



TECHNOLOGY DEVELOPMENT FUND (TDF) SCHEME



TITLE: BATTERY OPERATED TOWING TAXI BOTS FOR AIRCRAFT MOVEMENT

1. Objective:

To design and develop battery-operated towing taxi bots to facilitate efficient, eco-friendly, and cost-effective movement of aircraft on the ground. These bots aim to reduce fuel consumption, minimize carbon emissions, and improve operational efficiency at airports and airbases.

2. Background:

Aircraft ground movements traditionally rely on onboard engines or conventional towing vehicles. These methods are fuel-intensive, lead to significant wear and tear, and contribute to high carbon emissions. Battery-operated taxi bots provide an innovative solution by offering autonomous, electric-powered towing capabilities, reducing dependence on jet fuel and enhancing overall sustainability.

3. Problem Statement:

The proposed Battery-Operated Taxi Bots will be used for towing aircraft from a standing start to the holding point before take-off and from the holding point to the parking bay after landing. This technology will enable push-back starts and engine-off taxiing, leading to several benefits, including:

- a. Increased available parking space
- b. Fuel savings
- c. Reduced engine hours
- d. Decreased manpower requirements

The primary goal is to develop battery-operated Taxi Bots that can efficiently manage aircraft movement on the ground.

4. Proposed Solution:

1. **Technology Development:** Design battery-powered taxi bots with autonomous and remote-controlled functionalities, ensuring safe and precise towing of various aircraft models.
2. **Sustainability Focus:** Integrate advanced battery technologies for extended operational hours and fast-charging capabilities.
3. **Operational Efficiency:** Enable seamless integration with airport ground operations and communication systems for optimal coordination.

5. Expected Outcome:

1. Deployment of battery-operated towing taxi bots capable of handling diverse aircraft types.
2. Reduction in fuel consumption and operational costs associated with aircraft ground movements.
3. Significant decrease in greenhouse gas emissions, aligning with global sustainability goals.

6. Key Deliverables:

1. Fully functional prototypes of battery-operated taxi bots.
2. testing reports demonstrating performance under diverse operational scenarios.
3. Integration framework for airport and airbase ground operations.
4. Documentation for operational guidelines and maintenance schedules.

7. Strategic Relevance:

This project will establish a new standard in sustainable aircraft ground movement technologies, contributing to energy conservation, environmental protection, and cost efficiency. It will also enhance operational readiness at military airbases and commercial airports while supporting the nation's broader green initiatives.

- 8. Future Expectation:** The Taxi Bots will be indigenously developed, adhering to industrial and environmental norms, and providing a sustainable and efficient solution for aircraft movement.

- 9. Likely Order Quantity (MoQ):** The anticipated order quantity is 100 units.

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