro Enterprise (MSME) **-** Yes /No

If yes, please enclose copy of certificate.

i) Enterprise owned by (please tick which is applicable) - General/ Woman/ SC/ST

ii) Udyam Registration Number (URN) - ……

iii) Whether Registered on TReDS - Yes/No

(b) **Certifications**:

Type of Certification	Accredited Institution	Standard	Valid up to (date)
Quality Management			
Environment Management			
Operational Health & Safety Assessment			
Social Accountability			

(c) Give details of registration, if any, with HAL or its Divisions (Specify Division)/GeM/PSUs/ Central/State Govt./ Major Private Institutions/ Others (Specify):

Company	Registration Number	Dated	Validity	Class/ Type of Registration

Note: Attach necessary certificates from the registering authorities.

(d) Do you have License form Drug Controller – Yes/No.

If Yes, Indicate License Number …….

and Validity ……..

(Applicable only in case of applications pertaining to registration of Drugs/ Medical Equipment vendors).

2.3 Give the floor area of your factory and Offices. If you own more than one factory, please give separate details for each unit:

Factory or Office	Location	Area in Square Meters

2.4 **A.** Give a list of your major products/services, you intend to offer as a vendor:

Sl. No.	Major Products/Services*	Are you Original Equipment Manufacturer for listed product
		Yes / No
		Yes / No
		Yes / No
		Yes / No
		Yes / No
		Yes / No

*Please enclose your Company/ Product Catalogues.

(In case of Stockist/ Distributor please enclose relevant authorization from respective OEM/ Manufacturer/ Principals)

B. Please refer Material Categorisation chart as per **Annexure - 3A** and mention the material category/ies, under which you intend to register with HAL:

Material Group	Material Category	Material Sub-Categories

Note: In case of "Others" – please mention the products description.

2.5 Give a List of your major Customers

Sl.No.	Customer's Name & Address	Serial No. of the Product/ Service (from para 2.4 above) provided to the Customer

Note: Please attach Proof in the form of Purchase Order copies/ Invoice etc.

2.6 List the names of Owners/ Partners/Promoters and Directors/ Company Secretary/ Holder of Power of Attorney, as applicable, in the format detailed below:

Name of Owners/ Partners/ Promoters and Directors/ Company Secretary/ Holder of Power of Attorney	Relationship of the person with the firm

Note: Indicate Director Identification Number (DIN) also, wherever applicable.

2.7 List the names & addresses of all associated, subsidiary & holding companies, including trusts

Company Name	Address	Nature of Business	Relationship with Applicant

Section 3: Financial details

3.1 Annual Turnover in the last 3 years:

Year			
Annual Turn-over (Rs. Lakhs)			
Profit/ Loss (Rs. Lakhs)			

Attach the audited Balance sheet and Profit & Loss statement for the above.

3.2 IMPORTANT NOTE – Financial Assessment:

Before the assessment of this application can be completed, a representative from HAL may contact you concerning the financial and technical information that you provide. Your co-operation is required to assist in the assessment process. Failure to co-operate may affect registration.

The assessment report is specifically for use by HAL for the purpose of assessing Vendor for registration, and will be treated as strictly confidential.

3.3 Bank(s) details:

Will you authorise your Bank/s to provide information to HAL with a reference as to your financial position, if required?	YES / NO
Name of Bank & Branch	
Account Number	
Account Type	
IFSC code of the Bank	
Name and Designation of Contact Person:	
Address: Tel No:	

The above bank account details will be used for processing any payment to you.

Attach the cancelled cheque or bank mandate as a proof of the bank account details.

3.4 Furnish details of Income Tax Assessment in the last 3 Assessment years.

Assessment YEAR			
Amount Assessed (Rs. Lakhs)			
Amount paid/ payable(Rs. Lakhs)			

Attach the copies of Income Tax Returns filed.

3.5 Goods & Services Tax (GST) Details:

Goods & Service Tax Registration Number (GSTIN) _____

Attach copy of GST Registration along with copies of GST Returns filed for the past 3 years.

4 In the last 3 years, has your firm, or any firm with which any of your company's owners, officers or partners were associated, been debarred, disqualified, removed, business dealings banned or otherwise prevented from bidding ? YES/NO

If yes, State the reference to Customer and their orders and the basis for the action.

5 Whether any criminal case/s is/are pending in the name of the company for the last 5 years. YES/NO

If yes, provide a brief of the same.

6 Please provide any additional information, which will help you in securing registration with HAL.

7 DECLARATION

(This declaration should be completed by Proprietor/ Partner/ Director or other Senior Manager who has the authority to do so.)

I/We declare and confirm that –

a) The HAL Conditions of Registration are acceptable.

b) All information and attachments submitted in this application are true and correct.

c) I/We are aware that any false information provided herein will result in the rejection of my application and cancellation of any registrations granted.

d) I/We shall be bound by the acts of duly constituted attorney who has signed this application and of any other person who in future shall be appointed by us in his place to carry on business of the concern whether or not an intimation of such changes is given to HAL.

e) I/We have read and understood HAL's General Conditions of Contract and agree to abide by the same in all respects,

f) I/We undertake to communicate promptly to HAL any changes in organization, management, condition or working of the firm.

Note: Refer **Annexure – 5A** for the list of documents to be submitted along with the Vendor Registration Application Form.

Signature:……..……..

Name:……..

Position:……...……

Date:……

Details of person holding the Power of Attorney (If different from above) (attach attested copy of Power of Attorney)

Name ……. Tel. No. (….) … …….. Mobile No..……

Position ……..Fax No. (….) ……...

Official Seal

Annexure – 5A

Check List of Documents to be Submitted along with the Vendor Registration Application Form (for Vendors based in India)

Sl	Details Required as per Form	Proof/ Document Required	Yes/No
1	Company Registration/ Address:	(As applicable to your company)	[ ]
a.	For Individual/ Single person/ Proprietorship firm - where firm registration is not mandatory	Notarised affidavit for Proof of Company address	[ ]
b.	For Partnership/ Limited Liability Partnership (LLP) firm - where firm registration is not mandatory	Copy of Registration with Registrar of Firm (in case of Partnership/ LLP Firm) Registered or Unregistered Partnership Deed Notarised affidavit for Proof of Company address	[ ] [ ] [ ]
c.	For companies registered under Company Act 1956	Memorandum of Association/ Article of Association Certificate of Incorporation with registrar of firms Certificate of GST Registration	[ ] [ ] [ ]
2	Income Tax registration	PAN or TIN document	[ ]
3	Registration Category	If Stockist/Distributor/ Dealer/ Trader - Authorized Distributor Certificate and Copy of Agreement/Contract with Principal/ OEM.	[ ]
4	Udyam Registration (in case of MSME only)	Udyam Registration Certificate	[ ]
5	Quality Certification	ISO Certificate/ Any Other Certificate	[ ]
6	Registration with other HAL Divisions/ Organizations	Registration Certificate	[ ]
7	List of Major Products/Services	Product Catalog/ Service Catalog	[ ]
8	List of Major Customers	Past Purchase Orders Copy Any other proof	[ ]
9	Annual Turnover (of Past 3 years)	Audited Balance Sheet of FY..... last three years Audited Profit/Loss statement of FY… last three years	[ ] [ ]
10	Bank(s) Details	Cancelled Cheque/ Bank Mandate	[ ]
11	Income Tax Assessed (of Past 3 years)	Copy of ITR Acknowledgment for AY... last 03 years.	[ ]
12	Tax Details	Copy of GST returns filed for FY….. last 3 years	[ ]
13	Details & Mandatory document uploaded on HAL e-procurement portal for 'e-Registration'		[ ]
Note - Kindly provide all current documents as above, tick mark and send back along with form.			

Annexure - 6

Application Form for Registration as Approved Vendor (Foreign Vendor - Manufacturer)

IMM Department

Application for Registration as Approved Vendor (Foreign Vendor - Manufacturer)

Ref:.....

(Office Use Only)

1	Name of the Firm	
2	Parent Company	
3	Address	
	City	
	State & Zip Code	
	Country	
4	Contact Name	
5	Phone	
6	Fax	
7	E-mail	
8	Website/ URL	
9	Category	Original Equipment Manufacturer (OEM) ☐ Consortiums/ State/ Govt. Agencies ☐ Others ☐
10	Company Type	Limited Company ☐ Partnership ☐ Individual ☐ Educational or Research Institute ☐ Trust ☐ Others ☐
11	Data Universal Numbering System (DUNS) Number	
12	Capital Employed	
13	Annual Sales	
14	Quality Certifications/ Accredition	
15	Employees (Total)	
16	Products/ Services	

17	Major Customers	
18	Address of Liaison office/ Branch office/ subsidiary in India if any with details of necessary clearance from Reserve Bank of India	
19	Details of authorised Stockist/ Distributor/ Service Centers if any to manage HAL supplies	
20	Company's Catalogue/ Brochure enclosed.	Yes/ No
21	Bank Account Details	Bank Name & Branch …….. IBAN Number …… SWIFT code ……..

Date…….

Signature:……

Name:……..

Position:……....……

Note: i) Refer **Annexure – 6A** for the list of documents to be submitted along with the Vendor Registration Application Form.

ii) Vendor is requested to get e-registered on line at HAL e-Portal. Visit https://eproc.hal-india.co.in.

Annexure – 6A

Check List of Documents to be Submitted along with the Application for Foreign Vendor – Manufacturer

Sl. No.	Details Required	Proof Required	Yes/ No
1	Details of Business Establishment	A certified copy of the charter, statutes, or Memorandum and Articles of the company or other instrument constituting or defining the constitution of the company; and if the instrument is not in the English language, a certified translation thereof	[ ]
2	Full address of Registered office of the company/firm & proof thereof	Notarised affidavit for Proof of Company address	[ ]
3	Sales Tax Registration as per law of the country of registration	Copy of Sales Tax Registration	[ ]
4	Income Tax Registration as per law of the country of registration	Copy of Income Tax Registration	[ ]
5	Certification from reputed Accreditation agencies	Certificate of accreditation	[ ]
6	Major customers list	Past Purchase Orders or any other suitable document	[ ]
7	Product Details	Product catalogs/ Brochures	[ ]
8	Annual Sales	Audited Balance Sheet of FY..... Last 03 years	[ ]
9	Any other important detail		[ ]
10	Details & Mandatory document uploaded on HAL e-proc portal for 'e-Registration'		Yes/ No
Remarks: Kindly provide all current documents as above, tick mark and send back along with form.			

Annexure - 7

Application Form for Registration as Approved Vendor (Foreign Vendor - Stockist/Distributor)

IMM Department

Application for Registration as Approved Vendor

(Foreign Vendor - Stockist/Distributor)

Ref:.....

(Office Use Only)

1	Name of the Firm	
2	Name of OEM(s) represented by the firm	
3	Address for communication	
	City	
	State & Zip Code	
	Country	
4	Contact Name	
5	Phone	
6	Fax	
7	E-mail	
7A	Address of Registered office with proof thereof (Certified copy of Charter, Memorandum of Association and Articles of Association, Income tax, Sales Tax registration as per law of country of registration and Country of Business operation, if different from country of registration to be enclosed)	
8	Document proof of OEM authorization for Stockist/ Distributor	
9	Website/ URL	
10	Category	Stockist ☐ Distributor ☐ Others ☐
11	Company Type	Limited Company ☐ Partnership ☐ Individual ☐ Educational or Research Institute ☐ Trust ☐

12	Data Universal Numbering System (DUNS) Number	
13	Capital Employed	
14	Annual Sales	
15	Equipment	
16	Facilities (sq. mtr)	
17	Quality Certifications/ Accredition	
18	Employees (Total)	
19	Key Sector	
20	Products / Services	
21	Major Customers	
22	Company's Catalogue/ Brochure enclosed.	Yes/ No
23	Bank Account Details	Bank Name & Branch …….. IBAN Number …… SWIFT code ……..

Date…….

Signature:……

Name……

Position……

Company Seal

Note: i) Refer **Annexure – 7A** for the list of documents to be submitted along with the Vendor Registration Application Form.

ii) Vendor is requested to get e-registered on line at HAL e-Portal. Visit https://eproc.hal-india.co.in.

Annexure – 7A

Check List of Documents to be Submitted along with the Application for Foreign Vendors/ Stockist/ Distributors

Sl. No.	Details Required	Proof Required	Yes/ No
1	Details of Business Establishment	A certified copy of the charter, statutes, or Memorandum and Articles of the company or other instrument constituting or defining the constitution of the company; and if the instrument is not in the English language, a certified translation thereof	[ ]
2	Full address of Registered office of the company/firm & proof thereof	Notarised affidavit for Proof of Company address	[ ]
3	OEM/ Distributor/ Stockist category and OEM authorizations	If Stockist/Distributor - Authorized Distributor Certificate/ Copy of Agreement with Principal/ OEM.	[ ]
4	Sales Tax Registration as per law of the country of registration	Copy of Sales Tax Registration	[ ]
5	Income Tax Registration as per law of the country of registration	Copy of Income Tax Registration	[ ]
6	Certification from reputed Accreditation agencies	Certificate of accreditation	[ ]
7	Major customers list	Past Purchase Orders or any other suitable document	[ ]
8	Product Details	Product catalogs/ Brochures	[ ]
9	Annual Sales	Audited Balance Sheet of FY..... Last 03 years	[ ]
10	Any other important detail		[ ]
11	Details & Mandatory document uploaded on HAL e-proc portal for 'e-Registration'		Yes/ No
Remarks: Kindly provide all current documents as above, tick mark and send back along with form.			

Annexure – 23A

Format of Bank Guarantee for Advance Payment

1. In consideration of the HINDUSTAN AERONAUTICS LTD., _____ Division (hereinafter called as "HAL") having agreed to make advance payment to _____ [hereinafter called "the said Contractor/Vendor(s)"], under Agreement/Contract/Order No. _____ dated _____ (hereinafter called "the said Agreement/ the said Contract/ the said Order"), made between _____ and _____ for _____ (indicate the scope of supply), for the due fulfillment of the terms and conditions contained in the said Agreement/Contract/Order, on production of a Bank Guarantee for _____ (indicate the amount in Rs/ Foreign Currency) (_____ Only), We, _____, (indicate the name of the bank) (hereinafter referred to as "the Bank") at the request of _____ [Contractor/Vendor(s)] do hereby undertake to pay to HAL an amount not exceeding _____ (indicate the amount in Rs/ Foreign Currency) against any loss or damage, costs, charges and expenses, claims caused to/ suffered or would be caused to/ suffered by HAL by reason of any breach by the said Contractor/Vendor(s) of any of the terms or conditions contained in the said Agreement/Contract/Order.

2. We, _____ (indicate the name of the bank) do hereby unreservedly, irrevocably undertake to pay immediately the amounts due and payable under this guarantee without any demur, merely on a written demand from HAL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by HAL by reason of breach by the said Contractor/Vendor(s) of any of the terms or conditions contained in the said Agreement/Contract/Order or by reason of the said Contractor/Vendor(s)' failure to perform the said Agreement/Contract/Order. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding _____ (indicate the amount in Rs/ Foreign Currency).

3. We undertake to pay to HAL an amount not exceeding _____ (indicate the amount in Rs/ Foreign Currency) so demanded notwithstanding any dispute or disputes raised by the said Contractor(s)/ Vendor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this Guarantee being absolute and unequivocal.

4. We, _____ (indicate the name of bank) further agree with HAL that HAL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement/Contract/Order or to extend time of performance by the said Contractor/Vendor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by HAL against the said Contractor/Vendor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement/Contract/Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Vendor(s) or for any forbearance, act or omission on the part of HAL or any indulgence by HAL to the said Contractor/ Vendor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

5. We, _____ (indicate the name of bank) lastly undertake not to revoke this Guarantee during its currency except with the previous consent of HAL in writing and agree that any change in the constitution of the said Contactor(s)/Vendor(s) or the Bank shall not discharge the Bank of its liability under this deed.

6. The validity of Bank Guarantee shall be up to _____ (dd/mm/yyyy) and such date shall be 60 days after the last delivery/Services against the said Agreement/Contract/Order. The Bank Guarantee shall continue to be enforceable till all the dues of HAL under or by virtue of the said

Agreement/Contract/Order have been fully paid and its claims satisfied or discharged or till HAL certifies that the terms and conditions of the said Agreement/Contract/Order have been fully and properly carried out by the said Contractor/Vendor(s) and accordingly discharges this Guarantee.

7. The Bank Guarantee can be invoked by submitting the claim at _____ (Place of respective HAL's Division) any Branch of the issuing Bank.

8. Notwithstanding anything contained herein:

a) Our liability under this Bank Guarantee shall not exceed Rs.....… (Rupees ……..… Only)

b) This Bank Guarantee shall be valid up to _____ (being the date of expiry of the guarantee) and

c) The Beneficiary's right as well the Bank's liability under this Guarantee shall stand extinguished unless a written claim or demand is made under this Guarantee on or before _____ [ ] ((being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of Bank Guarantee as per **clause 8 (b)** above).

9. This Bank Guarantee shall be governed by and constitute in accordance with Indian Law and shall be subject to exclusive Jurisdiction of Indian Courts.

10. Dated the_____day of_____for_____(indicate the name of the Bank).

Annexure – 23B

Format of Bank Guarantee for Security Deposit

1. In consideration of the HINDUSTAN AERONAUTICS LTD., _____ Division (hereinafter called as "HAL") having agreed to exempt _____ [hereinafter called "the said Contractor/ Vendor(s)"] from the demand of Security Deposit, under Agreement/Contract/Order No. _____ dated _____ (hereinafter called "the said Agreement/ the said Contract/ the said Order"), made between _____ and _____ for _____ (indicate the scope of supply) for the due fulfillment by the said Contractor/Vendor(s) of the terms and conditions contained in the said Agreement/Contract/Order, on production of a Bank Guarantee for _____ (indicate the amount in Rs/ Foreign Currency) (_____ Only), We, _____, (indicate the name of the bank) (hereinafter referred to as "the Bank") at the request of _____ [Contractor/Vendor(s)] do hereby undertake to pay to HAL an amount not exceeding _____ (indicate the amount in Rs/ Foreign Currency) against any loss or damage, costs, charges and expenses, claims caused to/ suffered or would be caused to/ suffered by HAL by reason of any breach by the said Contractor/ Vendor(s) of any of the terms or conditions contained in the said Agreement/Contract/Order.

2. We, _____ (indicate the name of the bank) do hereby unreservedly, irrevocably undertake to pay immediately the amounts due and payable under this Guarantee without any demur, merely on a written demand from HAL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by HAL by reason of breach by the said Contractor(s)/Vendor of any of the terms or conditions contained in the said Agreement/Contract/Order or by reason of the said Contractor/Vendor(s)' failure to perform the said Agreement/Contract/Order. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding _____ (indicate the amount in Rs/ Foreign Currency).

3. We undertake to pay to HAL an amount not exceeding _____ (indicate the amount in Rs/ Foreign Currency) so demanded notwithstanding any dispute or disputes raised by the said Contractor(s)/ Vendor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this Guarantee being absolute and unequivocal.

4. We, _____ (indicate the name of bank) further agree with HAL that HAL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement/Contract/Order or to extend time of performance by the said Contractor/Vendor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by HAL against the said Contractor(s)/Vendor and to forbear or enforce any of the terms and conditions relating to the said Agreement/Contact/Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Vendor(s) or for any forbearance, act or omission on the part of HAL or any indulgence by HAL to the said Contractor/Vendor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

5. We,_____(indicate the name of bank) lastly undertake not to revoke this Guarantee during its currency except with the previous consent of HAL in writing and agree that any change in the constitution of the said Contactor(s)/Vendor(s) or the Bank shall not discharge the Bank of its liability under this deed.

6. The validity of Bank Guarantee shall be up to_____(dd/mm/yyyy) and such date shall be 60 days after the last delivery/Services against the said Agreement/Contact/Order. The Bank Guarantee shall continue to be enforceable till all the dues of HAL under or by virtue of the said Agreement/Contact/Order have been fully paid and its claims satisfied or discharged or till HAL certifies that the terms and conditions of the said Agreement/Contact/Order have been fully and properly carried out by the said Contractor(s)/ Vendor

and accordingly discharges this Guarantee.

7. The Bank Guarantee can be invoked by submitting the claim at _____ (Place of respective HAL's Division) any Branch of the issuing Bank.

8. Notwithstanding anything contained herein:

   a) Our liability under this Bank Guarantee shall not exceed Rs.....… (Rupees ……..… Only)

   b) This Bank Guarantee shall be valid up to _____ (being the date of expiry of the Guarantee) and

   c) The Beneficiary's right as well the Bank's liability under this Guarantee shall stand extinguished unless a written claim or demand is made under this Guarantee on or before _____ [ ] ((being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of Bank Guarantee as per **clause 8 (b)** above).

9. This Bank Guarantee shall be governed by and constitute in accordance with Indian Law and shall be subject to exclusive Jurisdiction of Indian Courts.

10. Dated the_____day of_____for_____(indicate the name of the Bank)

Annexure – 23C

Format of Performance Bank Guarantee

1. HINDUSTAN AERONAUTICS LTD., _____ Division (hereinafter called as "HAL") have entered into Agreement/Contract/Order _____ (hereinafter called "the said Agreement/ the said Contract/ the said Order"), with _____ (hereinafter called "the said Contractor/Vendor(s))", for _____ (indicate the scope of supply).

2. Whereas under the terms of the said Agreement/Contact/Order, the said Contractor/Vendor is required to furnish a Performance Bank Guarantee for_____(indicate the amount in Rs/ Foreign Currency _____ Only) towards the due fulfillment of the terms and conditions during the agreed time period or extension thereof, and also satisfactory performance of the items supplied to HAL during warranty period as per the warranty terms stipulated in the said Agreement/Contract/Order.

3. Accordingly We,_____, (indicate the name of the bank) (hereinafter referred to as "the Bank") at the request of_____[Contractor/Vendor(s)] do hereby undertake to pay to HAL an amount not exceeding_____(indicate the amount in Rs/ Foreign Currency) on the failure of the said Contractor/Vendor in performance of their obligations as per the terms and conditions of the said Agreement/Contract/Order including the satisfactory performance of the item during warranty period as per the warranty terms stipulated in the said Agreement/Contract/Order.

4. We,_____(indicate the name of the bank) do hereby unreservedly, irrevocably undertake to pay immediately the amounts due and payable under this Guarantee without any demur, merely on a written demand from HAL stating that the amount claimed is due by way of non-performance/ unsatisfactory performance by the said Contractor/Vendor with respect to the terms and conditions of the said Agreement/Contract/Order including failure in satisfactory performance of the items supplied/services rendered under the warranty terms stipulated in the said Agreement/Contract/Order. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this Guarantee shall be restricted to an amount not exceeding _____ (indicate the amount in Rs/ Foreign Currency).

5. We undertake to pay to HAL an amount not exceeding_____(indicate the amount in Rs/ Foreign Currency) so demanded notwithstanding any dispute or disputes raised by the said Contractor(s)/Vendor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this Guarantee being absolute and unequivocal.

6. We,_____(indicate the name of bank) further agree that the Guarantee herein contained shall remain in full force and effect, during the period that would be taken for the performance of the said Agreement/Contract/Order and that it shall continue to be enforceable till all the dues of HAL under or by virtue of the said Agreement/Contract/Order have been fully paid and its claims satisfied or discharged or till HAL certifies that the terms and conditions of the said Agreement/Contract/Order have been fully and properly carried out by the said Contractor/Vendor(s) and accordingly discharges this Guarantee.

7. We,_____(indicate the name of bank) further agree with HAL that HAL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement/Contract/Order or to extend time of performance by the said Contractor/Vendor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by HAL against the said Contractor/Vendor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement/Contract/Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Vendor(s) or for any forbearance, act or omission on the part of HAL or any indulgence by HAL to the said Contractor/Vendor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

8. We,_____(indicate the name of bank) lastly undertake not to revoke this Guarantee during its currency except with the previous consent of HAL in writing and agree that any change in the constitution of the said Contactor(s)/Vendor(s) or the Bank shall not discharge the Bank of its liability under this deed.

9. The validity of Bank Guarantee shall be up to_____(dd/mm/yyyy) and such date shall cover the period of warranty of all the supplies and also the period of defect liability/ warranty period for last batch of supplies. The validity of Bank Guarantee will be for a period up to which the Contractor/Vendor is obliged for due performance of the said Agreement/Contract/Order including the warranty period.

10. The Bank Guarantee can be invoked by submitting the claim at _____ (Place of respective HAL's Division) any Branch of the issuing Bank.

11. Notwithstanding anything contained herein:

a) Our liability under this Bank Guarantee shall not exceed Rs.....… (Rupees ……..… Only)

b) This Bank Guarantee shall be valid up to _____ (being the date of expiry of the guarantee) and

c) The Beneficiary's right as well the Bank's liability under this Guarantee shall stand extinguished unless a written claim or demand is made under this Guarantee on or before _____ [ ] ((being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of Bank Guarantee as per **clause 11 (b)** above).

12. This Bank Guarantee shall be governed by and constitute in accordance with Indian Law and shall be subject to exclusive Jurisdiction of Indian Courts.

13. Dated the_____day of_____for_____(indicate the name of the Bank).

Annexure – 23D

Format of Bank Guarantee towards Earnest Money

1. In consideration of the HINDUSTAN AERONAUTICS LIMITED _____ Division (hereinafter called as "HAL") on the first part and M/s _____ of _____ (hereinafter referred to as "Bidder") on the Second part, having agreed to accept the Earnest Money Deposit of Rs _____ (Rupees _____) in the form of Bank Guarantee for the Request for Proposal/Quote for procurement of _____.

2. We _____ (Name of the Bank), (hereinafter referred to as the "Bank"), do hereby undertake to pay immediately to HAL on a written demand without any demur and without seeking any reasons whatsoever, an amount not exceeding _____ (Rupees _____) and the Guarantee will remain valid up to a period _____. It will, however, be open to HAL to return the Guarantee earlier than this period to the Bidder(s), in case the Bidder(s) does not/do not qualify for the negotiation by the Price Negotiation Committee (PNC) as constituted by HAL.

3. In the event of the Bidder withdrawing the tender before the completion of the stages prior to the Price negotiations or during the Price negotiation or during validity of offer, as the case may be, the Guarantee deposited by the Bidder stands forfeited to HAL. We also undertake not to revoke this Guarantee during this period except with the previous consent of HAL in writing and we further agree that our liability under the Guarantee shall not be discharged by any variation in the term of the said tender and we shall be deemed to have agreed to any such variation.

4. The Bank Guarantee can be invoked by submitting the claim at _____ (Place of respective HAL's Division) any Branch of the issuing Bank

5. Notwithstanding anything contained herein:

   a. Our liability under this Bank Guarantee shall not exceed Rs.....… (Rupees ……..… Only)

   b. This Bank Guarantee shall be valid up to _____ (being the date of expiry of the Guarantee) and

   c. The Beneficiary's right as well the Bank's liability under this Guarantee shall stand extinguished unless a written claim or demand is made under this Guarantee on or before _____ [ ] ((being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of Bank Guarantee as per **clause 5(b)** above).

6. This Bank Guarantee shall be governed by and constitute in accordance with Indian Law and shall be subject to exclusive Jurisdiction of Indian Courts.

7. No interest shall be payable by HAL to the Bidder (s) on the Guarantee for the period of its currency.

Dated this_____day of_____20__.

For the Bank of _____

(Agent /Manager)

Annexure – 23E[268]

Format of Insurance Surety Bond for Advance Payment

1. In consideration of the HINDUSTAN AERONAUTICS LTD., _____ Division (hereinafter called as "HAL") having agreed to make advance payment to _____ [hereinafter called "the said Contractor/Vendor(s)"], under Agreement/Contract/Order No. _____ dated _____ (hereinafter called "the said Agreement/ the said Contract/ the said Order"), made between _____ and _____ for _____ (indicate the scope of supply), for the due fulfillment of the terms and conditions contained in the said Agreement/Contract/Order, on production of a Surety Bond for _____ (indicate the amount in Rs) (Rs _____ Only), We, _____, (indicate the name of the Insurance Company) (hereinafter referred to as "the Surety") at the request of _____ [Contractor/Vendor(s)] do hereby undertake to pay to HAL an amount not exceeding _____ (indicate the amount in Rs) against any loss or damage, costs, charges and expenses, claims caused to/ suffered or would be caused to/ suffered by HAL by reason of any breach by the said Contractor/Vendor(s) of any of the terms or conditions contained in the said Agreement/Contract/Order.

2. We, _____ (indicate the name of the Insurance Company) do hereby unreservedly, irrevocably undertake to pay immediately the amounts due and payable under this Bond without any demur, merely on a written demand from HAL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by HAL by reason of breach by the said Contractor/Vendor(s) of any of the terms or conditions contained in the said Agreement/ Contract/Order or by reason of the said Contractor/Vendor(s)' failure to perform the said Agreement/Contract/Order. Any such demand made on the Surety shall be conclusive as regards the amount due and payable by the Surety under this Bond. However, our liability under this Bond shall be restricted to an amount not exceeding _____ (indicate the amount in Rs).

3. We undertake to pay to HAL an amount not exceeding _____ (indicate the amount in Rs) so demanded notwithstanding any dispute or disputes raised by the said Contractor(s)/ Vendor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this Bond being absolute and unequivocal.

4. We, _____ (indicate the name of Insurance Company) further agree with HAL that HAL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement/Contract/Order or to extend time of performance by the said Contractor/Vendor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by HAL against the said Contractor/Vendor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement/Contract/Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Vendor(s) or for any forbearance, act or omission on the part of HAL or any indulgence by HAL to the said Contractor/Vendor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

5. We, _____ (indicate the name of Insurance Company) lastly undertake not to revoke this Bond during its currency except with the previous consent of HAL in writing and agree that any change in the constitution of the said Contactor(s)/Vendor(s) or the Surety shall not discharge the Surety of its liability under this deed.

6. The validity of Surety Bond shall be up to _____ (dd/mm/yyyy) and such date shall be 60 days after the last delivery/Services against the said Agreement/Contract/Order. The Surety Bond shall continue to be enforceable till all the dues of HAL under or by virtue of the said Agreement/Contract/Order have been fully paid and its claims satisfied or discharged or till HAL certifies that the terms and conditions of the said

[268] (Annexure 23E, an additional/new annexure is included vide Amendment no. 3 Dt. 01-04-2026)

Agreement/Contract/Order have been fully and properly carried out by the said Contractor/Vendor(s) and accordingly discharges this Bond.

7. The Surety Bond can be invoked by submitting the claim at _____ (Place of respective HAL's Division) any Branch of the issuing Surety.

8. Notwithstanding anything contained herein:

a) Our liability under this Surety Bond shall not exceed Rs.....… (Rupees ……..… Only)

b) This Surety Bond shall be valid up to _____ (being the date of expiry of the Bond) and

c) The Beneficiary's right as well the Surety's liability under this Bond shall stand extinguished unless a written claim or demand is made under this Bond on or before _____ [ ] ((being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of the Bond as per **clause 8 (b)** above).

9. This Surety Bond shall be governed by and constitute in accordance with Indian Law and shall be subject to exclusive Jurisdiction of Indian Courts.

10. Dated the _____ day of _____ for _____ (indicate the name of the Insurance Company).

Annexure – 23F[269]

Format of Insurance Surety Bond for Security Deposit

1. In consideration of the HINDUSTAN AERONAUTICS LTD., _____ Division (hereinafter called as "HAL") having agreed to exempt _____ [hereinafter called "the said Contractor/ Vendor(s)"] from the demand of Security Deposit, under Agreement/Contract/Order No. _____ dated _____ (hereinafter called "the said Agreement/ the said Contract/ the said Order"), made between _____ and _____ for _____ (indicate the scope of supply) for the due fulfillment by the said Contractor/Vendor(s) of the terms and conditions contained in the said Agreement/Contract/Order, on production of a Surety Bond for _____ (indicate the amount in Rs) (_____ Only), We, _____, (indicate the name of the Insurance Company) (hereinafter referred to as "the Surety") at the request of _____ [Contractor/Vendor(s)] do hereby undertake to pay to HAL an amount not exceeding _____ (indicate the amount in Rs) against any loss or damage, costs, charges and expenses, claims caused to/ suffered or would be caused to/ suffered by HAL by reason of any breach by the said Contractor/Vendor(s) of any of the terms or conditions contained in the said Agreement/Contract/Order.

2. We, _____ (indicate the name of the Insurance Company) do hereby unreservedly, irrevocably undertake to pay immediately the amounts due and payable under this Bond without any demur, merely on a written demand from HAL stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by HAL by reason of breach by the said Contractor(s)/Vendor of any of the terms or conditions contained in the said Agreement/Contract/Order or by reason of the said Contractor/Vendor(s)' failure to perform the said Agreement/Contract/Order. Any such demand made on the Surety shall be conclusive as regards the amount due and payable by the Surety under this Bond. However, our liability under this Bond shall be restricted to an amount not exceeding _____ (indicate the amount in Rs).

3. We undertake to pay to HAL an amount not exceeding _____ (indicate the amount in Rs) so demanded notwithstanding any dispute or disputes raised by the said Contractor(s)/Vendor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this Bond being absolute and unequivocal.

4. We, _____ (indicate the name of Insurance Company) further agree with HAL that HAL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement/Contract/Order or to extend time of performance by the said Contractor/Vendor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by HAL against the said Contractor(s)/Vendor and to forbear or enforce any of the terms and conditions relating to the said Agreement/Contact/Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Vendor(s) or for any forbearance, act or omission on the part of HAL or any indulgence by HAL to the said Contractor/Vendor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

5. We,_____(indicate the name of Insurance Company) lastly undertake not to revoke this Bond during its currency except with the previous consent of HAL in writing and agree that any change in the constitution of the said Contactor(s)/Vendor(s) or the Surety shall not discharge the Surety of its liability under this deed.

6. The validity of Surety Bond shall be up to_____(dd/mm/yyyy) and such date shall be 60 days after the last delivery/Services against the said Agreement/Contract/Order. The Surety Bond shall continue to be enforceable till all the dues of HAL under or by virtue of the said Agreement/Contact/Order

[269] (Annexure 23F, an additional/new annexure is included vide Amendment no. 3 Dt. 01-04-2026)

have been fully paid and its claims satisfied or discharged or till HAL certifies that the terms and conditions of the said Agreement/Contact/Order have been fully and properly carried out by the said Contractor(s)/Vendor and accordingly discharges this Bond.

7. The Surety Bond can be invoked by submitting the claim at _____ (Place of respective HAL's Division) any Branch of the issuing Surety.

8. Notwithstanding anything contained herein:

a) Our liability under this Surety Bond shall not exceed Rs.....… (Rupees ……..… Only)

b) This Surety Bond shall be valid up to _____ (being the date of expiry of the Bond) and

c) The Beneficiary's right as well the Surety's liability under this Bond shall stand extinguished unless a written claim or demand is made under this Bond on or before _____ [ ] ((being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of the Surety Bond as per **clause 8 (b)** above).

9. This Surety Bond shall be governed by and constitute in accordance with Indian Law and shall be subject to exclusive Jurisdiction of Indian Courts.

10. Dated the _____day of _____for _____(indicate the name of the Insurance Company)

Annexure – 23G[270]

Format of Insurance Surety Bond for Warranty Coverage

1. HINDUSTAN AERONAUTICS LTD., _____ Division (hereinafter called as "HAL") have entered into Agreement/Contract/Order _____ (hereinafter called "the said Agreement/ the said Contract/ the said Order"), with _____ (hereinafter called "the said Contractor/Vendor(s))", for _____ (indicate the scope of supply).

2. Whereas under the terms of the said Agreement/Contact/Order, the said Contractor/Vendor is required to furnish a Surety Bond _____ (indicate the amount in Rs) (Rs _____ Only) towards the due fulfillment of the terms and conditions during the agreed time period or extension thereof, and also satisfactory performance of the items supplied to HAL during warranty period as per the warranty terms stipulated in the said Agreement/Contract/Order.

3. Accordingly We,_____, (indicate the name of the Insurance Company) (hereinafter referred to as "the Surety") at the request of_____[Contractor/Vendor(s)] do hereby undertake to pay to HAL an amount not exceeding_____(indicate the amount in Rs) on the failure of the said Contractor/Vendor in performance of their obligations as per the terms and conditions of the said Agreement/Contract/Order including the satisfactory performance of the item during warranty period as per the warranty terms stipulated in the said Agreement/Contract/Order.

4. We,_____(indicate the name of the Insurance Company) do hereby unreservedly, irrevocably undertake to pay immediately the amounts due and payable under this Bond without any demur, merely on a written demand from HAL stating that the amount claimed is due by way of non-performance/ unsatisfactory performance by the said Contractor/Vendor with respect to the terms and conditions of the said Agreement/Contract/Order including failure in satisfactory performance of the items supplied/services rendered under the warranty terms stipulated in the said Agreement/Contract/Order. Any such demand made on the Surety shall be conclusive as regards the amount due and payable by the Surety under this Bond. However, our liability under this Bond shall be restricted to an amount not exceeding _____ (indicate the amount in Rs).

5. We undertake to pay to HAL an amount not exceeding_____(indicate the amount in Rs) so demanded notwithstanding any dispute or disputes raised by the said Contractor(s)/Vendor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this Bond being absolute and unequivocal.

6. We,_____(indicate the name of Insurance Company) further agree that the Bond herein contained shall remain in full force and effect, during the period that would be taken for the performance of the said Agreement/Contract/Order and that it shall continue to be enforceable till all the dues of HAL under or by virtue of the said Agreement/Contract/Order have been fully paid and its claims satisfied or discharged or till HAL certifies that the terms and conditions of the said Agreement/Contract/Order have been fully and properly carried out by the said Contractor/Vendor(s) and accordingly discharges this Bond.

7. We,_____(indicate the name of Insurance Company) further agree with HAL that HAL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement/Contract/Order or to extend time of performance by the said Contractor/Vendor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by HAL against the said Contractor/Vendor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement/Contract/Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Vendor(s) or for any forbearance, act or omission on the part of HAL or any indulgence by HAL to the said Contractor/Vendor(s)

[270] (Annexure 23G, an additional/new annexure is included vide Amendment no. 3 Dt. 01-04-2026)

or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

8. We,_____(indicate the name of Insurance Company) lastly undertake not to revoke this Bond during its currency except with the previous consent of HAL in writing and agree that any change in the constitution of the said Contactor(s)/Vendor(s) or the said Surety shall not discharge the Surety of its liability under this deed.

9. The validity of Surety Bond shall be up to_____(dd/mm/yyyy) and such date shall cover the period of warranty of all the supplies and also the period of defect liability/ warranty period for last batch of supplies. The validity of Surety Bond will be for a period up to which the said Contractor/Vendor is obliged for due performance of the said Agreement/Contract/Order including the warranty period.

10. The Surety Bond can be invoked by submitting the claim at _____ (Place of respective HAL's Division) any Branch of the issuing Surety.

11. Notwithstanding anything contained herein:

a) Our liability under this Surety Bond shall not exceed Rs.....… (Rupees ……..… Only)

b) This Surety Bond shall be valid up to _____ (being the date of expiry of the Bond) and

c) The Beneficiary's right as well the Surety's liability under this Bond shall stand extinguished unless a written claim or demand is made under this Bond on or before _____ [ ] ((being the date of expiry of claim period which in no case should be less than 1 year from the date of expiry of validity period of the Surety Bond as per **clause 11 (b)** above).

12. This Surety Bond shall be governed by and constitute in accordance with Indian Law and shall be subject to exclusive Jurisdiction of Indian Courts.

13. Dated the _____day of _____for _____(indicate the name of the Insurance Company).

STATE BANK OF INDIA
HAL BRANCH (01114)
Post Office Vimanapura, BANGALORE – 560 017.
Tele-080-25943235, 25943236
E-mail: sbi.01114@sbi.co.in

Bank Accounts Details for Foreign Inward Remittances

A. DETAILS OF ACCOUNT HOLDER :	
NAME OF ACCOUNT HOLDER	HAL (BC) FOUNDRY AND FORGE DIVISION
COMPLETE CONTACT ADDRESS	HINDUSTAN AERONAUTICS LIMITED, FOUNDRY & FORGE DIVISION, PB NO; 1791, VIMANAPURA POST,
PH NO	91-80-22322688
E.MAIL	finance.fnf@hal-india.com
B. BANK ACCOUNT DETAILS :	
ACCOUNT NAME (Name appearing in your Cheque Book)	FOUNDRY & FORGE DIVISION CPC
BRANCH NAME WITH COMPLETE ADDRESS	STATE BANK OF INDIA VIMANAPURA HAL VIMANAPURA POST BANGALORE-560017
IFSC / BRANCH CODE	SBIN0001114/ 1114
COMPLETE BANK ACCOUNT NUMBER	39187603916
SWIFT CODE	SBININBB147
TYPE OF ACCOUNT (SB/CURRENT/CASH CREDIT)	CASH CREDIT ACCOUNT
MICR CODE OF BANK	560002018

Certified that the particulars furnished above are correct as per our records.

ಭಾರತೀಯ ಸ್ಟೇಟ್ ಬ್ಯಾಂಕ್ ಪರವಾಗಿ / कृते भारतीय स्टेट बैंक
For STATE BANK OF INDIA

ಉಪ ವ್ಯವಸ್ಥಾಪಕರು / उप प्रबंधक / Deputy Manager
ಹೆಚ್.ಎ.ಎಲ್. ಶಾಖೆ, ಬೆಂಗಳೂರು / हेच.ए.एल. शाखा, बेंगलूरु
HAL Branch (01114), Bengaluru - 560 017

04/11/2021

ಹಿಂದೂಸ್ತಾನ್ ಏರೋನಾಟಿಕ್ಸ್ ಲಿಮಿಟೆಡ್
ಕೇಂದ್ರೀಕೃತ ಪಾವತಿ ಪ್ರಕ್ರಿಯೆ ಕೋಶ
हिन्दुस्तान एरोनाटिक्स लिमिटेड
केंद्रीकृत भुगतान प्रक्रिया सेल
CENTRALIZED PAYMENT PROCESSING CELL
HINDUSTAN AERONAUTICS LIMITED

Date: 28.09.2020

Electronic Clearing Service (Credit Clearing)/RTGS/NEFT
Mandate Form

1. Customer's Name & Address (Name of the Beneficiary) : HINDUSTAN AERONAUTICS LIMITED
   15/1, CUBBON ROAD,
   POST BOX NO. 5150
   Bangalore 560001

2. Particulars of the Bank Account

Name of the Bank	: State Bank of India
Name of the Branch	: HAL Branch, Bangalore
Address	: Vimanpura Post, Airport Road, Bangalore
Telephone No	: 80-25220957
9-Digit code number of the Bank & Branch	:
Branch Code	: 01114
MICR Code	
RTGS/IFSC/NEFT Code	: SBIN0001114
Type of Account	: Current Account

3. Account Number : 39187603916
4.

I hereby declare that the particulars given above are correct and complete. If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information. I would not hold the user institution responsible. I have read the option invitation letter and agree to discharge the responsibility expected of me as a participant under the scheme.

For HINDUSTAN AERONAUTICS LIMITED

For STATE BANK OF INDIA
Chief Manager
HAL Br., Bangalore-17
28/09/2020

Authorized Signatory Authorized Signatory

Certified that the Bank Particulars furnished above are correct as per records

Bank Stamp

ಓಲ್ಡ್ ಹೆಚ್‌ಎಂಎ ಕ್ಯಾಂಪಸ್, ಸುರಂಜನ್ ದಾಸ್ ರಸ್ತೆ, ಬೆಂಗಳೂರು - 560 017, ಭಾರತ, ओल्ड एचएमए कैम्पस, सुरंजन दास रोड, बेंगलूर - 560 017, भारत
Old HMA Campus, Suranjan Das Road, Bangalore-560 017, India
ದೂರವಾಣಿ (दूरभाष) **Ph.:** +91-80-2231 3160, 22332 3178,
ಇ ಮೇಲ್ (ई) **Email** : shantanu.chakraborty@hal-india.co.in
CIN: L35301KA1963GOI001622

www.hal-india.co.in

No.F.7/10/2021-PPD (1)
Government of India
Ministry of Finance
Department of Expenditure
Procurement Policy Division
264-C, North Block, New Delhi.
23.02.2023.

Order (Public Procurement No. 4)

Subject: Restrictions under Rule 144(xi) of the General Financial Rules (GFRs), 2017.

Attention is invited to Order (Public Procurement No. 1) issued vide F.6/18/2019-PPD dated 23.07.2020, Order (Public Procurement No. 2) issued vide F.6/18/2019-PPD dated 23.07.2020, Order (Public Procurement No. 3) issued vide F.6/18/2019-PPD dated 24.07.2020, Office Memorandum (OM) No. F.18/37/2020-PPD dated 08.02.2021, OM No. F.12/1/2021-PPD(Pt.) dated 02.03.2021 and OM No. F.7/10/2021-PPD dated 08.06.2021. In this regard, the following is hereby ordered under Rule 144(xi) (as amended vide OM No. F.7/10/2021-PPD dated 23.02.2023) on the grounds stated therein, in supersession to all of the above mentioned Orders/ clarifications:

Requirement of registration:

2. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority, specified in **Annexure I**.

3. Any bidder (including an Indian bidder) who has a Specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority, specified in **Annexure I**.

4. The requirement of registration for cases covered by paragraph 2 above has been applicable since 23.07.2020. The requirement of registration for bidders covered by paragraph 3 above will be applicable for all procurements where tenders are issued/ published after 01.04.2023.

5. In tenders issued after 23.07.2020 or 01.04.2023, as the case may be, the provisions of requirement of registration of bidders and of other relevant provisions of this Order shall be incorporated in the tender conditions.

Applicability:

6. Apart from Ministries/ Departments, attached and subordinate bodies, notwithstanding anything contained in Rule 1 of the GFRs 2017, the Order shall also be applicable

a) to all Autonomous Bodies;

b) to all public sector banks and public sector financial institutions;

c) to all Central Public Sector Enterprises;

d) to all procurement in Public Private Partnership projects receiving financial support from the Government or public sector enterprises/ undertakings; and

e) Union Territories, National Capital Territory of Delhi and all agencies/ undertakings thereof.

7. This order will not be applicable for cases falling under **Annexure II**.

Definitions:

8. "*Bidder*" for the purpose of the Order (including the term 'tenderer', 'consultant' 'vendor' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency, branch or office controlled by such person, participating in a procurement process.

9. "*Tender*" for the purpose of the Order will include other forms of procurement, except where the context requires otherwise.

10. *"Transfer of Technology"* means dissemination and transfer of all forms of commercially usable knowledge such as transfer of know-how, skills, technical expertise, designs, processes and procedures, trade secrets, which enables the acquirer of such technology to perform activities using the transferred technology independently. (Matters of interpretation of this term shall be referred to the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade, and the interpretation of the Committee shall be final.)

11. *"Specified Transfer of Technology"* means a transfer of technology in the sectors and/ or technologies, specified in paragraph 15, occurring on or after 23.07.2020.

12. *"Bidder (or entity) from a country which shares a land border with India"* for the purpose of the Order means

(a) An entity incorporated, established or registered in such a country; or

(b) A subsidiary of an entity incorporated, established or registered in such a country; or

(c) An entity substantially controlled through entities incorporated, established or registered in such a country; or

(d) An entity whose beneficial owner is situated in such a country; or

(e) An Indian (or other) agent of such an entity; or

(f) A natural person who is a citizen of such a country; or

(g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

13. *Beneficial owner* for the purposes of Para 12 (d) will be as under:

(i) In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person(s), has a controlling ownership interest or who exercises control through other means.

Explanation:-

a. "Controlling ownership interest" means ownership of, or entitlement to, more than twenty-five per cent of shares or capital or profits of the company;

b. "Control" shall include the right to appoint the majority of the directors or to control the management or policy decisions, including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

(ii) In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

(iii) In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

(iv) Where no natural person is identified under (i) or (ii) or (iii) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

(v) In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

14. "*Agent*" for the purpose of the Order is a person employed to do any act for another, or to represent another in dealings with third persons.

[Note:

i. A person who procures and supplies finished goods from an entity from a country which shares a land border with India will, regardless of the nature of his legal or commercial relationship with the producer of the goods, be deemed to be an Agent for the purpose of this Order.

ii. However, a bidder who only procures raw material, components etc. from an entity from a country which shares a land border with India and then manufactures or converts them into other goods will not be treated as an Agent.]

Sensitive Sectors/ Technologies (relevant only for the provisions on ToT arrangements):

15. (i) Certain sectors and technologies have been identified as sensitive from the national security point of view. The sectors listed in Schedule I to this Order are considered Category-I sensitive sectors. The sectors listed in Schedule II to this Order are considered Category-II sensitive sectors. The technologies listed in Schedule III are considered sensitive technologies.

(ii) For Category-I sensitive sectors, bidders with ToT arrangement in any technology with an entity from a country which shares a land border with India shall require registration.

(iii) For Category-II sensitive sectors, bidders with ToT arrangement in the sensitive technologies listed in Schedule III, with an entity from a country which shares a land border with India shall require registration.

(iv) In Category-II sensitive sectors, the Secretary (or an officer not below the rank of Joint Secretary to Government of India, so authorized by the Secretary) of the Ministry/ Department of the Government of India is empowered, after due consideration, to waive the requirement of registration for a particular item/ application or a class of items/ applications from the requirement of registration, even if included in Schedule III. The Ministry/ Department concerned shall intimate the Department for Promotion of Industry and Internal Trade (DPIIT) and National Security Council Secretariat (NSCS) of their decision to waive the requirement of registration. Ministries/ Departments of the Government of India are not required to consult the DPIIT/ NSCS before deciding and are only required to intimate the decision to DPIIT/ NSCS. If any point is raised by DPIIT/ NSCS, it should be considered in future procurements; ongoing procurement for which the waiver was granted need not be interrupted or altered.

16. Based on security considerations, a Ministry/ Department in a Category II sensitive sector or other Ministries/ Departments may recommend to DPIIT inclusion of any other technology in the list of sensitive technologies, either generally or for their Ministry/ Department.

Sub-contracting in works contracts

17. In works contracts, including turnkey contracts, contractors shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. The definition of "contractor from a country which shares a land border with India" shall be as in paragraph 12 above. This shall not apply to sub-contracts already awarded on or before 23.07.2020.

[Note: Procurement of raw material, components, etc. does not constitute sub-contracting.]

Certificate regarding compliance

18. An undertaking shall be taken from bidders in the tender documents **(Annexure III)** that the extant guidelines for participation in the tenders (which should include conditions for implementation of this Order) have been complied with. If such certificate given by a bidder whose bid is accepted is found to be false, this would be a ground for debarment and further legal action in accordance with law.

Validity of registration

19. In respect of tenders, registration should be valid at the time of submission of bids and at the time of acceptance of bids. In respect of supply otherwise than by tender, registration should be valid at the time of placement of order. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution.

Government e-Marketplace (GeM)

20. GeM shall remove non-compliant entities from GeM unless/ until they are registered in accordance with this Order.

Model Clauses/ Certificates

21. Model Clauses and Model Certificates which may be inserted in tenders/ obtained from Bidders are given at Annexure-III. While adhering to the substance of the Order, procuring entities are free to appropriately modify the wording of these clauses based on their past experience, local needs etc.

23/02/2023

(Kanwalpreet)
Director(PPD)
Tel.No. 2309 3811; email: kanwal.irss@gov.in

To

1. Secretaries of all Ministries/ Departments of Government of India for information and necessary action. They are also requested to inform these provisions to all procuring entities.
2. Secretary, Department of Public Enterprises with a request to immediately reiterate these orders in respect to public enterprises.
3. Secretary, Department of Financial Services with a request to immediately reiterate these orders in respect to public sector and public sector financial institutions.
4. Secretary DPIIT with a request to take action as provided under Annexure I.
5. Chief Secretaries/ Administrators of Union Territories/ National Capital Territory of Delhi.
6. CEO/ GeM with a request to ensure implementation of this order on GeM.

Schedule I

List of Category-I Sensitive sectors:

Sr.No.	Sector
(i)	Atomic Energy
(ii)	Broadcasting/ Print and Digital Media
(iii)	Defence
(iv)	Space
(v)	Telecommunications

Schedule II

List of Category-II Sensitive sectors:

Sr.No.	Sector
(i)	Power and Energy (including exploration/ generation/ transmission/ distribution/ pipeline)
(ii)	Banking and Finance including Insurance
(iii)	Civil Aviation
(iv)	Construction of ports and dams & river valley projects
(v)	Electronics and Microelectronics
(vi)	Meteorology and Ocean Observation
(vii)	Mining and extraction (including deep sea projects)
(viii)	Railways
(ix)	Pharmaceuticals & Medical Devices
(x)	Agriculture
(xi)	Health
(xii)	Urban Transportation

Schedule-III

List of Sensitive Technologies:

Sr.No.	Sensitive Technologies
(i)	Additive Manufacturing (e.g. 3D Printing)
(ii)	Any equipment having electronic programmable components or autonomous systems (e.g. SCADA systems)
(iii)	Any technology used for uploading and streaming of data including broadcasting, satellite communication etc.
(iv)	Chemical Technologies
(v)	Biotechnologies including Genetic Engineering and Biological Technologies
(vi)	Information and Communication Technologies
(vii)	Software

ANNEXURE I

Competent Authority and Procedure for Registration

A. The Competent Authority for the purpose of registration under this order shall be/ continue to be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT)*. [This Committee was already constituted under Order (Public Procurement) No.1].

B. The Registration Committee shall have the following members*:

   i. An officer, not below the rank of Joint Secretary, designated for this purpose by DPIIT, who shall be the Chairman;

   ii. Officers (ordinarily not below the rank of Joint Secretary) representing the Ministry of Home Affairs, Ministry of External Affairs, and of those Departments whose sectors are covered by applications under consideration;

   iii. Any other officer whose presence is deemed necessary by the Chairman of the Committee.

   iv. With effect from 01.04.2023, an officer (ordinarily not below the rank of Joint Secretary) representing the National Security Council Secretariat.

C. DPIIT shall lay down the method of application, format etc. for such bidders as covered by the Order.

D. On receipt of an application seeking registration from a bidder covered by Para 2 and 3 of this order, the Competent Authority shall first seek political and security clearances from the Ministry of External Affairs and Ministry of Home Affairs, as per guidelines issued from time to time. Registration shall not be given unless political and security clearance have both been received.

E. The Ministry of External Affairs and Ministry of Home Affairs may issue guidelines for internal use regarding the procedure for scrutiny of such applications by them.

F. The decision of the Competent Authority, to register such bidder may be for all kinds of tenders or for a specified type(s) of goods or services, and may be for a specified or unspecified duration of time, as deemed fit. The decision of the Competent Authority shall be final.

G. Registration granted by the Competent Authority of the Government of India shall be valid not only for procurement by the Central Government and its bodies specified in para 6 of this order, but also for procurement by State Governments and their agencies/ public enterprises etc. No fresh registration at the State level shall be required.

H. The Competent Authority is empowered to cancel the registration already granted if it determines that there is sufficient cause. Such cancellation by itself, however, will

not affect the execution of contracts already awarded. Pending cancellation, it may also suspend the registration of a bidder, and the bidder shall not be eligible to bid in any further tenders during the period of suspension.

I. For national security reasons, the Competent Authority shall not be required to give reasons for rejection/cancellation of registration of a bidder.

[*Note:

(i) In respect of application of the Order to procurement by/ under State Governments, all functions assigned to DPIIT shall be carried out by the State Government concerned through a specific department or authority designated by it. The composition of the Registration Committee shall be as decided by the State Government. However, the requirement of political and security clearance as per para D shall remain and no registration shall be granted without such clearance.

(ii) Registration granted by State Governments shall be valid only for procurement by the State Government and its agencies/ public enterprises etc. and shall not be valid for procurement in other states or by the Government of India and their agencies/ public enterprises etc.]

ANNEXURE II

Special Cases

A. In projects which receive international funding with the approval of the Department of Economic Affairs (DEA), Ministry of Finance, the procurement guidelines applicable to the project shall normally be followed, notwithstanding anything contained in this order and without reference to the Competent Authority. Exceptions to this shall be decided in consultation with DEA.

B. This order shall not apply to procurement by Indian missions and by offices of government agencies/ undertakings located outside India.

C. This order will not apply to bidders (or entities) from those countries (even if sharing a land border with India) to which the Government of India has extended lines of credit or in which the Government of India is engaged in development projects. Updated lists of countries to which lines of credit have been extended or in which development projects are undertaken are given on the website of the Ministry of External Affairs.

D. Procurement of spare parts and other essential service support like Annual Maintenance Contract (AMC)/ Comprehensive Maintenance Contract (CMC), including consumables for closed systems, from Original Equipment Manufacturers (OEMs) or their authorized agents, shall be exempted from the requirement of registration.

ANNEXURE III

Model Clause/ Certificate/ Undertaking to be inserted in tenders etc.

[While adhering to the substance of the Order, procuring entities and GeM are free to appropriately modify the wording of the clause/ certificate based on their past experience, local needs etc.

The conditions relating to specified ToT (as shown in italics) should be incorporated only in the tenders which attract the restrictions due to specified ToT.]

A. Model Clauses for Tenders (including tenders issued manually or any electronic portal including GeM):

I. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turnkey projects) only if the bidder is registered with the Competent Authority. *Further, any bidder (including bidder from India) having specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India, shall also require to be registered with the same competent authority.*

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder (or entity) from a country which shares a land border with India" for the purpose of this Order means: -

(a) An entity incorporated, established or registered in such a country; or
(b) A subsidiary of an entity incorporated, established or registered in such a country; or
(c) An entity substantially controlled through entities incorporated, established or registered in such a country; or
(d) An entity whose beneficial owner is situated in such a country; or
(e) An Indian (or other) agent of such an entity; or
(f) A natural person who is a citizen of such a country; or
(g) A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

IV. The beneficial owner for the purpose of (iii) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation—

a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;

b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. [To be inserted in tenders for Works contracts, including Turnkey contracts] The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

VII. The registration shall be valid at the time of submission of bid and at the time of acceptance of bid.

VIII. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution

Model Certificate for Tenders:

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model Certificate for Tenders for Works involving possibility of sub-contracting:

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any

work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

Model additional certificate by Bidders in the cases of specified ToT:

"I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder does not have any ToT arrangement requiring registration with the competent authority."

OR

"I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder has valid registration to participate in this procurement."

B. Model Certificate for GeM (to be taken by the GeM from seller during registration on GeM. GeM should also obtain this certificate from all existing bidders as soon as possible):

"I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this vendor/ bidder is not from such a country and does not have any specified Transfer of Technology (ToT) from such a country or, if from such a country or if having specified ToT from such a country has been registered with the Competent Authority. I hereby certify that this vendor/ bidder fulfills all requirements in this regard and is eligible to be considered for procurement on GeM. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

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No. P-45021/2/2017-PP (BE-II)-Part(4)Vol.II
Government of India
Ministry of Commerce and Industry
Department for Promotion of Industry and Internal Trade
(Public Procurement Section)

Vanijya Bhawan, New Delhi
Dated: 19 July,2024

To

All Central Ministries/Departments/CPSUs/All concerned

ORDER

Subject: Public Procurement (Preference to Make in India), Order 2017– Revision; regarding.

Department for Promotion of Industry and Internal Trade, in partial modification [Paras 2, 3, 5, 10 & 13] of Order No.P-45021/2/2017-B.E.-II dated 15.6.2017 as amended by Order No.P-45021/2/2017-B.E.-II dated 28.05.2018, Order No.P-45021/2/2017-B.E.-II dated 29.05.2019, Order No.P-45021/2/2017-B.E.-II dated 04.06.2020 and Order No.P-45021/2/2017-B.E.-II dated 16.09.2020 hereby issues the revised 'Public Procurement (Preference to Make in India), Order 2017" dated 19.07.2024 effective with immediate effect.

Whereas it is the policy of the Government of India to encourage 'Make in India' and promote manufacturing and production of goods and services in India with a view to enhancing income and employment, and

Whereas procurement by the Government is substantial in amount and can contribute towards this policy objective, and

Whereas local content can be increased through partnerships, cooperation with local companies, establishing production units in India or Joint Ventures (JV) with Indian suppliers, increasing the participation of local employees in services and training them,

Now therefore the following Order is issued:

1. This Order is issued pursuant to Rule 153 (iii) of the General Financial Rules 2017.
2. **Definitions**: For the purposes of this Order:
   'Local content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

Explanatory notes for calculation of local content given above

a. Imported items sourced locally from resellers/distributors shall be excluded from calculation of local content.
b. The license fees/royalties paid/ technical charges paid out of India shall be excluded from local content calculation.

c. Procurement/Supply of repackaged/refurbished/rebranded imported products as understood commonly shall be treated as reselling of imported products and shall be excluded from calculation of local content. The definition of repackaged/refurbished/rebranded imported products is as follows;

'Refurbishing' means repair or reconditioning of an imported product does not amount to manufacture because no new goods come into existence.

'Repackaging' means repacking of imported goods from bulk pack to smaller packs would not ordinarily amount to manufacture of a new item.

'Rebranding' means relabeling or renaming or change in symbol or logo/makes or corporate image of a company/organization/ firm for an imported product would amount to rebranding.

d. To ensure that imported items sourced locally from resellers/distributors are excluded from calculation of local content, procuring entities to obtain from bidders, the cost of such locally-sourced imported items (Inclusive of taxes) along with break-up on license/royalties paid/technical expertise cost etc. sourced from outside India. For items sold by bidder as reseller, OEM certificate for country of origin to be submitted.

e. For contracts involving supply of multiple items, weighted average of all items to be taken while calculating the local content.

'Class-I local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-I local supplier' under this Order.

'Class-II local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for 'Class-II local supplier' but less than that prescribed for 'Class-I local supplier' under this Order.

'Non - Local supplier' means a supplier or service provider, whose goods, services or works offered for procurement, has local content less than that prescribed for 'Class-II local supplier' under this Order.

'L1' means the lowest tender or lowest bid or the lowest quotation received in a tender, bidding process or other procurement solicitation as adjudged in the evaluation process as per the tender or other procurement solicitation.

'Margin of purchase preference' means the maximum extent to which the price quoted by a "Class-I local supplier" may be above the L1 for the purpose of purchase preference.

'Nodal Ministry' means the Ministry or Department identified pursuant to this order in respect of a particular item of goods or services or works.

'Procuring entity' means a Ministry or department or attached or subordinate office of, or autonomous body controlled by, the Government of India and includes Government companies as defined in the Companies Act.

'Works' means all works as per Rule 130 of GFR- 2017, and will also include *'turnkey works'*.

2A. *Special treatment for items covered under PLI Scheme*

The manufacturers manufacturing an item under PLI scheme shall be treated as deemed Class II local supplier for that item unless they have minimum local content equal to or higher than that notified for Class-I local supplier for that item, provided the manufacturer has received incentive from the concerned PLI Ministry for the item. The above shall be applicable for the specific time period only, as notified by concerned PLI Ministry.

3. Eligibility of 'Class-I local supplier'/ 'Class-II local supplier'/ 'Non-local suppliers' for different types of procurement

(a) In procurement of all goods, services or works in respect of which the Nodal Ministry / Department has communicated that there is sufficient local capacity and local competition, only 'Class-I local supplier', as defined under the Order, shall be eligible to bid irrespective of purchase value.

(b) Only 'Class-I local supplier' and 'Class-II local supplier', as defined under the Order, shall be eligible to bid in procurement undertaken by procuring entities, except when Global tender enquiry has been issued. In global tender enquiries, 'Non-local suppliers' shall also be eligible to bid along with 'Class-I local suppliers' and 'Class-II local suppliers'. In procurement of all goods, services or works, not covered by sub-para 3(a) above, and with estimated value of purchases less than Rs. 200 Crore, in accordance with Rule 161(iv) of GFR, 2017, Global tender enquiry shall not be issued except with the approval of competent authority as designated by Department of Expenditure.

(c) For the purpose of this Order, works includes Engineering, Procurement and Construction (EPC) contracts and services include System Integrator (SI) contracts.

3.1 Mandatory sourcing of items, with sufficient local capacity and competition, from Class-I local suppliers in SI/EPC/Turnkey Contracts/Service Tenders

a. The items, notified as having sufficient local capacity and competition, shall mandatory be sourced from Class-I local suppliers in SI/EPC/Turnkey Contracts/ Services tenders. This provision will be applicable only for those items which have been notified by the Nodal Ministry as Class I i.e. having sufficient local capacity and competition, with specific HSN codes."

b. Notwithstanding above, if in any project, it is considered that it is not practically feasible to source such items from Class I local suppliers, it may take relaxation from such stipulation with the approval of Secretary of the administrative Ministry/ Department concerned or with the approval of the Competent Authority specified by the Administrative Ministry/Department, on case-specific basis.

3A. Purchase Preference

(a) Subject to the provisions of this Order and to any specific instructions issued by the Nodal Ministry or in pursuance of this Order, purchase preference shall be given to 'Class-I local supplier' in procurement undertaken by procuring entities in the manner specified here under.

(b) In the procurement of goods or works, which are covered by para 3(b)

above and which are divisible in nature, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is 'Class-I local supplier', the contract for full quantity will be awarded to L1.
ii. If L1 bid is not a 'Class-I local supplier', 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price for the remaining 50% quantity subject to the Class-I local supplier's quoted price falling within the margin of purchase preference, and contract for that quantity shall be awarded to such 'Class-I local supplier' subject to matching the L1 price. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price or accepts less than the offered quantity, the next higher 'Class-I local supplier' within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and contract shall be awarded accordingly. In case some quantity is still left uncovered on Class-I local suppliers, then such balance quantity may also be ordered on the L1 bidder.

(c) In the procurement of goods or works, which are covered by para 3(b) above and which are not divisible in nature, and in procurement of services where the bid is evaluated on price alone, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is Class -I local supplier', the contract will be awarded to L1.
ii. If L1 is not 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier', will be invited to match the L1 price subject to Class-I local supplier's quoted price falling within the margin of purchase preference, and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price.
iii. In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and contract shall be awarded accordingly. In case none of the 'Class-I local supplier' within the margin of purchase preference matches the L1 price, the contract may be awarded to the L1 bidder.

(d) "Class-II local supplier" will not get purchase preference in any procurement, undertaken by procuring entities.

3B. Applicability in tenders where contract is to be awarded to multiple bidders- In tenders where contract is awarded to multiple bidders subject to matching of L1 rates or otherwise, the 'Class-I local supplier' shall get purchase preference over 'Class-II local supplier' as well as 'Non-local supplier', as per following procedure:

a. In case there is sufficient local capacity and competition for the item to be procured, as notified by the nodal Ministry, only Class I local suppliers shall be eligible to bid. As such, the multiple suppliers, who would be awarded the contract, should be all and only 'Class I Local suppliers'.
b. In other cases, 'Class II local suppliers' and 'Non local suppliers' may also participate in the bidding process along with 'Class I Local suppliers' as per provisions of this Order.
c. If 'Class I Local suppliers' qualify for award of contract for at least

50% of the tendered quantity in any tender, the contract may be awarded to all the qualified bidders as per award criteria stipulated in the bid documents. However, in case 'Class I Local suppliers' do not qualify for award of contract for at least 50% of the tendered quantity, purchase preference should be given to the 'Class I local supplier' over 'Class II local suppliers'/ 'Non local suppliers' provided that their quoted rate falls within 20% margin of purchase preference of the highest quoted bidder considered for award of contract so as to ensure that the 'Class I Local suppliers' taken in totality are considered for award of contract for at least 50% of the tendered quantity.

d. First purchase preference has to be given to the lowest quoting 'Class-I local supplier', whose quoted rates fall within 20% margin of purchase preference, subject to its meeting the prescribed criteria for award of contract as also the constraint of maximum quantity that can be sourced from any single supplier. If the lowest quoting 'Class-I local supplier', does not qualify for purchase preference because of aforesaid constraints or does not accept the offered quantity, an opportunity may be given to next higher 'Class-I local supplier', falling within 20% margin of purchase preference, and so on.

e. To avoid any ambiguity during bid evaluation process, the procuring entities may stipulate its own tender specific criteria for award of contract amongst different bidders including the procedure for purchase preference to 'Class-I local supplier' within the broad policy guidelines stipulated in sub- paras above.

4. **Exemption of small purchases**: Notwithstanding anything contained in paragraph 3, procurement where the estimated value to be procured is less than Rs. 5 lakhs shall be exempt from this Order. However, it shall be ensured by procuring entities that procurement is not split for the purpose of avoiding the provisions of this Order.

4A. Exemption in sourcing of spares and consumables of closed systems:

Procurement of spare parts, consumables for closed systems and Maintenance/ Service contracts with Original Equipment Manufacturer/Original Equipment Supplier/Original Part Manufacturer shall be exempted from this Order.

5. **Minimum local content**: The 'local content' requirement to categorize a supplier as 'Class-I local supplier' is minimum 50%. For 'Class-II local supplier', the 'local content' requirement is minimum 20%. Nodal Ministry/ Department may prescribe only a higher percentage of minimum local content requirement to categorize a supplier as 'Class-I local supplier'/ 'Class- II local supplier'. For the items, for which Nodal Ministry/ Department has not prescribed higher minimum local content notification under the Order, it shall be 50% and 20% for 'Class-I local supplier'/ 'Class-II local supplier' respectively.

6. **Margin of Purchase Preference**: The margin of purchase preference shall be 20%.

7. **Requirement for specification in advance**: The minimum local content, the margin of purchase preference and the procedure for preference to Make in India shall be specified in the notice inviting tenders or other form of procurement solicitation and shall not be varied during a particular procurement transaction.

8. **Government E-marketplace**: In respect of procurement through the Government E-marketplace (GeM) shall, as far as possible, specifically mark the items which meet the minimum local content while registering the item for

display, and shall, wherever feasible, make provision for automated comparison with purchase preference and without purchase preference and for obtaining consent of the local supplier in those cases where purchase preference is to be exercised.

9. **Verification of local content**:
   a. The 'Class-I local supplier'/ 'Class-II local supplier' at the time of tender, bidding or solicitation shall be required to indicate percentage of local content and provide self-certification that the item offered meets the local content requirement for 'Class-I local supplier'/ 'Class-II local supplier', as the case may be. They shall also give details of the location(s) at which the local value addition is made.
   b. In cases of procurement for a value in excess of Rs. 10 crores, the 'Class-I local supplier'/ 'Class-II local supplier' shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
   c. The bidder shall give self-certification for local content in the quoted item (goods/works/services) at the time of tendering. However, at the time of execution of the project, for all contracts above INR 10 Crore, the contractor/ supplier shall be required to give local content certification duly certified by cost/ chartered accountant in practice. For cases where it is not possible to provide certification by Cost/Chartered Accountant at the time of execution of project, the supplier shall be permitted to provide the certificate for local content from Cost/ Chartered Accountant after completion of the contract, within time limit acceptable to the procuring entity. In case the contractor/ supplier does not meet the stipulated local content requirement and the category of the supplier changes from Class-I to Class-II/ Non-local or from Class-II to Non-local, a penalty upto 10% of the contract value may be imposed. However, contract once awarded shall not be terminated on this account.
   d. Decisions on complaints relating to implementation of this Order shall be taken by the competent authority which is empowered to look into procurement-related complaints relating to the procuring entity.
   e. Nodal Ministries may constitute committees with internal and external experts for independent verification of self-declarations and auditor's/ accountant's certificates on random basis and in the case of complaints.
   f. Nodal Ministries and procuring entities may prescribe fees for such complaints.
   g. False declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.
   h. A supplier who has been debarred by any procuring entity for violation of this Order shall not be eligible for preference under this Order for procurement by any other procuring entity for the duration of the debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of other procurement entities, in the manner prescribed under paragraph 9

i below.

i. The Department of Expenditure shall issue suitable instructions for the effective and smooth operation of this process, so that:
   i. The fact and duration of debarment for violation of this Order by any procuring entity are promptly brought to the notice of the Member-Convenor of the Standing Committee and the Department of Expenditure through the concerned Ministry /Department or in some other manner;
   ii. On a periodical basis such cases are consolidated and a centralized list or decentralized lists of such suppliers with the period of debarment is maintained and displayed on website(s);
   iii. In respect of procuring entities other than the one which has carried out the debarment, the debarment takes effect prospectively from the date of uploading on the website(s) in the such a manner that ongoing procurement are not disrupted.

10. **Specifications in Tenders and other procurement solicitations**:
   a. Every procuring entity shall ensure that the eligibility conditions in respect of previous experience fixed in any tender or solicitation do not require proof of supply in other countries or proof of exports.
   b. Procuring entities shall endeavour to see that eligibility conditions, including on matters like turnover, production capability and financial strength do not result in unreasonable exclusion of 'Class-I local supplier'/ 'Class-II local supplier' who would otherwise be eligible, beyond what is essential for ensuring quality or creditworthiness of the supplier.
   c. Procuring entities shall, within 2 months of the issue of this Order review all existing eligibility norms and conditions with reference to sub-paragraphs 'a' and 'b' above.
   d. **Reciprocity Clause**
      i. When a Nodal Ministry/Department identifies that Indian suppliers of an item are not allowed to participate and/ or compete in procurement by any foreign government, due to restrictive tender conditions which have direct or indirect effect of barring Indian companies such as registration in the procuring country, execution of projects of specific value in the procuring country etc., it shall provide such details to all its procuring entities including CMDs/CEOs of PSEs/PSUs, State Governments and other procurement agencies under their administrative control and GeM for appropriate reciprocal action.
      ii. Entities of countries which have been identified by the nodal Ministry/Department as not allowing Indian companies to participate in their Government procurement for any item related to that nodal Ministry shall not be allowed to participate in Government procurement in India for all items related to that nodal Ministry/ Department, except for the list of items published by the Ministry/ Department permitting their participation.
      iii. The stipulation in (ii) above shall be part of all tenders invited by the Central Government procuring entities stated in (i) above. All purchases on GeM shall also necessarily have the above provisions for items identified by nodal Ministry/ Department.
      iv. State Governments should be encouraged to incorporate similar provisions in their respective tenders.
      v. The term 'entity' of a country shall have the same meaning as under the FDI Policy of DPIIT as amended from time to time.
   e. Specifying foreign certifications/ unreasonable technical specifications/

brands/ models in the bid document is restrictive and discriminatory practice against local suppliers. If foreign certification is required to be stipulated because of non-availability of Indian Standards and/or for any other reason, the same shall be done only after written approval of Secretary of the Department concerned or any other Authority having been designated such power by the Secretary of the Department concerned.

f. "All administrative Ministries/Departments *whose procurement exceeds Rs. 1000 Crore per annum* shall notify/update their procurement projections every year, including those of the PSEs/PSUs, for the next 5 years on their respective website."

10A. Action for non-compliance of the Provisions of the Order: In case restrictive or discriminatory conditions against domestic suppliers are included in bid documents, an inquiry shall be conducted by the Administrative Department undertaking the procurement (including procurement by any entity under its administrative control) to fix responsibility for the same. Thereafter, appropriate action, administrative or otherwise, shall be taken against erring officials of procurement entities under relevant provisions. Intimation on all such actions shall be sent to the Standing Committee.

11. **Assessment of supply base by Nodal Ministries**: The Nodal Ministry shall keep in view the domestic manufacturing / supply base and assess the available capacity and the extent of local competition while identifying items and prescribing the higher minimum local content or the manner of its calculation, with a view to avoiding cost increase from the operation of this Order.

12. **Increase in minimum local content**: The Nodal Ministry may annually review the local content requirements with a view to increasing them, subject to availability of sufficient local competition with adequate quality.

13. **Manufacture under license/ technology collaboration agreements with phased indigenization**: While notifying the minimum local content, Nodal Ministries may make special provisions for exempting suppliers from meeting the stipulated local content if the product is being manufactured in India under a license from a foreign manufacturer who holds intellectual property rights and where there is a technology collaboration agreement / transfer of technology agreement for indigenous manufacture of a product developed abroad with clear phasing of increase in local content.

13A. In procurement of all goods, services or works in respect of which there is substantial quantity of public procurement and for which the nodal ministry has not notified that there is sufficient local capacity and local competition, the concerned nodal ministry shall notify an upper threshold value of procurement beyond which foreign companies shall enter into a joint venture with an Indian company to participate in the tender. Procuring entities, while procuring such items beyond the notified threshold value, shall prescribe in their respective tenders that foreign companies may enter into a joint venture with an Indian company to participate in the tender. The procuring Ministries/Departments shall also make special provisions for exempting such joint ventures from meeting the stipulated minimum local content requirement, which shall be increased in a phased manner.

14. **Powers to grant exemption and to reduce minimum local content**: The administrative Department undertaking the procurement (including

procurement by any entity under its administrative control), with the approval of their Minister-in-charge, may by written order, for reasons to be recorded in writing,

a. reduce the minimum local content below the prescribed level; or
b. reduce the margin of purchase preference below 20%; or
c. exempt any particular item or supplying entities from the operation of this Order or any part of the Order.

The Administrative Department, while seeking exemption under this para, shall certify that such an item(s) has not been notified by Nodal Ministry/ Department concerned under para 3 (a) of the Order.

A copy of every such order shall be provided to the Standing Committee and concerned Nodal Ministry / Department. The Nodal Ministry / Department concerned will continue to have the power to vary its notification on Minimum Local Content.

15. **Directions to Government companies**: In respect of Government companies and other procuring entities not governed by the General Financial Rules, the administrative Ministry or Department shall issue policy directions requiring compliance with this Order.
16. **Standing Committee**: A standing committee is hereby constituted with the following membership:
Secretary, Department for Promotion of Industry and Internal Trade - Chairman
Secretary, Commerce—Member
Secretary, Ministry of Electronics and Information Technology—Member Joint Secretary (Public Procurement), Department of Expenditure—Member Joint Secretary (DPIIT)—Member-Convenor

The Secretary of the Department concerned with a particular item shall be a member in respect of issues relating to such item. The Chairman of the Committee may co-opt technical experts as relevant to any issue or class of issues under its consideration.

17. **Functions of the Standing Committee:** The Standting Committee shall meet as often as necessary, but not less than once in six months. The Committee

a. shall oversee the implementation of this order and issues arising therefrom, and make recommendations to Nodal Ministries and procuring entities.
b. shall annually assess and periodically monitor compliance with this Order
c. shall identify Nodal Ministries and the allocation of items among them for issue of notifications on minimum local content
d. may require furnishing of details or returns regarding compliance with this Order and related matters
e. may, during the annual review or otherwise, assess issues, if any, where it is felt that the manner of implementation of the order results in any restrictive practices, cartelization or increase in public expenditure and suggest remedial measures
f. may examine cases covered by paragraph 13 above relating to manufacture under license/ technology transfer agreements with a view to satisfying itself that adequate mechanisms exist for enforcement of such agreements and for attaining the underlying objective of progressive indigenization

g. may consider any other issue relating to this Order which may arise.

18. **Removal of difficulties**: Ministries /Departments and the Boards of Directors of Government companies may issue such clarifications and instructions as may be necessary for the removal of any difficulties arising in the implementation of this Order.

19. **Ministries having existing policies**: Where any Ministry or Department has its own policy for preference to local content approved by the Cabinet after 1st January 2015, such policies will prevail over the provisions of this Order. All other existing orders on preference to local content shall be reviewed by the Nodal Ministries and revised as needed to conform to this Order, within two months of the issue of this Order.

20. **Transitional provision**: This Order shall not apply to any tender or procurement for which notice inviting tender or other form of procurement solicitation has been issued before the issue of this Order.

19/7/24

(Himani Pande)
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