



International Civil Aviation Organization

MIDANPIRG ATM Sub-Group

Second Meeting (ATM SG/2)
(Cairo, Egypt, 30 November – 03 December 2015)

Agenda Item 3: Global and Regional Developments related to ATM and SAR

GLOBAL/REGIONAL DEVELOPMENTS RELATED TO WRC-15

(Presented by the Secretariat)

SUMMARY

This paper presents some of the wins in the WRC-15 (World radio communication conferences, mainly related to the Global Flight Tracking (GFT) and RPAS C2 link.

Action by the meeting is at paragraph 3.

REFERENCES

- Report of Special Meeting on Global Flight Tracking
- ITU Resolution from WRC-15

1. INTRODUCTION

1.1 World radio communication conferences (WRC) are held every three to four years. It is the job of WRC to review, and, if necessary, revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits. Revisions are made on the basis of an agenda determined by the ITU Council, which takes into account recommendations made by previous world radio communication conferences.

2. DISCUSSION

2.1 The loss of AF447 and the disappearance of MH370 for a prolonged period of time have reiterated the need to improve global flight tracking capabilities in the near term.

2.2 The meeting may wish to recall that a Special Meeting on Global Flight Tracking was convened in Montreal, 12-13 May 2014 to address the flight tracking issues in order to gain consensus among ICAO Member States and the international air transport industry sector on the near-term priority to track airline flights, no matter their global location or destination. The meeting established a framework for future efforts in this regard for the medium and long term

2.3 The Special Meeting on Global Flight Tracking noted that:

- ICAO Air Navigation Commission (ANC) tasked the Operational Data Link Panel (OPLINKP) with the review of ICAO SARPs and guidance material with the objective of improving safety for flights over oceanic and remote areas, based on the recommendations from the BEA report and the HLSC 2010.
- Changes to ICAO Annex 10 — *Aeronautical Telecommunications*, Volume II — *Communication Procedures including those with PANS status* and ICAO *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) become applicable in November 2014 to facilitate surveillance of aircraft, using existing equipment and technology. It will require operators and air navigation service providers to make better use of existing controller-pilot data link communications (CPDLC) and automatic dependent surveillance – contract (ADS-C) through the implementation of more stringent procedures to ensure successful logon between ground and airborne systems, as well as the introduction of mandatory warnings sent to air traffic control (ATC) by an aircraft whenever deviations from the cleared route of flight and level are detected. This was determined to be an initial step for the improvement of surveillance and communications over oceanic and remote areas. This was also identified as a low cost solution, using existing equipment and technology. It was not meant to mandate additional equipment.

2.4 The Conclusions and recommendations of the Special Meeting on Global Flight Tracking are at **Appendix A**, among them was:

“ICAO should encourage States and International Telecommunication Union (ITU) to take action, at the earliest opportunity, to provide the necessary spectrum allocations as emerging aviation needs are identified. This includes spectrum for satellite and radio services used for safety of life aviation services. ICAO encourages ITU to place this on the Agenda for the upcoming ITU World Radio Conference 2015”.

2.5 The WRC-15 was held in Geneva, Switzerland (2-27 November 2015) and was attended by more than 4100 people and delegates, while WRC-12, (23 January - 17 February 2012 Geneva, Switzerland) was attended by 3200 people.

2.6 The meeting may wish to note that the end result of WRC-15, were great success in promoting/defending the ICAO Position, agreement has been reached at the WRC-15 on the allocation of radiofrequency spectrum for global flight tracking in civil aviation. **Appendix B** presents the ITU Resolution.

2.7 The frequency band 1087.7-1092.3 MHz has been allocated to the aeronautical mobile-satellite service (Earth-to-space) for reception by space stations of Automatic Dependent Surveillance-Broadcast (ADS-B) emissions from aircraft transmitters.

2.8 The frequency band 1087.7-1092.3 MHz is currently being utilized for the transmission of ADS-B signals from aircraft to terrestrial stations within line-of-sight. The WRC-15 has now allocated this frequency band in the Earth-to-space direction to enable transmissions from aircraft to satellites. This extends ADS-B signals beyond line-of-sight to facilitate reporting the position of aircraft equipped with ADS-B anywhere in the world, including oceanic, polar and other remote areas.

2.9 WRC-15 recognized that as the standards and recommended practices (SARP) for systems enabling position determination and tracking of aircraft are developed by the International Civil Aviation Organization (ICAO), the performance criteria for satellite reception of ADS-B signals will also need to be addressed by ICAO.

2.10 The meeting may wish to note that the earliest win the GFT was due to a lot of legwork and sweat prior to the conference. Another win for the aviation in WRC-15 was an allocation for Wireless Aircraft Intra-communications (WAIC).

2.11 Furthermore, as a follow-up to GFT, ICAO now has a WRC-19 agenda item to facilitate the development of Global Aeronautical Distress and Safety System (GADSS). End results of WRC-15 were exceptional since Aviation has a really good and flexible agenda item for WRC-19; and ICAO with States have to work very hard for the next four years to make good use of it.

2.12 The meeting may wish to note toughest victory in WRC-15 was the development of an allocation for RPAS C2 links using FSS spectrum. The allocation is provisional, and will enter into full force in 2023, provided that ICAO are successful in developing SARPs using the conditions described in the ITU Resolution associated with the allocation. However the important part is that this Resolution gives the RPAS panel the spectrum allocation they need for development of SARPs for the C2 link.

2.13 The meeting may wish to note the possible consequence of these developments as an impact on Distress Tracking in the future and affirmed that it would monitor and actively involve itself, where able, in the development of guidelines by ICAO.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) urge States to bring to the attention of their relevant authorities the new ITU Resolution at **Appendix B**, for appropriate action; and
- b) encourage States to monitor and consider the developments related to ADS-B in their national ATM and SAR plans.

APPENDIX A

**CONCLUSIONS AND RECOMMENDATIONS
SPECIAL MEETING ON GLOBAL FLIGHT TRACKING
MONTRÉAL, 12-13 MAY 2014**

The International Civil Aviation Organization (ICAO), upon the completion of this Special Meeting on Global Flight Tracking of Aircraft, forged consensus among its Member States and the international air transport industry sector on the near-term priority to track airline flights, no matter their global location or destination. Furthermore, the meeting established a framework for future efforts in this regard for the medium and long term.

The meeting concluded that:

NEAR-TERM

- a) global tracking of airline flights will be pursued as a matter of priority to provide early notice of and response to abnormal flight behaviour;
- b) a DRAFT concept of operations on flight tracking will be developed that includes a clear definition of the objectives of flight tracking that ensures that information is provided in a timely fashion to the right people to support search and rescue, recovery and accident investigation activities, as well as, the roles and responsibilities of all stakeholders;
- c) under the ICAO framework, the contribution by the industry through an Aircraft Tracking Task Force (ATTF) will help address the near-term needs for flight tracking;
- d) ICAO will consider establishing a short term joint ICAO/IATA advisory group to support the global tracking initiative;
- e) airlines will be encouraged to use existing equipment and procedures to the extent possible to support flight tracking pending the outcome of the AATF;
- f) in partnership with the Task Force, ICAO will develop guidance material, based on available flight tracking best practices;
- g) a FINAL high level concept of operations should be delivered to the ICAO High Level Safety Conference (HLSC 2015, February, Montreal);
- h) ICAO should increase its resources allocated to the Search and Rescue in order to improve the effectiveness across national and regional boundaries;

- i) ICAO should, in collaboration with a pool of search and rescue experts, identify and address operational search and rescue challenges with implementation of existing Annex 12 provisions, and provide assistance to States, including aiding in the setting of priorities for the mid and long term;
- j) ICAO should facilitate the sharing of experience and lessons learned from States that were recently involved in accidents where flight tracking could have facilitated search and rescue efforts to all other States;
- k) ICAO should strongly encourage States to regularly run practice exercises involving airlines operation centres, air navigation service providers (ANSPs) and rescue coordination centres (RCCs) to test and verify their ability to respond and coordinate together in an integrated manner to abnormal flight behaviour scenarios;

MID-TERM

- l) ICAO performance based provisions should be developed, using a multidisciplinary approach, on flight tracking to support the location of an accident site in a timely manner for the purpose of search and rescue and accident investigation;
- m) ICAO performance based provisions addressing flight tracking requirements should be sufficiently flexible to accommodate regional needs and be commensurate to operational situations;
- n) ICAO should encourage States and International Telecommunication Union (ITU) to take action, at the earliest opportunity, to provide the necessary spectrum allocations as emerging aviation needs are identified. This includes spectrum for satellite and radio services used for safety of life aviation services. ICAO encourages ITU to place this on the Agenda for the upcoming ITU World Radio Conference 2015;
- o) COSPAS-SARSAT should be invited to continue to investigate, within its own program and in partnership with the industry, the means of improving the reliability and utility of emergency locator transmitter (ELTs), particularly in the context of flight tracking during a distress event; and

LONG-TERM

- p) ICAO should work in coordination with ITU to develop aviation requirements for network communications associated with remote storage of flight information.

APPENDIX B

RESOLUTION COM4/2 (WRC-15)

Use of the frequency band 1 087.7-1 092.3 MHz by the aeronautical mobile-satellite (R) service (Earth-to-space) to facilitate global flight tracking for civil aviation

The World Radiocommunication Conference (Geneva, 2015),

considering

- a) that Resolution 185 (Busan, 2014) of the Plenipotentiary Conference instructed WRC-15, pursuant to No. 119 of the ITU Convention, to include in its agenda, as a matter of urgency, the consideration of global flight tracking, including, if appropriate, and consistent with ITU practices, various aspects of the matter, taking into account ITU-R studies;
- b) that the frequency band 960-1 164 MHz is allocated to the aeronautical radionavigation service (ARNS) and the aeronautical mobile (R) service (AM(R)S);
- c) that the frequency band 960-1 164 MHz is used by International Civil Aviation Organization (ICAO) standardized and non-ICAO systems, thus creating a complex interference environment;
- d) that Automatic Dependent Surveillance-Broadcast (ADS-B) is defined by ICAO, and involves aircraft transmission of data such as identification and position;
- e) that the frequency band 1 087.7-1 092.3 MHz is currently utilized for terrestrial transmission and reception of ADS-B signals in accordance with ICAO standards, involving transmissions from aircraft to terrestrial stations on the ground within line-of-sight;
- f) that this conference allocated the frequency band 1 087.7-1 092.3 MHz to the aeronautical mobile-satellite (R) service (AMS(R)S) in the Earth-to-space direction, limited to the space station reception of ADS-B emissions from aircraft transmitters that operate in accordance with recognized international aeronautical standards;
- g) that the allocation of the frequency band 1 087.7-1 092.3 MHz to AMS(R)S is to extend reception of currently transmitted ADS-B signals beyond terrestrial line-of-sight, to facilitate reporting the position of ADS-B equipped aircraft located anywhere in the world;
- h) that, taking into account *considering c)*, use of the frequency band 1 087.7-1 092.3 MHz requires some administrations to control all users to ensure proper operation of all terrestrial systems,

recognizing

- a) that ICAO develops Standards and Recommended Practices (SARPs) for systems enabling position determination and tracking of aircraft;
- b) that Annex 10 to the Convention on International Civil Aviation contains SARPs for terrestrial ADS-B usage of the frequency band 1 087.7-1 092.3 MHz,

noting

that the development of performance criteria for space station reception of ADS-B operating under the provisions of No. 5.A25, including whether such criteria would require modifications to ICAO standard ADS-B equipment, is the responsibility of ICAO,

resolves

1. that the use of the frequency band 1 087.7-1 092.3 MHz by AMS(R)S systems shall be in accordance with recognized international aeronautical standards;
2. that AMS(R)S systems (Earth-to-space) in the frequency band 1 087.7-1 092.3 MHz shall be designed so that they can operate in the interference environment as described in *considering c*);
3. that, taking into account *resolves 2*, AMS(R)S use of the frequency band 1 087.7-1 092.3 MHz shall not constrain administrations which have responsibilities as referred to in *considering h*),

invites the ITU Radiocommunication Sector

to complete, as a matter of urgency, the studies related to the space station reception of ADS-B in the frequency band 1 087.7-1 092.3 MHz,

further invites the International Civil Aviation Organization

to continue to participate in the studies,

instructs the Secretary-General

to bring this resolution to the attention of ICAO and communicate the results of the studies when available.