



# TECHNOLOGY DEVELOPMENT FUND (TDF) SCHEME



## **TITLE: UNIVERSAL FLIGHT DATA RECORDER DATA MINING SUITE FOR AVIONICS APPLICATION**

### **1. Objective:**

To design and develop a Universal Flight Data Recorder (FDR) Data Mining Suite for the avionics application to facilitate quick, efficient, and comprehensive analysis of flight data across multiple aircraft platforms. The suite aims to streamline maintenance processes, enhance safety protocols, and optimize fleet performance.

### **2. Background:**

The user operates a diverse fleet of aircraft, each with unique FDR data formats and analysis requirements. Existing tools are platform-specific and lack the capability to uniformly handle and analyze data from various aircraft. This limitation leads to inefficiencies in post-flight analysis, maintenance, and operational readiness.

### **3. Problem Statement:**

With upgradation of photographic film-based FDRs to solid state FDRs in vintage fleets and induction of new generation aircraft, it is a fact that aircraft generate more data than ever. Various aircraft fleets have different flight data analysis methodologies but similar guiding philosophies. FDR analysis is a weak area and there are number of instances wherein investigation of accidents /incidents has revealed sufficient evidences of known problems during post-accident/incident FDR analysis. Present flight data analysis philosophy does not sufficiently leverage FDR data towards aircraft health monitoring and flight safety.

The challenge is to develop a universal FDR data mining suite that leverages advances in artificial intelligence and data mining to provide comprehensive aircraft health monitoring across all aircraft fleets.

Details of Innovations: The universal FDR data mining suite should feature the following capabilities:

- a. Incorporate AI-driven analysis to identify both known and emerging issues, bypassing the limitations of traditional exceedance detection methods, which only focus on pre-defined parameters.
- b. Provide customized GUI and functionalities that can be tailored to different aircraft fleets, allowing for a flexible and scalable approach to flight data analysis.
- c. Integrate with the existing e-MMS ERP system, creating a robust system that allows for real-time monitoring of aircraft health, safety, and performance.

#### **4. Proposed Solution:**

1. **Universal Compatibility:** Develop a data mining suite capable of decoding FDR data from multiple aircraft platforms.
2. **Advanced Features:** Integrate advanced analytics, including anomaly detection, trend analysis, and predictive maintenance insights.
3. **Modular Architecture:** Ensure scalability and adaptability to future aircraft systems and technologies.
4. **User-Centric Design:** Provide an intuitive interface for ease of use by maintenance teams and data analysts.

#### **5. Expected Outcome:**

1. Unified and efficient analysis of FDR data across various fleet.
2. Reduced aircraft downtime through quicker identification of issues and predictive maintenance.
3. Improved safety and operational readiness of user assets.

#### **6. Key Deliverables:**

1. Fully functional Universal FDR Data Mining Suite.
2. Comprehensive training modules and user documentation.
3. Validation and performance reports demonstrating efficacy across diverse aircraft.
4. Integration plan for seamless deployment within the user ecosystem.

#### **7. Strategic Relevance:**

This project is essential for modernizing maintenance and data analysis capabilities. By providing a unified tool for FDR data mining, it supports the mission readiness and aligns with the nation's indigenization and technological advancement objectives.

#### **8. Future Expectation:**

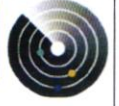
As the e-MMS ERP system stabilizes and is implemented across the country, it will create a large repository of data that can be exploited by the FDR data mining suite. By combining FDR data with e-MMS data analytics, the system will be able to generate high-confidence models that will become a powerful tool for the user. This will significantly enhance aircraft health monitoring, safety, and operational efficiency.

9. **Likely Order Quantity (MoQ):** An immediate requirement exists for an integrated universal FDR data mining suite that can be used by all presently operating fleets. Future inductions of aircraft fleets will also be integrated into this suite.

**--End of Document--**



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### **FEASIBILITY CUM RFI RESPONSE FOR THE PROJECT REQUIREMENT UNDER TDF SCHEME (PROFORMA)**

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**

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