TECHNOLOGY DEVELOPMENT FUND (TDF) SCHEME

TITLE: DESIGN AND DEVELOPMENT OF JAM TOLERANT GEARED ROTARY ACTUATORS (GRA) FOR AEROSPACE APPLICATION

1. **Description:** A Geared Rotary Actuator (GRA) is a mechanical assembly which is widely used in aerospace for providing controlled motion to secondary flight-controlled surfaces. Their main purpose is performing speed reduction and torque amplification from the input shaft to actuator output utilizing an epicyclic gear train. A jam tolerant GRA has the ability to permit continued input shaft drive capabilities in the event of jam in the actuator, resulting from the gear teeth breakage or other internal actuator failure.

2. **Functional and operational requirements:** The objective is to design, development, testing, and qualification of Jam Tolerant GRA along with connecting torques tubes. GRA should be able to provide rotation of 120° - 150° to the flap in 1-1.2 sec, and it should be capable of bi-directional motions. The design of each element should be done to ensure synchronous motion.

Parameters		Value
1. Input Torque	:	59 Nm at 2600 RPM
2. Output torque (max)	:	6000 Nm at 24 RPM
3. Overall diameter	:	130 mm (approx.)
4. Overall length	:	225 mm
5. Material	:	AISI 9310 or equivalent (aerospace grade gear material)
6. Storage Temperature	:	-54°C to 85°C
7. Operational temperature	:	-40°C to 73°C
8. Core hardness of material	:	As per relevant standard
9. Surface hardness	:	As per relevant standard
10. Jam Tolerant	:	Input shaft should provide torque and motion to other actuators in case of failure of any actuators connected in series
11. Design Load for drive shaft (torque tubes)	:	210 Nm at 2600 RPM

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TECHNOLOGY DEVELOPMENT FUND (TDF) SCHEME

FEASIBILITY CUM RFI RESPONSE FOR THE PROJECT REQUIREMENT UNDER TDF SCHEME

(PROFROMA)

1. **Name of the Institute** (Industry/Academia):
2. **Contact details:**
    a. Email
    b. PoC
    c. Address
3. **Title of the project requirement:**
4. **Project Description** (Define broad understanding of the project requirement and proposed solution under the project).
5. **Briefly detail the proposed technical solution in terms of subsystem/submodule levels.**
6. **Road map for achieving the proposed outcome (Development Plan Phase wise -Max 5 phases).**
7. **Development and production Estimates:**
    i. Estimated time required for development of the proposed technology /product (In Months).
    ii. Estimated cost required for the for development of the proposed technology /product (BQs of submodules/subsystems if any pls attach).
    iii. Estimated production cost of the end product after successful development (per unit or batch cost).
    iv. Whether the industry has already done any Suo moto design and development of the proposed product/technology at Technology Readiness Level – Yes/No
    v. Details of Suo moto design and development done if marked Yes in previous question (within 250 words).
    vi. Essential infrastructure required for development of the proposed product/technology for which funding is required.
8. **Technical strength in terms of manpower.**
9. **Relevant Work Experience.**
10. **Any other relevant information**

Queries if any and the reply in **PDF FORMAT** to be submitted online addressing to;

TO,

THE DIRECTOR TDF, DRDO

DRDO BHAWAN, RAJAJI MARG, NEW DELHI 110011

Email to, arjunk.hqr@gov.in, CC to dir.tdf-drdo@gov.in,