

ARINC Project Initiation/Modification (APIM)

- 1.0 Name of Proposed Project** **APIM 17-004**
Autonomous Distress Tracking (ADT)
- 1.1 Name of Originator and/or Organization**
Boeing / Jessie Turner
- 2.0 Subcommittee Assignment and Project Support**
- 2.1 Suggested AEEC Group and Chairman**
Group: Global Aeronautical Distress and Safety System (GADSS) Working Group of the Systems Architecture and Interfaces (SAI) Subcommittee
Chairman: Charles Adler, Boeing
- 2.2 Support for the activity**
Airlines: American, Delta, FedEx, Southwest, TAP, United, UPS
Airframe Manufacturers: Airbus, Boeing, Embraer
Suppliers: L3T AP, Avionica, Cobham Satcom, FLYHT, Honeywell, Inmarsat, Iridium, Panasonic, Rockwell Collins, Teledyne, Thales, Universal Avionics, and TBD-others
Others: TBD
- 2.3 Commitment for Drafting and Meeting Participation**
Airlines: American, United
Airframe Manufacturers: Boeing, Airbus
Suppliers: L3T AP, FLYHT, Inmarsat, Iridium, Panasonic, Thales and TBD-others
Others: TBD
- 2.4 Recommended Coordination with other groups**
AEEC: Traffic Surveillance Subcommittee
EUROCAE: Working Group 98 (WG-98)
ICAO Surveillance Panel
- 3.0 Project Scope**
- 3.1 Description**
The difficulty in locating the crash sites of Air France Flight 447 in June 2009 and Egypt Air Flight 804 in May 2016, and the disappearance of Malaysia Airlines Flight 370 in March 2014, has prompted significant international effort to provide means for a global aircraft tracking capability. Since 2015, ICAO has worked to amend ICAO Annex 6 standards to include requirements for tracking commercial

Specify: To comply with forthcoming ADT mandates

Mandate/regulatory requirement yes no

Forthcoming global mandates for Autonomous Distress Tracking.

Is the activity defining/changing an infrastructure standard? yes no

Specify: TBD

When is the ARINC Standard required? Jan. 2019

What is driving this date? Expected Autonomous Distress Tracking mandates of Jan. 1, 2021 (for forward-fit aircraft).

Are 18 months (min) available for standardization work? yes no

Are Patent(s) involved? yes no

If YES please describe, identify patent holder: Boeing is aware that multiple patents from multiple companies (including Boeing) have been applied for in this area.

3.3 Issues to be worked

Phase 1

Tasks:

1. Document the end-to-end system requirements that are being levied by ICAO and individual Civil Aviation Authorities (CAAs) (both at the aircraft-level and on-ground systems).
2. Develop a System Functional Block Diagram, allocating the requirements (ICAO and CAAs) to each functional block.

Product: ARINC Report (under configuration control)

Duration: ~3 months

Phase 2

Tasks:

1. Develop candidate architectures (both at the aircraft-level and on-ground systems) that would meet these system-level requirements.
2. Choose an architecture (or architectures) in which to develop detailed equipment and aircraft installation requirements, as well as ground system requirements

Product: ARINC Report (under configuration control)

Duration: ~6 months

Phase 3

Task: Develop detailed equipment, interface, and aircraft installation requirements, as well as ground system requirements, for an architecture (or architectures).

Product: ARINC Characteristic(s) (new or revised)

Duration: ~10 months

There are a few potential aircraft tracking architectures that are expected to be evaluated, including (but not limited to) the following:

- A Satcom-based tracker
- A Fixed Emergency Locator Transmitter – Distress Tracker (ELT-DT)
- Space-based Automatic Dependent Surveillance – Broadcast (ADS-B)

In order to complete Phase 2, other AEEC subcommittees (e.g. the Traffic Surveillance Subcommittee for Space-based ADS-B) may be requested to assist the SAI subcommittee to develop candidate architectures. Also, depending on the chosen architecture(s), Phase 3 may be worked within the SAI subcommittee, or another AEEC subcommittee(s).

4.0 Benefits

4.1 Basic benefits

Operational enhancements? yes no

For equipment standards:

- a. Is this a hardware characteristic? yes no
- b. Is this a software characteristic? yes no
- c. Interchangeable interface definition? yes no
- d. Interchangeable function definition? yes no

If not fully interchangeable, please explain: Not applicable

Is this a software interface and protocol standard? yes no

Specify:

Product offered by more than one supplier yes no

Identify: Yes – Multiple suppliers depending on the chosen architecture(s).

4.2 Specific project benefits (Describe overall project benefits.)

4.2.1 Benefits for Airlines

Airlines are expected to benefit in being able to meet the forthcoming worldwide Autonomous Distress Tracking mandates in the most effective manner (minimize overall cost, reduced risk, within schedule, etc.).

4.2.2 Benefits for Airframe Manufacturers

Airframe manufacturers will benefit by being able to implement common installation(s)/solution(s) across all of their aircraft models with minimized changes to the aircraft.

4.2.3 Benefits for Avionics Equipment Suppliers

Avionics equipment suppliers will benefit by being able to provide equipment that can be installed on multiple aircraft platforms, across multiple aircraft OEMs.

5.0 Documents to be Produced and Date of Expected Result

ARINC Status Report, “Autonomous Distress Tracking (ADT) System-Level Requirements”, in July October 2017.

ARINC Report, “Autonomous Distress Tracking (ADT) Requirements and Architectures Study”, in Feb. 2018.

Modification of existing ARINC Characteristic(s), or introduction of a new “Autonomous Distress Tracking (ADT) System” Characteristic, in Jan. 2019 (dependent upon chosen architecture(s)).

5.1 Meetings and Expected Document Completion

The following table identifies the number of meetings and proposed meeting days needed to produce the documents described above.

Activity	Mtgs	Mtg-Days (Total)	Expected Start Date	Expected Completion Date
<i>Phase 1: Document the end-to-end system requirements</i>	One 2-day meeting plus teleconferences	2	May 2017*	July Oct 2017
<i>Phase 2: Develop candidate architectures, and select architecture(s)</i>	Three 3-day meetings plus teleconferences	9	August 2017	Feb. 2018
<i>Phase 3: Develop detailed equipment, interface, and aircraft installation requirements, as well as ground system requirements</i>	Three 3 day meetings plus teleconferences	9	March 2018	Jan. 2019**

* The start date of Phase 1 (May 2017) is contingent on completion of the ICAO GADSS ConOps (and other associated documents).

** The completion date of Phase 3 (Jan. 2019) is driven by a Jan. 1, 2021 (individual Certificate of Airworthiness) forward-fit mandate (ref. ICAO Annex 6, Part I, §6.18.1). 24 months is considered the minimum time needed for system development.

6.0 **Comments**

6.1 **Expiration Date for the APIM**

February 2019