

SOLICITATION AMENDMENT 1

Amendment 1 is raised to formally incorporate the following changes to the solicitation:

1. Amend Annex A to remove “off-the-shelf” verbiage.
2. Amend Annex B to insert Table 3, Schedule of Milestones to the solicitation.

Accordingly, the solicitation is hereby amended as follows:

DELETE: Annex A – STATEMENT OF WORK in its entirety.

INSERT: Annex A – STATEMENT OF WORK as attached.

DELETE: Annex B – BASIS OF PAYMENT in its entirety.

INSERT: Annex B – BASIS OF PAYMENT as attached.

All other terms and conditions remain the same.

STATEMENT OF WORK

1. SCOPE

1.1. Purpose

1.1.1. The purpose of this Statement of Work (SOW) is to describe the requirements and support required from the contractor (hereby referred to as the *provider*), for providing a Flight Data Monitoring (FDM) capability to meet the Canadian Armed Forces (CAF) trial objectives.

1.1.2. The objective of the FDM trial is to assess this capability which could bridge the gap in flight safety prevention. Since the Royal Canadian Air Force (RCAF) does not currently have the means to build this capability internally, the Directorate of Flight Safety (DFS) proposes to contract a third-party supplier (TPS), or provider, that specializes in FDM.

1.2. Background

1.2.1. The RCAF invests an enormous amount of resources in training aircrew and in purchasing technologically advanced aircraft and materiel. Past mishaps have caused tremendous monetary losses, and more tragically, loss of lives. Consequently, DFS was mandated to champion a pro-active, effective, and innovative Flight Safety Program (FSP) that enhances combat-effectiveness by preventing the accidental loss of aerospace resources. To that effect, it is incumbent upon DFS to always strive to provide effective preventive measure (PM) recommendations to stakeholders, and to find pro-active and innovative solutions to predict and prevent mishaps.

1.2.2. Flight Safety (FS) data collection currently relies entirely on occurrences that have been reported, or through evident outcomes. This makes FS prevention efforts reactive by nature. Moreover, this method makes no use of available technology that enables continuous monitoring of routine flights.

1.2.3. FDM is a capability that leverages existing technology. It requires the routine download of flight data saved on aircraft Flight Data Recorders (FDR), or similar recording devices. That data is then analyzed with software capable of identifying trigger events which are set in accordance with (IAW) the current phase of flight, and alerts FS personnel that an event requires their attention. After review, this data is then compiled. The aggregated data can help an FDM analyst determine if unsafe emergent trends exist, if improvement was measurable following the implementation of past pms, or if further investigation is required.

1.2.4. Most accidents are preventable, and result from developing trends and multi-layered latent conditions. In order to become proactive, FS prevention needs to bring into focus those trends and latent conditions through the use of FDM, and to implement pms that

effectively negate the threat. This is akin to ‘analyzing the accident that did not happen.’

1.3. **Intended Use**

- 1.3.1. DFS intends to use this trial as a proof of concept and as an experimental approach to further develop this capability. DFS will internally appoint an FDM cell to manage the capability and operate as FDM analysts.
- 1.3.2. The trial will be conducted on a limited selection of aircraft and will allow collaboration between the selected provider and the FDM cell to establish this new capability, identify best practices, and determine how it can be implemented on the remaining CAF aircraft fleets.

1.4. **Acronyms and Abbreviations**

Abbreviation	Description
CAF	Canadian Armed Forces
COTS	Commercial Off-The-Shelf
DND	Department of National Defence
DFS	Directorate of Flight Safety
FDR	Flight Data Recorder
FDM	Flight Data Monitoring
FS	Flight Safety
FSP	Flight Safety Program
IAW	In Accordance With
NCR	National Capital Region
OPI	Office of Primary Interest
PM	Preventative Measure
RCAF	Royal Canadian Air Force
SME	Subject Matter Expert
SOW	Statement of Work
TPS	Third Party Supplier

Table 1: List of Abbreviations

1.5. **References**

- 1.5.1. The following references are provided with the Request for Proposal. Where mentioned, the following specifications, standards and publications must be used for the preparation of deliverables to the extent specified in this SOW:

Reference	Promulgation	Reference Title
A-GA-135-001/AA-001	2021-11-18	FLIGHT SAFETY FOR THE CANADIAN ARMED FORCES
A-GA-135-003-AG-001	2019-11-19	AIRWORTHINESS INVESTIGATION MANUAL (AIM)
C-05-005-001/AG-001	2022-03-01	TECHNICAL AIRWORTHINESS MANUAL (TAM)

1.6. **Order of Precedence**

1.6.1. In the event of a conflict between the content in this SOW and the referenced documents, the content of this SOW must take precedence.

2. **GENERAL REQUIREMENTS**

2.1. **Scope of Work**

2.1.1. The FDM services provider must meet all the specific requirements identified in this SOW.

2.1.2. The provider must provide the following services:

(a) Full-spectrum FDM services consisting of:

- i. Web application for use by FDM analysts;
- ii. Web hosting of flight data; and
- iii. Automated data processing.

(b) Customer service for the duration of the contract at no additional cost; and

(c) One-time FDM analysis training session.

2.1.3. The FDM services must be established for the following aircraft:

(a) 83 x CH146 Griffon;

(b) 4 x CT142 Gonzo;

(c) 4 x CC144 Challengers.

2.1.4. The duration of the FDM trial is two calendar years from the agreed upon commencement date by DFS and the provider, and all FDM services must remain in place until the end of this contract.

2.2. **Tasks**

2.2.1. The provider must:

- (a) Establish a web platform for DFS to conduct FDM;
- (b) Establish a procedure to manually upload flight data to a dedicated server;
- (c) Provide IT equipment required (i.e. Workstations) to upload flight data, if required;
- (d) Provide secured, remote-access server(s);
- (e) Assist DFS in the setup of the FDM capability (i.e. The technical profiles and flags); and
- (f) Train DFS personnel on the system and in-flight data analysis in general.

2.3. **Constraints**

2.3.1. The provider must provide the capability without the need to install additional hardware on the subject fleet(s). Additionally:

- (a) The FDM system must not contravene the *Technical Airworthiness Manual (TAM)*; and
- (b) The FDM services provided must follow the intent of the FSP as described in the *A-GA-135 series of documents*.

2.4. **Support Provided by Canada**

2.4.1. DFS will appoint an FDM Officer to manage the project, and act as the FDM cell Lead within DFS. This person will be the Office of Primary Interest (OPI) for technical set up of the capability.

3. **OPERATIONAL REQUIREMENTS**

3.1. **Security**

3.1.1. The system must be able to send, receive, process, and store data in a secure manner. The flight data is not classified but *may contain sensitive information*. As such, safeguards must be in place to ensure only authorized personnel can access it. The authority for accessing flight data rests with DFS.

3.2. **Compatibility**

- 3.2.1. The system must be compatible with existing FDR data. It must not require any additional airframe hardware installation in order to function (IAW paragraph 2.3.1 above).
- 3.2.2. The Web Application must be accessible from the Internet from any type of device (desktop or mobile) in a browser-based application.
- 3.2.3. The application should be accessible via the Defence-Wide Area Network (DWAN). In the event the application is blocked by DWAN firewall, DFS personnel would not be able to access the application using their government-issued IT equipment (laptop). In this case, the provider must lend an adequate number of laptops (minimum of 2) to DFS for the duration of the contract.

3.3. **Operability**

- 3.3.1. The Web platform must be accessible from any CAF operational location.
- 3.3.2. The capability must be accessible at all times, with the exception of short outages for maintenance purposes or due to unforeseen circumstances. The provider must give DFS a 48-hour notice for any known upcoming outages.

4. **PLATFORM REQUIREMENTS**

4.1. **System**

- 4.1.1. The system must be capable of handling all the required data without any bandwidth or storage limitations.
- 4.1.2. The system must be able to store all available flight data with high fidelity and minimal data loss.

4.2. **Web Interface**

- 4.2.1. The User Interface (UI) must be modern and designed to be user-friendly and intuitive. This is to ensure only minimal training is required for new DFS personnel.
- 4.2.2. The UI must also have a customizable layout to fit user preferences.
- 4.2.3. The UI must be available in both official languages (i.e. French and English).
- 4.2.4. The system must allow the user to pre-define event flags of interest.
- 4.2.5. The user must also be able to add additional flags and conduct retrospective analysis on all available flight data based on those new flags.

4.3. **User Profiles**

- 4.3.1. The Web Application must be tailored to the user-level access determined by DFS.
- 4.3.2. DFS (as the administrator) must be able to create new user-profiles and determine their level of access.
- 4.3.3. User accounts properties must include:
 - (a) Personal identification credentials;
 - (b) Level of access; and
 - (c) Group inbox access (i.e. Assigned to a fleet or unit, depending on user).
- 4.3.4. Users must be able to select their preferred settings, including official language preference per paragraph 4.2.3 above.

4.4. **Application Features**

- 4.4.1. The application's main page must be a user dashboard which highlights the following information at a minimum:
 - (a) Recent alerts/flagged events;
 - (b) Statistics of trending events;
 - (c) An inbox of events assigned to the user for review.
- 4.4.2. Notwithstanding paragraph 4.1.1 above, these items need not to be always displayed:
 - (a) A toggle display (show-hide) is perfectly acceptable; and
 - (b) Empty items may be hidden by default.
- 4.4.3. The application must allow for collaboration between multiple users/groups. This must include, at a minimum:
 - (a) The ability for a user to receive only alerts assigned to their group (fleet/unit);
 - (b) The ability for multiple users of the same group (fleet/unit) to collaborate and review events from a common inbox, and track the remaining open items in real-time; and
 - (c) Re-assign event for review to another user of the same group, or to another group (fleet/unit), if required.
- 4.4.4. The application must allow user to research previous events using keywords and filters on the following data fields as a minimum:

- (a) Geolocation;
- (b) Aircraft type;
- (c) Event type;
- (d) Risk level; and
- (e) Event status (open or closed).

4.4.5. The application must include a visual playback (i.e. Animation module) feature. This feature must include:

- (a) A customizable layout which lets the user rearrange cockpit displays and flight path information;
- (b) 3D rendering of the playback sequence; and
- (c) High-fidelity own-ship geolocation, as well as terrain and airport rendering.

4.4.6. The system must include an information distribution feature to allow DFS to create reports on interpreted FDM data and statistics for external use. This feature must:

- (a) Include the option to create and publish some predefined reports automatically; and
- (b) Host published reports on the Web for internal (DFS use), or public access, as determined by DFS for the specified report type.

5. PROVIDER REQUIREMENTS

5.1. Provider Expertise

5.1.1. The provider must have a minimum of 5 years of experience as an FDM service provider.

5.1.2. Additionally, the provider should have experience in aviation crash investigation.

5.1.3. The provider should have experience as an FDM service provider to major aircraft operators, either military or civilian.

5.1.4. The provider must be capable of training DFS personnel and offer this training within the agreed upon schedule after contract award. This training must be conducted in person in the NCR.

BASIS OF PAYMENT

During the period of the Contract, the Contractor will be paid in a single payment as specified below.

1. Contract Period

The contract period is for a duration of two (2) calendar years.

All Prices must be projected for the entire contract length of two (2) years.			
Line Item	Description	Requirement	Cost
1	Software Subscription	2 Years	\$
2	Initial training (as per Annex A, 5.1.4)	One-time	\$
3	Accessories (list all expected costs to GoC)	2 Years	\$
4			\$
5			\$
6			\$
		Total (excluding taxes)	\$

Table 2: Basis of Payment

2. Schedule of Milestones

The schedule of milestones for which payments will be made in accordance with the Contract is as follows:

Milestone No.	Description or “Deliverable”	Firm Amount	Due Date or “Delivery Date”
1	Software Subscription activated and required equipment delivered to destination, Year 1	As per Annex B, Table 2	Upon Contract award
2	Initial training (as per Annex A, 5.1.4)	As per Annex B, Table 2	Upon contract award
3	Software Subscription activated and required equipment delivered to destination, Year 2	As per Annex B, Table 2	Upon start of the second calendar year of the contract

Table 3: Schedule of Milestones