INTERNATIONAL CIVIL AVIATION ORGANIZATION

**TWENTY NINTH MEETING OF THE ASIA/PACIFIC
AIR NAVIGATION PLANNING AND IMPLEMENTATION
REGIONAL GROUP (APANPIRG/29)**

Bangkok, Thailand, 3 to 5 September 2018

Agenda Item 3:	**Performance Framework for Regional Air Navigation Planning and Implementation**
3.2:	**ATM**

GLOBAL AERONAUTICAL DISTRESS AND SAFETY SYSTEM

(Presented by the United States)

SUMMARY

This paper discusses the Global Aeronautical Distress and Safety System (GADSS) and the implementation of its aircraft tracking functions.

Strategic Objectives:
  A: ***Safety*** *– Enhance global civil aviation safety*

1. INTRODUCTION

1.1 The Sixth Meeting of the APANPIRG Air Traffic Management Sub-Group (ATM/SG/6), Hong Kong, China, 30 July to 03 August 2018) endorsed two Draft Conclusions regarding ICAO Montreal's Global Aeronautical Distress and Safety System (GADSS) aircraft tracking requirements. The United States submitted a working paper to the Thirteenth Air Navigation Conference (ANC 13), 09-19 October 2018, which discusses GADSS under Agenda Item 4 *Implementing the global air navigation system and the role of planning and implementation regional groups (PIRGs)*.

2. DISCUSSION

2.1 The two draft conclusions from APANPIRG ATM/SG/6 and the U.S. working paper submitted for ANC 13 discuss issues pertaining to the implementation of the GADSS functions for aircraft tracking. The U.S. paper also has recommendations regarding the need for further resources, including at regional offices.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to note the information contained in this paper.

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International Civil Aviation Organization

WORKING PAPER

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE A

Agenda Item 4: **Implementing the global air navigation system and the role of planning and implementation regional groups (PIRGs)**
4.4: Implementing search and rescue (SAR) processes and procedures

IMPLEMENTING SEARCH AND RESCUE (SAR) PROCESSES AND PROCEDURES

(Presented by the United States)

EXECUTIVE SUMMARY

This paper outlines the improvements needed in the area of search and rescue (SAR) and the impact of the Global Aeronautical Distress and Safety System (GADSS).

Action: The Conference is invited to agree to Recommendation 4.4/x: SAR and the GADSS, in paragraph 3.1.

1.   **INTRODUCTION**

1.1   SAR processes and procedures are best implemented through regional cooperation and collaboration as detailed in Annex 12 – *Search and Rescue*. Implementation of new Standards, relating to the location of an aeroplane in distress in support of the GADSS, will enhance aviation safety for the crew and passengers of commercial aircraft and for SAR responders. However, response to some SAR incidents and audits under the Universal Safety Oversight Audit Programme reveal significant gaps in SAR capability and the need to improve cooperation and collaboration among the various SAR stakeholders within many States and regions.

1.2   Performance of SAR operations depends largely on the organization of SAR services and preparations undertaken before the operations occur, and is based on planning and coordinated approaches. Local, regional and global collaborative frameworks support these operations based on SAR operational scenarios and requirements. Planning and implementation regional groups (PIRGs) can provide direction to national plans for implementation of the global SAR system. PIRG actions therefore have a direct relevance for SAR.

2.   **DISCUSSION**

2.1   The 38th Session of the Assembly resolved (Resolution A38-12, Appendix H) that Member States should, in cooperation with other States and ICAO, seek the most efficient and effective delineation of SAR regions. They should consider, as necessary, pooling available resources or jointly establishing a single SAR organization to be responsible for the provision of SAR services within areas extending over the territories of two or more States or over the high seas.

2.2   PIRGs are best suited to initiate the action called for in Assembly Resolution A38-12. Workshops and working groups conducted under ICAO Regional Offices have demonstrated how regions can initiate cooperation within themselves and with adjacent regions. Conclusion of cooperation agreements has been a common theme among many of these initiatives.

2.3   Cooperation agreements can encompass various levels of the organizations usually involved in SAR. Agreements should be concluded both at the State level, as well as at the operational level to ensure cooperation between operational units involving, when necessary, military authorities who often play an important role in SAR operations. They can also be comprehensive bilateral agreements specifying the cooperative arrangements supporting overall SAR cooperation and coordination.

2.4   Implementation of the GADSS offers an opportunity for all PIRGs to re-evaluate SAR-related regional agreements and cooperation mechanisms in their regions. This will facilitate discussions and overcome the shortcomings of SAR organization, notably the absence of cooperation agreements to facilitate the organization and the conduct of SAR operations. Such agreements will ensure efficient information exchange between air traffic services units (ATSUs) and rescue coordination centres (RCC), as well as with military authorities.

2.5   **Global Aeronautical Distress and Safety System (GADSS)**

2.5.1   GADSS is being implemented in the short, medium, and long terms. It has four high level objectives, three of which are for SAR: (1) Ensure timely detection of aircraft in distress (timely initiation of SAR actions); (2) Ensure tracking of aircraft in distress and timely accurate location of end of flight (accurate direction of SAR actions); (3) Enable efficient and effective SAR operations; and (4) Ensure timely retrieval of flight recorder data.

2.5.2   To achieve the high-level objectives, GADSS identifies three specific functions: (1) Ensure timely detection of aircraft in distress (timely initiation of SAR actions); (2) Autonomous Distress Tracking (ADT); and (3) Post flight localization and recovery.

2.5.3   The "aircraft tracking" function for normal aircraft operations does not introduce any changes to current air traffic control alerting procedures and becomes applicable 8 November 2018.

2.5.4   The ADT can have a major positive impact on SAR. The ADT capability is still being developed and becomes applicable 1 January 2021.

2.6   Several ICAO documents apply to GADSS and implementing of SAR processes and procedures. Some of these documents are outlined below to show that the basic ground infrastructure already exists to attain the GADSS goal of exchanging information and alert notifications among the aircraft operator, the ATSU and the RCC. Core ICAO documents include:

2.6.1   **Annex 6 –** *Operation of Aircraft, Part I* – *International Commercial Air Transport –* *Aeroplanes,* Chapter 6, 6.18: Location of an aeroplane in distress; and, Appendix 9 and Attachment K to Annex 6 Part I: The recent amendment to Annex 6 requires the aircraft when in distress to transmit information on its position; and, for the operator to make this information available to the appropriate organizations. This information is to be available to the ATSUs and the RCCs. Various ICAO expert groups continue to develop the guidance material and procedures to implement these Standards and Recommended Practices (SARPs).

2.6.2   **Annex 11 –** *Air Traffic Services*, Chapter 5: Alerting Service: Requires air traffic services units to notify RCCs immediately when an aircraft is considered to be in a state of emergency. In addition, when an area control or a flight information center decides that an aircraft is in the uncertainly or the alert phase, it shall, when practicable, advise the operator prior to notifying the RCC; and, if the aircraft is in the distress phase, the RCC has to be notified immediately.

2.6.3   **Annex 12 –** *Search and Rescue*: Current RCC processes are established under the provisions of ICAO Annex 11 and ICAO Annex 12, and apply to the Aeronautical RCC. As specified in Annex 11, Chapter 5, the ATSU is to notify the RCC immediately when an aeroplane is considered to be in a state of emergency. Once notified of a distress, the RCC will initiate action based on operating procedures set forth in Annex 12. The RCC is required to have readily available at all times up-to-date information on its SAR region, including ATSUs addresses and telephone numbers of all operators, or their designated representatives, engaged in operations in the region. The responsible RCC and associated ATSU serving the flight information region in which the aeroplane is operating coordinate their activities and work closely together. If the aeroplane in distress continues in flight and crosses into other SAR region(s), coordination may be handed off to other RCCs and their associated ATSUs.

2.6.4   **GADSS Concept of Operations (ConOps):** The GADSS ConOps describes in an evolutionary manner the execution of actions in the short, medium and long terms with each action resulting in benefits. This document specifies the high-level requirements and objectives for the GADSS, which is discussed above.

2.6.5   **ANWP Job-Card Implementation of the GADSS:** ANWP Job-Card V 4.0, approved by the Air Navigation Commission, provides an overview of the outputs from the GADSS Advisory Group and the basic work plan for it and other ICAO expert groups. The Job-Card has 14 tasks for working on guidance material and procedures, and possible future amendments to ICAO SARPs, for the next several years. The last task applies specifically to PIRGs.

2.7   **Implementation of GADSS in support of SAR**

2.7.1   Implementation of GADSS may confirm significant gaps in SAR capability in many regions and reaffirm the need to improve cooperation and collaboration among various SAR stakeholders within many States and regions. Effectiveness of the current alerting of SAR services should be improved by addressing a number of key areas, such as the general organization of SAR services or the timely reaction to a distress alert. Implementation of GADSS will improve overall efficiency of SAR for crew and passengers of commercial aircraft and SAR responders by reducing the area to search and searching time.

2.7.2   The capacity to exchange aircraft position information among aircraft operators, ATSUs and RCCs, as well as military authorities and others, will rely on an information management system ensuring the timely availability of data to the appropriate stakeholders. The basic infrastructure is in place and would be further enabled by implementation of system-wide information management (SWIM).

States, on a national and regional level, need to ensure its effectiveness, and where needed, improvements. SAR operations, especially over the high seas, are often a multi-national response, based on the establishment of coordination and cooperation procedures at the level of States, ATSUs and RCCs.

2.8   ICAO has limited sources of SAR expertise. In many ways, the ICAO Regional Office ATM Officer is overloaded. Other than one technical officer at ICAO Montreal assigned SAR and other duties, there is one primary standing group, the ICAO/International Maritime Organization Joint Working Group on SAR (ICAO/IMO JWG). The JWG meets annually. The IMO has established the ICAO/IMO JWG as a permanent advisory body for the review and modernization of its Global Maritime Distress and Safety System. The JWG could serve a similar role for the implementation of GADSS. In addition, some JWG members might be able to provide other types of support, such as participating in ICAO regional meetings, other regional/international forums related to GADSS, applicable ICAO expert groups, etc.

2.9   The Global Air Navigation Plan (GANP) (Doc 9750) guides States and stakeholders towards interoperability of systems and harmonization of procedures. SAR and GADSS should be included in the GANP. As part of the development of the sixth edition of the GANP, the Aviation System Block Upgrades framework outlines elements and enablers that allow achievement of operational improvements. Inclusion of SAR as a Basic Building Block and GADSS functions within the GANP will enable a methodical, sustained effort to improve SAR services and quality implementation of GADSS.

3.   **CONCLUSION**

3.1   Providing competent SAR services is dependent on their organization and implementation of regional cooperation and collaboration. The implementation of new Standards in support of GADSS will help to further enhance aviation safety and provide an opportunity to review and improve existing SAR processes and procedures. The Conference is invited to agree to the following recommendation:

> **Recommendation 4.4/x: Search and rescue (SAR) and the global aeronautical distress and safety system (GADSS)**
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> That the Conference:
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> a) request ICAO to provide further support to its regional offices, particularly for organizing and conducting regional SAR seminars/workshops to facilitate implementation of GADSS and regional SAR cooperation and collaboration efforts;
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> b) request ICAO to expand the role of the ICAO/International Maritime Organization Joint Working Group on Search and Rescue (ICAO/IMO JWG) to support GADSS and other SAR initiatives; and,
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> c) request ICAO to include the organization of SAR and the description of all GADSS functions in the sixth edition of the GANP.

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