

BRIEF ON EXPLORATORY MAKE PROJECT
MAIN ROTOR BLADE FOR MEDIUM LIFT HELICOPTER

Brief about the Project

1. It is proposed to explore preliminary feasibility for indigenous development and manufacture of Main Rotor Blade for Medium Lift Helicopter by the indigenous industry, through the Make Procedure (Industry Funded) of DPP 2016 (as amended).

2. The equipment intended for development is as under:-

Main Rotor Blades for Medium Lift helicopter are designed to create lift and thrust required for the helicopter flight and to change the helicopter attitude relative to longitudinal and lateral axis.

3. Indian vendors (term to include, public limited company, private limited company, partnership firms, limited liability partnership, one person company, sole proprietorship registered as per applicable Indian laws) desirous of undertaking the design/development/manufacture may submit their response, as per format placed at Appendix B, through letter, fax or email to:-

Make PMU (IAF)
Room No 490 (E),
Air HQ (Vayu Bhavan)
New Delhi – 110106
Telefax: (011) 23013225
Email: makeind.iaf@gov.in

4. **Technical Aspects.** Technical data is attached as Appendix A.

5. **Questionnaire.** A generic format for examination of the project by the vendors is placed at Appendix B.

6. **Industry Interaction.** Based on industry response to this brief, vendors may be called for detailed interaction.

Appendix A

(Refer Para 4 of
Main Rotor Blade for Medium
Lift Helicopter)

TECHNICAL ASPECTS

1. **Technical Specification.** Main Rotor Blades of Medium Lift helicopter are rectangular in shape with geometrical twist. The blade twist is 5° in sections 1-4 and thereafter changes according to linear law with 0° at tip. The blade profile confirms to NACA-230, between sections 0-1, NACA-230-12 between sections 2-3 and NACA-230-12 between sections 4-22. Specification of the blade are:-

- (a) Blade chord : 520 mm
- (b) Blade shape : Rectangular with geometrical twist
- (c) Blade mass : 135/140 Kgs each (Approx)

2. **Construction.** The main rotor blade consists of following main structural elements; spar, twenty one boxes (tail compartments), end piece and tip.

(a) **Spar.** The main load carrying member of the blade is spar. It is a hollow beam with constant section interior outline. It is made of aluminium alloy ABT-1. The upper and lower spar booms have ribs inside. To ensure required lateral centering of the blades, eight counterweights 400 mm long and weighing about 1 kg each are inserted inside the spar. Ribs serve as guide for mounting the counterweights and its tip carries an assembly for installing balance weights. The spar is sealed with covers at both its ends. Spar leading edge is fitted with anti erosion steel strips to protect its leading edge against erosion due to dust particles. Anti icing wiring and heater strap are glued to nose section of blade.

(b) **Tail section (box).** Tail section is formed by 21 boxes cemented to the spar rear edge. Each box comprises of a honeycomb structure, skin made of 0.3 mm avail sheet, side ribs and tail stringers. Honey comb structure is glued up form aluminium foil 0.04 mm thick and forming hexahedron with side length of 5 mm. Ribs are made of avail 0.4 mm thick. They provide aerofoil shape to the box. Tail stringer is made of textolite. Trim tabs are attached to box No. 16 and 17. Trailing edge for adjusting blade co-taper (track) at high RPM and for elimination of the control stick creeping.

(c) **End Piece.** Spar is fastened to the end piece by means of 21 bolts. Nine of them are through ones and are lock punched. Six bolts on either side are screwed into the spar root end and are wire locked. End piece is attached to the feathering hinge lug by means of two bolts.

(d) **Tip.** The blade tip consists of a detachable and a fixed part. The fixed part is riveted to the box and the detachable part is attached with the help of screws. Blade tip mounts tip light and bolts for securing balance weights.

Appendix B
(Refer Para 5 of
Main Rotor Blade for Medium
Lift Helicopter)

GENERAL ASPECTS

1. Whether the company/Association of Persons (AoP) is eligible as per provisions of DPP 2016? (Eligibility of Participation: Indian vendors only).
2. Whether the vendor can provide an assessment of its capability (Financial and Technical)? If so provide the necessary documentation for verification.
3. Whether 40% or higher (specify) Indigenous Content (IC) that can be ensured?
4. Does the vendor envisage the feasibility of achieving future exports?
5. Whether R&D or ToT through foreign collaboration is proposed by the vendor? (Provide indicative information)
6. Estimated cost of development in case indigenous R&D is proposed.
7. Estimated tentative time period of completion of R&D or ToT.
8. Please indicate an assessment of minimum economic order quantities required, if applicable.
9. Please indicate plan/status of airworthiness certification of the system/components. Ab-initio indigenous designs will need to be certified through Centre for Military Airworthiness Certification (CEMILAC).
10. Please provide relevant and applicable technical details – specific to the product under development.
11. Any other information considered necessary to assess feasibility for indigenous design, development and manufacture.